City Plan Services P/L
30 075 223 353

CONSTRUCTION CERTIFICATE NO. 240258/1

Issued under Part 6 of the Environmental Planning and Assessment Act 1979

APPLICANT

Name of person having benefit of the development consent:	**Frasers Property Ivanhoe Pty Limited**
Address:	**Level 2, 1C Homebush Bay Drive, Rhodes NSW 2138**

DEVELOPMENT CONSENT

Consent Authority/Local Government Area:	**Ryde City Council**
Development Consent No:	**SSD-15822622, SSD 15822622 MOD 1 & SSD 15822622 MOD 2**
Date of Development Consent:	**28/11/2022, 14/11/2023 & 05/08/2024**

PROPOSAL

Address of Development:	**Ivanhoe Estate, Macquarie Park, Ryde**
Lot & DP No:	**Lot 100/-/DP1262209**
Building Code of Australia (BCA) Classification:	**Class 2, 6, 7a & 9b**
Applicable version of the BCA:	**BCA 2022**
Type of Construction:	**Type A**
Description of development:	**Stage 2 redevelopment of the Ivanhoe Estate, including:** ▪ **Excavation and earthworks** ▪ **Construction of a community facilitates building (Building C2) and two residential apartment buildings (Building C3 and Building C4) with basement car parking:** - **Building C3 with 162 dwellings, 163 car parking spaces and ground floor retail** - **Building C4 with 488 dwellings and 396 car parking spaces** ▪ **Construction of Village Green public open space** ▪ **Utilities, services infrastructure and public domain areas**
Scope of building works covered by this Certificate:	**Stage 1 – Piling, earthworks, stormwater and demolition (Building C2)**
Value of Construction Certificate (Incl GST):	**$29,856,651.00**
Plans and Specifications approved:	**Schedule 1**
Fire Safety Schedule:	**N/A**
Critical Stage Inspections:	**See attached Notice**
Conditions (as per Sections 111 & 115-117 of the *Environmental Planning & Assessment (Development Certification & Fire Safety) Regulation 2021*):	**Nil**
PROJECT BUILDING SURVEYOR	Please contact **Bernardo Santos** for any inquiries
CERTIFIER	**Chris Michaels** for and on behalf of **City Plan Services Pty Ltd**

Level 6, 120 Sussex Street, Sydney NSW 2000
P +61 2 8270 3500
CITYPLAN.COM.AU

City Plan Services P/L
30 075 223 353

REGISTRATION NUMBER **BDC1974**

That I, Chris Michaels as the certifier:

a) *certify that the work if completed in accordance with the plans and specifications identified in Schedule 1 (with such modifications verified by the certifying authority as may be shown on that documentation) will comply with the requirements of the Environmental Planning & Assessment (Development Certification & Fire Safety) Regulation 2021 as referred to in Part 6 of the Environmental Planning and Assessment Act 1979; and*

b) *am satisfied that, in the case where fire safety system plans and specifications have been provided, that such plans and specifications correctly identify both the performance requirements and the deemed-to-satisfy provisions of the Building Code of Australia.*

DATED THIS **23** **August** **2024**



Chris Michaels
Director

NB: Prior to the commencement of work Section 6.6 of the Environment Planning and Assessment Act 1979 must be satisfied.

SCHEDULE 1
APPROVED PLANS AND SPECIFICATIONS

1. Endorsed Architectural plans

Plan Title	Prepared By	Drawing No / Ref	Revision	Date
Cover Page	Chrofi	A-CD-001	4	16/08/24
Site Plan	Chrofi	A-CD-002	2	16/08/24
Grid Set Out Plan	Chrofi	A-CD-010	2	16/08/24
Bulk Ex & Shoring Reference Plan – Basement	Chrofi	A-CD-020	2	16/08/24
Bulk Ex & Shoring Reference Plan – Lower Ground	Chrofi	A-CD-021	2	16/08/24
Shoring Wall Sections	Chrofi	A-CD-023	1	16/08/24

2. Endorsed Shoring plans & specifications

Plan Title	Prepared By	Drawing No / Ref	Revision	Date
Notes Sheet	Paragon Engineering Pty Ltd	S001	D	15/08/24
Shoring Plan	Paragon Engineering Pty Ltd	S100	D	15/08/24
Shoring Elevation and Details	Paragon Engineering Pty Ltd	S110	D	15/08/24

3. Endorsed Structural plans & specifications

Plan Title	Prepared By	Drawing No / Ref	Revision	Date
Cover Sheet	Van der meer	S01-00	1	19/08/24
Structural Notes – Sheet 1	Van der meer	S01-01	1	19/08/24
Structural Notes – Sheet 2	Van der meer	S01-02	1	19/08/24
Structural Notes – Sheet 3	Van der meer	S01-03	1	19/08/24
Structural Notes – Sheet 4	Van der meer	S01-04	1	19/08/24
Structural Notes – Sheet 5	Van der meer	S01-05	1	19/08/24
Retention Plan	Van der meer	S02-01	1	19/08/24
Retention Elevations – Sheet 1	Van der meer	S02-11	1	19/08/24
Retention Elevations – Sheet 2	Van der meer	S02-12	1	19/08/24
Retention Section – Sheet 1	Van der meer	S02-31	1	19/08/24
Retention Section – Sheet 2	Van der meer	S02-32	1	19/08/24
Retention Details – Sheet 1	Van der meer	S02-51	1	19/08/24
Retention Details – Sheet 2	Van der meer	S02-52	1	19/08/24
Bulk Excavation Plan	Van der meer	S02-61	1	19/08/24
Bulk Excavation Section – Sheet 1	Van der meer	S02-65	1	19/08/24

Plan Title	Prepared By	Drawing No / Ref	Revision	Date
Footing Plan – Sheet 1	Van der meer	S03-01	A	19/08/24
Footing Plan – Sheet 2	Van der meer	S03-02	A	19/08/24
Footing Details – Sheet 1	Van der meer	S03-51	A	19/08/24
Footing Details – Sheet 2	Van der meer	S03-52	A	19/08/24

4. Endorsed Hydraulic plans

Plan Title	Prepared By	Drawing No / Ref	Revision	Date
Project Information	Donnelley Simpson Cleary	H01	1	16/08/24
Basement Plan A – Drainage Layout	Donnelley Simpson Cleary	H03	1	16/08/24
Basement Plan B – Drainage Layout	Donnelley Simpson Cleary	H04	1	16/08/24
Details – Sheet 1	Donnelley Simpson Cleary	H23	1	16/08/24
Details – Sheet 2	Donnelley Simpson Cleary	H24	1	16/08/24
Details – Sheet 3	Donnelley Simpson Cleary	H25	1	16/08/24

5. Other documents relied upon

Title	Prepared By	Reference	Date
CC Application Form	Frasers property Ivanhoe Pty Ltd	CFT-558345	22/08/24
Architectural Design Statement	Chrofi	-	16/08/24
Design Compliance Declaration - Architectural	Steven Fighera - Chrofi	DEP0001770	16/08/24
Temporary rock bolt design and permanent shotcrete analysis	JK Geotechnics	36870YFlet Rev1	16/08/24
Design Compliance Declaration - Temporary rock bolt design and permanent shotcrete analysis	Woodie Theunissen – JK Geotechnics	PDP0001308	16/08/24
Shoring Wall Design Certificate	Paragon Engineering Pty Ltd	PAR-24871-SD-DC [3]	16/08/24
Design Compliance Declaration - Shoring	Ghassan Habeeb - Paragon Engineering Pty Ltd	DEP0001307	16/08/24
Structural Design Certificate	Van der meer	SY220116	19/08/24
Design Compliance Declaration - Structural	Brian Cardelli – Van der meer	DEP0001799	19/08/24
Hydraulic Design Certificate	Donnelley Simpson Cleary	8314	16/08/24

Title	Prepared By	Reference	Date
Design Compliance Declaration - Hydraulics	Xinjie Ding - Donnelley Simpson Cleary	DEP0001253	16/08/24
Access Statement	MGAC	-	16/05/23
Accessibility Report	MGAC	Final V2	28/06/21
Condition A9 - Long Service Levy Receipt	Long Service Corporation	L0000156469	27/06/24
Condition B6 and B7 - Pre-Construction Compliance Report	Grindley Construction	6410	16/08/24
Condition B11 and B12 - Community Communication Strategy - Stage 2	Frasers Property	-	07/11/23
Condition B18 - Preconstruction Dilapidation Report Notification to Council	Grindley Construction	-	07/08/24
Condition B18 - Pre-Construction Dilapidation Report (16 Sandstone Crescent, Macquarie Park)	Van der meer	SY244023 Rev A	31/07/24
Condition B18 - Pre-Construction Dilapidation Report (7 Mahogany Avenue, Macquarie Park)	Van der meer	SY244023 Rev A	31/07/24
Condition B18 - Pre-Construction Dilapidation Report (Ivanhoe Building C3)	Van der meer	SY244023 Rev A	31/07/24
Condition B18 - Private Roads, Council Assets & TFNSW	Van der meer	SY244023 Rev B	06/08/24
Condition B29 - ESD consultant statement	Introba	2060.0010523.000	16/08/24
Condition B31 - Aboriginal Cultural Heritage Assessment email notification	Urbis Pty Ltd	-	01/02/24
Condition B31 & C22 - Aboriginal Cultural Heritage Assessment	Urbis Pty Ltd	P0032333 F01	06/08/21
Condition B35 - Construction Environmental Management Plan	Grindley Construction	6410 (1)	09/07/24
Condition B35 - CEMP submission to Council	Grindley Construction	SSD15822622	02/08/24
Condition B36 - Construction Traffic & Pedestrian Management Plan	Traffix	24.277r01v02	11/07/24

Title	Prepared By	Reference	Date
Condition B36 - TfNSW endorsement of Construction Traffic & Pedestrian Management Plan	Transport NSW	-	17/07/24
Condition B36 - City of Ryde endorsement of Construction Traffic & Pedestrian Management Plan	Grindley Construction & City of Ryde	24.277	31/07/24
Condition B37 - Construction Noise Vibration Management Plan	Pulse White Noise Acoustics	240360 - 0	02/07/24
Condition B37 - submission receipt	New South Wales Land and Housing Corporation	-	03/07/24
Condition B38 - Air Quality Management plan	EDP	S-07641. AQOMP.001	26/07/24
Condition B39 - Construction Waste Management plan	Elephants Foot Consulting	C	28/06/24
Condition B39 - Construction Waste Management Plan email submission to Council	Grindley Construction	-	03/07/24
Condition B40 - Sediment Control Plan	ADW Johnson	D	17/07/24
Condition B40 - Sediment Control Plan submission to Council	Grindley Construction	-	26/07/24
Condition B43 and 44 - Telecommunications installation	Fiberpro Pty Ltd	PRJ0010101-BF3D63CF	-
Condition B43 and 44 - WAE Site Sewer	Total Surveying Solutions	B	22/08/23
Condition B43 and 44 - WAE conduits HV	Shelmerdines	AN-22381	20/04/21
Civil works as executed plans - Lyon Park Road connection	ADW Johnson & City of Ryde	1	14/02/22
Condition B43 and 44 - Stormwater Calculation Charts	ADW Johnson & City of Ryde	1	14/02/22
Condition B43 and 44 - WAE - Water	Total Surveying Solutions	9105	18/10/23
Condition B43 and 44 - Detailed Lighting Design	Shelmerdines & City of Ryde	F	01/06/21
Condition B46 - Unexpected Finds Protocol	Douglas Partners	86043.26	17/07/24
Sydney Water building plan approval	Chrofi	12	23/06/23
Sydney Water building plan approval conditions	Sydney Water	1941738	02/08/24

Title	Prepared By	Reference	Date
Condition B49 - Evidence of Lodgement of S73 Sydney Water Certificate Application	Frasers	-	23/08/24
Condition B58 - As built car parking plan	Crone Architects	K	25/02/24
Condition B66 - Dewatering Management Plan	Douglas Partners	86043.06 Rev 0	04/05/22
Condition B79 - Flood Impact Report	BMT Commercial Australia Pty Ltd	L.A11141.002.MidtownStg2_FIA	30/06/21
Condition B79 - Flood Letter	ADW Johnson Pty Ltd	BMY/LF/ 300001 (8)	10/07/24
Condition B79, B80, B81, B82 - Email statement from civil engineer	ADW Johnson Pty Ltd	-	
Condition D13 - Sustainability Report	Integral Group	V3	05/08/21
Pre-CC Inspection Report	City Plan Services	240258/1	22/08/24

City Plan Services P/L
30 075 223 353

NOTICE TO APPLICANT OF CRITICAL STAGE INSPECTIONS

Made under Part 6 of the Environmental Planning and Assessment Act 1979 Section 6.6(2)(b) and Section 58 of the Environmental Planning & Assessment (Development Certification & Fire Safety) Regulation 2021.

PROPOSAL

Address of land on which the work is to be carried out:	**Ivanhoe Estate, Macquarie Park, Ryde**
Lot No.:	**Lot 100**
DP No.:	**DP1262209**
Description of building:	**Stage 2 redevelopment of the Ivanhoe Estate, including:** ▪ **Excavation and earthworks** ▪ **Construction of a community facilitates building (Building C2) and two residential apartment buildings (Building C3 and Building C4) with basement car parking:** - **Building C3 with 162 dwellings, 163 car parking spaces and ground floor retail** - **Building C4 with 488 dwellings and 396 car parking spaces** ▪ **Construction of Village Green public open space** ▪ **Utilities, services infrastructure and public domain areas**
Scope of works covered by this Notice	**Stage 1 – Piling, earthworks, stormwater and demolition (Building C2)**

APPLICANT

Name of person having benefit of the development consent:	**Frasers Property Ivanhoe Pty Limited**
Address:	**Level 2, 1C Homebush Bay Drive, Rhodes NSW 2138**

RELEVANT CONSENTS

Consent Authority:	**Ryde City Council**
Development Consent No:	**SSD-15822622, SSD 15822622 MOD 1, SSD 15822622 MOD 2**
Date of Development Consent:	**28/11/2022, 14/11/2023, 05/08/2024**
Construction Certificate No:	**CC 240258/1**
Date of Construction Certificate:	**23/08/2024**

Please telephone the following number to book a critical stage inspection: Ph: **+61 2 8270 3500**
A minimum period of 48 hours is to be provided

PRINCIPAL CERTIFIER — **Chris Michaels** for and on behalf of **City Plan Services Pty Ltd**

REGISTRATION NUMBER — **BDC1974**

MANDATORY CRITICAL STAGE INSPECTIONS

That I, Chris Michaels, of City Plan Services Pty Ltd located at Level 6, 120 Sussex Street, Sydney NSW 2000 acting as the principal certifier hereby give notice in accordance with Section 6.6(2)(b) of the Environmental Planning and Assessment Act 1979 to the person having the benefit of the development consent that the mandatory critical stage inspections identified in Schedule 1 are to be carried out in respect of the building work.

The applicant, being the person having benefit of the development consent is required under Section 6.6(2)(d)(iii) of the Environmental Planning and Assessment Act 1979 to notify the principal contractor (if not an owner-builder) of the applicable mandatory critical stage inspections specified under this notice.

To allow a principal certifier or another certifier time to carry out mandatory critical stage inspections, the principal contractor for the building site, or the owner builder, must notify the principal certifier at least 48 hours before building work is commenced at the site if a mandatory critical stage inspection is required before the commencement of the work in accordance with Section 65 of the Environmental Planning & Assessment (Development Certification & Fire Safety) Regulation 2021.

Failure to request a mandatory critical stage inspections will prohibit the principal certifier from issuing an occupation certificate.

DATED THIS **23** **August** **2024**



Chris Michaels
Director

SCHEDULE 1
MANDATORY CRITICAL STAGE INSPECTIONS

NO	CRITICAL STAGE INSPECTION	INSPECTOR
1.	After the commencement of the excavation for, and before the placement of, the first footing	Certifier
2.	Prior to covering any stormwater drainage connections	Certifier
3.	In the case of a swimming pool, as soon as practicable after the barrier (if one is required under the Swimming Pools Act 1992) has been erected.	Certifier
4.	After the building work has been completed & prior to any Occupation Certificate being issued in relation to the building	Principal Certifier

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

IVANHOE VILLAGE GREEN & COMMUNITY CENTRE

IVANHOE PRECINCT - MIDTOWN MACQUARIE PARK

DRAWING LIST

NO.	DRAWING TITLE	SCALE	ISSUE
CD-001	COVER PAGE		4
CD-002	SITE PLAN	1:200	2
CD-010	GRID SET OUT PLAN	1:2000, 1:200	2
CD-020	BULK EX & SHORING REFERENCE PLAN - BASEMENT	1:200	2
CD-021	BULK EX & SHORING REFERENCE PLAN - LOWER GROUND	1:200	2
CD-023	SHORING WALL SECTIONS	1:20	1



ARTIST IMPRESSION

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CLIENT
Grindley

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GENERAL NOTES:
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NOTES REGARDING DRAWINGS:
These drawings illustrate the design intent and are subject to further coordination. CHROFI believes that the information in these drawings is sufficient for a builder to understand the design intent and to achieve a finished product conforming with the design intent. Some elements shown on these drawings are subject to final advice or design from other consultants. It is the responsibility of those consultants to ensure their proposals conform with the design intent.

LEGEND

REV	DATE	ISSUE
0	25/07/2024	FOR COORDINATION
1	9/08/2024	FOR COORDINATION - DRAFT CC1
2	9/08/2024	FOR COORDINATION
3	14/08/2024	FOR COORDINATION
4	16/08/2024	ISSUED FOR CC1

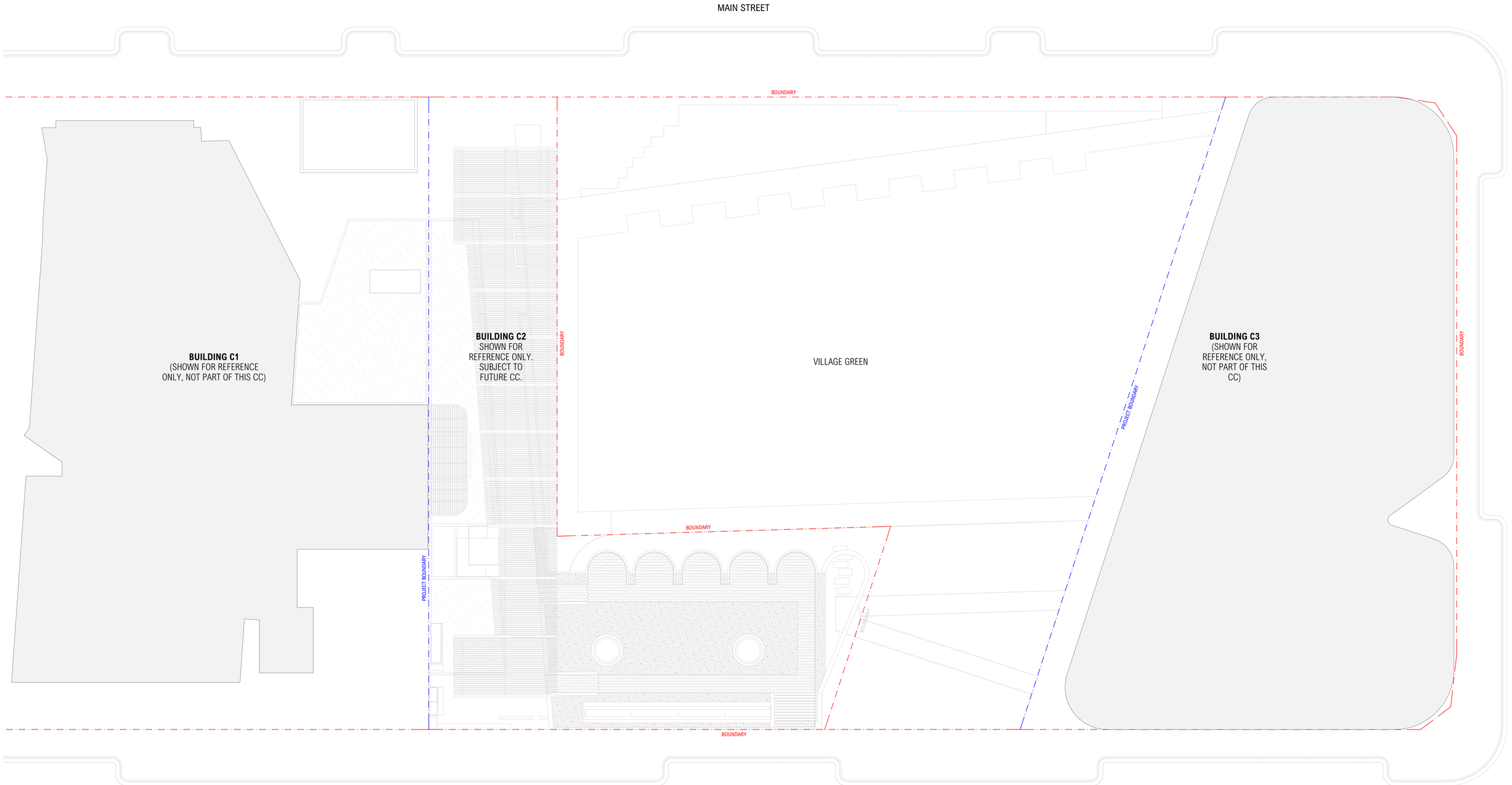
PROJECT
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	16/08/2024	LH	HR		A1	

DRAWING TITLE
COVER PAGE

DRAWING NUMBER	REVISION
A-CD-001	4

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974



1 SITE PLAN
1:200

FOR CONSTRUCTION

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LEGEND

REV	DATE	ISSUE
0	25/07/2024	FOR COORDINATION
1	9/08/2024	FOR COORDINATION - DRAFT CC1
2	16/08/2024	ISSUED FOR CC1

PROJECT
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	16/08/2024	LH	HR	1:200	A1	N

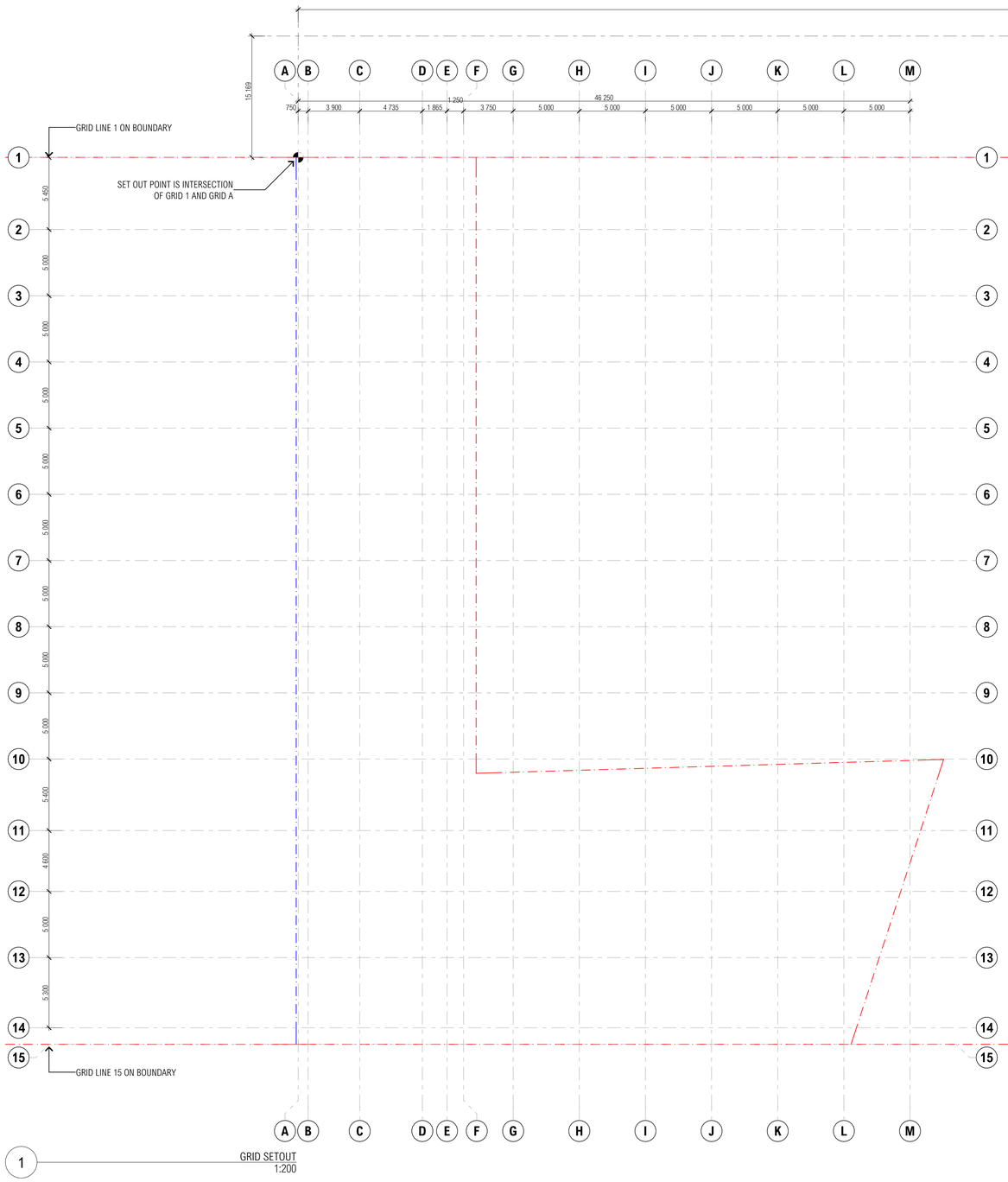
DRAWING TITLE
SITE PLAN

DRAWING NUMBER	REVISION
A-CD-002	2

Regulated Design Record				
Project Address:	1 IVANHOE PLACE, MACQUARIE PARK NSW 2113			
Project Title:	IVANHOE VILLAGE GREEN & COMMUNITY CENTRE			
Consent No:	SSD 15822622 (MOD 2)	**Body Corporate Reg No:**	N/A	
Drawing Title:	GRID SET OUT PLAN	**Drawing No:**	A-CD-010	

Rev	Date	Description	DP Full Name	Reg No
2	16.08.24	REGULATED DESIGN - CC1	STEVEN FIGHERA	DEP0001770

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974



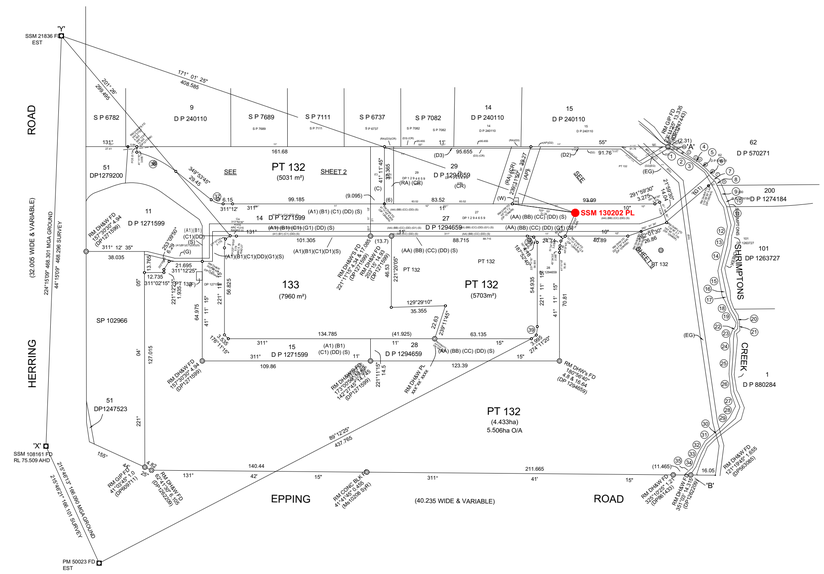
1 GRID SETOUT
1:200

SSM 130202 PL
SURVEY POINT SHOWN IN RED BELOW

REFERENCED SURVEY

PLAN OF SUBDIVISION OF LOT 13 IN DP 1271599 & LOT 26 IN DP 1294659

SURVEYOR: DAVID A SMITH
DATE OF SURVEY: 23.08.2023
SURVEYOR'S REF: 1601644DP_Lot 26



2 SURVEY REFERENCE - PLAN OF SUBDIVISION OF LOT 12 IN DP 127599 & LOT 26 IN DP 1294659
1:2000

FOR CONSTRUCTION

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CLIENT
Grindley

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LEGEND

REV	DATE	ISSUE
1	9/08/2024	FOR COORDINATION - DRAFT CC1
2	16/08/2024	ISSUED FOR CC1

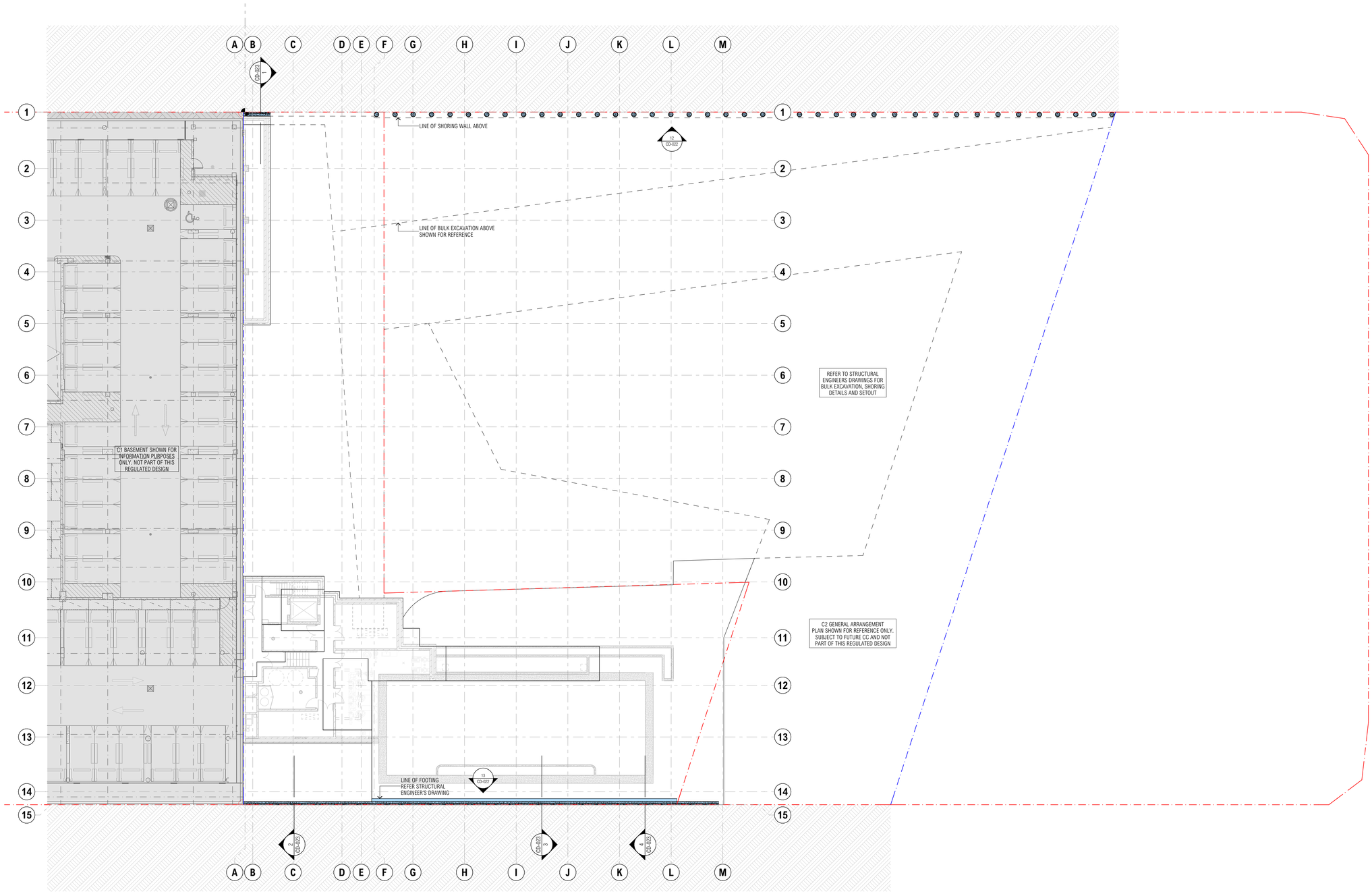
PROJECT
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	16/08/2024	LH	HR	1:2000, 1:200	A1	N

DRAWING TITLE
GRID SET OUT PLAN

DRAWING NUMBER	REVISION
A-CD-010	2

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974



GENERAL NOTE:

REFER TO STRUCTURAL ENGINEER FOR BULK EXCAVATION, SHORING AND PILING LEVELS AND SETOUT. BULK EXCAVATION, SHORING AND PILING ARE SHOWN FOR REFERENCE ONLY.

FOR CONSTRUCTION

ARCHITECT
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LEGEND

REV	DATE	ISSUE
1	9/08/2024	FOR COORDINATION - DRAFT CC1
2	16/08/2024	ISSUED FOR CC1

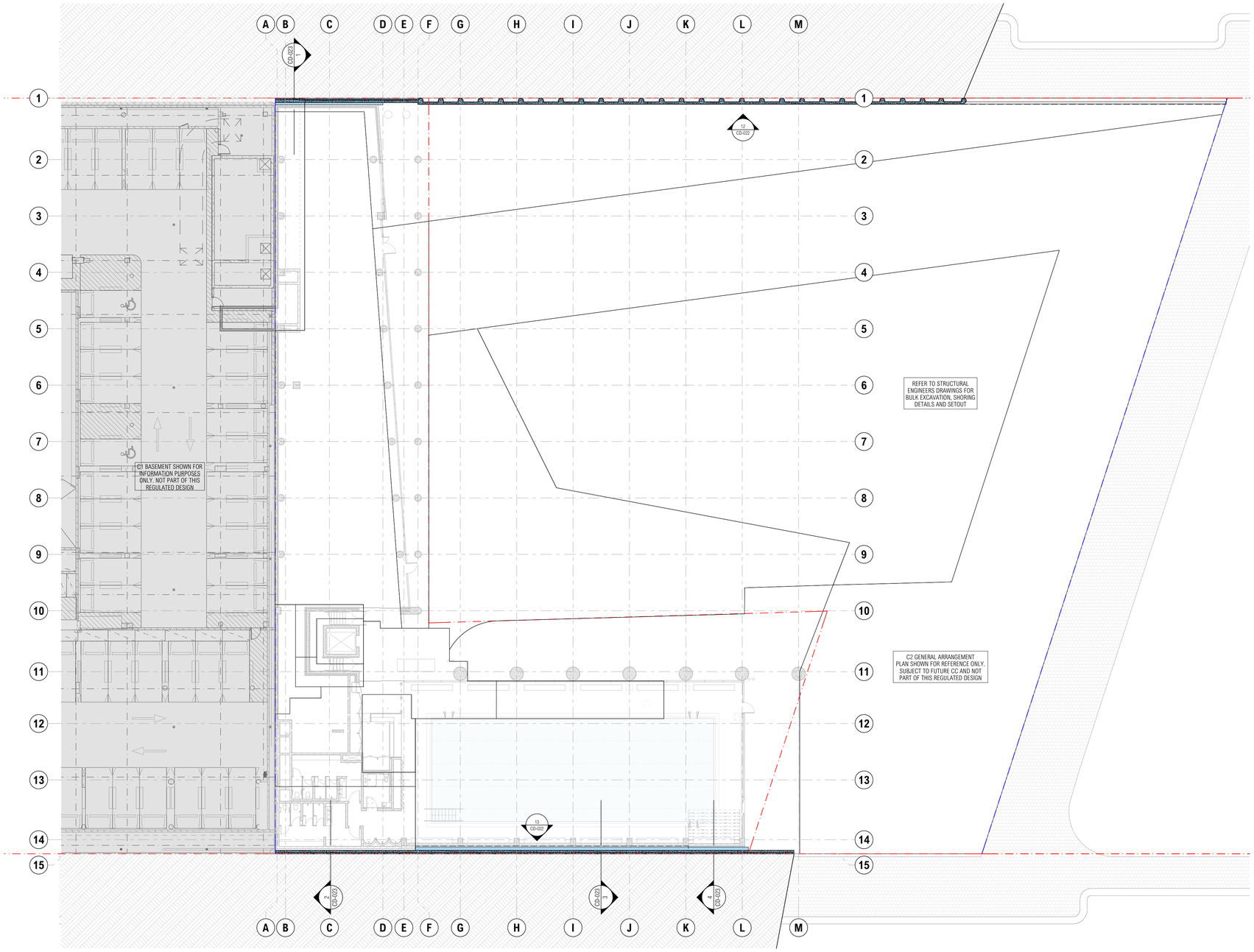
PROJECT
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	16/08/2024	LH	HR	1:200	A1	

DRAWING TITLE
BULK EX & SHORING REFERENCE PLAN - BASEMENT

DRAWING NUMBER	REVISION
A-CD-020	2

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974



GENERAL NOTE:

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CLIENT
Grindley

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LEGEND

REV	DATE	ISSUE
1	9/08/2024	FOR COORDINATION - DRAFT CC1
2	16/08/2024	ISSUED FOR CC1

PROJECT
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	16/08/2024	LH	HR	1:200	A1	N

DRAWING TITLE
BULK EX & SHORING REFERENCE PLAN - LOWER GROUND

DRAWING NUMBER	REVISION
A-CD-021	2

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

GENERAL NOTE:

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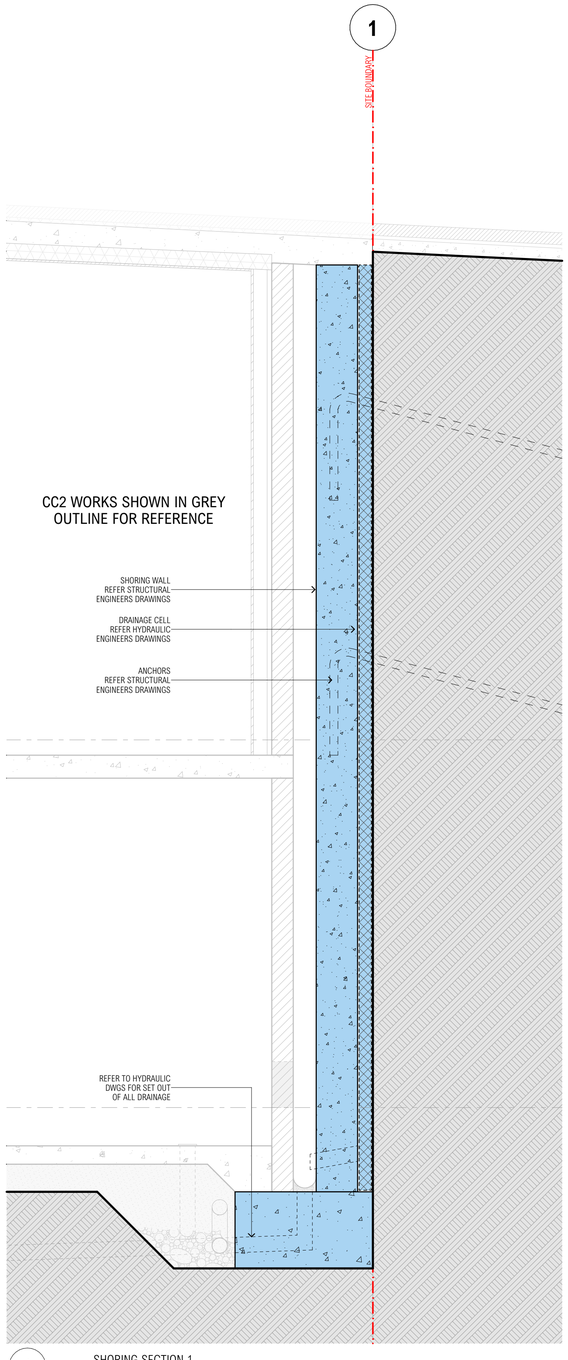
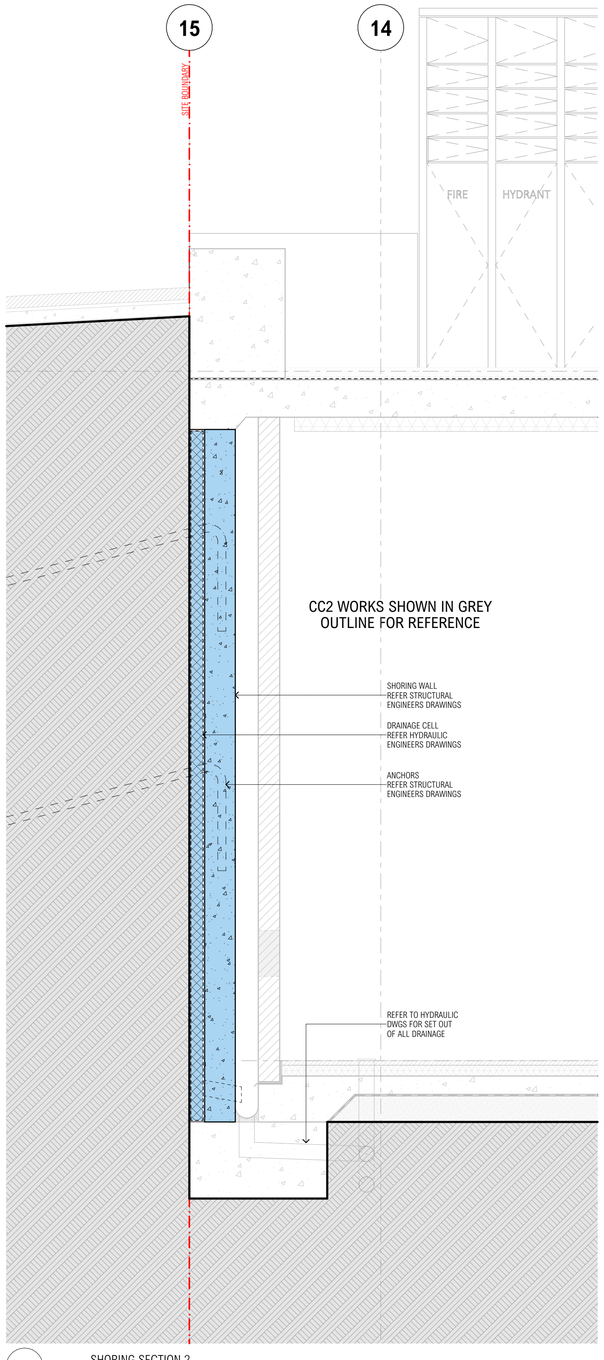


1 SHORING SECTION 1
1:20



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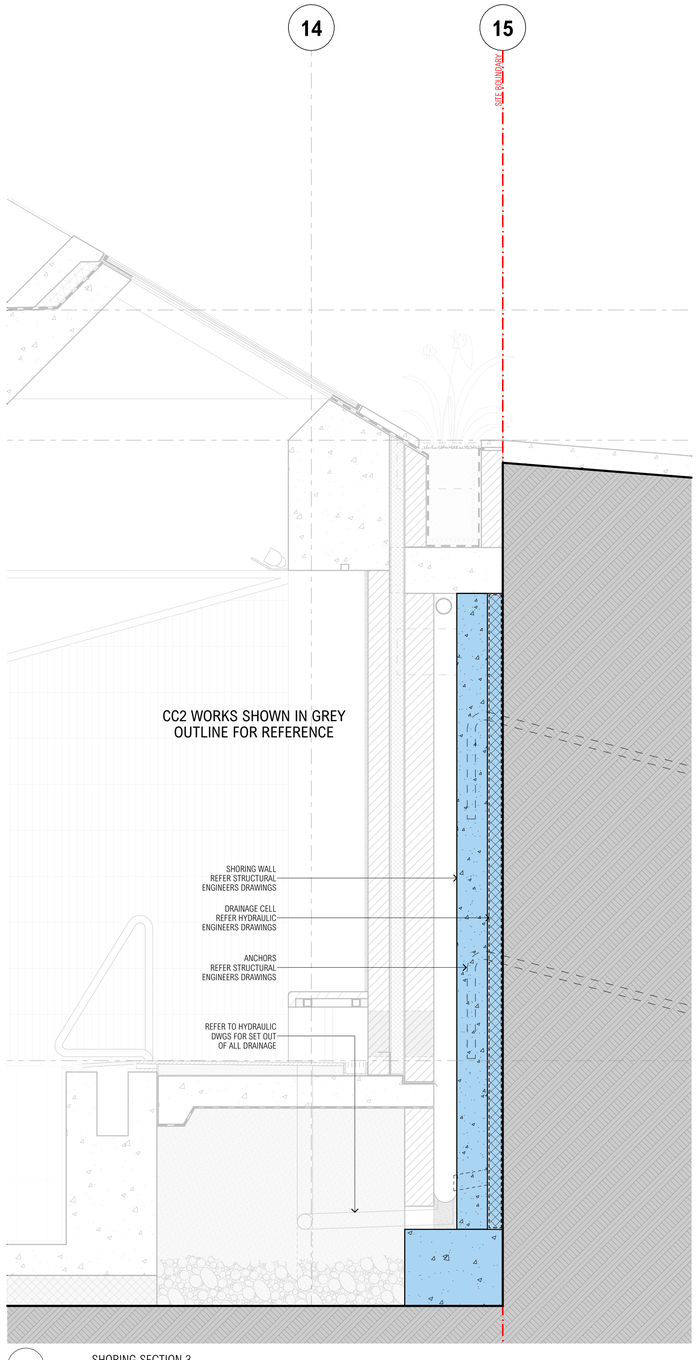

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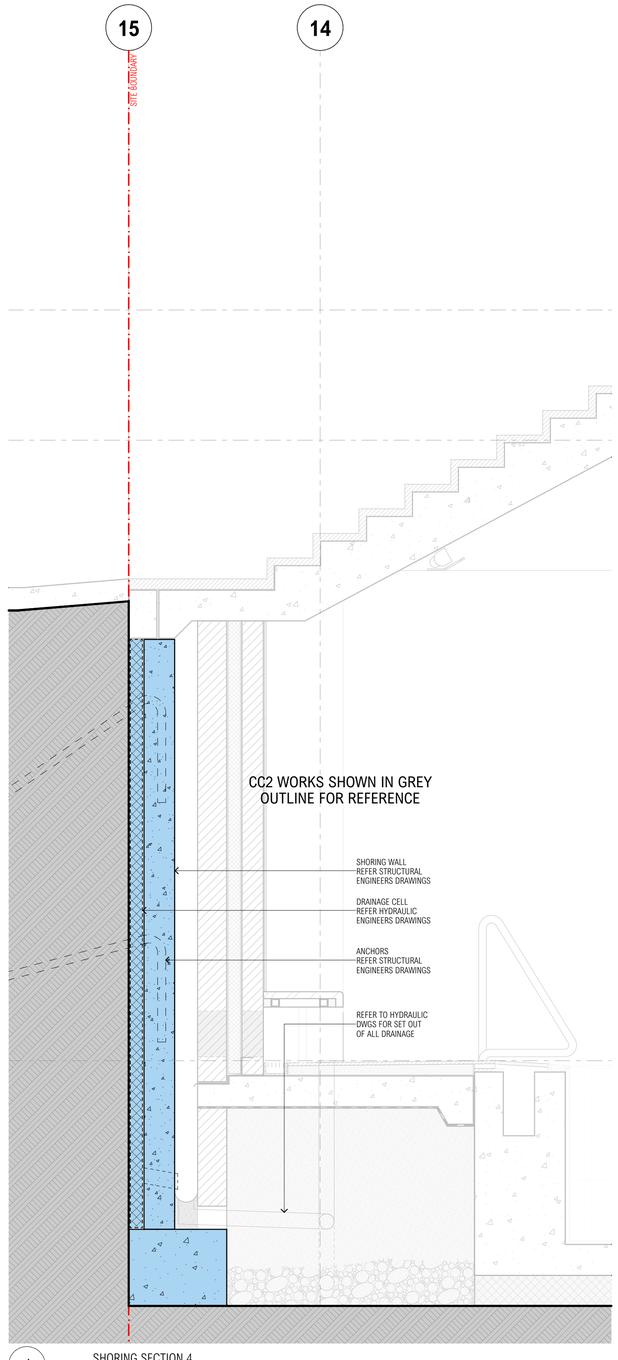

4 SHORING SECTION 4
1:20

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LEGEND

REV	DATE	ISSUE
1	16/08/2024	ISSUED FOR CC1

PROJECT
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	16/08/2024	LH	HR	1:20	A1	

DRAWING TITLE
SHORING WALL SECTIONS

DRAWING NUMBER	REVISION
A-CD-023	1

Regulated Design Record				
Project Address: 1 Ivanhoe Place, Macquarie Park, NSW 2113				
Project Title: Shoring System Design to Village Green				
Consent No: SSD 15822622 (Mod 2)		Body Coporate Reg No: NA		
Drawing Title: Notes Sheet		Drawing No: S001		
Rev	Date dd.mm.yyyy	Description	DP Full Name	Reg No.
D	15/08/2024	Issued For CC1	Ghassan Habeeb	DEP0001307

GENERAL NOTES:

G1 THESE DRAWINGS AND NOTES SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANT'S DRAWINGS, REPORTS, SPECIFICATIONS AND ANY OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF CONSTRUCTION. ALL DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR CLARIFICATION OR DECISION BEFORE PROCEEDING WITH THE WORK.

G2 CONSTRUCTION FROM THESE DRAWINGS SHALL NOT COMMENCE UNTIL THEY ARE APPROVED BY THE RELEVANT AUTHORITIES.

G3 DIMENSIONS SHALL NOT BE OBTAINED FROM THESE DRAWINGS, REFER TO ARCHITECTURAL DRAWINGS FOR PILES SETOUT AND OTHER MEASUREMENTS.

G4 ALL WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH ALL WORKCOVER REQUIREMENTS AND OCCUPATIONAL HEALTH AND SAFETY ACT REGULATIONS.

G5 ALL WORKS SHALL COMPLY WITH THE CURRENT, RELEVANT SAA CODES AND THE BUILDING CODE OF AUSTRALIA.

G6 ALL EXPOSED ROCK SURFACES SHALL BE INSPECTED AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER TO CONFIRM STABILITY AND ADVISE ON ANY ADDITIONAL MEASURES AS REQUIRED.

ADJACENT STRUCTURES & ASSETS:

A1 THE SIZE, TYPE AND EXTENT OF THE FOUNDATIONS OF THE ADJACENT STRUCTURES MUST BE DETERMINED AND VERIFIED BY A QUALIFIED STRUCTURAL/GEOTECHNICAL ENGINEER PRIOR TO ANY CONSTRUCTION WORK COMMENCING ONSITE.

A2 ONCE THE FOOTING SYSTEM OF ANY ADJACENT STRUCTURE HAS BEEN LOCALLY EXPOSED, A QUALIFIED STRUCTURAL/GEOTECHNICAL ENGINEER SHOULD BE CONSULTED TO CONFIRM THE STABILITY OF THE ADJACENT STRUCTURE OR OTHERWISE DESIGN AN APPROPRIATE SUPPORT MEASURES FOR THE FOOTING, SUCH AS UNDERPINNING OR OTHER SUITABLE SHORING SYSTEM.

A3 THE BUILDER OR ITS APPOINTED SPECIALIST CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EXCAVATIONS IN A STABLE CONDITION WITHOUT AFFECTING THE ADJACENT STRUCTURES OR ASSETS.

A4 GENERALLY, EXCAVATION SHALL NOT EXTEND BEYOND THE INFLUENCE LINE DRAWN FROM THE NEAREST UNDERSIDE CORNER OF ANY EXISTING FOOTINGS. THE LINE SHALL BE DIPPING AT 45 DEGREES FOR CLAY AND 30 DEGREES FOR SAND.

A5 AT NO STAGE SHALL THE BASE OF THE SHORING WALL CAPPING BEAM BE LOWER THAN THE BASE OF THE ADJACENT BUILDING FOUNDATION OR ELSE A HIGH-LEVEL SHORING SOLUTION MAY BE REQUIRED. LEVELS OF THE EXISTING STRUCTURES MUST BE CONFIRMED PRIOR TO CONSTRUCTION COMMENCING ONSITE.

PILING NOTES:

P1 FOUNDATION MATERIAL SHALL BE INSPECTED AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF CONCRETE.

P2 THE PERMISSIBLE POSITIONAL DEVIATION SHALL NOT BE MORE THAN 75MM IN PLAN POSITION AND WITHIN 1% INCLINATION.

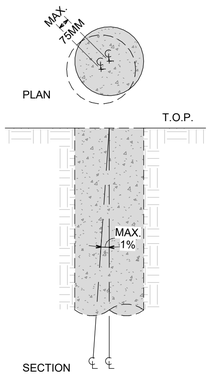
P3 ALL PILES SHALL BE INSTALLED IN ACCORDANCE WITH AS 2159 AND WITH THE PROJECT SPECIFICATION.

P4 BORED PILES NOT CONCRETE FILLED BY THE END OF THE DAY WILL REQUIRE RE-DRILLING TO REMOVE ANY LOOSE MATERIAL.

P5 PLACE CONCRETE TO ENSURE A SOUND MONOLITHIC COMPACTED CONCRETE SHAFT OF THE FULL DIAMETER REQUIRED TO CUT-OFF LEVEL. TAKE ADEQUATE MEASURES TO AVOID SEGREGATION, BLEEDING AND GROUT DEFICIENCY OF THE PILE.

P6 DEPTH OF SOIL LAYERS SHALL BE VERIFIED BY A QUALIFIED GEOTECHNICAL ENGINEER.

P7 ALL REINFORCEMENT SHALL COMPLY WITH AS 2159 AND AS 3600.



CONCRETE NOTES:

C1 ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 AND ANY OTHER RELEVANT AUSTRALIAN STANDARDS UNLESS VARIED BY THE ENGINEER.

C2 CONCRETE QUALITY, AND REQUIRED PROPERTIES OF CONCRETE SHALL BE IN ACCORDANCE TO AS 1379.

CONCRETE NOTES (cont.):

C3 THE FINISHED CONCRETE SHALL BE FULLY MECHANICALLY VIBRATED TO ACHIEVE FULL COMPACTION, COMPLETELY FILLING FORMWORK, THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS. ALL CONCRETE, INCLUDING SLABS ON GROUND AND FOOTINGS, SHALL BE FULLY VIBRATED USING A HIGH FREQUENCY MECHANICAL VIBRATOR.

C4 ALL CONCRETE SHALL BE PROPERLY CURED. CURING SHALL COMMENCE WITHIN 2 HOURS OF POURING AND SHALL CONTINUE FOR A MINIMUM OF 7 DAYS, FOLLOWED BY A GRADUAL DRYING OUT. CURING SHALL BE BY CONTINUOUS SATURATION WITH POTABLE WATER OR BY USE OF AN APPROVED PROPRIETARY CURING COMPOUND COMPLYING WITH AS 3799, APPLIED UNIFORMLY IN ACCORDANCE WITH THE MANUFACTURERS INSTRUCTIONS. THE COMPATIBILITY OF CURING COMPOUNDS WITH PROPOSED APPLIED FINISHES SHALL BE VERIFIED PRIOR TO APPLICATION.

C5 THE CONTRACTOR IS TO SEEK APPROVAL FROM THE SUPERSTRUCTURE ENGINEER IN WRITING IF ANY ADMIXTURES TO BE USED IN THE CONCRETE MIX. CALCIUM CHLORIDE WILL NOT BE PERMITTED AND SHALL NOT BE USED UNDER ANY CIRCUMSTANCES.

C6 THE FACE OF ALL CONCRETE WHICH HAS REINFORCEMENT PROJECTING FROM IT AND AGAINST WHICH NEW CONCRETE IS TO BE CAST, IS TO BE THOROUGHLY MECHANICALLY SCABBLED, FULLY EXPOSING THE AGGREGATE MATRIX.

C7 CONCRETE SIZES AS DRAWN ARE MINIMUM AND DO NOT INCLUDE APPLIED FINISHES.

C8 ALL CONCRETE SHALL BE SUBJECT TO PROJECT ASSESSMENT AND TESTING TO AS 1379.

C9 CONCRETE TESTING SHALL BE CONDUCTED AT LEAST ONE SAMPLE PER BATCH ON EACH DAY THAT CONCRETE OF ANY PARTICULAR GRADE IS USED.

C10 A BATCH SHALL BE DEFINED AS THE QUANTITY OF CONCRETE MIXED IN ONE CYCLE OF OPERATIONS OF A BATCH MIXER OR THE QUANTITY OF CONCRETE DELIVERED TO SITE READY MIXED IN A VEHICLE.

C11 SAMPLING, IDENTIFICATION AND TESTING: SAMPLE THE CONCRETE ON SITE, AT THE POINT OF DISCHARGE FROM THE AGITATOR TO AS 1012.

C12 SLUMP: TEST AT LEAST ONE SAMPLE FROM EACH BATCH BEFORE PLACING CONCRETE FROM THAT BATCH IN THE WORK.

C13 STRENGTH GRADE/CHARACTERISTIC COMPRESSIVE STRENGTH: SPREAD THE SITE SAMPLING EVENLY THROUGHOUT THE POUR.

C14 **ACCEPTANCE CRITERIA:**
- AVERAGE STRENGTH OF ALL SAMPLES MUST BE EQUAL OR HIGHER THAN THE TARGET STRENGTH VALUE.
- STRENGTH OF ANY ONE SAMPLE MUST NOT BE LESS THAN 0.85 OF THE TARGET STRENGTH VALUE.

C15 **CONCRETE STRENGTH TEST SAMPLING TABLE**

NUMBER OF BATCHES FOR EACH TYPE AND GRADE OF CONCRETE PER DAY	MINIMUM NUMBER OF SAMPLES ELEMENTS PER DAY
1	1
2-5	2
6-10	3
11-20	4
each additional 10	1 ADDITIONAL

REINFORCEMENT NOTES:

R1 'N' DENOTES HOT ROLLED DEFORMED BARS OF GRADE 500 (D500N) COMPLYING WITH AS/NZS 4671. 'SL' AND 'RL' DENOTES LOW DUCTILITY SQUARE AND RECTANGULAR WELDED WIRE MESH OF GRADE 500 (D500L) COMPLYING WITH AS/NZS 4671. 'R' DENOTES STRUCTURAL GRADE ROUND BAR OF GRADE 250 (R250N) COMPLYING WITH AS/NZ 4671.

R2 MINIMUM LAPS ARE: MESH: OVERLAP 2 STANDARD TRANSVERSE BAR SPACINGS, I.E. RL818=400. N & R BARS: 50 BAR DIAMETERS UNLESS OTHERWISE NOTED.

R3 WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT THE PRIOR APPROVAL OF THE ENGINEER.

R4 HOOKS AND COGS SHALL COMPLY WITH AS 3600 UNLESS OTHERWISE SHOWN. SLOPES OF CRANKS ARE NOT TO EXCEED 1 IN 6.

R5 REINFORCEMENT IS NOT PERMITTED TO BE HEATED ABOVE 400 DEGREES.

R6 REFER TO THE SCHEDULE FOR THE SPECIFIED COVERS TO REINFORCEMENT. COVER MUST BE MAINTAINED AT ALL CHAMFERS, DRIP GROVES AND REGLETS etc. UNLESS NOTED OTHERWISE ON THE DRAWINGS.

R7 SPLICE IN REINFORCEMENT SHALL BE AS INDICATED BELOW:

BAR SIZE	TENSION LAP (MM)	COMPRESSION LAP (MM)
N20	1000	800

SHOTCRETE NOTES:

S1 EXCAVATION AND TRIMMING IN PREPARATION FOR SHOTCRETE SHALL BE PERFORMED WITH CONSIDERATION OF THE POOR GROUND CONDITIONS WITHIN THE UPPER LAYERS. MAXIMUM DROP SIZE TO BE CONFIRMED BY GEOTECHNICAL ENGINEER.

S2 TO AVOID COLLAPSING OF THE SOIL BEHIND THE GROUND TO BE TRIMMED, SURFACES SHALL BE SPRAYED AS SOON AS PRACTICALLY POSSIBLE.

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

SHOTCRETE NOTES (cont.):

S3 NO CONCRETE SHALL BE SPRAYED IN AIR TEMPERATURES LESS THAN 10°C. FRESHLY SPRAYED CONCRETE SHALL BE PROTECTED FROM RAIN OR WATER UNTIL THE SURFACE IS OF SUFFICIENT HARDNESS TO PREVENT DAMAGE. SPRAYING SHALL BE DISCONTINUED IF WIND OR AIR CURRENTS CAUSE SEPARATION OF THE NOZZLE STREAM DURING PLACEMENT.

CONSTRUCTION METHODOLOGY:

CM1 A SUITABLE PILING PLATFORM TO BE PREPARED BY THE CONTRACTOR AND APPROVED BY A QUALIFIED GEOTECHNICAL ENGINEER.

CM2 PILE SETTING OUT TO BE CONDUCTED BY A QUALIFIED SURVEYOR ACCORDING TO THE ARCHITECTURAL PLANS.

CM3 COMMENCE PILE DRILLING BY EITHER ROTARY BORED.

CM4 DURING THE DRILLING OPERATION IF THE MATERIALS ARE NOT SELF-SUPPORTING AS ASSESSED BY THE CONTRACTOR, TEMPORARY STEEL CASING SHALL BE INSTALLED TO A LEVEL BELOW THESE MATERIALS. AN UNCASED HOLE MAY BE DRILLED PROVIDED THAT THE MATERIAL BELOW THE CASING IS SELF SUPPORTING.

CM5 INSTALL PILE REINFORCEMENT CAGE.

CM6 CONCRETE SHALL BE PLACED IN A CONTINUOUS PROCESS FROM THE TOE LEVEL TO THE TOP OF THE PILE USING TREMIE METHOD.

CM7 CONSTRUCT CAPPING BEAM AS PER DESIGN SPECIFIED.

CM8 COMMENCE EXCAVATION TO SPECIFIED BULK EXCAVATION LEVELS (BEL).

CM9 CLEAN THE EXPOSED FACE OF PILES AND INSTALL REINFORCEMENT AND DRAINAGE AS SPECIFIED.

CM10 SPRAY SHOTCRETE AS PER DESIGN SPECIFIED.

HOLD POINTS:

H1 PARAGON TO INSPECT THE PILES AND CAPPING BEAM REINFORCEMENT. INSTALLATION RECORDS TO BE PROVIDED.

H2 A QUALIFIED GEOTECHNICAL ENGINEER TO INSPECT THE PILE DRILLING TO ENSURE MINIMUM SPECIFIED SOCKET LENGTH IS ACHIEVED.

H3 SHOTCRETE MESH TO BE INSTALLED AS PER THE DESIGN. PARAGON TO BE NOTIFIED TO INSPECT THE INSTALLATION OF THE SHOTCRETE REINFORCEMENT.

DESIGN ASSUMPTIONS:

D1 GEOTECHNICAL PARAMETERS HAVE BEEN DERIVED BASED ON THE PROVIDED INFORMATION IN DOUGLAS PARTNERS GEOTECHNICAL REPORT (REF: 86043.06.R.001.REV1, ISSUED DATE: 04/08/2021) AND JK TEMPORARY ROCK BOLT DESIGN (REF: 36870YFLET1 ISSUED DATE: 26/07/2024).

D2 THE BULK EARTHWORK AND CAPPING BEAM LEVEL IS ADOPTED BASED ON THE VANDERMEER STRUCTURAL DRAWINGS (REF: S02-01 TO S02-032) AND DETAILED SHORING SECTIONS MARKUP RECEIVED VIA EMAIL ON 13/08/2024.

D3 SHORING PILE DESIGNED FOR MAXIMUM LATERAL DEFLECTION OF 15MM.

D4 A SURCHARGE OF 20KPA HAS BEEN ASSUMED TO BE APPLIED BEHIND THE SHORING WALL.

D5 AS PER THE SUPERSTRUCTURE ENGINEER MARKUP (REF: SYD230-070, ISSUED DATE: 08/08/2024) A 10KPA SUPERIMPOSED DEAD, 20KPA LIVE LOAD, AND LINE LOAD OF 1KN/M (BALUSTRADE) HAVE BEEN ASSUMED ON TOP OF THE CAPPING BEAM.

D6 AS PER THE SUPERSTRUCTURE ENGINEER MARKUP RECEIVED VIA EMAIL ON 13 AUGUST 2024, THE IMPACT LOADS (M* = 35KN-M & Q*=32KN) HAVE BEEN ADOPTED IN DESIGN. THE IMPACT LOADS HAVE BEEN APPLIED ALONG IN-SITU FEATURE WALL (STARTING FROM THE FIRST CAPPING BEAM STEP TOWARDS THE EASTERN BOUNDARY CORNER) ONLY.

D7 ALL PILES ARE DESIGNED AS PER AS2159-2009, AS3600-2018 AND AS4678-2002.

D8 ALL PILES TO BE F'C 40MPA, UNLESS STATED OTHERWISE.

D9 YIELD STRENGTH OF REINFORCEMENT STEEL IS 500 MPA.

D10 DESIGN LIFE IS 50 YEARS.

D11 ALL REINFORCEMENT CAGES TO BE INSTALLED TO THE FULL LENGTH OF THE PILES.

D12 GEOTECHNICAL PARAMETERS ARE INDICATED BELOW:

MATERIAL	UNIT WEIGHT (KN/M³)	MODULUS OF ELASTICITY (MPA)	C (KPA)	Φ (degree)	POISSON'S RATIO	ULTIMATE BEARING CAPACITY (MPA)	ULTIMATE SHAFT ADHESION (KPA)
UNIT 1 - FILL	18	8	1	28	0.3	-	-
UNIT 2 - RESIDUAL SOIL	18	20	1	28	0.3	-	-
UNIT 3A - SANDSTONE - VARIABLE	22	40	30	32	0.3	-	-
UNIT 3B - SANDSTONE - LOW TO MEDIUM STRENGTH	22	350	100	35	0.3	15	750
UNIT 3C - SANDSTONE - MEDIUM TO HIGH STRENGTH	24	900	400	38	0.3	40	1500

DRAWING LIST

SHEET S001 NOTES SHEET
SHEET S100 SHORING PLAN
SHEET S110 SHORING ELEVATION AND DETAILS

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REV	BY	DATE	DESCRIPTION	APPD.
D	JM	15/08/2024	ISSUED FOR CC1	GH
C	AA	07/08/2024	ISSUED FOR CC1 REVIEW	GH
B	JM	02/08/2024	ISSUED FOR APPROVAL	GH
A	JM	01/08/2024	ISSUED FOR APPROVAL	GH

CIVIL CONTRACTOR: CHALOUHI — DEMOLITION • EXCAVATION • CIVIL CONSTRUCTION

BUILDER: Grindley

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DRAWN J.M.
DESIGNED R.H.
CHECKED O.A.
APPROVED G.H.

Quality ISO 9001 · Environment ISO 14001 · OHS ISO 45001 · JAS-ANZ

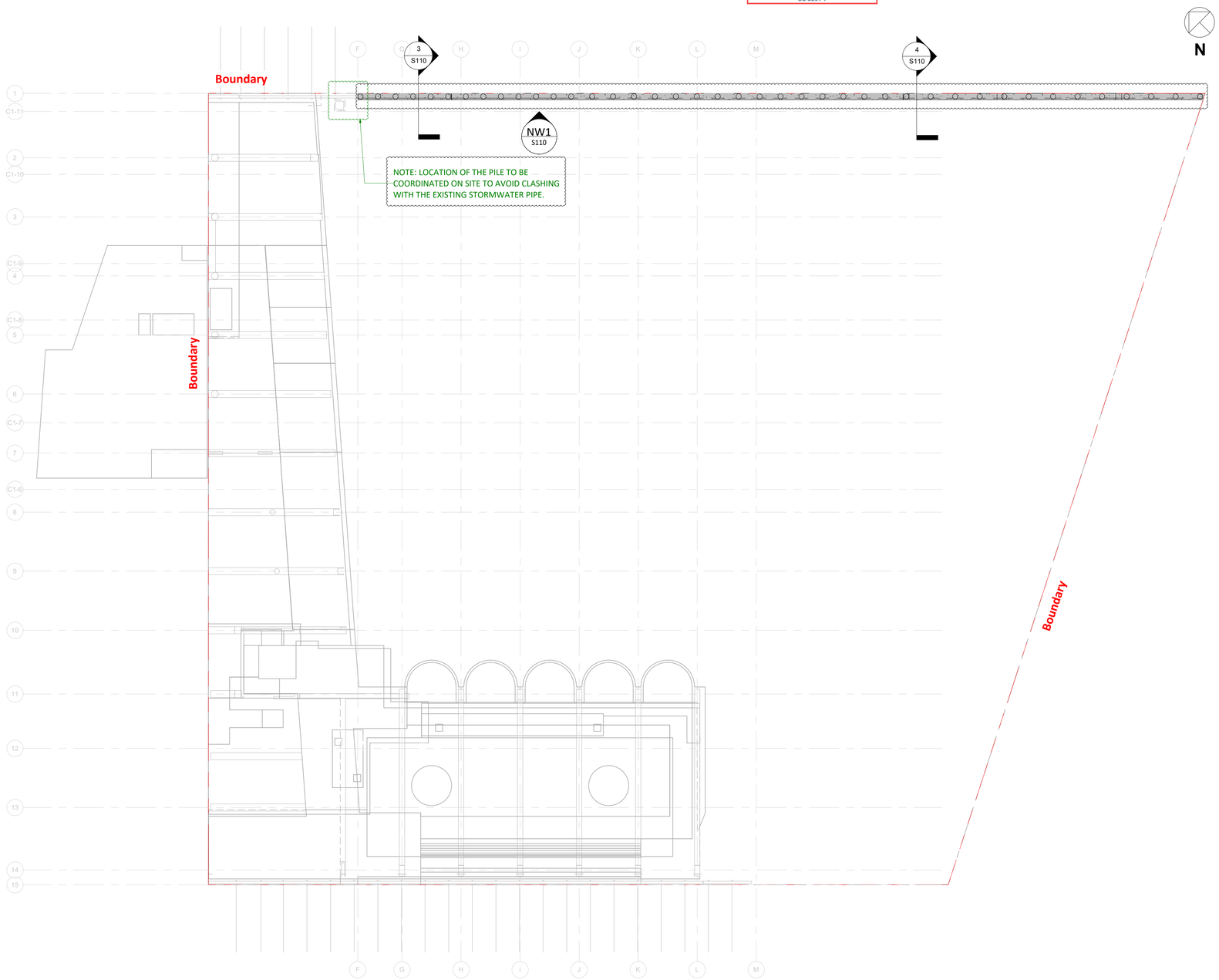
SHEET TITLE: NOTES SHEET

PROJECT: SHORING SYSTEM DESIGN
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK, NSW 2113

PROJECT REF.: PAR-24871 | DRG NO.: S001 | SHEET: 1 of 3 | A1 | STATUS: For Approval | D

Regulated Design Record				
Project Address: 1 Ivanhoe Place, Macquarie Park, NSW 2113				
Project Title: Shoring System Design to Village Green				
Consent No: SSD 15822622 (Mod 2)		Body Coporate Reg No: NA		
Drawing Title: Shoring Plan		Drawing No: S100		
Rev	Date dd.mm.yyyy	Description	DP Full Name	Reg No.
D	15/08/2024	Issued For CC1	Ghassan Habeeb	DEP0001307

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974



1 Shoring Plan
1 : 200

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REV	BY	DATE	DESCRIPTION	APPD.
D	JM	15/08/2024	ISSUED FOR CC1	GH
C	AA	07/08/2024	ISSUED FOR CC1 REVIEW	GH
B	JM	02/08/2024	ISSUED FOR APPROVAL	GH
A	JM	01/08/2024	ISSUED FOR APPROVAL	GH

CIVIL CONTRACTOR
CHALOUHI
DEMOLITION • EXCAVATION • CIVIL CONSTRUCTION

BUILDER
Grindley

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DRAWN	J.M.
DESIGNED	H.R.
CHECKED	O.A.
APPROVED	G.H.

Certified System Quality ISO 9001 · Certified System Environment ISO 14001 · Certified System OHS ISO 45001 · JAS-ANZ

SHEET TITLE:
SHORING PLAN

PROJECT:
SHORING SYSTEM DESIGN
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK, NSW 2113

PROJECT REF.: PAR-24871		DRG NO.: S100		D
SHEET: 2 of 3	A1	STATUS: For Approval		

Regulated Design Record				
Project Address: 1 Ivanhoe Place, Macquarie Park, NSW 2113				
Project Title: Shoring System Design to Village Green				
Consent No: SSD 15822622 (Mod 2)		Body Coporate Reg No: NA		
Drawing Title: Shoring Elevation and Details		Drawing No: S110		
Rev	Date dd.mm.yyyy	Description	DP Full Name	Reg No.
D	15/08/2024	Issued For CC1	Ghassan Habeeb	DEP0001307

SHORING PILES SCHEDULE

Mark	Pile Diameter (mm)	Vertical Reinf.	Spiral	Cover (mm)	Socket length (m) Whichever is deeper[2)(3)]	Founding Criteria	Compressive Strength f'c (MPa)	Pile Spacing c/c (mm)	Projection Length (mm)	Cage Length (m)
SW1	450	6N20	N12@250	75	2.0	Below BEL	40	1500	250	Full Depth
					2.0	Into Unit 3B - Sandstone - Low to Medium Strength				
SW2	450	6N20	N12@250	75	2.0	Below BEL	40	1800	250	Full Depth
					2.0	Into Unit 3B - Sandstone - Low to Medium Strength				
SW3	450	6N20	N12@250	75	2.0	Below BEL	40	2200	250	Full Depth

NOTES:

1. THE GEOTECHNICAL PARAMETERS HAVE BEEN DERIVED BASED ON THE PROVIDED INFORMATION IN DOUGLAS PARTNERS GEOTECHNICAL REPORT (REF: 86043.06.R.001.REV1, ISSUED DATE: 04/08/2021) AND JK TEMPORARY ROCK BOLT DESIGN (REF: 36870YFLET1 ISSUED DATE: 26/07/2024).
2. WHERE EXCAVATION BELOW BULK IS LOCALLY REQUIRED ADJACENT TO THE SHORING WALLS, PILE SOCKET SHALL BE MEASURED FROM THE LOWEST EXCAVATION LEVEL
3. THE BULK EARTHWORK AND CAPPING BEAM LEVEL IS ADOPTED BASED ON THE VANDERMEER STRUCTURAL DRAWINGS (REF: S02-01 TO S02-032) AND DETAILED SHORING SECTIONS MARKUP RECEIVED VIA EMAIL ON 13/08/2024.

CAPPING BEAM SCHEDULE

Mark	Width (mm)	Depth (mm)	Reinforcement			Cover (mm)	Compressive Strength f'c (MPa)
			Longitudinal	Side Reinf	Ties		
CB1	550	300	4N20 T&B	-	N12@250	50	40

NOTES:

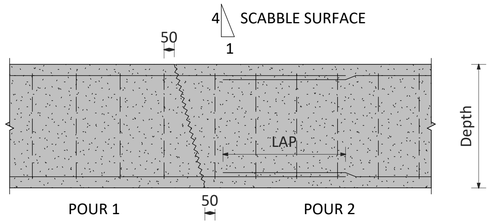
1. THE CAPPING BEAM DESIGN HAS BEEN DESIGNED TO SATISFY THE SHORING REQUIREMENTS, THE SUPERSTRUCTURE ENGINEER MAY AMEND THE DESIGN AND THE GEOMETERY AS NEEDED TO SATISFY THE SUPERSTRUCTURE REQUIREMENTS AND ANY THICKENINGS, DOWNTURNS OR OTHER CONSIDERATIONS.
2. FOR CAPPING BEAM STARTER BARS REFER TO STRUCTURAL ENGINEER DRAWINGS.
3. THE CAPPING BEAM LEVEL IS ADOPTED BASED ON THE VANDERMEER STRUCTURAL DRAWINGS (REF: S02-01 TO S02-032) AND DETAILED SHORING SECTIONS MARKUP RECEIVED VIA EMAIL ON 13/08/2024.

SHOTCRETE WALL SCHEDULE

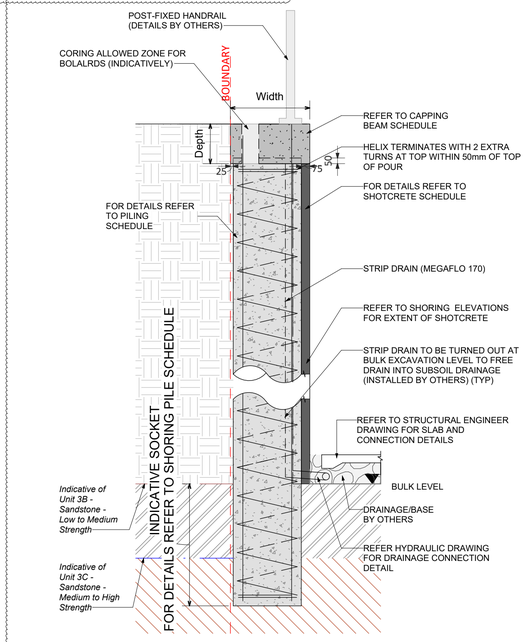
Mark	Thickness (mm)	Reinforcement	Cover (mm)	Compressive Strength f'c (MPa)
All Elevations	150	RL818	30	32

NOTES:

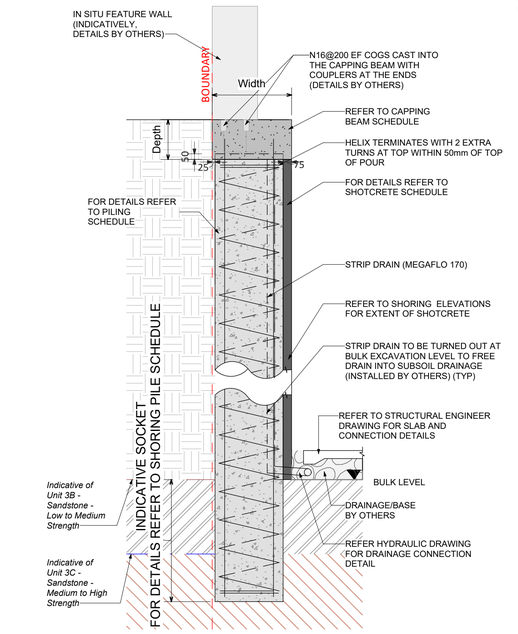
1. MINIMUM LAPS ARE: MESH: OVERLAP 2 STANDARD TRANSVERSE BAR SPACINGS, I.E. RL818=400.
2. THE MAIN WIRE IN THE MESH SHOULD BE SPANING BETWEEN THE PILES.



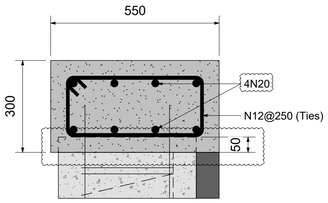
2 Typical Capping Beam Construction Joint Details
1 : 15



3 Typical Pile Section (Through Gabion Wall)
NTS

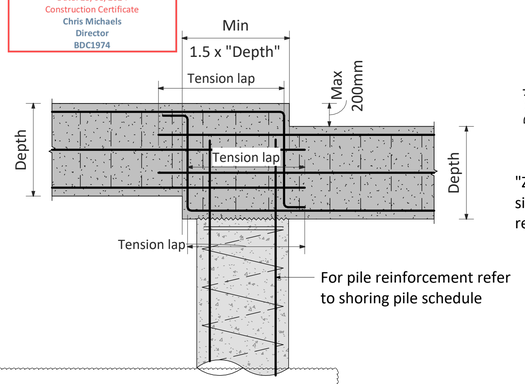


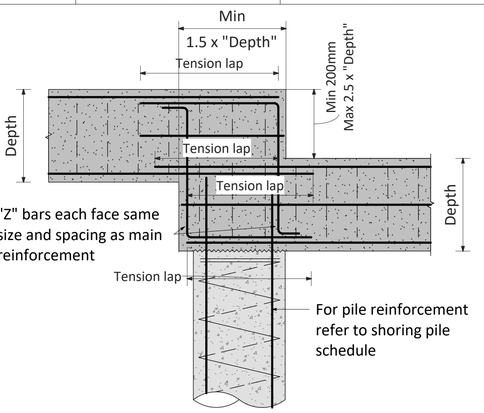
4 Typical Pile Section (In-situ Feature Wall)
NTS



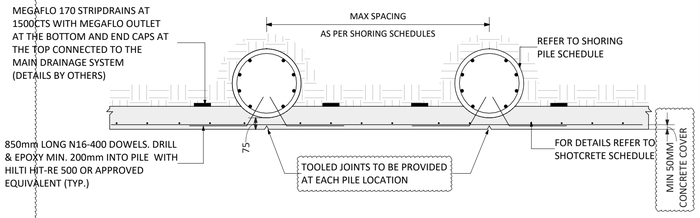
7 Typical Capping Beam Section Detail
NTS

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

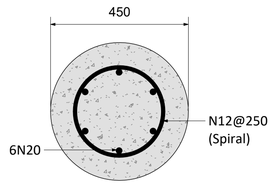




8 Typical Capping Beam Step Detail
1 : 20



6 Typical Shoring Detail - Anchored Piles
NTS



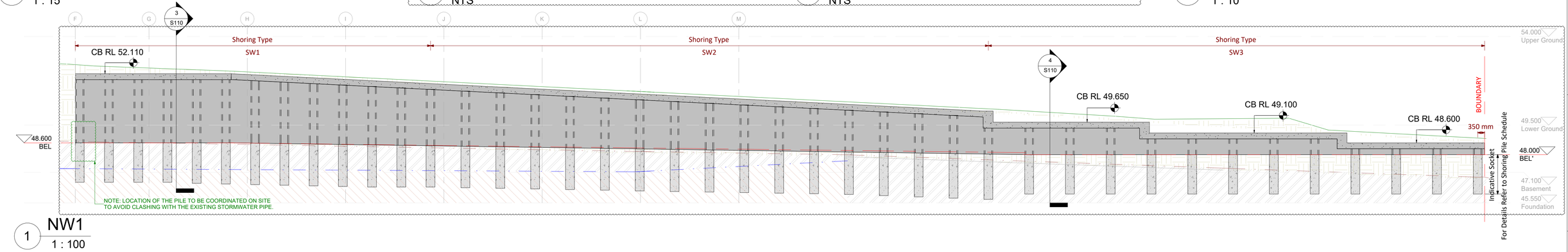
5 Pile Type
1 : 10

Soil Profile Legends

- *Residual Soil*
- *Unit 3B - Sandstone - Low to Medium Strength*
- *Unit 3C - Sandstone - Medium to High Strength*

Line Legend

- Natural Ground Level (NGL) - Indicative
- Top of Unit 3B - Sandstone - Low to Medium Strength - Indicative
- Top of Unit 3C - Sandstone - Medium to High Strength - Indicative



1 NW1
1 : 100

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REV	BY	DATE	DESCRIPTION	APPD.
D	JM	15/08/2024	ISSUED FOR CC1	GH
C	AA	07/08/2024	ISSUED FOR CC1 REVIEW	GH
B	JM	02/08/2024	ISSUED FOR APPROVAL	GH
A	JM	01/08/2024	ISSUED FOR APPROVAL	GH

CIVIL CONTRACTOR: CHALOUHI — DEMOLITION • EXCAVATION • CIVIL CONSTRUCTION

BUILDER: Grindley

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DRAWN	J.M.
DESIGNED	H.R.
CHECKED	O.A.
APPROVED	G.H.

SHEET TITLE: SHORING ELEVATION AND DETAILS

PROJECT: SHORING SYSTEM DESIGN
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK, NSW 2113

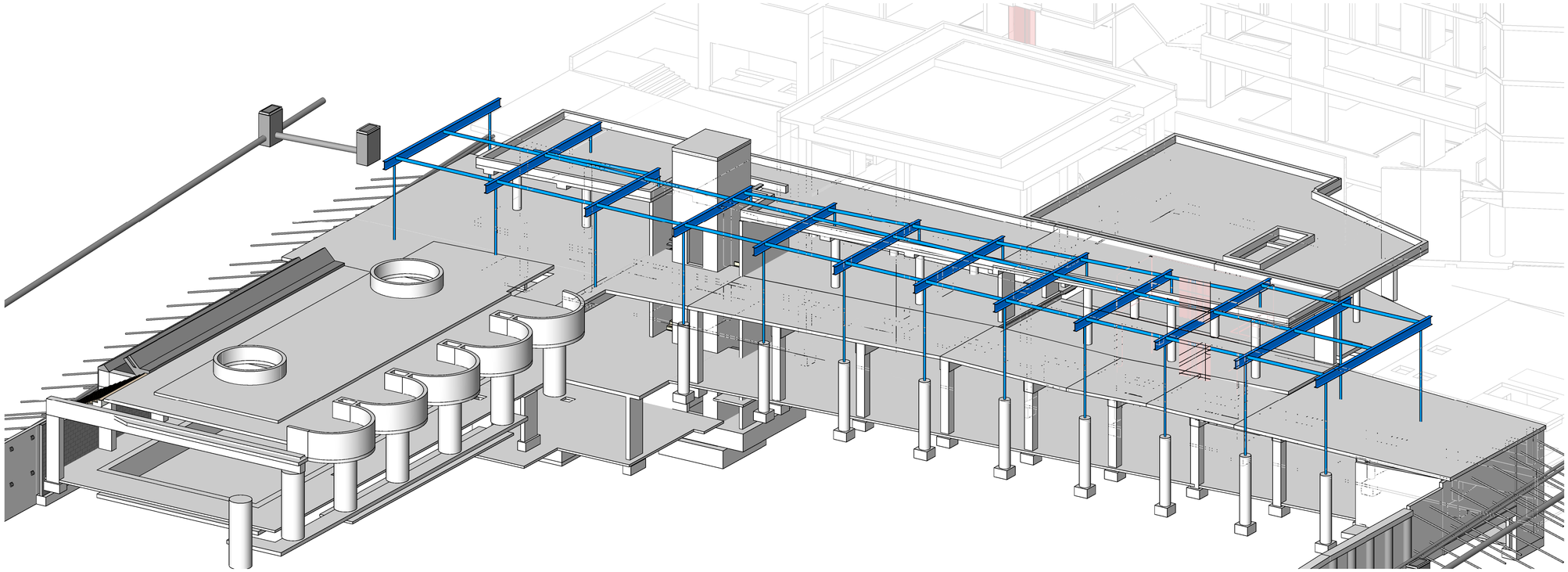
PROJECT REF.: PAR-24871	DRG NO.: S110	D
SHEET: 3 of 3	A1 STATUS: For Approval	

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: COVER SHEET		Drawing Number: S01-00		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

IVANHOE VILLAGE GREEN & COMMUNITY CENTRE

1 IVANHOE PLACE, MACQUARIE PARK NSW 2113



STRUCTURAL DRAWING LIST

S01-00	COVER SHEET
S01-01	STRUCTURAL NOTES - SHEET 1
S01-02	STRUCTURAL NOTES - SHEET 2
S01-03	STRUCTURAL NOTES - SHEET 3
S01-04	STRUCTURAL NOTES - SHEET 4
S01-05	STRUCTURAL NOTES - SHEET 5
S02-01	RETENTION PLAN
S02-11	RETENTION ELEVATIONS - SHEET 1
S02-12	RETENTION ELEVATIONS - SHEET 2
S02-31	RETENTION SECTION - SHEET 1
S02-32	RETENTION SECTION - SHEET 2
S02-51	RETENTION DETAILS - SHEET 1
S02-52	RETENTION DETAILS - SHEET 2
S02-61	BULK EXCAVATION PLAN
S02-65	BULK EXCAVATION SECTION - SHEET 1
S03-01	FOOTING PLAN - SHEET 1
S03-02	FOOTING PLAN - SHEET 2
S03-51	FOOTING DETAILS - SHEET 1
S03-52	FOOTING DETAILS - SHEET 2
S04-01	BASEMENT PLAN - SHEET 1
S04-02	BASEMENT PLAN - SHEET 2
S05-01	LOWER GROUND PLAN - SHEET 1
S05-02	LOWER GROUND PLAN - SHEET 2
S06-01	UPPER GROUND PLAN - SHEET 1
S06-02	UPPER GROUND PLAN - SHEET 2
S07-01	ROOF PLANT PLAN - SHEET 1
S07-02	ROOF PLANT PLAN - SHEET 2
S07-11	ROOF STEELWORK PLAN - SHEET 1
S07-12	ROOF STEELWORK PLAN - SHEET 2

REVISIONS

No.	REVISION DESCRIPTION	DRAWN	DATE
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024

19/08/2024 2:14:17 PM

SCALE BAR
0 10 20 30 40 50 100 mm
1:1

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Grindley CONSTRUCTION

ARCHITECT
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PROJECT TITLE
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE
COVER SHEET

DRAWING STATUS
CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	N/A	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S01-00	1

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)			Body Corporate No: NOT APPLICABLE	
Drawing Title: STRUCTURAL NOTES - SHEET 1			Drawing Number: S01-01	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

GENERAL

G1. THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT.

G2. ALL DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR A DECISION BEFORE PROCEEDING WITH THE WORK.

G3. APPROVAL FOR THE USE OF ALTERNATIVE PRODUCTS OR DETAILS SHALL BE SOUGHT FROM THE ENGINEER. ANY APPROVAL GIVEN DOES NOT CONSTITUTE AUTHORISATION OF A VARIATION, WHICH MUST BE REFERRED TO THE ARCHITECT / SUPERINTENDENT FOR AUTHORISATION BEFORE THE WORK COMMENCES.

G4. ALL DIMENSIONS ARE IN MILLIMETRES AND ALL LEVELS ARE IN METRES UNLESS STATED OTHERWISE.

G5. ALL DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE WORK SHALL BE VERIFIED BY THE CONTRACTOR BEFORE FABRICATION OR CONSTRUCTION COMMENCES.

G6. DIMENSIONS SHALL NOT BE OBTAINED BY SCALING THE DRAWINGS.

G7. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE BCA, RELEVANT AUSTRALIAN STANDARDS AND THE REQUIREMENTS OF LOCAL COUNCIL AND OTHER RELEVANT STATUTORY AUTHORITIES.

G8. ALL CODES AND STANDARDS REFERRED TO IN THESE NOTES OR ON THE DRAWINGS ARE THE CURRENT EDITION INCLUDING AMENDMENTS.

G9. DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION AND ENSURING THAT NO PART IS OVERSTRESSED UNDER CONSTRUCTION ACTIVITIES.
THE BUILDER IS RESPONSIBLE FOR THE DESIGN AND CONSTRUCTION OF ALL TEMPORARY WORKS REQUIRED FOR THE BUILDING OF THE PROJECT.

G10. THE CONTRACTOR SHALL EMPLOY A QUALIFIED GEOTECHNICAL ENGINEER AS REQUIRED FOR ALL GEOTECHNICAL ASPECTS OF THE BUILDING WORKS.

G11. THE CONTRACTOR SHALL GIVE 48 HOURS NOTICE OF INSPECTIONS BEING REQUIRED BEFORE ANY STRUCTURAL WORK IS CONCEALED.

G12. THE CONTRACTOR SHALL INSPECT AND SIGN OFF ALL STRUCTURAL ELEMENTS PRIOR TO REQUESTING AN INSPECTION FROM THE ENGINEER.

G13. ALL INTERNAL NON-LOADBEARING PARTITIONS SHALL BE INSTALLED WITH A TOP PLATE DEFLECTION HEAD TO ALLOW FOR VERTICAL AND LATERAL DEFLECTIONS OF THE SLAB/RAFTER OVER THAT THE PARTITION IS BEING ATTACHED, IN ACCORDANCE WITH MANUFACTURERS SPECIFICATIONS.
UNLESS NOTED OTHERWISE, THE MINIMUM VERTICAL DEFLECTION ALLOWANCE BELOW FLOORS SHALL BE SPAN/250 OR 20mm MIN WHICHEVER IS GREATER AND BELOW STEEL ROOFS SHALL BE +/- SPAN/150 OR +/- 50mm WHICHEVER IS GREATER, WITH THE WALL SYSTEM SET EQUALLY WITHIN THE DEFLECTION HEAD.
HORIZONTAL MOVEMENT SHALL ALSO BE ALLOWED FOR WITH AN ALLOWANCE OF HT/150 FOR INDUSTRIAL BUILDINGS AND INTER-STORY DRIFT OF HT/300 FOR HIGH RISE.
INTERNAL WALLS BOUND BY LOAD BEARING STRUCTURAL ELEMENTS/CROSS WALLS/FAÇADE ELEMENTS, SHALL ALLOW FOR A COMPRESSIBLE VERTICAL JOINT OR SIDE PLATE DEFLECTION CHANNEL ADJACENT TO THESE WALLS TO ACCOMMODATE FOR RACKING OF THESE ELEMENTS. CONTROL JOINTS SHALL BE INCLUDED AT 6 M MAX CENTRES, 4 M FROM EVERY CORNER AND AT DOOR LOCATIONS TYPICAL UNLESS NOTED OTHERWISE ON THE DRAWINGS IN ACCORDANCE WITH MANUFACTURERS DETAILS.
FIRE RATED WALLS SHALL HAVE AN APPROVED COMPRESSIBLE FIRE RATED SEALANT INSTALLED IN ACCORDANCE WITH MANUFACTURERS DETAILS.
ANY PROPOSED VARIATIONS TO THE ABOVE LIMITS REQUIRE WRITTEN APPROVAL BY THE PROJECT STRUCTURAL ENGINEER PRIOR TO ANY CHANGES.

G14. THE CONTRACTOR SHALL SUBMIT ONE (1) SET OF WORKSHOP DRAWINGS FOR PREFABRICATED COMPONENTS OF THE WORK TO THE ENGINEER FOR REVIEW AT LEAST THREE (3) WEEKS PRIOR TO FABRICATION. **ALLOW FIVE (5) WORKING DAYS FOR THE REVIEW.** FABRICATION SHALL NOT COMMENCE UNTIL ALL REVIEW COMMENTS ON THE WORKSHOP DRAWINGS HAVE BEEN RESOLVED TO THE ENGINEER'S SATISFACTION.

G15. THE "TENDER" ISSUE SET OF THESE DRAWINGS IS BASED ON PRELIMINARY ARCHITECTURAL INFORMATION AND PRELIMINARY ENGINEERING DESIGN. ANY QUANTITIES AND RATES GIVEN ARE FOR INITIAL PRICING AND MAY VARY IN LATER "FOR CONSTRUCTION" ISSUE DOCUMENTS.

G16. THE WORD 'ENGINEER' USED IN THESE NOTES OR ON THE DRAWINGS REFER TO AN EMPLOYEE OR NOMINATED REPRESENTATIVE OF **VAN DER MEER CONSULTING.**

G17. ABBREVIATIONS

ALT.	ALTERNATE BARS
BS	BOTH SIDES
BTM	BOTTOM
CFW	CONTINUOUS FILLET WELD
CPBW	COMPLETE PENETRATION BUTT WELD
CJ	CONSTRUCTION JOINT
C/S	BRICKWORK COURSE
CTS	CENTRES
EF	EACH FACE
EW	EACH WAY
FF	FAR FACE
FFL	FINISH FLOOR LEVEL
GL	GROUND LINE
HOR.	HORIZONTAL
IJ	ISOLATION JOINT
LV	LENGTH VARIES
MC	MASS CONCRETE
MJ	MOVEMENT JOINT
NF	NEAR FACE
NOM	NOMINAL
NSOE	NOT SHOWN ON ELEVATION
NSOP	NOT SHOWN ON PLAN
NTS	NOT TO SCALE
RL	REDUCED LEVEL
RC	REINFORCED CONCRETE
STAGG.	STAGGERED BARS
SSL	STRUCTURAL SLAB LEVEL
TMJ	TEMPORARY MOVEMENT JOINT
U/S	UNDERSIDE
VERT.	VERTICAL
UNO	UNLESS NOTED OTHERWISE
(o)	OVER
(u)	UNDER
(b)	BEHIND

NOTE:
THE CONTRACTOR SHALL ENSURE THAT ALL PERSONNEL ON SITE HAVE BEEN ADEQUATELY TRAINED AND ARE AWARE OF ALL HEALTH AND SAFETY REGULATIONS.

DESIGN REQUIREMENTS

1. **LOADINGS**

L1. ALL LOADS SHALL BE AS NOTED IN THE STRUCTURAL DESIGN BRIEF DOCUMENT, OR AS TABLED BELOW.
WHERE A VALUE IS INDICATED DIFFERENTLY ON THE STRUCTURAL DESIGN BRIEF, THEN THE MORE ONEROUS CONDITION SHALL APPLY.

a. AREA	LIVE LOAD		SUPERIMPOSED DEAD LOAD (SDL)
	UDL	POINT LOAD	UDL
COMMUNITY GATHERINGS / CAFES / LOBBIES	5.00 kPa	3.60 kN	2.00 kPa
POOL AREAS / AMENITIES	5.00 kPa	3.60 kN	2.00 kPa
CORRIORS / STAIRS	4.00 kPa	4.50 kN	0.75 kPa
PLANTROOMS / BINROOMS / STORAGE / GYM. NOTE: PLANT EQUIPMENT WEIGHTS TO BE ADVISED BY SERVICE	5.00 kPa	9.00 kN	1.00 kPa
COURTYARDS / LANSCAPING / TERRACES / EXTERNALLY PAVED AREAS	5.00 kPa	4.50 kN	AS PER LANDSCAPING DRAWINGS BUT NOT LESS THAN 2 kPa
PLANTERS	5.00 kPa	4.50 kN	MIN 18.0 kPa/m DEPTH
ROOF (NON-TRAFFICABLE)	0.25 kPa	1.80 kN	1.00 kPa
b. MASONRY PARTITIONS AND OTHER NON-STRUCTURAL WALLS			AS INDICATED ON ARCHITECTS DRAWINGS
c. BCA IMPORTANCE LEVEL			2
d. WIND LOAD REGION TERRAIN CATEGORY			A2 3
e. EARTHQUAKE DESIGN CATEGORY (EDC) ANNUAL PROBABILITY OF EXCEEDENCE (Kp) HAZARD FACTOR (Z) SITE SUB-SOIL CLASS			II 1/500 (1.0) 0.08 Be

2. **EXPOSURE CLASSIFICATIONS**

INTERNAL	A1
EXTERNAL	B1
ITEM IN CONTACT WITH GROUND	B1

3. **FIRE RATING CLASSIFICATIONS**

COMMUNITY GATHERINGS

NON RESIDENTIAL, BASEMENTS AND PLANTROOM	WALLS (LOAD BEARING)	120/120/120
	SLABS	120/120/120
	COLUMNS	120/120/120
	BEAMS	120/120/120
SUB-STATION	ALL ELEMENTS	180/180/180
STORAGE ROOMS	ALL ELEMENTS	240/240/240

NOTE:
ALL FIRE RATING CLASSIFICATIONS TO BE CONFIRMED BY FIRE ENGINEER

SAFETY IN DESIGN

THIS DESIGN IS IN ACCORDANCE WITH THE CURRENT SAFE WORK AUSTRALIA ACT, REGULATIONS, PRIORITY CODES OF PRACTICE STATE BY STATE.

SD01. **A RISK MANAGEMENT PROCESS HAS BEEN APPLIED.**
THIS RISK MANAGEMENT PROCESS IS A SYSTEMATIC WAY OF MAKING THE WORKPLACE AS SAFE AS REASONABLY POSSIBLE . IT SHALL BE USED AS PART OF THE DESIGN PROCESS WHICH INVOLVES THE FOLLOWING FIVE STEPS:
1. IDENTIFY THE LIKELIHOOD OF ANY HAZARD OR RISK ASSOCIATED WITH THE STRUCTURE OCCURRING.
2. ASSESS THE DEGREE OF HARM THAT MIGHT RESULT FROM THE HAZARD AND/OR RISK.
3. GATHER KNOWLEDGE ABOUT THE HAZARD AND/OR RISK.
4. IDENTIFY THE AVAILABILITY AND SUITABILITY OF WAYS TO ELIMINATE OR MINIMISE THE RISK BY DESIGNING CONTROL MEASURES.
5. REVIEW THE CONTROL MEASURES AND THE COST ASSOCIATED WITH ELIMINATING OR MINIMISING THE RISK, INCLUDING WHETHER THE COST IS GROSSLY DISPROPORTIONATE TO THE RISK.

THE ENGINEER SHALL CONSULT THE ARCHITECT AND THE CLIENT FOR ANY KNOWLEDGE OF POTENTIAL HAZARDS IDENTIFIED THAT MAY EFFECT THE DESIGN, CONSIDERATION HAS BEEN GIVEN TO:
- THE INTENDED PURPOSE OF THIS STRUCTURE.
- THE DESIGN OF THIS STRUCTURE.
- MATERIALS TO BE USED.
- POSSIBLE METHOD OF CONSTRUCTION, MAINTENANCE, OPERATION, DEMOLITION OR DISMANTLING AND DISPOSAL.
- WHAT LEGISLATION, CODES OF PRACTICE AND STANDARDS NEED TO BE CONSIDERED AND COMPLIED WITH .
- MATTERS OF WORKPLACE HEALTH AND SAFETY IMPACTED BY THIS DESIGN SHALL CONFORM TO CURRENT SAFE WORK AUSTRALIA SAFE DESIGN OF STRUCTURES.
- THE CONTRACTOR SHOULD ENSURE THAT ALL PROFESSIONAL DESIGN SERVICES ENGAGED FOR THIS CONTRACT SHALL COMPLY WITH SAFE WORK AUSTRALIA.

THIS STRUCTURE HAS BEEN DESIGNED TO ELIMINATE HAZARDS TO HEALTH AND SAFETY WHEREVER POSSIBLE. WHERE THIS HAS NOT BEEN POSSIBLE, THE RISK TO HEALTH AND SAFETY OF PERSONS HAS BEEN MINIMISED TO BE REASONABLY PRACTICABLE FOR THE DESIGNED LIFE OF THE STRUCTURE.

SD02. **WORK HEALTH AND SAFETY**
THE CONTRACTOR SHALL ENSURE THAT THE CONSTRUCTION OF THIS PROJECT IS CARRIED OUT UNDER A WORK HEALTH AND SAFETY CO-ORDINATION PLAN AND ANY OTHER APPLICABLE SAFETY IN THE WORKPLACE LEGISLATION COMPLIANT WITH AUSTRALIAN REQUIREMENTS STATE BY STATE IN WHICH THE WORK IS CARRIED OUT.

SD03. **IDENTIFY HAZARDS**
THE CONTRACTOR SHALL MAKE EVERY EFFORT TO ENSURE ALL PERSONS WHO MAY ENTER THE CONSTRUCTION SITE WHICH INCLUDES WORKERS AND NON WORKERS ALIKE, ARE MADE AWARE OF THE RISK OF HAZARDS AND POTENTIAL HAZARDS WHICH MAY INCLUDE, BUT ARE NOT LIMITED TO IN-GROUND HOLES OR OBSTACLES, TEMPORARY CONSTRUCTION WORKS AND OVERHEAD ACTIVITIES, NOISE AND WELDING FLASHES, ANY SUCH HAZARD SHALL BE ISOLATED AND CLEARLY IDENTIFIED WITH HIGH VISIBILITY OFFICIAL SIGNAGE AND HIGH VISIBILITY BARRICADES. THE CORRECT LEVEL OF TRAINING SHALL BE MANDATORY BEFORE ANY PERSON ENTERS THE CONSTRUCTION AREA. ALL PERSONS SHALL WEAR THE APPROPRIATE SAFETY PROTECTION APPAREL SUPPLIED BY THE CONTRACTOR BEFORE ENTERING THE SITE. A QUALIFIED GUIDE SHALL ACCOMPANY ALL NEW CONSTRUCTION WORKERS DURING THEIR INITIATION AND ALL SITE VISITORS WHILE ON THE SITE.

SD04. **EXISTING SERVICES**
THIS DESIGN HAS TAKEN INTO ACCOUNT EXISTING SERVICES AS IDENTIFIED ON DRAWINGS SUPPLIED. THE SUB-CONTRACTOR SHALL TAKE ALL NECESSARY SAFETY PRECAUTIONS WHEN WORKING WITH EXISTING SERVICES AND INSTALLING NEW SERVICES. THIS INCLUDES PERSONAL SAFETY AND THE SAFETY OF OTHERS. THESE WORKS SHALL INCLUDE BUT ARE NOT LIMITED TO:

WORKING WITH EXISTING SERVICES, BUT NOT LIMITED TO SERVICES INVOLVING:
- WORKING IN AREAS OF HIGH VOLTAGE ELECTRICAL CABLES
- WORKING WITH MACHINERY IN AREAS OF HIGH VOLTAGE CABLES e.g. USING MOBILE CRANES, TOWER CRANES ETC.
- WORKING IN AREAS OF UNDERGROUND SERVICES INCLUDING SEWER, WATER, FIRE, GAS AND ELECTRICAL CABLES
- DEEP EXCAVATIONS - UNSTABLE GROUND AND ROCK EXCAVATIONS AND TENSIONING SYSTEMS
- HIGH PRESSURE GAS
- TOXIC WASTE
- CONTAMINATED SOIL
- DEMOLITION WORKS WHERE SERVICES ARE EXPOSED
- POWER CABLES AND OVERHEAD CABLES
- ASBESTOS OR ANY FIBROUS MATERIALS
- FIRE HYDRANTS ETC.
- WORKING OVER/UNDER THOROUGHFARES-TRAFFIC AND/OR PEDESTRIAN

SD05. **DIAL BEFORE YOU DIG**
THE CONTRACTOR SHALL ENSURE THE SUB-CONTRACTOR OBTAINS 'DIAL BEFORE YOU DIG' INFORMATION AND IDENTIFIES AREAS OF EXISTING UNDERGROUND SERVICES PRIOR TO EXCAVATION.

SD06. **PRIOR TO EXCAVATION**
PRIOR TO COMMENCING ANY EXCAVATION WORKS ON SITE, THE CONTRACTOR IS TO IDENTIFY AND LOCATE ANY IN GROUND SERVICES VIA AN ULTRASONIC UNDERGROUND SURVEY. ENSURE AREAS OF HIGH RISK HAVE BEEN IDENTIFIED ON DRAWINGS AND ARE CLEARLY MARKED WITH AN APPROPRIATE DANGER SYMBOL EXAMPLES AS FOLLOW:
DEEP EXCAVATION, HIGH VOLTAGE, UNDERGROUND SERVICES, CONTAMINATED SOIL, ETC.

SD07. **STABILITY OF THE STRUCTURE**
TEMPORARY MEASURES WILL NEED TO BE TAKEN DURING CONSTRUCTION AND DEMOLITION TO ENSURE THE STABILITY OF THE STRUCTURE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND THE CONTRACTOR'S ERECTION DESIGN ENGINEER TO TAKE ALL MEASURES NECESSARY TO MAINTAIN STRUCTURAL INTEGRITY DURING ALL PHASES OF DECONSTRUCTION AND CONSTRUCTION. ATTENTION IS DRAWN TO THE NEED TO PROVIDE TEMPORARY SUPPORT TO (BUT NOT LIMITED TO):

TEMPORARY SUPPORT REQUIRED, BUT NOT LIMITED TO ITEMS INVOLVING:
- SOIL AND ROCK EXCAVATION
- CONCRETE FORMWORK TO FACILITATE CONCRETE PLACEMENT
- STRUCTURAL STEEL FRAMEWORK.
- BRICK OR CONCRETE BLOCKWORK
- PRECAST CONCRETE ELEMENTS
- TIMBER FRAMEWORK
- STATIC OR OPERATING PLANT AND EQUIPMENT
- STORED MATERIALS

SD08. **SPECIALIST CONTRACTOR**
ACTIVITIES REQUIRED TO BE CARRIED OUT DURING THE CONSTRUCTION WHICH ARE NOT CONSIDERED TO BE NORMAL BUILDING PRACTICE AND THEREFORE MAY REQUIRE ENGAGEMENT OF A SPECIALIST CONTRACTOR.

SD09. **BUILDING CODE REQUIREMENT**
THE DESIGN HAS BEEN CARRIED OUT IN ACCORDANCE WITH THE DESIGN INTENT OF THE BUILDING CODE OF AUSTRALIA AS APPLIES STATE BY STATE

SD10. **BUILDING OPERATION AND MAINTENANCE**
MUST BE CARRIED OUT IN ACCORDANCE WITH THE DESIGN INTENT OF THE BUILDING CODE OF AUSTRALIA AS APPLIES STATE BY STATE. OPERATION, CLEANING AND MAINTENANCE OF THE BUILDING MAY REQUIRE, BUT NOT LIMITED TO ITEMS INVOLVING
- ACCESS USING WORK PLATFORMS, STEPS, FALL ARREST SYSTEMS AND LADDERS
- WORKING AT HEIGHT
- INCLUSION OF BMU IN ROOF LAYOUT
- USE OF HAZARDOUS MATERIAL/CHEMICALS
- LIFTING OF MATERIALS
- ACCESS AND WORKING IN CONFINED SPACES
- SUFFICIENT WORK SPACE
- OPERATION AND MAINTENANCE MANUALS
- USE OF HEAVY EQUIPMENT
- WORKING ON SMOOTH/SLIPPERY SURFACES
- WORKING ADJACENT TO VEHICULAR/FORKLIFT TRAFFIC
- WORKING NEAR TRAFFIC OR MOVING FREIGHT CARRIERS

SD11. **DESIGN OUT RISK**
METHODS USED TO DESIGN OUT OCCUPATIONAL RISKS RELATED TO THE CONSTRUCTION, OCCUPATION OR DEMOLITION OF THIS STRUCTURE INCLUDES:
- OFF-SITE PREFABRICATION OF CONSTRUCTION ELEMENTS
- USE OF BOLTED STEEL SITE CONNECTIONS TO AVOID ON-SITE WELDING

SD12. **DECONSTRUCTION**
AT THE END OF THE LIFE OF THIS STRUCTURE, ENGAGE SUITABLY QUALIFIED DEMOLITION ENGINEERS TO ASSIST WITH ITS DECONSTRUCTION.

DEMOLITION NOTES

DE1. ALL DEMOLITION TO BE DONE IN ACCORDANCE WITH WORK COVER CODE OF PRACTICE.

DE2. THE BUILDER / SUB-CONTRACTOR IS RESPONSIBLE TO MAINTAIN STRUCTURAL STABILITY.

DE3. THE DEMOLITION BUILDER / SUB-CONTRACTOR MUST NOT ALLOW FOR DEMOLITION MATERIAL TO DROP ON EXISTING / NEW SLABS. INTRODUCE CATCH DECKS AS REQUIRED.

SITE PREPARATION AND FILL CONSTRUCTION

SITE PREPARATION AND EARTHWORKS FOR PAVEMENT AND STRUCTURE SUPPORT SHOULD CONSIST OF:

1. THE PROPOSED DEVELOPMENT AREA SHOULD BE STRIPPED TO REMOVE ALL VEGETATION, TOP SOIL, ROOT AFFECTED OR OTHER POTENTIALLY DELETERIOUS MATERIALS. STRIPPING IS GENERALLY EXPECTED TO BE REQUIRED TO A DEPTH IN ACCORDANCE WITH BULK EXCAVATION PLANS.
2. IN AREAS TO BE FILLED OR IN PAVEMENT SUBGRADE AREAS EXPOSED BY STRIPPING AS OUTLINED ABOVE, THE EXPOSED SUBGRADE MATERIAL SHOULD BE PROOF ROLLED TO IDENTIFY ANY WET OR EXCESSIVELY DEFLECTING MATERIAL. ANY SUCH AREAS SHOULD BE EXCAVATED AND BACKFILLED WITH AN APPROVED SELECTED MATERIAL.
3. APPROVED FILL MATERIAL SHOULD BE PLACED IN LAYERS NOT EXCEEDING 200mm COMPACTED THICKNESS AND COMPACTED IN ACCORDANCE WITH GEOTECHNICAL ENGINEER REQUIREMENTS.
4. IT IS THE BUILDERS RESPONSIBILITY TO CONFIRM SITE PREPARATION IS IN ACCORDANCE WITH:
GEOTECH REPORT 86043.06.R.001.Rev1.C2 DATED AUGUST 2021
PREPARED BY DOUGLAS AND PARTNERS

GROUND WORKS AND BULK EXCAVATION

GW1. ALL GROUND WORKS AND EXCAVATION SHALL BE IN ACCORDANCE WITH
GEOTECH REPORT 86043.06.R.001.Rev1.C2 DATED AUGUST 2021
PREPARED BY DOUGLAS AND PARTNERS

GW2. SEPARATE AND REMOVE ALL TOP SOIL, VEGETATION, ROOT AFFECTED SOIL, EXISTING FILL, CONCRETE , BRICK, TIMBER AND OTHER NON-SOIL MATERIAL. STORE TOP SOIL IF REQUIRED.

GW3. ALL EXCAVATIONS SHALL BE FINISHED CLEAN AND TO LEVEL AND SHALL NOT UNDERMINE ADJACENT FOOTINGS, WALLS etc..

GW4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXCAVATIONS IN A STABLE CONDITION WITHOUT AFFECTING ADJACENT PROPERTIES OR SERVICES.
WHERE REQUIRED, TEMPORARY SHORING SHALL BE PROVIDED TO THE SIDES OF THE EXCAVATION.

GW5. UNLESS STATED OTHERWISE IN THE GEOTECHNICAL REPORT, PROOF ROLL WITH A MINIMUM OF 8 PASSES WITH AN 8 TONNE ROLLER. REPLACE ANY SOFT MATERIAL WITH APPROVED FILL AND RE-COMPACT. GEOTECHNICAL ENGINEER TO INSPECT AND APPROVE THE WORKS.

GW6. SELECTED IMPORTED FILL MAY COMPRISE MATERIAL SUCH AS CLASS 3 OR 4 CRUSHED ROCK AS DEFINED BY GEOTECH ENGINEER CLAYEY SAND OR WEATHERED SEDIMENTARY ROCK.
IMPORTED FILL MATERIAL SHALL HAVE A MAXIMUM PARTICLE SIZE AFTER COMPACTION OF 50 mm AND HAVE A LIQUID LIMIT NOT EXCEEDING 50%.
ANY GRANULAR MATERIAL USED SHOULD BE WELL GRADED.
OPEN GRADED, GRANULAR BACKFILLING SHALL NOT BE USED.
ALTERNATIVE MATERIALS MAY BE CONSIDERED, BUT SAMPLES SHALL BE SUBMITTED FOR APPROVAL BY THE GEOTECHNICAL ENGINEER BEFORE USE.

GW7. THE FILL SHALL BE PLACED AND COMPACTED IN LAYERS OF 250mm MAXIMUM LOOSE THICKNESS.

GW8. UNLESS STATED OTHERWISE IN THE GEOTECHNICAL REPORT, THE TOP TWO LAYERS OF PAVED AREAS SHALL BE COMPACTED TO MINIMUM 100% STANDARD MAXIMUM DRY DENSITY. LOWER LAYERS SHALL BE COMPACTED TO A MINIMUM 95% STANDARD DRY DENSITY AT OPTIMUM MOISTURE CONTENT ± 2% AS REQUIRED BY AS 1289 E1.1. GEOTECHNICAL ENGINEER TO VERIFY.

GW9. ANY PERMANENT OR TEMPORARY EMBANKMENTS REQUIRED SHALL BE CUT TO GEOTECHNICAL SPECIFICATIONS.

GW10. UNLESS STATED OTHERWISE IN THE GEOTECHNICAL REPORT, ALL GROUND WORKS SHALL BE TESTED BY AN APPROVED GEOTECHNICAL ENGINEER TO A LEVEL 2 STANDARD, IN ACCORDANCE WITH AS 3798.

GW11. CONTRACTOR SHALL ADVISE OF THE GEOTECHNICAL CONSULTANT AT TIME OF TENDER.
ENGINEER TO APPROVE THE GEOTECHNICAL CONSULTANT FOR CONSTRUCTION.

GW12. ALL EXCAVATIONS SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER.

GW13. THE LEVELS WHERE SHOWN ARE FOR THE BULK EARTHWORKS ONLY. DETAILED EARTHWORKS, INCLUDING EXCAVATION OF LIFT OVERRUNS, FOOTINGS, SHEET PILING, TEMPORARY SHORING, UNDERPINNING (WHERE NECESSARY) AND SITE DEWATERING ARE NOT INCLUDED AND SHALL BE CARRIED OUT SEPARATELY.

GW14. THE SITE SHALL BE LEFT SO WATER RUNS OFF THE SURFACE TO TEMPORARY SUMPS, WHERE IT SHALL BE REGULARLY PUMPED DRY.

GW15. BULK EXCAVATION LEVELS ARE BASED ON SLAB THICKNESS AND BASE COURSE AS SPECIFIED ON THE DRAWINGS U.N.O.

GW16. THE CONTRACTOR SHALL STOCK PILE SUFFICIENT APPROVED SOIL TO BACKFILL BEHIND RETAINING WALLS.

GW17. THE CONTRACTOR SHALL ALLOW FOR ANY ADDITIONAL BASE (e.g. CRUSHED ROCK) REQUIRED DURING CONSTRUCTION (e.g. FOR ACCESS WAYS AND PLATFORM FOR DRILLING RIG). BULK EXCAVATION LEVELS SHALL BE ADJUSTED TO SUIT.

GW18. ALL CONTOURS AND LEVELS USED TO PRODUCE EARTHWORK DETAILS HAVE BEEN BASED ON THE SURVEYORS AND ARCHITECTS SURVEY INFORMATION.

GW19. ROCK CONTOURS ARE INDICATIVE ONLY. THE CONTRACTOR SHALL MAKE THEIR OWN ASSESSMENT OF ROCK LEVELS AND PRICE ACCORDINGLY.

GW20. ALL FINISHED FLOOR LEVELS ARE TO BE IN ACCORDANCE WITH THE ARCHITECT'S DETAILS.

GW21. ALL EXISTING SERVICES SHALL BE CAPPED OFF PRIOR TO ANY WORKS. REFER TO EXISTING SURVEY DRAWINGS.

GW22. A PRE-CONSTRUCTION MEETING SHALL BE HELD BETWEEN THE CONTRACTOR, THE GEOTECHNICAL ENGINEER, AND THE EARTHWORKS CONTRACTOR TO UNDERSTAND POTENTIAL DIFFICULTIES AND TO ORGANISE TESTING PROCEDURES. THE CONTRACTOR SHALL CONFIRM TO THE ENGINEER THAT THE MEETING HAS BEEN HELD.

STRUCTURAL EXISTING / NEW WORKS

SE1. THIS SET OF STRUCTURAL DOCUMENTATION IS BASED ON PARTIAL EXISTING STRUCTURAL / ARCHITECTURAL DRAWINGS / RECORDS AND ALL WORKS AS DOCUMENTED SHALL BE VERIFIED ON SITE PRIOR TO ANY STRUCTURAL ALTERATIONS, DEMOLITION OR ADDITIONS.

SE2. ANY DISCREPANCIES OR CHANGE OF SCOPE OF WORKS MUST BE REPORTED TO VAN DER MEER CONSULTING FOR APPROVAL PRIOR TO WORK COMMENCING OR CONTINUING ON SITE.

SE3. ANY DISCREPANCIES MAY INTRODUCE ADDITIONAL/ALTERATION TO THE WORK AS DOCUMENTED ON THIS SET OF DRAWINGS. ALL BUILDER/SUBCONTRACTOR VARIATIONS DUE TO THE ABOVE MUST BE APPROVED BY THE SUPERINTENDENT.
(VAN DER MEER CONSULTING TAKES NO RESPONSIBILITY FOR ANY COST INVOLVED)

SE4. VAN DER MEER CONSULTING STRUCTURAL DESIGN / SPECIFICATIONS AS DOCUMENTED REPLACED EXISTING MEMBERS WITH NEW TO ENSURE THE STRUCTURAL ADEQUACY OF THE STRUCTURE AS A WHOLE IS MAINTAINED OR STRENGTHENED AS PER AS1170, 1 TO 4 (LOADING CODE)

SE5. IN AREAS WITH NEW SLAB PENETRATIONS, THE SLAB SPAN ADJACENT TO IT WILL HAVE A RESULTANT RESIDUAL DEFLECTION. (THIS MAY RESULT IN SOME EXISTING FLOOR FINISHES TO BE REINSTATED.)

FOUNDATIONS

F1. FOUNDATIONS SHALL BE IN ACCORDANCE WITH GEOTECH REPORT 86043.06.R.001.Rev1.C2 DATED AUGUST 2021 PREPARED BY DOUGLAS AND PARTNERS

F2. FOUNDATIONS SHALL BE FOUNDED ON CLASS III/IV SANDSTONE HAVING AN ALLOWABLE BEARING CAPACITY OF 3500 kPa.

F3. THE CONTRACTOR SHALL ENGAGE A GEOTECHNICAL ENGINEER TO VERIFY THE ADEQUACY OF FOUNDATION MATERIAL IN ALL FOOTINGS PRIOR TO PLACEMENT OF CONCRETE.

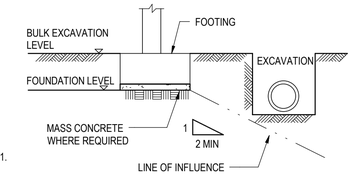
F4. FOOTINGS SHALL BE LOCATED CENTRALLY BENEATH WALLS AND COLUMNS UNLESS SHOWN OTHERWISE.

F5. ALL LOOSE MATERIAL AND WATER SHALL BE CLEANED OUT OF FOOTING EXCAVATIONS PRIOR TO PLACEMENT OF CONCRETE.

F6. FOUNDING LEVELS, WHERE SHOWN ON THE DRAWINGS, ARE INDICATIVE ONLY. ACTUAL FOUNDING LEVELS WILL BE DETERMINED BY SITE CONDITIONS.

F7. WHERE FOOTING EXCAVATION IS DEEPER THAN SPECIFIED, THE EXCESS EXCAVATION SHALL BE BACKFILLED WITH MASS CONCRETE, GRADE N20.

F8. FOOTINGS LOCATED ADJACENT TO EXCAVATIONS, BASEMENTS AND THE LIKE SHALL BE FOUNDED AT A LEVEL SUCH THAT LINE OF INFLUENCE FALLS BELOW THE EXCAVATION. STABILITY OF EXCAVATION BY OTHERS. WHERE NECESSARY, LOWER THE FOUNDING LEVEL AND BACKFILL WITH CONCRETE AS PER NOTE F7.



EXCAVATION SHALL NOT BE CARRIED OUT BELOW THE LINE OF INFLUENCE OF NEW OR EXISTING FOOTINGS WITHOUT THE ENGINEER'S APPROVAL.

F9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING EXCAVATIONS IN A STABLE CONDITION, WITHOUT AFFECTING ADJACENT PROPERTIES OR SERVICES. WHERE REQUIRED, TEMPORARY SHORING SHALL BE PROVIDED TO THE SIDES OF EXCAVATIONS.

F10. DO NOT BACKFILL RETAINING WALLS (OTHER THAN CANTILEVER WALLS) UNTIL FLOOR CONSTRUCTION AT TOP AND BOTTOM IS COMPLETED AND THE WALL IS PROPERLY TIED IN.

BORED PIERS

P1. BORED PIERS SHALL BE INSTALLED BY THE SUB-CONTRACTOR IN ACCORDANCE WITH AS 2159

P2. BORED PIER DETAILS ARE SHOWN ON THE FOUNDATION PLAN. SOCKET CAPACITIES ARE TO BE DEVELOPED BELOW ADJACENT DETAIL EXCAVATION. DETAIL EXCAVATION IS NOT SHOWN ON THE PLANS AND ADJUSTMENT TO SOCKET LENGTHS MAY BE REQUIRED ACCORDINGLY.

P3. BORED PIERS SHALL BE TERMINATED AT THE LEVELS REQUIRED TO ACHIEVE CONSTRUCTION OF THE PILE CAPS AS INDICATED ON THE DRAWINGS. ALLOW REINFORCEMENT TO PROTRUDE INTO PILE CAPS.

P4. BORED PIERS SHALL BE ADEQUATE TO ACHIEVE THE WORKING LOADS AS SPECIFIED ON THE DRAWINGS. THE CONTRACTOR SHALL DETERMINE THE PREDICTED DRILLING LENGTHS AND THESE SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER.

P5. A FULL DRILLING RECORD SHALL BE KEPT FOR ALL PIERS INDICATING DEPTHS, PLAN LOCATION, BEARING CAPACITY REACHED AND ANY PROBLEMS ENCOUNTERED.

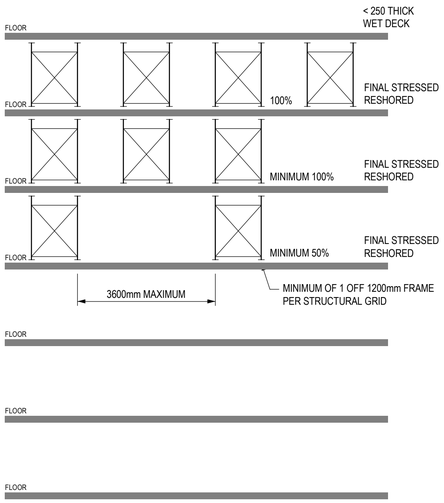
P6. IF RATIONALIZATION OF THE BORED PIER SCHEDULE IS PROPOSED BY THE SUBCONTRACTOR, SUBMIT PROPOSED SIZES AND CALCULATIONS FOR APPROVAL BY THE ENGINEER PRIOR TO COMMENCING WORK ON SITE.

P7. BORED PIERS SHALL BE WITHIN 2% OF VERTICAL AND WITHIN 75 mm OF LOCATION (MEASURED IN ANY DIRECTION). THE PILING SUB-CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW A RECTIFICATION

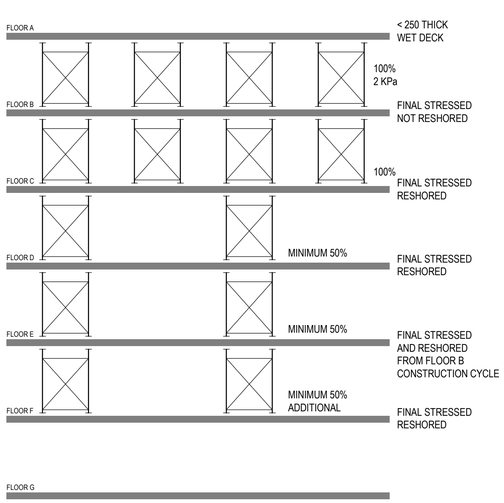
Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: STRUCTURAL NOTES - SHEET 2		Drawing Number: S01-02		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

GENERIC BACK PROPPING FOR RESIDENTIAL FLOOR STRUCTURE

ASK VAN DER MEER PROJECT ENGINEER FOR A BACK PROPPING ARRANGEMENT SPECIFIC TO THE PROJECT



STANDARD BACK PROPPING WITH SHORING



ALTERNATIVE BACK PROPPING FOR PARTIAL RESHORING CONDITION

NOTES:

- 50% BACK PROPPING IS A GENERIC TERM AND TYPICALLY DESCRIBES TEMPORARY SUPPORT AT 1800 CENTERS EACH WAY. SUBJECT TO FORMWORK SYSTEM AND TO BE REVIEWED BY VAN DER MEER AS REQUIRED
- RESHORING DENOTES A SLAB THAT HAS SELF SUPPORTED ITSELF PRIOR TO BEING A SUPPORT STRUCTURE FOR A WET LOADING DECK
- ADDITIONAL LEVELS OF NON-RESHORED LEVELS CREATES ACCUMULATIVE TEMPORARY LOADING. TO AVOID OVERLOAD ADDITIONAL BACK PROPPING IS REQUIRED.
- BACK PROPPING ARRANGEMENTS ABOVE ENSURE APPLIED LOADS ARE WITHIN DESIGN CAPACITIES, THEREFORE ENSURING PREDICTABLE DEFLECTION OUTCOMES.

CORE HOLE METHODOLOGY

CH1. CORE HOLES TO BE REVIEWED AND APPROVED BY VAN DER MEER PRIOR TO ANY CORING WORK COMMENCING.

CH2. CONCRETE ELEMENTS TO BE SCANNED FOR PT/REINFORCEMENT LOCATIONS AND CAST-IN SERVICES AND RESULTS TO BE MARKED ON SURFACE FOR FUTURE REFERENCE.
WHERE CONCRETE ELEMENTS ARE GREATER THAN 350mm THICK SCANS ARE TO OCCUR ON BOTH FACES OF CONCRETE, AND WHEN EXACT LOCATION OF ANY PT/REINFORCEMENT IS UNCLEAR

CH3. CORE HOLES ARE TO MAINTAIN A MINIMUM CLEAR DISTANCE BETWEEN THE FACE OF EACH HOLE AND ADJACENT REINFORCEMENT BAR NOT LESS THAN 50mm.

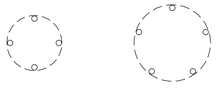
CH4. CORE HOLES ARE TO MAINTAIN A MINIMUM CLEAR DISTANCE BETWEEN THE FACE OF EACH HOLE AND ADJACENT PT TENDON/DUCT NOT LESS THAN 100mm.

CH5. MINIMUM CLEAR DISTANCE BETWEEN FACE OF ADJACENT CORE HOLE TO BE NOT LESS THAN 100mm.

CH6. **HOLD POINT:** VAN DER MEER TO ATTEND SITE AND PROVIDE APPROVAL AND FORMAL SIGN OFF FOR ALL SCANNED CORE HOLE LOCATIONS PRIOR TO STEP CH6.

CH7. DRILL PILOT HOLES WITHIN THE PROPOSED CORE HOLE PERIMETER USING MASONRY DRILL BIT ONLY ONCE APPROVED BY VAN DER MEER. REFER PILOT HOLE PROCEDURE NOTED BELOW.

PILOT HOLE PROCEDURE



UP TO 90mm DIA. UP TO125mm DIA.

○ = DENOTE 12mm MAX. PILOT HOLE EVENLY SPACED AROUND AND WITHIN PERIMETER OF CORE HOLE.

STEP A
ENSURE NO SERVICES ARE ACTIVE WITHIN THE NOMINATED AREA OF DRILLING. NOTE THAT IT IS THE BUILDER'S RESPONSIBILITY TO UNDERTAKE ALL MEASURES TO ENSURE NO SERVICES ARE ACTIVE OR PRESENT WITHIN THE SLAB PRIOR TO DRILLING.

STEP B
ENSURE ALL DEBRIS DUE TO DRILLING IS COLLECTED FROM THE UNDERSIDE OF THE SLAB

STEP C
DRILL PILOT HOLES AS SHOWN ABOVE USING A STANDARD MASONRY ROTARY DRILL AND MASONRY DRILL BIT. (NOT CAPABLE OF CUTTING REINFORCEMENT)

STEP D
ENSURE ALL PILOT HOLES PENETRATE THE FULL DEPTH OF CONCRETE ELEMENT.

STEP E
WHERE PT OR REINFORCEMENT OR CAST-IN SERVICES ARE ENCOUNTERED
HOLD POINT : DRILLING IS TO CEASE IMMEDIATELY, VAN DER MEER IS TO BE NOTIFIED AND AN ALTERNATIVE LOCATION TO BE FOUND AND APPROVED BY VAN DER MEER PRIOR TO RECOMMENCING THE ABOVE STEPS. ALL ABORTED PILOT HOLES ARE TO BE FILLED WITH 40MPa CEMENTITIOUS GROUT.

CH8. **HOLD POINT : VAN DER MEER TO ATTEND SITE AND PROVIDE APPROVAL AND FORMAL SIGN OFF FOR ALL CORE HOLE LOCATIONS PRIOR TO COMMENCEMENT OF ANY CORING.**

CH9. CORE HOLES TO BE MADE WITH DRILL RIG STAND (NOT HAND HELD).

CH10. ONCE APPROVAL IS GIVEN TO PROCEED FROM VAN DER MEER; IT REMAINS THE RESPONSIBILITY OF THE BUILDER TO COLLECT ALL DEBRIS FROM THE CORE AND TO ENSURE NO SERVICES ARE DISTURBED OR COMPROMISED.

CH11. CORES TO BE PLACE ASIDE FOR INSPECTION BY VAN DER MEER TO DETERMINE THAT NO PT, REINFORCEMENT OR CAST-IN SERVICES HAVE BEEN AFFECTED.

CH12. ANY DAMAGE CAUSED TO THE SLAB IS TO BE INSPECTED BY VAN DER MEER WHO WILL PROVIDE A REPAIR METHODOLOGY. DAMAGE IS BE REPAIRED BY THE CONTRACTOR STRICTLY IN ACCORDANCE INSTRUCTION PROVIDED. REPAIR WORKS TO BE INSPECTED BY VAN DER MEER UPON COMPLETION.

SHORING NOTES

SH1. PRIOR TO COMMENCEMENT OF WORK CONTRACTOR SHALL OBTAIN ALL NECESSARY APPROVALS FOR ENCROACHMENT OF EXCAVATIONS AND ANCHORS ON ADJOINING PROPERTIES AND STREETS. LOCATE ALL SERVICES IN STREETS LIKELY TO BE AFFECTED BY ANCHORS, WHERE APPLICABLE.

SH2. REFER TO ARCHITECTURAL DRAWINGS FOR FINISHED SURFACE LEVELS AND FOR ALL WALL AND PIER SET-OUT. THE BULK EXCAVATION LEVELS DO NOT INCLUDE ALLOWANCES FOR LOCALISED FALLS, DETAIL PIT, TRENCH OR PAD EXCAVATIONS. REFER TO THE RESPECTIVE STRUCTURAL, ARCHITECTURAL AND HYDRAULIC DRAWINGS FOR DETAILS.

SH3. EXCAVATION BELOW ANY SECTION OF "SHOTCRETE" WALL SHALL NOT PROCEED UNTIL THE CONCRETE HAS ACHIEVED A STRENGTH OF f'c = 15 MPa.

SH4. ALL ROCK ANCHORS ARE TO BE SUPPLIED, INSTALLED, STRESSED AND MAINTAINED IN ACCORDANCE WITH AS 4678.

SH5. RECORDS OF STRESSING ARE TO BE KEPT IN ACCORDANCE WITH AS 4678 AND SHALL BE AVAILABLE ON SITE.

SH6. DESTRESSING OF ROCK ANCHORS SHALL NOT BE UNDERTAKEN UNLESS APPROVAL HAS BEEN GIVEN BY THE ENGINEER. DESTRESSING WILL OCCUR AFTER CONSTRUCTION OF ALL SUPPORTING ELEMENTS.

SH7. TEMPORARY POST TENSIONED ROCK ANCHORS INSTALLED IN ACCORDANCE WITH THIS DOCUMENTATION. FOR WORKING FORCES AND PROOF TESTING REFER TO THE SCHEDULE. THE SHORING SUB-CONTRACTOR IS TO SUBMIT DETAILS OF ANCHORAGE DESIGN, BURSTING REINFORCEMENT AND BOND LENGTHS TO THE ENGINEER FOR REVIEW.

SLAB ON GROUND NOTES

SG1. REFER STRUCTURAL NOTES FOR CONCRETE GRADE.

SG2. SLAB TO BE POURED ON A VAPOUR BARRIER MEMBRANE OVER 30mm FCR OVER 120mm THICK CRUSHED ROCK TO SUBGRADE SPECIFICATION (COMPACT TO 100% MDD). REFER TYPICAL SLAB ON GROUND SECTION.

SG3. SLAB TO BE BUILT OFF COMPACTED SUBGRADE AT 4% CBR. CBR % TO BE VERIFIED BY GEOTECHNICAL CONSULTANT.

SG4. CONCRETE SLUMP SHALL BE 60mm PRIOR TO ADDITION OF SUPERPLASTICIZER. 120mm SLUMP AFTER ADDITION OF SUPERPLASTICIZER.

SG5. NO WATER TO BE ADDED TO THE CONCRETE MIX ON SITE.

SG6. CURING OF CONCRETE TO BE IN ACCORDANCE WITH AS 3600 AND SHALL COMMENCE WITHIN **2 HOURS** OF FINISHING OPERATIONS AND SHALL BE MAINTAINED FOR A MINIMUM OF **7 DAYS** USING AN APPROVED PROPRIETARY CURING COMPOUND OR CONTINUOUS PONDING WITH POTABLE WATER.

SG7. ALIPHATIC ALCOHOL
WHEN SHADE TEMPERATURE EXCEEDS 30°C SPRAY THE EXPOSED SURFACE OF CONCRETE SLAB DURING THE PLACING AND FINISHING OPERATION WITH FINE FILM OF APPROVED ALIPHATIC ALCOHOL. REPEAT THE SPRAY IF THE SPRAYED SURFACE HAS BEEN RE-WORKED.

SG8. CONCRETE MAXIMUM DRYING SHRINKAGE TO BE 600 MICROSTRAIN AT 56 DAYS. ENSURE POINT LOADS ARE 300mm MIN. FROM SLAB JOINTS (EDGE DISTANCE). MOVE JOINT IF REQUIRED TO ACHIEVE A 300mm EDGE DISTANCE.

SG9. CONCRETE SAW CUTS (SJ) SHALL COMMENCE WITHIN **4 TO 12 HOURS** AFTER CONCRETE SETS.

FORMWORK, STRIPPING, TEMPORARY WORKS

FSP1. ALL FORMWORK ARRANGEMENTS SHALL BE DETERMINED BY THE FORMWORK CONTRACTOR. FORMWORK SHALL BE IN ACCORDANCE WITH AS3610 AND CERTIFIED BY A TEMPORARY WORKS ENGINEER WITH APPROPRIATE NER REGISTRATION.

FSP2. TEMPORARY WORKS ENGINEER DETAILS INCLUDING BUT NOT LIMITED TO NAME, BUSINESS NAME, INSURANCES, QUALIFICATIONS AND CONTACT DETAILS TO BE SUBMITTED TO VAN DER MEER CONSULTING.

FSP3. WRITTEN APPROVAL BY THE TEMPORARY WORKS ENGINEER OF ALL FORMWORK INSTALLATIONS SHALL BE PROVIDED TO VAN DER MEER CONSULTING PRIOR TO ALL CONCRETE POURS.

FSP4. SPECIFIC STRIPPING AND TEMPORARY LOAD APPLICATION PROCEDURES ARE SUBJECT TO VAN DER MEER REVIEW AND APPROVAL PRIOR TO THE COMMENCEMENT OF CONCRETE WORKS ON SITE.

FSP5. SPECIFIC STRIPPING PROCEDURES ARE TO BE SUBMITTED TO VAN DER MEER CONSULTING FOR COORDINATION WITH THE STRUCTURE.

FSP6. ALL FORMWORK AND STRIPPING ARRANGEMENTS TO BE UNDERTAKEN IN CONSIDERATION OF THE BUILDING LOAD CAPACITIES. IN THE ABSENCE OF ANY INFORMATION CONTACT VAN DER MEER CONSULTING FOR CONFIRMATION OF STRUCTURAL DESIGN CAPACITIES.

SHOTCRETE

Certified Services Pty Ltd
Reference: 240258/1
Chris Michaels
Date: 19/08/24

ST1. THE CONTRACTOR SHALL SUBMIT A METHOD STATEMENT FOR APPROVAL BY THE ENGINEER PRIOR TO COMMENCING THE WORKS.

ST2. THE METHOD STATEMENT SHALL ADDRESS MIX DESIGN, QUALIFICATION AND EXPERIENCE OF OPERATORS, PLANT, SUBSTRATE PREPARATION AND SPRAYING PROCEDURE.

ST3. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600, CIA Z5-1987, RTA QA SPECIFICATION B82 AND OTHER RELEVANT AUSTRALIAN CODES.

ST4. MINIMUM SHOTCRETE COMPONENTS AND QUALITY SHALL BE AS FOLLOWS UNO BY SUBCONTRACTOR

ELEMENT	STRENGTH GRADE	SLUMP (mm)	MAX. AGGREGATE (mm)	MIN. BINDER	**AVERAGE BASE DRYING SHRINKAGE**
SHOTCRETE WALL	S32	60	10	10 *	750 μM **

* DENOTES EUCOSHOT B, OR APPROVED EQUIVALENT XYPEX C1000 NF TO MANUFACTURERS DETAILS. REBOUND 10% MAX.

** FOR LIQUID RETAINING STRUCTURES, 700 μM MAX. IS REQUIRED IN ACCORDANCE WITH AS 3735.

ST5. MIX PROPORTIONS SHALL BE DESIGNED BY THE CONTRACTOR AND SHALL BE TO THE APPROVAL OF THE ENGINEER. ALL CONCRETE SHALL BE PREMIXED AND DELIVERED TO SITE IN ACCORDANCE WITH AS 1379.
WHERE ADMIXTURES ARE APPROVED BY THE ENGINEER FOR ADDITION TO THE MIX TO SPEED THE SETTING RATE OF THE CEMENT. THE FOLLOWING SETTING TIMES AND STRENGTHS SHALL APPLY UNLESS OTHERWISE STATED.

- INITIAL SET OF CEMENT/ADMIXTURE PASTE = 3 MINS.
- FINAL SET OF CEMENT/ADMIXTURE PASTE = 12 MINS.
- 8 HOUR STRENGTH OF CONCRETE = 3 MPa
- 24 HOUR STRENGTH OF CONCRETE = 10 MPa

ALL CONSTITUENTS SHALL BE UNIFORMLY DISPERSED THROUGHOUT THE MIX.

ST6. DEFINITIONS
THE FOLLOWING DEFINITIONS EXPLAIN THE MEANINGS OF CERTAIN WORDS AND TERMS USED IN THIS SPECIFICATION. SPRAYED CONCRETE IS A MIXTURE OF CEMENT. AGGREGATE AND WATER PROJECTED AT A HIGH VELOCITY FROM THE NOZZLE INTO PLACE TO PRODUCE A DENSE HOMOGENOUS MASS. SHOTCRETE IS A TERM USED FOR SPRAYED CONCRETE WHERE THE MAXIMUM AGGREGATE SIZE IS NOT MORE THAN 20 mm. REBOUND IS A TERM USED FOR ALL MATERIAL HAVING PASSED THROUGH THE NOZZLE WHICH DOES NOT CONFORM TO THE DEFINITION OF SPRAYED CONCRETE.
NOZZLE IS THE ATTACHMENT AT THE END OF THE MATERIAL HOSE FROM WHICH THE MATERIAL IS JETTED AT HIGH VELOCITY. NOZZLE MAN IS THE WORKMAN WHO MANIPULATES THE NOZZLE, CONTAINS THE CONSISTENCY, AND MAKES THE FINAL DISPOSITION OF THE MATERIAL.

ST7. QUALIFICATIONS OF OPERATORS
ALL OPERATORS SHALL BE TO THE APPROVAL OF THE ENGINEER. PRIOR TO COMMENCEMENT OF SPRAYING THE CONTRACTOR SHALL CERTIFY TO THE ENGINEER THAT THE FOREMAN, NOZZLEMAN, AND DELIVERY EQUIPMENT OPERATIVES HAVE COMPLETED SATISFACTORY WORK IN SIMILAR CAPACITIES ELSEWHERE. WHERE REQUIRED BY THE ENGINEER THE OPERATOR SHALL SPRAY PRECONSTRUCTION PANELS WHICH SHALL BE APPROVED BY THE ENGINEER BEFORE THE OPERATORS ARE EMPLOYED ON THE WORKS. SUCH PANELS MAY ALSO BE USED BY THE ENGINEER TO ACCESS THE COMPETENCE OF OPERATORS OR TRAINEES FOR WHOM SUCH CERTIFICATION IS NOT AVAILABLE.

ST8. SUBSTRATE PREPARATION
THE SURFACE SHALL BE COMPACT, TRIMMED AND GRADED AS REQUIRED AND DAMP BEFORE THE APPLICATION OF THE SPRAYED CONCRETE. NATURAL SURFACES MUST BE SUFFICIENTLY COHESIVE TO PREVENT EROSION WHEN THE SPRAYED CONCRETE IS APPLIED.

ST9. SPRAYING PROCEDURE
NO CONCRETE SHALL BE SPRAYED IN AIR TEMPERATURE LESS THAN 1 DEGREE (1°) CELSIUS. FRESHLY SPRAYED CONCRETE SHALL BE PROTECTED FROM RAIN OR WATER UNTIL THE SURFACE IS OF SUFFICIENT HARDNESS TO PREVENT DAMAGE.
SPRAYING SHALL BE DISCONTINUED IF WIND OR AIR CURRENTS CAUSE SEPARATION OF THE NOZZLE STREAM DURING PLACEMENT. DURING STARTING OR STOPPING OF THE SPRAYED OPERATION OR WHENEVER SPRAYING IS IRREGULAR. THE NOZZLE SHALL BE DIRECTED AWAY FROM THE WORKS. ALL CORNERS AND ANY AREAS WHERE REBOUND CANNOT ESCAPE OR BE BLOWN FREE, SHALL BE FILLED PRIOR TO GENERAL SPRAYING. REBOUND SHALL NOT BE WORKED INTO THE CONSTRUCTION OR RE-USED IN THE WORKS. GUIDES SHALL BE SET UP TO ESTABLISH FINISHED SURFACES. THESE GUIDES SHALL BE TO THE APPROVAL OF THE ENGINEER PRIOR TO SPRAYING. SPRAYED CONCRETE SHALL BE APPLIED SO THAT IT NEITHER SAGS NOR SLUMPS.
SPRAYED CONCRETE SHALL BE TROWELLED TO A SMOOTH SURFACE. MAXIMUM DEVIATION FROM A 1 m STRAIGHT EDGE SHALL BE 10 mm. FULL RECORDS OF ALL MATERIALS DELIVERED TO THE SPRAYED CONCRETE MIXER SHALL BE KEPT AND MADE AVAILABLE TO THE CONSTRUCTION MANAGER.

ST10. JOINTS
THE POSITION AND TYPE OF ALL CONSTRUCTION JOINTS SHALL BE APPROVED BY THE ENGINEER.

ST11. QUALITY CONTROL
TESTING OF SHOTCRETE SHALL BE CARRIED OUT IN ACCORDANCE WITH THE SPRAYED CONCRETE MANUAL, CLAUSE A12, 'RECOMMENDED PRACTICE SPRAYED CONCRETE' PREPARED BY THE CONCRETE INSTITUTE OF AUSTRALIA.

GROUND ANCHORS STRESSING AND TESTING CRITERIA

STRESSING AND TESTING PROCEDURE

ALL STRANDS OF WIRE IN A TENDON SHALL BE STRESSED SIMULTANEOUSLY BY A SINGLE JACK.
ALL ANCHORS SHALL BE STRESSED IN ACCORDANCE WITH THE FOLLOWING PROCEDURE:-

GA1. APPLY THE TEST LOAD OF 1.3 TIMES THE WORKING LOAD IN FIVE EQUAL INCREMENTS AND RECORD THE EXTENSION AT EACH INCREMENT. HOLD AT THE TEST LOAD FOR 10 MINUTES.

GA2. RELEASE THE TEST LOAD TO ZERO IN FIVE EQUAL INCREMENTS AND RECORD DISPLACEMENT FOR EACH INCREMENT. IF DURING THE 10 MINUTE TEST PERIOD, THE MEASURED EXTENSION EXCEEDS 2 mm UNDER CONSTANT LOAD, THE ABOVE STEPS SHALL BE REPEATED. IF DURING THE SECOND 10 MINUTE TEST PERIOD THE MEASURED EXTENSION EXCEEDS 2 mm UNDERCONSTANT LOAD, THE ANCHOR SHALL BE DOWN-GRADED IN WORKING LOAD LEVELS AT THE DISCRETION OF THE ENGINEER. UNDER THE DIRECTION OF THE SUPERINTENDENT, THE BUILDER SHALL INSTALL ADDITIONAL ANCHOR (S)
FOR TENDONS WITH WEDGE TYPE ANCHORAGE DEVICES, THESE STEPS SHALL BE PERFORMED WITHOUT THE WEDGES INSTALLED.

GA3. APPLY THE JACKING FORCE SHOWN ON THE DRAWINGS IN FIVE EQUAL INCREMENTS (RECORDING EXTENSIONS) AND LOCK OFF. NOT LESS THAN THREE DAYS AFTER LOCK OFF, CARRY OUT A LIFT- OFF TEST.

GA4. IF THE FORCE VARIES BY MORE THAN 5 % FROM THE JACKING FORCE, RELEASE THE LOAD AND REPEAT STEP GA3. IF THE VARIATION IS STILL MORE THAN 5 %, THEN RELEASE THE LOAD TO SUCH A LEVEL THAT THE VARIATION IS WITHIN 5 %. THE LOAD CAPACITY OF THE ANCHOR SHALL BE DOWN-GRADED AND THE LOSS MADE GOOD AS PER STEP GA2. NO ADDITIONAL PAYMENT WILL BE MADE TO THE BUILDER TO MAKE GOOD ANY LOST LOAD CAPACITY.

GA5. ALL ANCHOR TESTING WILL BE OVERSEEN BY THE SUPERINTENDENT. THE STRESSING PROCEDURE AND ACCEPTANCE CRITERIA FOR ANCHOR TESTING SHALL BE IN ACCORDANCE WITH AS 5100.3 - 2004 BRIDGE DESIGN - PART 3 FOUNDATIONS AND SOIL SUPPORTING STRUCTURES.

GA6. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL SERVICES AND DESIGNING ANCHORS TO CLEAR.

GA7. PRIOR TO COMMENCING WORK ON SITE, THE CONTRACTOR SHALL SUBMIT DETAILS OF THE PROPOSED GROUND ANCHORS OUTLINING ANGLE OF INCLINATION, FREE LENGTH, BOND LENGTH AND CONSTRUCTION METHODOLOGY. THE CONTRACTOR SHALL ALSO PROVIDE CERTIFICATES FROM A CHARTERED PROFESSIONAL ENGINEER CONFIRMING THAT THE ANCHORS ARE ADEQUATELY DESIGNED AT THE OUTSET AND FURTHER CERTIFICATES ARE TO BE ISSUED DURING CONSTRUCTION.

DATA TO BE RECORDED

GA8. IDENTIFICATION NUMBER OF DYNAMOMETERS, GAUGES, PUMPS, AND JACKS.

GA9. IDENTIFICATION PARTICULARS OF TENDON(S), INCLUDING THE COIL NUMBERS FROM WHICH STRAND COMPRISING EACH TENDON ARE CUT.

GA10. INITIAL FORCE (OR PRESSURE) AND ELONGATION OBTAINED ON COMPLETION OF TENSIONING.

GA11. ELONGATION REMAINING AFTER RELEASE OF JACKS.

GA12. RAMMING PRESSURES (IF APPLICABLE).

GA13. ELONGATION OBTAINED AT SUITABLE INTERVALS DURING TENSIONING TOGETHER WITH CORRESPONDING FORCE (OR PRESSURE), IF AND WHEN REQUIRED BY THE SUPERINTENDENT.

GA14. FULLY COMPLETED FORMS SHALL BE FORWARDED TO THE SUPERINTENDENT.

CONCRETE PILES

P1. PILES SHALL BE DESIGNED AND INSTALLED BY PILE SUB-CONTRACTOR IN ACCORDANCE WITH AS 2159-2009.

P2. THE PILE LENGTHS SHOWN ARE PROVIDED TO ESTABLISH CONTRACT QUANTITIES. THE LENGTHS SHOWN ARE BASED ON END BEARING AND SOCKET CAPACITIES AS FOLLOWS:-

FOUNDATION STRATA (END BEARING)	SOCKET CAPACITY (FRICTION)	REMARKS
MEDIUM-HIGH STRENGTH SANDSTONE. (3500 kPa)	MEDIUM-HIGH STRENGTH SANDSTONE. (300 kPa)	REFER GEOTECH REPORT 86043.06.R.001.REV1.C2 DATED AUGUST 2021 PREPARED BY DOUGLAS AND PARTNERS FOR SPECIFIC REQUIREMENT REFER GEOTECH FOR SPECIFIC REQUIREMENTS

SOCKET CAPACITIES ARE TO BE DEVELOPED BELOW ADJACENT DETAIL EXCAVATION. DETAIL EXCAVATION IS NOT SHOWN ON THE ELEVATIONS AND ADJUSTMENT IS REQUIRED TO SOCKET LENGTHS ACCORDINGLY.

P3. PILE SIZES SHOWN ARE INDICATIVE ONLY.
THE PILE SUB-CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND REINFORCEMENT OF ALL PILES.
ALL LOADS ARE WORKING LOADS.

P4. PILE LOAD TESTING SHALL BE THE RESPONSIBILITY OF THE PILE SUB-CONTRACTOR. THE PILE SUB-CONTRACTOR SHALL GUARANTEE THAT THE PILES ARE STRUCTURALLY ADEQUATE TO SUSTAIN THE GIVEN WORKING LOADS.

P5. FULL CERTIFICATION SHALL BE PROVIDED REGARDING TREATING AND TESTING OF THE PILES FOR ADEQUACY TO RESIST SOIL CONDITIONS.

P6. PILES SHALL BE CUT OFF AT THE LEVELS REQUIRED TO ACHIEVE CONSTRUCTION OF THE PILE CAPS AS INDICATED ON THE DRAWINGS. ALLOW REINFORCEMENT TO PROTRUDE INTO PILE CAPS.

P7. PILES SHALL BE ADEQUATE TO ACHIEVE THE WORKING LOADS AS SPECIFIED ON THE DRAWINGS. THE CONTRACTOR SHALL DETERMINE THE PREDICTED DRIVING OR DRILLING LENGTHS AND THESE SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER. ACTUAL DRIVING OR DRILLING LENGTHS SHALL BE RECORDED ON SITE.

P8. A FULL DRIVING RECORD SHALL BE KEPT FOR ALL PILES INDICATING DRIVING TIME, SETS, PLAN LOCATION AND ANY PROBLEMS ENCOUNTERED.

P9. A FULL DRILLING RECORD SHALL BE KEPT FOR ALL PILES INDICATING DEPTHS, PLAN LOCATION, BEARING CAPACITY REACHED AND ANY PROBLEMS ENCOUNTERED.

P10. THE CONTRACTOR SHALL SUBMIT PROPOSED PILE SIZES AND CALCULATIONS FOR APPROVAL BY THE ENGINEER PRIOR TO COMMENCING WORK ON SITE.

P11. PILES SHALL BE WITHIN 2% OF VERTICAL AND WITHIN 75 mm OF LOCATION (MEASURED IN ANY DIRECTION). THE PILING SUB-CONTRACTOR TO SUBMIT A RECTIFICATION DESIGN FOR PILES OUT OF LOCATION.

P12. PILE SPACING AND PILE CAP DESIGN IS BASED ON THE PILING SYSTEM SHOWN ON THE DRAWINGS. ALTERNATE PROPOSALS ARE TO BE APPROVAL BY THE ENGINEER.

REVISIONS			
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A.	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024
No.	REVISION DESCRIPTION	DRAWN	DATE

19/08/2024 2:14:31 PM

SCALE BAR
0 10 20 30 40 50 100 mm 1:1

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IF IN DOUBT - ASK.

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PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: STRUCTURAL NOTES - SHEET 2

DRAWING STATUS: **CONSTRUCTION**

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.		AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S01-02	1

Regulated Design record			
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113			
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE			
Consent No: SSD 15822622 (Mod 2)	Body Corporate No: NOT APPLICABLE		
Drawing Title: STRUCTURAL NOTES - SHEET 3	Drawing Number: S01-03		

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

REINFORCEMENT

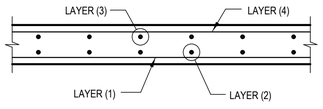
R1. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 AND OTHER RELEVANT AUSTRALIAN CODES.

R2. REINFORCEMENT TYPE AND GRADE.

TYPE	DESCRIPTION	STANDARD	GRADE
N	HOT ROLLED DEFORMED BAR	AS 4671	D500N
R	HOT ROLLED PLAIN ROUND BAR	AS 4671	R250N
SL	SQUARE MESH	AS 4671	D500L
RL	RECTANGULAR MESH	AS 4671	D500L
L_TM	TRENCH MESH	AS 4671	D500L
RW	COLD ROLLED RIBBED WIRE	AS 4671	D500L
W	COLD DRAWN ROUND WIRE	AS 4671	D500L

R3. REINFORCING BARS ARE DENOTED ON THE DRAWING AS FOLLOWS:-No. OF BARS, TYPE, BAR SIZE (mm), SPACING (mm), LAYER e.g. 20 N16-200 (1)

R4. REINFORCEMENT LAYERS ARE AS FOLLOWS:-



R5. REINFORCEMENT MESH IS DENOTED ON THE DRAWINGS AS FOLLOWS:-TYPE, AS 4671 REFERENCE NUMBER, LOCATION e.g. RL818 TOP.

R6. REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY SHOWN IN TRUE PROJECTION.

R7. ALL REINFORCEMENT SHALL BE SECURELY SUPPORTED AND MAINTAINED IN CORRECT POSITION DURING CONCRETING.

R8. BAR CHAIRS TO EXTERIOR SURFACES WITHIN 1 km OF THE COAST SHALL BE PLASTIC OR STAINLESS STEEL.

R9. CONCRETE COVER TO REINFORCEMENT SHALL BE AS TABULATED BELOW, UNLESS SHOWN OTHERWISE ON THE DRAWINGS.

CONDITION	AS 3600 EXPOSURE CLASSIFICATION	COVER TO NEAREST REINFORCEMENT (mm)
SURFACES IN CONTACT WITH THE GROUND (NON-AGGRESSIVE SOILS ONLY)		
- CAST DIRECTLY AGAINST THE GROUND	A2	50
- CAST AGAINST A WATERPROOF MEMBRANE	A1	30
- FORMED SURFACE	A2	30
SURFACES IN INTERIOR ENVIRONMENTS (FULLY ENCLOSED WITHIN A BUILDING)		
- RESIDENTIAL	A1	20
- NON-RESIDENTIAL	A2	30
SURFACES IN ABOVE-GROUND EXTERIOR ENVIRONMENTS		
- INLAND (> 50 km)	A2	30
- NEAR COASTAL (1 - 50 km)	B1	40
- COASTAL (< 1 km)	B2	45
SURFACES IN CONTACT WITH FRESH WATER	B1	40

SPECIFIED COVER ALSO APPLIES LOCALLY AT RECESSES, DRIP GROOVES ETC.

R10. WELDING OF REINFORCEMENT SHALL NOT BE PERMITTED WITHOUT THE APPROVAL OF THE ENGINEER. WELDING SHALL BE IN ACCORDANCE WITH AS 1554.3.

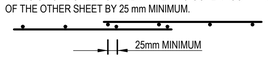
R11. HOOKS, BENDS AND COGS SHALL BE IN ACCORDANCE WITH AS 3600, UNLESS NOTED OTHERWISE ON THE DRAWINGS.

R12. REINFORCEMENT THAT HAS BEEN BENT AND SUBSEQUENTLY STRAIGHTENED OR BENT IN THE REVERSE DIRECTION SHALL NOT BE BENT AGAIN WITHIN 20 BAR DIAMETERS OF THE PREVIOUS BEND.

R13. HEATING OF REINFORCEMENT SHALL NOT BE PERMITTED.

R14. LAP REINFORCEMENT ONLY AT LOCATIONS SHOWN ON THE DRAWINGS OR AS APPROVED BY THE ENGINEER. UNLESS OTHERWISE NOTED, LAP BARS AS TABULATED.

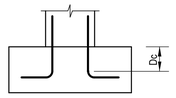
R15. FABRIC SHALL BE LAPPED SUCH THAT THE TWO OUTERMOST WIRES OF ONE SHEET OVERLAP THE TWO OUTERMOST WIRES OF THE OTHER SHEET BY 25 mm MINIMUM.



A MAXIMUM OF THREE SHEETS OF FABRIC SHALL BE LAPPED AT ANY POINT.

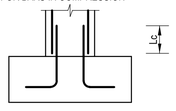
R16. COMPRESSION LAPS

DEVELOPMENT LENGTH OF DEFORMED BARS IN COMPRESSION



f'c MPa	N10	N12	N16	N20	N24	N28	N32	N36	N40
20	250	300	400	500	600	700	800	900	1000
≥ 25	225	275	350	450	525	625	700	800	900

LAPPED SPLICES FOR BARS IN COMPRESSION

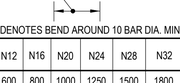


f'c MPa	N10	N12	N16	N20	N24	N28	N32	N36	N40
≥ 20	400	500	650	800	1000	1150	1300	1450	1600

NOTE:
- FOR BUNDLED BARS, LENGTH BASED ON LARGEST BAR.
  - FOR 3-BAR BUNDLE INCREASE LENGTHS BY 20%
  - FOR 4-BAR BUNDLE INCREASE LENGTHS BY 33%
- INDIVIDUAL BAR SPLICES WITHIN A BUNDLE SHALL NOT OVERLAP.

R17. TENSION LAPS

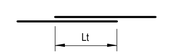
DEVELOPMENT LENGTH FOR A DEFORMED BAR IN TENSION



'R' - DENOTES BEND AROUND 10 BAR DIA. MINIMUM

f'c MPa	N10	N12	N16	N20	N24	N28	N32	N36	N40
20	475	600	800	1000	1250	1500	1800	2100	2450
25	425	500	700	900	1150	1350	1600	1900	2200
32	375	450	650	800	1000	1200	1450	1700	1950
40	325	400	550	750	900	1100	1300	1500	1750
50	300	350	500	650	800	950	1150	1350	1550
≥65	300	350	500	600	700	850	1000	1200	1350

LAPPED SPLICES FOR BARS IN TENSION



f'c MPa	N10	N12	N16	N20	N24	N28	N32	N36	N40
20	575	700	1000	1250	1550	1900	2250	2650	3050
25	525	650	900	1150	1400	1700	2000	2350	2750
32	450	550	800	1000	1250	1500	1800	2100	2400
40	400	500	700	900	1100	1350	1600	1850	2150
50	375	450	650	800	1000	1200	1450	1650	1950
≥65	325	400	550	700	900	1050	1250	1450	1700

NOTE:
- INCREASE LENGTHS BY 30% FOR A HORIZONTAL BAR WITH MORE THAN 300mm OF CONCRETE CAST BELOW THE BAR.
- FOR BUNDLED BARS, LENGTHS BASED ON LARGEST BAR
  - FOR 3-BAR BUNDLES INCREASE LENGTHS BY 20%
  - FOR 4-BAR BUNDLES INCREASE LENGTHS BY 33%

CHEMICALLY ANCHORED REINFORCEMENT AND POST INSTALLED ANCHORS

CA1. REINFORCEMENT BARS SHALL BE 2-PART EPOXY ANCHORED INTO EXISTING CONCRETE WHERE SHOWN ON DRAWING.

CA2. EPOXY ADHESIVE SYSTEM SHALL BE ONE OF:-
- HILTI HIT-RE 500
- RAMSET EPCON C8 XTREM
- CHEMSET REO 502 PLUS
- OR APPROVED EQUIVALENT

ALL CHEMICALLY ANCHORED REINFORCEMENT SHALL COMPLY WITH AS3600

CA3. ALL HOLES TO BE HAMMER DRILLED. CORE HOLES SHALL NOT BE USED WITHOUT PRIOR APPROVAL FROM VAN DER MEER.

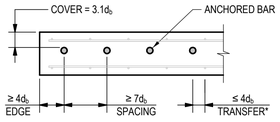
CA4. POST-INSTALLED MECHANICAL AND CHEMICAL ANCHORS AND REINFORCEMENT SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131, AND BE INSTALLED IN ACCORDANCE WITH AS/NZS 5131 IN ADDITION TO THE MANUFACTURERS SPECIFICATION.

CA5. FOR CHEMICALLY ANCHORED REINFORCEMENT, THE FOLLOWING DRILLED HOLE DIAMETERS AND EMBEDMENT DEPTHS SHALL BE USED UNLESS NOTES OTHERWISE ON THE DRAWINGS.

BAR SIZE (db)	DRILLED HOLE DIA (mm)		HOLE DEPTH (mm) CONCRETE GRADE N32
	HILTI HIT-RE-500, RAMSET CHEMSET REO 502 PLUS	RAMSET EPCON C8 XTREM	
N12	16	15	240
N16	20	20	320
N20	25	25	400
N24	32	30	500

HOLE DEPTH BASED ON CONCRETE GRADE N32, AND MIN. 3.1 x BAR DIA. COVER

COVER AND SPACING ARE AS FOLLOWS:-



TRANSFER* DIMENSION IS THE MAXIMUM GAP BETWEEN THE CHEMICALLY ANCHORED BAR AND PARALLEL REINFORCEMENT, REQUIRED FOR TENSION TRANSFER

CA6. FOR CHEMICAL ANCHORS, THE FOLLOWING DEPTHS AND DIMENSIONS SHALL BE ADOPTED UNLESS NOTED OTHERWISE ON THE DRAWINGS.

ANCHOR SIZE (db)	HOLE DIA (mm)	HOLE DEPTH (mm)	MIN. EDGE DISTANCE (mm)	MIN. SPACING (mm)
M12	14	240	200	360
M16	18	320	260	480
M20	25	400	320	600
M24	28	480	390	720

ANCHOR GRADE 8.8, UNO.

CA7. ALL STRUCTURAL POST-FIXED ANCHORS INTO CONCRETE SHALL COMPLY WITH AS5216. ANCHORS NOT CERTIFIED TO AS5216 MAY ONLY BE USED FOR NON-STRUCTURAL (E.G. DUCT WORK, LIGHT WEIGHT CLADDING, NON LIFE SAFETY) CONNECTIONS AND CONNECTIONS INTO BLOCKWORK.

CA8. ALL CAST-IN AND POST-FIXED ANCHORS FOR LIFTING, TRANSPORT AND ERECTION OF PRECAST CONCRETE (INCLUDING TILT-UP PANELS) SHALL COMPLY WITH AS3850.

CA9. DEFORMATION CONTROLLED ANCHORS, INCLUDING SELF-DRILLING ANCHORS AND DROP-IN (SETTING) IMPACT ANCHORS SHALL NOT BE USED FOR LIFTING, TRANSPORT OR ERECTION OF PRECAST CONCRETE.

CA10. IF HOLES INTO CONCRETE ARE DRILLED THEN ABORTED, THE HOLE SHALL BE FILLED WITH MORTAR THE SAME STRENGTH AS THE SUBSTRATE, OR 40MPa, WHICHEVER IS THE GREATER. DO NOT TORQUE OR LOAD ANCHORS UNTIL THE MORTAR HAS ACHIEVED THE DESIGN STRENGTH.

CA11. ALL TESTING OF POST-INSTALLED ANCHORS ON SITE SHALL BE BY THE ANCHOR MANUFACTURER OR THEIR APPROVED SUB-CONTRACTOR. ALL TESTING SHALL COMPLY WITH AEFAC GUIDELINES.

CONCRETE SAWCUT

EXISTING CONCRETE

SEC1. SAWCUT TO FACE OF EXISTING REINFORCEMENT TOP AND BOTTOM.

SEC2. SCABBLE REMAINING FACE OF EXISTING CONCRETE WITHIN THE EXISTING REINFORCEMENT. LEAVE THE EXISTING REINFORCEMENT PROTRUDING INTO THE NEW CONCRETE. LAP AS REQUIRED WITH THE NEW REINFORCEMENT.

NEW PENETRATIONS

SEC3. CORE DRILL 4 CORNERS.

SEC4. SAWCUT TO CORE HOLES WITHOUT OVERCUTTING.



SEC5. TREAT EXPOSED REINFORCEMENT - REFER REMEDIAL WORKS NOTES TE1, TE2 AND TE3.

SEISMIC RESTRAINT OF ENGINEERING SERVICES

GENERAL

SR1. SECURELY FIX ALL PLANT AND EQUIPMENT TO THE BUILDING STRUCTURE. DO NOT RELY ON GRAVITY AND/OR FRICTION TO RESIST SEISMIC FORCES.

SR2. BASE ISOLATION MAY BE USED TO REDUCE THE FORCES ON A COMPONENT. WHERE FLEXIBLE MOUNTING DEVICES (SUCH AS SPRING MOUNTINGS) ARE USED, THEY SHALL BE FITTED WITH RESTRAINING DEVICES TO LIMIT THE HORIZONTAL AND VERTICAL MOTIONS, TO INHIBIT THE DEVELOPMENT OF RESONANCE IN THE FLEXIBLE MOUNTING SYSTEM, AND TO PREVENTOVERTURNING.

SR3. DO NOT USE COMPONENTS THAT WILL BE DAMAGED BY EARTHQUAKE CONDITIONS.

SR4. DUCTS AND PIPING DISTRIBUTION SYSTEMS ALSO NEED TO BE PROVIDED WITH RESTRAINTS / BRACING TO RESIST SEISMIC LOADS EXCEPT WHERE THEY ARE BELOW THE THRESHOLDS SET IN AS1170.4.

DESIGN.

SR5. NON-STRUCTURAL PARTS AND COMPONENTS AND THEIR FASTENINGS, AS LISTED IN AS 1170.4 2007, CLAUSE 8.1.4, SHALL BE DESIGNED FOR HORIZONTAL AND VERTICAL EARTHQUAKE FORCES DETERMINED IN ACCORDANCE WITH AS 1170.4.

SR6. DESIGN LOAD CALCULATIONS USING SECTION 8.2 OR 8.3 OF AS1170.4 - 2007. SHOULD BE BASED ON THE VALUES FROM GENERAL NOTES L1.E, FOR THE FOLLOWING FACTORS;

- ACCELERATION COEFFICIENT,
- SITE SUB-SOIL CLASS,
- IMPORTANCE FACTOR

POST TENSIONED CONCRETE

APPROVED FOR CONSTRUCTION
Structural Engineer
BRIAN CARDELLI
BPC13574

DESIGN BY PRESTRESS CONTRACTOR

PS1. THE PRESTRESS CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN, PREPARATION OF CONSTRUCTION DRAWINGS, SITE INSPECTIONS AND CERTIFICATION OF ALL ASPECTS OF THE WORKS.

PS2. THE PRESTRESS CONTRACTOR SHALL PROVIDE THE FOLLOWING CERTIFICATES STATING COMPLIANCE WITH THESE DOCUMENTS AND STRUCTURAL ADEQUACY TO **VAN DER MEER CONSULTING** FOR:
- DESIGN
- CONSTRUCTION

PS3. ALL WORKS SHALL BE IN ACCORDANCE WITH THE BUILDING CODE OF AUSTRALIA AS3600, THE DESIGN LOADS SPECIFIED IN THESE DRAWINGS, THE FIRE RATINGS AND THE PROJECT SPECIFICATION. IF CONTRADICTIONS EXIST THE MORE ONEROUS WILL GOVERN.

PS4. THE PRESTRESS CONTRACTOR SHALL SUBMIT THE CONSTRUCTION DRAWINGS TO **VAN DER MEER CONSULTING** FOR REVIEW AND COMMENT PRIOR TO CONSTRUCTION.

PS5. THE CONCRETE PROFILES ARE SHOWN ON THE DRAWINGS.

PS6. RECORDS OF NET TENDON ELONGATION AND OTHER ASPECTS OF THE TENSIONING OPERATION REQUIRED BY THE SPECIFICATION SHALL BE SUBMITTED TO THE ENGINEER PRIOR TO THE CUTTING AND GROUTING OF DUCTS.

DESIGN DEFLECTION REQUIREMENTS
TO BE IN ACCORDANCE WITH AS3600 - 2018: TABLE 2.3.2

STRUCTURAL ELEMENT	MAXIMUM DEFLECTION *
SUPPORTING MASONRY WALLS	L/1000
FLOORS NOT SUPPORTING BRITTLE ELEMENTS	L/400
VEHICULAR OR PEDESTRIAN TRAFFIC	L/800
TRANSFER MEMBERS	L/500

*- FOR MEMBERS SUPPORTING WALLS OR PARTITION ELEMENTS THE RELEVANT DEFLECTION IS THAT WHICH OCCURS AFTER ADDITION OR ATTACHMENT OF WALLS OR PARTITION ELEMENTS.

PS7. SPECIFIC REQUIREMENTS : -

7.1 REDUCTION OF UNIFORMLY DISTRIBUTED LOADS IN ACCORDANCE WITH AS/NZS 1170.1 MAY BE APPLIED.

7.2 PATTERN LOADING TO BE IN ACCORDANCE WITH AS 3600 - 2018 - CLAUSE 2.5.4.

7.3 EXPOSED SLABS SHALL BE DESIGNED AS WATERTIGHT.

7.4 TO LIMIT THE AMOUNT OF MOMENT TRANSFERRED TO COLUMN, THE FRAME ANALYSIS IS TO BE BASED ON 25% OF COLUMN STIFFNESS FOR INTERNAL COLUMNS AND 0% OF COLUMN STIFFNESS FOR EXTERNAL COLUMNS.

7.5 PUNCHING SHEAR ANALYSIS SHALL BE BASED ON 100% OF COLUMN STIFFNESS.

POST-TENSIONING (DESIGN BY VAN DER MEER CONSULTING)

PS1. ALL WORK TO BE CARRIED OUT IN ACCORDANCE WITH AS 3600 AND THE SPECIFICATIONS.

PS2. SUBMIT ALL TEST CERTIFICATES CALCULATIONS AND SHOP DRAWINGS TO THE ENGINEER AS REQUIRED BY THE SPECIFICATIONS PRIOR TO CONSTRUCTION.

PS3. FORMWORK SHALL BE DESIGNED TO SUPPORT REACTIONS DURING STRESSING.

PS4. PAY PARTICULAR ATTENTION TO CONCRETE COMPACTION WHERE DUCTS CROSS COLUMNS AND AT ALL ANCHORAGES.

PS5. POST-TENSIONING SUB-CONTRACTOR IS TO CHECK AND CERTIFY (EXCLUDING REINFORCEMENT DETAILS BY VAN DER MEER) BEFORE EACH POUR.

PS6. ALL STRESSING EQUIPMENT AND GAUGES SHALL PASS CURRENT CALIBRATION CERTIFICATES AVAILABLE TO THE ENGINEER UPON REQUEST.

PS7. FINAL STRESSING SHALL FIRST BE APPLIED TO BEAM/BAND TENDONS, FOLLOWED BY SLAB TENDONS.

DESIGN ASSUMPTIONS

PS8. THE DESIGN ASSUMPTIONS USED IN THE CALCULATION OF THE POST-TENSION LOSSES WERE AS FOLLOWS:-
- FRICTIONAL CURVATURE COEFFICIENT (m) = 0.2
- WOBBLE (rad. per m) = 0.025
- DRAW IN AT ANCHORAGE = 6mm
- RELAXATION OF PRE-STRESS STEEL (AFTER 1000 HOURS AT 0.70 fp) = 2.0
- DESIGN TEMPERATURE DIFFERENTIAL: = 0.02° C/mm
- TENSILE STRENGTH AT 90 DAYS: fcp = 5.2 MPa
- EXPOSURE CLASSIFICATION: A1 INTERNAL

POST-TENSIONING TENDONS

PS9. STRAND SIZE IS NOTED ON PLAN. IN THE ABSENCE OF DENOTATION THE STRAND SHALL BE 12.7mm STRAND. STRAND SHALL BE WIRE STRESS RELIEVED SUPER GRADE LOW RELAXATION IN ACCORDANCE WITH AS4672.1 UNLESS NOTED OTHERWISE. ALL STRANDS SHALL BE STRESSED TO 85% OF THE BREAK LOAD.

PS10. BAR SHALL BE HOT ROLLED WORKED HIGH TENSILE ALLOY BARS IN ACCORDANCE WITH AS 1313 AND SHALL BE SUPER GRADE UNLESS NOTED OTHERWISE.

PS11. LOCATE AND FIX TENDONS AS SHOWN ON THE DRAWINGS. TENDON PROFILES SHALL BE PARABOLIC UNO AND VERTICAL OFFSETS SHALL BE MEASURED FROM THE DECK (SOFFIT OF THE CONCRETE) TO THE UNDERSIDE OF THE DUCT. (NOTE:- SOFFIT OF CONCRETE TO CENTRELINE OF DUCT AT ANCHORAGES UNLESS NOTED OTHERWISE).

PS12. DUCTING SHALL BE GALVANISED STEEL:
120 x 19 FOR 15.2mm STRAND.
90 x 19 FOR 12.7mm STRAND.
70 x 19 DUCTING CAN BE INCORPORATED FOR 3 AND 4 STRAND TENDONS TO THE SUBCONTRACTOR DISCRETION.

PS13. SEAL OFF ALL DUCTS AND SECURELY TAPE JOINTS TO PREVENT INGRESS OF MORTAR DURING CONSTRUCTION.

PS14. DIMENSIONS INDICATED ARE TO THE UNDERSIDE OF THE DUCT FROM THE SOFFIT OF THE SLAB EXCEPT AT THE ANCHORAGE, WHERE DIMENSIONS ARE TO THE CENTRELINE OF THE TENDON.

PS15. DEAD AND LIVE END ANCHORAGES SHALL HAVE A HORIZONTAL TOLERANCE OF ± 10mm FROM THE DIMENSIONS SHOWN ON DRAWING. CONTACT THE DESIGN OFFICE IF HIGHER TOLERANCE IS REQUIRED.

STRESSING PROCEDURE:

INITIAL STRESS	12.7mm STRAND: AT MINIMUM CONCRETE STRENGTH = 9 MPa AND AT A MAXIMUM OF 24 HOURS, JACK EACH STRAND TO 39kN U.N.O. 15.2mm STRAND: AT MINIMUM CONCRETE STRENGTH = 9 MPa AND AT A MAXIMUM OF 24 HOURS, JACK EACH STRAND TO 55kN U.N.O.
FINAL STRESS	12.7mm STRAND: AT MINIMUM CONCRETE STRENGTH = 22 MPa AND AT A MAXIMUM OF 10 DAYS, JACK EACH STRAND TO 156kN U.N.O. 15.2mm STRAND: AT MINIMUM CONCRETE STRENGTH = 25 MPa AND AT A MAXIMUM OF 10 DAYS, JACK EACH STRAND TO 205kN U.N.O.

PS16. TENDONS SHALL BELOCATED TO A VERTICAL TOLERANCE OF ± 5.0MM.

PS17. TENDONS SHALL BE SECURELY FIXED IN POSITION AT MAXIMUM 1200 MM ALONG THE LENGTH.

PS18. POST TENSIONING SYSTEM SHALL HAVE PRIORITY OVER NON TENSIONED REINFORCEMENT OR ANY KIND OF SERVICES CONDUITS.

PS19. JOINTS OF 19mm FLAT GALVANISED DUCT SHALL BE SECURELY TAPED AND SEALED TO PREVENT ENTRY OF SLURRY INTO POST TENSIONING DUCTS.

TENSIONING AND GROUTING

PS20. RECORDS OF NET TENDON ELONGATION AND OTHER ASPECTS OF THE TENSIONING OPERATION REQUIRED BY THE SPECIFICATION SHALL BE SUBMITTED TO THE ENGINEER AND APPROVED PRIOR TO THE CUTTING OF THE TENDONS AND GROUTING THE DUCTS.

PS21. ALL TENDONS TO BE GROUTED IN ACCORDANCE WITH THE SPECIFICATION AND SHALL OCCUR WITHIN 7 DAYS OF STRESSING APPROVAL.

CONCRETE REQUIREMENTS

PS18. ALL CONCRETE TEST CYLINDERS SHALL BE SITE CURED UNDER CONDITIONS CONSISTENT WITH THE CONCRETE POUR.

PS19. TO PREVENT DAMAGE TO STRESSING TENDONS AND REINFORCEMENT, CONCRETE PUMP LINES SHALL BE ADEQUATELY RESTRAINED AND SUPPORTED ON STOOLS OR TIMBER BLOCKS.

PS20. SLURRY USED TO LUBRICATE CONCRETE PUMP LINES SHALL NOT BE USED IN ANY STRUCTURAL MEMBER.

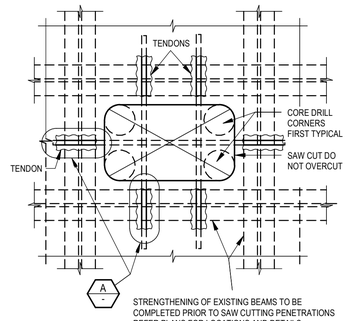
PS21. ALL CONCRETE IN POST TENSIONED SLAB SHALL HAVE A MAX. DRYING SHRINKAGE STRAIN (TO AS 1012 PART 13) NOT EXCEEDING 600 MICROSTRAIN AT 56 DAYS.

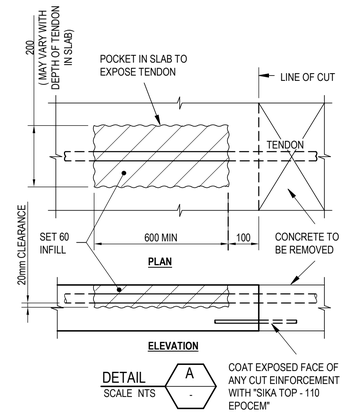
PS22. A FLYASH CONTENT IN EXCESS OF 20% BY WEIGHT OF CEMENTITIOUS MATERIAL IS NOT CONSIDERED APPROPRIATE FOR POST-TENSIONED WORKS DUE TO THE VARIABILITY IN EARLY AGE TENSILE STRENGTHS AND SUBSEQUENT DECREASE IN BOND STRENGTHS. AIR ENTRAINMEN AGENTS SHALL NOT BE USED.

TRUNCATION OF TENDONS (SLAB)

PROCEDURE:

1. INSTALL ANY BACKPROPPING AS REQUIRED BY VAN DER MEER CONSULTING.
2. STRENGTHENING OF EXISTING BEAMS TO BE COMPLETED PRIOR TO ANY SAWCUTTING. REFER PLANS FOR LOCATIONS AND DETAILS.
3. SCAN AND LOCATE TENDONS. MARK OUT THE POSITION OF THE TENDONS ON THE TOP SURFACE OF THE SLAB.
4. BREAK OUT CONCRETE TO FORM A POCKET AS SHOWN BELOW. (VAN DER MEER CONSULTING TO INSPECT AND APPROVE.)
5. REMOVE THE DUCT ALONG A 600mm WIDTH. IF THE TENDON IS UNGROUTED, PRESSURE GROUT THE TENDON.
6. CHIP AWAY ALL GROUT AROUND THE INDIVIDUAL STRANDS WHILST ENSURING THAT THE STRANDS ARE NOT DAMAGED.
7. FILL THE POCKET WITH 'SET 60' (OR SIMILAR PRODUCT AS APPROVED BY VAN DER MEER CONSULTING) AND ALLOW TO CURE FOR 3 DAYS.
8. CORE DRILL AT CORNERS AND SAWCUT SLAB. DO NOT OVER CUT.
9. CUT THE TENDON AT THE 'LINE OF CUT' AND REMOVE CONCRETE.





CONSTRUCTION METHODOLOGY FOR NEW PENETRATIONS IN EXISTING SUSPENDED P/T SLABS

STRUCTURAL NOTE.

1. WHERE NEW PENETRATIONS OCCUR, SLABS CHANGE FROM A CONTINUOUS SPAN SLAB TO AN END SPAN SLAB.
2. WHEN TENDONS ARE CUT SLABS MAY RELAX OVER TIME, RESULTING IN ADDITIONAL CRACKING / DEFLECTION. REFER STRUCTURAL EXISTING / NEW WORKS NOTE ON THIS DRAWING.

REVISIONS

No.	REVISION DESCRIPTION	DRAWN	DATE
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024

SCALE BAR
0 10 20 30 40 50 100 mm 1:1

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PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: STRUCTURAL NOTES - SHEET 3

DRAWING STATUS: CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.		AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S01-03	1

19/8/2024 2:14:38 PM

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)			Body Corporate No: NOT APPLICABLE	
Drawing Title: STRUCTURAL NOTES - SHEET 4			Drawing Number: S01-04	
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

STRUCTURAL STEELWORK

GENERAL

S1. CONSTRUCTION CATEGORIES IN ACCORDANCE WITH AS/NZS 5131 FOR THIS PROJECT ARE AS FOLLOWS UNO.:

	ELEMENT	SERVICE CATEGORY	FABRICATION CATEGORY	CONSTRUCTION CATEGORY
1	ALL STRUCTURAL STEELWORK UNO.	**SC1**	**FC1**	**CC2**
	[or list of drawings, components or assemblies to specify different construction category]			

S2. ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 4100 AND REFERENCED AUSTRALIAN STANDARDS.
ERECTION BRACING AND STABILITY SHALL BE IN ACCORDANCE WITH AS 3828. STEEL FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH AS/NZS 5131.

S3. ALL WORKMANSHIP IS TO BE CARRIED OUT BY A COMPETENT PERSONNEL AS DEFINED IN AS/NZS 5131.

S4. THE CONTRACTOR SHALL IMPLEMENT SYSTEMS TO ENSURE IDENTIFICATION AND TRACEABILITY COMPLYING WITH AS/NZS 5131 FOR THE APPROPRIATE CONSTRUCTION CATEGORY, INCLUDING BY ALL SUB CONTRACTORS.

S5. FABRICATION AND ERECTION OF ALL ARCHITECTURALLY EXPOSED STRUCTURAL STEELWORK (AESS) SHALL BE IN ACCORDANCE WITH AS/NZS 5131 AND ARCHITECTURAL DOCUMENTATION.

S6. ALL TOLERANCES SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131 AND AS 4100.

S7. FOR FUNCTIONAL TOLERANCES, THE TOLERANCE CLASS OF CC1 AND CC2 ELEMENTS IS CLASS 1, AND FOR CC3 AND CC4 ELEMENTS IS CLASS 2 UNO.

S8. TREATMENT GRADES IN ACCORDANCE WITH AS/NZS 5131 FOR THIS PROJECT ARE AS FOLLOWS UNO.:

	ELEMENT	TREATMENT GRADE
1	ALL PAINTED STRUCTURAL STEELWORK UNO.	**P2**

S9. ALL STEELWORK SHALL HAVE MINIMUM SURFACE TREATMENT IN ACCORDANCE WITH AS/NZS 5131.

S10. TEMPORARY BRACING SHALL BE PROVIDED AS NECESSARY TO MAINTAIN A STABLE CONDITION IN THE STRUCTURE DURING ALL STAGES OF CONSTRUCTION.

S11. ALL CONNECTIONS SHALL BE IN ACCORDANCE WITH AISC - STANDARDISED STRUCTURAL CONNECTIONS. MINIMUM CONNECTION TO BE 10 PLATE, 2 M20 8.8/S BOLTS UNO.

S12. IN ADDITION TO THE DETAILS SHOWN ON THE STRUCTURAL DRAWINGS, PROVIDE ADDITIONAL CLEATS AND ATTACHMENTS AS DETAILED BY THE ARCHITECT.

S13. ALL BEAM MEMBERS SHALL BE FABRICATED AND ERECTED WITH NATURAL CAMBER UP.
TRUSSES AND BEAMS WITH A SPAN OF 12m OR OVER SHALL BE PRECAMBERED / PRESET UPWARD BY SPAN / 250 UNO.
CANTILEVERED TRUSSES AND BEAMS WHICH CANTILEVER MORE THAN 3m SHALL BE PRECAMBERED / PRESET UPWARD BY LENGTH OF CANTILEVER / 250 UNO.

S14. THE ENDS OF ALL HOLLOW SECTIONS SHALL BE SEALED VIA A CONTINUOUS SEAL WELD WITH 6mm PLATES UNLESS NOTED OTHERWISE.

S15. IF HOLLOW SECTIONS ARE TO BE HOT-DIP GALVANISED, VENT AND DRAINAGE HOLES SHALL BE PROVIDED IN ACCORDANCE WITH AS/NZS 5131. RUBBER SEALS OR PLUG WELD TO VENT/DRAINAGE HOLES THAT REMAIN EXPOSED SHALL BE PROVIDED.

S16. ALL BASE PLATES AND THE LIKE SHALL BE GROUTED WITH AN APPROVED CEMENTITIOUS, NON-SHRINK GROUT WITH A MINIMUM COMPRESSIVE STRENGTH OF 40 MPa AT 7 DAYS.
THICKNESS OF GROUT SHALL BE 20mm UNLESS NOTED OTHERWISE.

S17. MATERIALS USED FOR GROUTING UNDER STEEL BASE PLATES AND BEARING PLATES SHALL BE IN ACCORDANCE WITH AS/NZS 5131.

S18. ROOF BRACING (INCLUDING DIAGONAL STRUT BRACING) SHALL BE SUPPORTED FROM EVERY 2ND PURLIN WITH HOOK BOLTS FIXED THROUGH THE PURLIN WEB.

S19. SUPPLEMENTARY ULTRASONIC TESTING SHALL BE CARRIED OUT FOR WELDED OR NON-WELDED ELEMENTS IN ACCORDANCE WITH AS 2207 AND AS/NZS 1554.1 FOR ALL PLATES THICKER THAN **40mm.**

S20. ALL STRUCTURAL STEELWORK MEMBERS SHALL BE SUPPLIED TO A SINGLE LENGTH UNO. SPLICE LOCATIONS WILL BE DENOTED ON STRUCTURAL DRAWINGS. ALL OTHER SPLICES MUST BE APPROVED BY THE ENGINEER.

S21. CUTTING, HOLING AND SHAPING OF ELEMENTS OTHER THAN THOSE SHOWN ON THE DRAWINGS SHALL NOT BE MADE WITH WITHOUT THE APPROVAL OF THE ENGINEER, AND SHALL BE CARRIED OUT IN ACCORDANCE WITH AS/NZS 5131.

S22. ANY PROPRIETARY ITEM (EG. PURLINS, ROOF / WALL SHEETING, FERRULES ETC.) SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S SPECIFICATIONS.

S23. ALL INSPECTION, TESTING AND CORRECTION SHALL BE IN ACCORDANCE WITH AS/NZS 5131.

S24. WHERE REQUIRED, MEMBERS DISTORTED DURING FABRICATION AND/OR GALVANISING PROCESS SHALL BE STRAIGHTENED USING AN APPROVED METHOD.

S25. THE FOLLOWING DOCUMENTATION SHALL BE PREPARED AND PROVIDED TO THE ENGINEER AS PER THE FOLLOWING:
- MATERIALS AND COMPONENTS ITP
- PREPARATION AND ASSEMBLY ITP
- WELDING PROCEDURES
- MECHANICAL FASTENING ITP
- SURFACE TREATMENT
- PAINT COATINGS ITP
- GALVANISED COATINGS ITP
- ERECTION SEQUENCE METHODOLOGY
- WELDERS QUALIFICATIONS
- WELDING SUPERVISOR QUALIFICATIONS
- WELDING PROCEDURE

STEEL PROPERTIES

S26. STEEL SHALL COMPLY WITH THE FOLLOWING UNLESS NOTED OTHERWISE.

COMPONENT	AUS. STAND.	GRADE
HOT ROLLED SECTIONS (UB, UC, BT, CT, PFC, TFB, EA, UA)	AS 3679.1	300 PLUS
WELDED SECTIONS (WB, WC)	AS 3679.2	300 PLUS
HOLLOW SECTIONS (CHS, SHS, RHS)	AS 1163	C350
PLATE AND FLOORPLATE	AS 3678	250
HOT ROLLED BARS (FLATS, SQUARES AND ROUNDS)	AS 3679.1	300 PLUS
PURLINS AND GIRTS	AS 1397	450

S27. FOR EACH BATCH OF STEEL SUPPLIED, THE CONTRACTOR SHALL OBTAIN A CERTIFICATE OF COMPLIANCE FROM THE STEEL SUPPLIER CERTIFYING COMPLIANCE WITH THE RELEVANT AUSTRALIAN STANDARD. STEEL SHALL BE SOURCED FROM MILLS WITH A CERTIFICATION FROM AN ACCREDITATION BODY THAT IS A MEMBER OF THE INTERNATIONAL ACCREDITATION FORUM (IAF). THE TEST REPORTS AND CERTIFICATES SHALL BE PROVIDED BY A LABORATORY ACCREDITED BY SIGNATORIES TO THE INTERNATIONAL LABORATORY ACCREDITATION CORPORATION (ILAC MRA). THESE REPORTS AND CERTIFICATES SHALL BE PROVIDED TO THE SUPERINTENDENT AND VAN DER MEER CONSULTING. ALL STEELWORK MATERIALS SHALL COMPLY TO THE REQUIREMENTS IN AUSTRALIAN STANDARDS. INTERNATIONALLY PROCURED STEEL SHALL ADHERE TO THE REQUIREMENTS SET OUT IN THE SECTION OF NOTES: "COMPLIANCE OF INTERNATIONALLY SOURCED.

BOLTING

S28. BOLTS SHALL COMPLY WITH THE FOLLOWING:

CATEGORY	AUS. STAND.	BOLT GRADE	METHOD OF INSTALLATION (IN ACCORD. WITH AS 4100)
4.6/S	AS 1111	4.6	SNUG TIGHT
8.8/S	AS 1252	8.8	SNUG TIGHT
8.8/TB	AS 1252	8.8	FULL TENSIONING
8.8/TF	AS 1252	8.8	FULL TENSIONING CONTACT SURFACES TO BE FREE FROM APPLIED FINISHES
10.9/TB	AS 1252	10.9	FULL TENSIONING
10.9/TF	AS 1252	10.9	FULL TENSIONING CONTACT SURFACES TO BE FREE FROM APPLIED FINISHES

METHOD OF INSTALLATION IN ACCORDANCE WITH AS 4100 AND AS/NZS 5131.

S29. FOR EACH BATCH OF BOLTS, TEST CERTIFICATES AND ANY ADDITIONAL COMPLIANCE CERTIFICATES SHALL BE PROVIDED BY A LABORATORY ACCREDITED BY SIGNATORIES TO THE INTERNATIONAL LABORATORY ACCREDITATION CORPORATION (ILAC MRA) CERTIFYING COMPLIANCE WITH THE RELEVANT AUSTRALIAN STANDARD. TEST CERTIFICATES SHALL MEET ALL THE REQUIREMENTS AS INDICATED IN AS 4291.1 AND AS 5216.

S30. UNLESS NOTED OTHERWISE:
- ALL BOLTS SHALL BE M20.
- ALL BOLTS (EXCEPT HOLDING DOWN BOLTS) SHALL BE CATEGORY 8.8/S. HOLDING DOWN BOLTS SHALL MEET THE REQUIREMENTS OF AS/NZS 5131 AND BE CATEGORY 4.6/S UNO.
- ALL NUTS, WASHERS, CAST-IN FERRULES, MASONRY ANCHORS AND EXTERNAL BOLTS SHALL BE HOT DIP GALVANISED IN ACCORDANCEW ITH AS/NZS 1214.
- A MINIMUM OF TWO THREADS MUST EXTEND PAST THE NUT.
- PURLIN CLEATS MUST BE AT LEAST 6mm THICK.
- ALL GALVANISED CONCRETE COMPONENTS TO BE CAST INTO CONCRETE MUST BE PASSIVATED.

S31. ALL BOLT HOLES SHALL BE MAXIMUM 2mm LARGER THAN THE NOMINATED BOLT DIAMETER FOR UP TO M24 BOLTS, OR 3mm LARGER FOR A BOLT OF GREATER DIAMETER, UNLESS NOTED ON DRAWINGS OR APPROVED BY THE ENGINEER.
ALL CIRCULAR HOLES EXCEEDING THE ABOVE, OR SLOTTED HOLES (EITHER SHORT OR LONG), SHALL COMPLY WITH AS4100 SECTION 14.3.2(a) FOR MAXIMUM SIZE AND SHALL HAVE PLATE WASHERS OR HARDENED WASHERS IN ACCORDANCE WITH AS 1252.1.
BASE PLATE BOLT HOLES SHALL NOT EXCEED 6mm LARGER THAN THE NOMINATED BOLT DIAMETER.
PLATE WASHERS SHALL COMPLETELY COVER OVERSIZE AND SLOTTED HOLES. THE DISTANCE BETWEEN THE EDGES OF ALL PLATE WASHERS AND EDGES OF BOLT HOLES SHALL BE AT LEAST 0.5 TIMES THE DIAMETER OF THE HOLE.
PLATE WASHERS SHALL BE PROVIDED OVER THE PLATE, OR PLATES, THAT HAVE OVERSIZE OR SLOTTED HOLES. WHERE ONLY ONE PLATE HAS AN OVERSIZE OR SLOTTED HOLE, A PLATE WASHER TO THE PLATE WITH A STANDARD HOLE MAY BE OMITTTED AND A STANDARD WASHER USED INSTEAD.
FOR M20 BOLTS IN OVERSIZE OR SHORT SLOTTED HOLES, PROVIDE 5mm PLATE WASHERS.
FOR M24 BOLTS IN OVERSIZE OR SHORT SLOTTED HOLES, PROVIDE 6mm PLATE WASHERS.
FOR M30 BOLTS IN OVERSIZE OR SHORT SLOTTED HOLES, PROVIDE 8mm PLATE WASHERS.
FOR ALL BOLTS IN LONG SLOTTED HOLES, PROVIDE 8mm PLATE WASHERS.

S32. ALL BOLTS SHALL BE FITTED WITH APPROPRIATE WASHERS IN ACCORDANCE WITH AS 1252.

S33. THE CONTRACTOR TO ENSURE TB AND TF BOLTS ARE TO BE INSTALLED USING EITHER THE PART TURN METHOD OR DIRECTION TENSION INDICATOR METHOD TO THE PROCEDURES AND REQUIREMENTS OUTLINED IN AS/NZS 5131 CI 8.5.6, CI 8.5.7 AND CI 8.5.8. ALL DIRECT TENSION INDICATOR WASHERS SHALL BE INSPECTED WITH AN APPROPRIATE FEELER GAUGE WITH THICKNESS AS SPECIFIED BY THE MANUFACTURER, IN ACCORDANCE WITH AS/NZS 5131.
A FEELER GAUGE SHALL NOT PASS THROUGH TO BOLT SHANK IN MORE THAN THE AVAILABLE INSPECTION POINTS AS SPECIFIED BY THE MANUFACTURER. BOLT TENSIONING SHALL CONTINUE UNTIL THIS REQUIREMENT IS SATISFIED.

S34. FOR CONNECTIONS WHERE 8.8/TF BOLTS ARE SPECIFIED, A FRICTION COEFFICIENT OF 0.35 HAS BEEN ASSUMED FOR THE DESIGN.
THE CONTACT SURFACES SHALL BE PREPARED ACCORDING TO AS/NZS 5131 AND BE FREE FROM PAINT, LACQUER OR OTHER APPLIED FINISHES UNLESS THE APPLIED FINISH HAS BEEN TESTED IN ACCORDANCE WITH AS 4100 APPENDIX J AND A FRICTION COEFFICIENT OF 0.35 OR HIGHER IS DETERMINED.

S35. HIGH STRENGTH STRUCTURAL BOLTS ARE REQUIRED TO HAVE VERIFICATION TESTING TO AS/NZS 1252.2 AFTER SURFACE TREATMENT HAS OCCURRED (EG. HOT DIP GALVANISATION). PROVIDE DOCUMENTATION AND A "SUPPLIER DECLARATION OF CONFORMITY" AS DEFINED IN AS/NZS 1252.2.

WELDING

S36. ALL WELDING SHALL BE IN ACCORDANCE WITH AS 1554.

S37. UNLESS NOTED OTHERWISE:
- ALL WELDS SHALL BE 6mm CONTINUOUS FILLET WELDS ALL AROUND.
- ALL BUTT WELDS SHALL BE COMPLETE PENETRATION BUTT WELDS.
- ALL WELDS SHALL BE CATEGORY SP UNO.
- ELECTRODES SHALL BE E48XX/W50X.

S38. ALL WELDS SHALL BE MADE IN THE SHOP, EXCEPT WHERE SITE WELDS ARE SHOWN ON THE DRAWING OR OTHERWISE APPROVED BY THE ENGINEER.

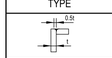
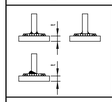
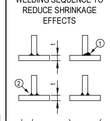
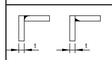
S39. WHERE USED IN AN EXTERNAL APPLICATION, HIT AND MISS WELDING SHALL HAVE A CONTINUOUS SEAM WELD IN BETWEEN.

S40. ALL WELDS SHALL BE SUBJECT TO INSPECTION AND TESTING IN ACCORDANCE WITH AS 1554 UNO. A HIGHER LEVEL OF INSPECTION THAN SPECIFIED IN AS 1554 MAY BE IMPOSED BY THE ENGINEER.

S41. NON-DESTRUCTIVE EXAMINATION (NDE) SHALL BE CONDUCTED ON WELDS WITH EXTENTS NO LESS THAN THE RECOMMENDATIONS OF AS/NZS 5131 TABLE 13.6.2.2(A) AND TABLE 13.6.2.2(B) WHERE APPLICABLE UNO.

S42. JOINTS THAT ARE SUSCEPTIBLE TO LAMELLAR TEARING AND FURTHER REQUIRE A Z-VALUE NOMINATION FOR THE PLATE ARE NOMINATED ON PROJECT DRAWINGS.
E.G. FOR A 80mm THICK PLATE REQUIRING Z GRADE OF Z15, IT WILL BE NOTED AS: 80 PLATE **Z15.**
ADDITIONALLY, WHERE NOT INDICATED ON DRAWINGS, Z-VALUES OF STEEL PLATES SHALL CONFORM TO THE FOLLOWING TABLE, IN ACCORDANCE WITH AS/NZS 3678:
NOTE: FOR THE USE OF THIS TABLE, PREHEATING OF ALL WELDED PLATES TO ≥ 100°C IS REQUIRED BEFORE THE WELDING PROCESS.

T-, CRUCIFORM- AND CORNER-CONNECTION WELD CONFIGURATIONS AS WELL AS WIDTHS OMITTED FROM THE TABLE BELOW HAVE NO REQUIREMENT FOR Z-GRADE STEEL.

CONNECTION TYPE	PLATE THICKNESS (t) mm	WELD SIZE (S) mm	Z GRADE
	t > 60	S > 40	Z15
	40 < t ≤ 50	S > 40	Z15
	50 < t ≤ 60	S > 30	Z15
	t > 60	S > 20	Z15
	10 < t ≤ 20	S > 40	Z15
	20 < t ≤ 30	S > 40	Z15
	30 < t ≤ 40	S > 30	Z15
	40 < t ≤ 50	S > 20	Z15
	50 < t ≤ 60	S > 20	Z15
	t > 60	10 ≤ S ≤ 40	Z15
		S > 40	Z25
WITH APPROPRIATE WELDING SEQUENCE TO REDUCE SHRINKAGE EFFECTS 	t ≤ 10	S > 40	Z15
	10 < t ≤ 20	S > 30	Z15
	20 < t ≤ 30	S > 30	Z15
	30 < t ≤ 40	S > 20	Z15
	40 < t ≤ 50	S > 10	Z15
	50 < t ≤ 60	10 < S ≤ 40	Z15
	t > 60	S > 40	Z25
		S ≤ 30	Z15
		S > 30	Z25
	t ≤ 10	S > 30	Z15
	10 < t ≤ 20	S > 30	Z15
	20 < t ≤ 30	S > 20	Z15
	30 < t ≤ 40	S > 10	Z15
	40 < t ≤ 50	10 < S ≤ 40	Z15
		S > 40	Z25
	50 < t ≤ 60	S ≤ 30	Z15
		S > 30	Z25
	t > 60	S ≤ 20	Z15
		S > 20	Z25
	t ≤ 10	S > 20	Z15
	10 < t ≤ 20	S > 20	Z15
	20 < t ≤ 30	10 < S ≤ 40	Z15
		S > 40	Z25
	30 < t ≤ 40	S ≤ 40	Z15
		S > 40	Z25
	40 < t ≤ 50	S ≤ 30	Z15
		S > 30	Z25
	50 < t ≤ 60	S ≤ 20	Z15
		S > 20	Z25
	t > 60	S ≤ 10	Z15
		S > 10	Z25

S43. PLATES MUST BE ORDERED TO THE DESIGNATED Z-VALUE IF SHOWN ON DRAWINGS OR REQUIRED AS PER NOTE S40.

S44. ANY PLATE JOINTS REQUIRING Z GRADE STEEL SHALL BE ULTRASONICALLY TESTED IN ACCORDANCE WITH AS 1710 CLASS 1.

PROTECTIVE COATINGS

S45. ALL STEELWORK SHALL BE GIVEN A PROTECTIVE COATING IN ACCORDANCE WITH AS 2312.1 FOR PAINT COATINGS AND AS 2312.2 FOR GALVANISED COATINGS.

S46. REFER TO ARCHITECTURAL SPECIFICATIONS AND REQUIREMENTS FOR ALL DECORATIVE OR VISIBLE STEELWORK.

S47. UNLESS OTHERWISE APPROVED, COATING SYSTEMS AND COATING QUALITY LEVEL IN ACCORDANCE WITH AS/NZS 5131 FOR RELEVANT ELEMENTS FOR THIS PROJECT ARE AS FOLLOWS:

ELEMENT	CORROSIVITY CATEGORY	SYSTEM DESIGNATION	COATING QUALITY LEVEL
ALL HIDDEN INTERIOR STEELWORK UNO.	**C2**	**AS 2312.1 / ALK1**	**PC-2**
ALL INTERIOR STEELWORK REQUIRING COLOUR FINISH UNO.	**C3**	**AS 2312.1 / ACL1**	**PC-2**
ALL EXTERIOR STEELWORK WHERE COLOUR IS NOT REQUIRED UNO.	**C3**	**AS 2312.1 / IZS1**	**PC-2**
ALL EXTERIOR STEELWORK IN INDUSTRIAL ENVIRONMENT UNO.	**C5-I**	**AS 2312.1 / EHB6**	**PC-2**
ALL EXTERIOR STEELWORK WHERE COLOUR AND GLOSS FINISH REQUIRED UNO.	**C3**	**AS 2312.1 / PUR4**	**PC-2**
ALL STEELWORK BUILT INTO MASONRY WALLS (E.G. LINTELS, STIFFENERS)	**C4**	**AS 2312.2 HOT DIP GALVANISING - HDG600**	**PC-2**
ALL STEELWORK IN CONTACT WITH THE GROUND, OR BELOW SLAB ON FILL	**C4**	**AS 2312.1 / EVH2**	**PC-2**

COMPLY WITH ALL PROTECTIVE COATING MANUFACTURERS RECOMMENDATIONS AND REQUIREMENTS AND CONFIRM COMPATIBILITY OF PRIMER WITH ANY TOP COATS PROPOSED BY THE ARCHITECT.

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels

S48. WHERE NOMINATED AS GALVANIZED, STEELWORK SHALL BE HOT DIPPED GALVANIZED IN ACCORDANCE WITH AS/NZS 4680, AS/NZS 5131 AND AS/NZS 1214 FOR FASTENERS.

S49. ANY FURTHER WELDING JOINTS ARE TO BE PAINTED WITH 2 COATS OF APPROVED GALVANISED PAINT.

S50. IN ADDITION TO THE FINISH SPECIFIED, STEELWORK IN CONTACT WITH THE GROUND, OR BELOW SLAB ON FILL, IS TO BE COATED WITH INTERZONE 954 MODIFIED EPOXY OR APPROVED EQUIVALENT, TO A MINIMUM THICKNESS OF 500 um.

S51. DAMAGE TO GALVANIZED COATING SHALL BE REPAIRED TO AS/NZS 4680 SECTION 8 -REPAIR AFTER GALVANIZING.

S52. GALVANIZED STEELWORK SHALL NOT BE PAINTED UNLESS SPECIFIED ON THE ENGINEERING DRAWINGS. GALVANIZED SURFACES SHALL BE PREPARED TO BE PAINTED AS PER AS/NZS 4680 APPENDIX I AND PAINT APPLIED IN THE WORKSHOP.

PURLINS AND GIRTS

S53. LIGHT GAUGE STEEL MEMBERS COMPRISING PURLINS, GIRTS AND STRUCTURAL DECKING, SHALL CONFORM TO THE REQUIREMENTS OF AS/NZS 5131.

S54. ALL PURLINS AND GIRTS (INCLUDING BRIDGING AND ACCESSORIES) SHALL BE LYSAGHT SUPA OR STRAMIT EXACTA SECTIONS, UNLESS NOTED OTHERWISE. ALTERNATIVE PRODUCTS SHALL NOT BE USED WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.

S55. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

S56. PURLIN MAXIMUM CENTRES SHALL BE AS NOTED ON PLAN. ROOF SHEETING END SPANS SHALL BE SUPPORTED AT MAXIMUM 1000 CTS.

S57. ALL SECTIONS SHALL HAVE MINIMUM **Z350** GALVANISED COATING UNO.

S58. MINIMUM LAPS FOR CONTINUOUS Z PURLINS, UNLESS NOTED OTHERWISE, SHALL BE 15% OF THE LONGEST SPAN EITHER SIDE OF A SUPPORTING RAFTER OR WALL. REFER TO PURLIN MANUFACTURER'S STANDARD PURLIN LAP DETAIL FOR BOLTING LAYOUT AT LAPS.

S59. BOLTS SHALL BE **M12 4.6/S** PURLIN BOLTS OR IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS UNO.

S60. BRIDGING, UNLESS NOTED OTHERWISE, SHALL BE LOCATED AT MAXIMUM 18 TIMES PURLIN DEPTH, OR 3600mm MAXIMUM CENTRES WHICHEVER IS THE LEAST. REFER PURLIN MANUFACTURER'S TECHNICAL MANUAL FOR SETOUT LOCATIONS FOR INTERNAL AND END SPANS. BRIDGING SHALL BE CONTINUOUS, INCLUDING ACROSS RIDGES.

S61. MAXIMUM FLY BRACE LOCATIONS, UNLESS NOTED OTHERWISE, SHALL BE AT EVERY THIRD PURLIN.

S62. GIRTS SHALL BE VERTICALLY SUPPORTED WITH GIRT FEET FIXED TO THE SLAB OR CONCRETE WALL AND GIRT HANGER WHERE SHOWN, OR BY OTHER APPROVED MEANS.

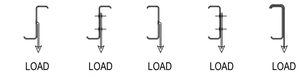
S63. PURLINS AND GIRTS SHALL BE INSTALLED WITH MINIMAL BOW. BOW (MEASURED IN THE PLANE OF THE SHEETING) SHALL NOT EXCEED 1 / 500TH OF THE SPAN OF THE PURLIN OR GIRT.

S64. PROVIDE TRIMMER PURLINS TO SUPPORT ENDS OF SHEETING EACH SIDE OF HIPS AND VALLEYS.
PROVIDE C15012 TRIMMER PURLINS BETWEEN MAIN PURLINS, TO SUPPORT SHEETING AT ROOF PENETRATIONS UNLESS NOTED OTHERWISE.
PROVIDE TRIMMER PURLINS IN ACCORDANCE WITH THE STANDARD DETAILS WHERE PURLINS ARE REQUIRED TO BE CUT. DO NOT CUT PURLINS WITHOUT APPROVAL OF THE ENGINEER.

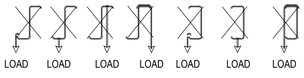
S65. ROOF AND WALL SHEETING SHALL BE FIXED AT EVERY ROW OF PURLINS OR GIRTS.

S66. CEILINGS, SERVICES, ETC., WHICH ARE SUSPENDED FROM PURLINS SHALL BE FIXED TO THE PURLIN WEBS ONLY.
NO LOADS SHALL BE SUSPENDED FROM, OR HOLES DRILLED THROUGH, PURLIN FLANGES.
WHERE NECESSARY TO HANG CEILING, SERVICES PIPES, DUCTWORK, ETC. FROM STANDARD PURLINS, THE BUILDER SHALL ONLY USE THE FOLLOWING APPROVED METHODS. REFER TO MANUFACTURER FOR APPROVED METHODS OF SUPPORTING LOADS FROM DUPLEX PURLINS.

APPROVED METHODS OF SUSPENDING FROM PURLINS



THE BUILDER SHALL NOT USE ANY OF THE FOLLOWING METHODS OF SUSPENSION:



LOAD SUSPENSION FROM PURLIN BRIDGING IS NOT PERMITTED.

COMPLIANCE OF INTERNATIONALLY SOURCED STEEL

S67. DESIGN OF STEELWORK HAS BEEN BASED ON THE REQUIREMENTS OF RELEVANT AUSTRALIAN STANDARDS INCLUDING AS 4100. ANY STEELWORK FOUND NOT TO BE IN COMPLIANCE WITH RELEVANT AUSTRALIAN STANDARDS, UNLESS APPROVED BY THE ENGINEER, MAY RENDER THE STRUCTURAL STEEL AND STEELWORK NOT FIT-FOR-PURPOSE AND NOT COMPLIANT WITH THE REQUIREMENTS OF THE NCC. THE STRUCTURAL STEEL AND/OR STEELWORK WILL NEED TO BE VERIFIED AND/OR RE-SUPPLIED UNDER THESE CIRCUMSTANCES.

S68. STEEL MILL CERTIFICATES AND TEST CERTIFICATES SHALL BE PROVIDED AND HAVE THE FOLLOWING:

A) ACCREDITATION BY SIGNATORIES TO THE ILAC-MRA AND THE ACCREDITATION NUMBER TO THE ACCREDITED INSPECTION BODY. THIS CAN BE IDENTIFIED WITH THE ILAC-MRA STAMP AND THE PARTICULAR ACCREDITED BODY STAMP.

IT IS A REQUIREMENT THAT THE ACCREDITED INSPECTION BODY CAN BE FOUND ON THE ILAC WEB SEARCH USING ILAC.ORG/SIGNATORY-SEARCH. IT IS A REQUIREMENT THAT THE TEST LABORATORY CAN BE IDENTIFIED ON THE ACCREDITED INSPECTION BODY WEB SEARCH.

B) TEST RESULTS AND CRITERIA PROVIDED SHALL COMPLY WITH ALL REQUIREMENTS IN AUSTRALIAN STANDARDS. TEST REPORT AND CERTIFICATE SHALL STATE THAT THE STEEL IS MANUFACTURED AND TESTED IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.

COMPLIANCE CHECKS SHALL BE CONDUCTED BY THE STEEL MILL AND SUPPLIER ENSURING THAT ALL PROPERTIES AND TESTING CONFORM TO APPROPRIATE AUSTRALIAN STANDARDS.

STEEL CONFORMITY ASSESSMENT SHALL BE PROVIDED BY AN INDEPENDENT THIRD PARTY BODY. PRODUCT CONFORMITY EVALUATION SHALL BE DEMONSTRATED BY INITIAL TYPE TESTING AND FACTORY PRODUCTION CONTROL, INCLUDING A MINIMUM TESTING AND INSPECTION FREQUENCY PLAN IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS.

AN EXAMPLE OF OBTAINING CONFORMITY IS THE ACRS CERTIFICATE ACCREDITED BY JAS ANZ OR MVL1 VERIFICATION OUTLINED IN TABLE 2 OF ASI TECHNICAL NOTE TN015: 'ASCERTAINING COMPLIANCE OF STRUCTURAL STEEL'.

THE CONFORMITY REQUIREMENTS IS TO MEET DEEMED TO SATISFY PROVISION IN THE NATIONAL CONSTRUCTION CODE (NCC). WHERE THE ABOVE REQUIREMENTS ARE NOT MET, A PERFORMANCE SOLUTION UNDER THE NCC IS REQUIRED.

ANY PERFORMANCE SOLUTION IS NOT WITHIN VAN DER MEER SCOPE OF ENGAGEMENT. THIS PROCESS WILL REQUIRE THE CONTRACTOR TO OBTAIN AGREEMENT FROM VAN DER MEER AND THE APPROVING AUTHORITY IN CONSULTATION WITH STAKEHOLDERS. THIS WILL REQUIRE ADDITIONAL ASSESSMENT, REPORTING, VERIFICATION AND TESTING.

S70. MARKING OF MATERIAL AS REQUIRED BY THE RELEVANT AUSTRALIAN STANDARD (AS/NZS 1163, AS/NZS 1594, AS/NZS 3678, AS/NZS 3679.1, AS/NZS 3679.2 OR AS 3597) SHALL BE ADHERED TO, WITH PHOTOS OF MARKINGS AND ID TAGS PROVIDED TO VAN DER MEER BEFORE THE MANUFACTURE OF STEEL.

S71. WHERE EVIDENCE OF MARKING OF MATERIAL IN ACCORDANCE WITH THE RELEVANT AUSTRALIAN STANDARD CANNOT BE PROVIDED, SUFFICIENT DOCUMENTATION SHALL BE PROVIDED TO LINK EACH MEMBER TO AN INDIVIDUAL BATCH OF STEEL, AND STATISTICALLY BASED VERIFICATION TESTING SHALL BE COMPLETED ON THE SOURCED STEEL.

S72. FAILURE TO PROVIDE ADEQUATE DOCUMENTATION TO SHOW A LINK FROM EACH MEMBER TO AN INDIVIDUAL BATCH OF STEEL SHALL RESULT IN THE ADOPTION OF THE PROPERTIES OF "UNIDENTIFIED STEEL" IN ACCORDANCE WITH AS 4100, OR TESTING SHALL BE PERFORMED ON A SAMPLE FROM EVERY MEMBER. THIS SHALL BE PROVIDED BEFORE THE FABRICATION OF THE STEEL.

S73. WHERE VERIFICATION (BATCH) TESTING IS CARRIED OUT BY AN INDEPENDENT THIRD PARTY, THE LABORATORY SHALL BE ACCREDITED BY SIGNATORIES TO THE INTERNATIONAL LABORATORY ACCREDITATION CORPORATION (ILAC MRA).

TEST CERTIFICATES FOR EACH BATCH SHALL BE ISSUED ON BEHALF OF THE MANUFACTURER AND ADHERE TO THE REQUIREMENTS OUTLINED IN THE RELEVANT AUSTRALIAN STANDARDS (AS/NZS 1163, AS/NZS 1594, AS/NZS 3678, AS/NZS 3679.1, AS/NZS 3679.2 OR AS 3597), INCLUDING BUT NOT LIMITED TO THE MANUFACTURER'S NAME, LABORATORY IDENTIFICATION, PRODUCT HEAT NUMBER, TRACEABILITY, AND A SIGNED DECLARATION THAT THE PRODUCTS SUPPLIED AND TESTED COMPLY WITH ALL THE REQUIREMENTS IN THE RELEVANT AUSTRALIAN STANDARDS.

S74. A SUPPLIER DECLARATION OF CONFORMITY (SDOC) CERTIFYING THAT SUPPLIED STEEL IS IN ACCORDANCE WITH ALL RELEVANT AUSTRALIAN STANDARDS SHALL BE PROVIDED TO VAN DER MEER.

S75. TEST AND INSPECTION CERTIFICATES MUST PROVIDE A DOCUMENTED LINK CONNECTING TEST AND INSPECTION OUTCOMES TO THE MARKING AND IDENTIFICATION ON THE PRODUCT PURCHASED. WHERE THIS IS NOT ACHIEVED, OR WHERE THE DOCUMENTED LINK CANNOT BE PROVIDED IN THE FORM OF SOME OTHER DOCUMENTATION, IT SHALL BE DEEMED THE TRACEABILITY OF PRODUCT CANNOT ADEQUATELY BE DETERMINED, AND HENCE ADDITIONAL VERIFICATION (BATCH) TESTING OF THE STEEL SHALL BE CONDUCTED.

S76. THE SCOPE OF V

Regulated Design record			
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113			
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE			
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE	
Drawing Title: STRUCTURAL NOTES - SHEET 5		Drawing Number: S01-05	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

MASONRY

GENERAL

M1. ALL WORKMANSHIP AND MATERIAL SHALL COMPLY WITH AS 3700 AND OTHER RELEVANT AUSTRALIAN STANDARDS.

M2. MINIMUM DURABILITY REQUIREMENTS:

LOCATION	SALT ATTACK RESISTANCE GRADE OF MASONRY UNIT	MORTAR CLASS	DURABILITY CLASS OF WALL TIES AND BUILT-IN COMPONENTS
INTERIOR MASONRY	GENERAL PURPOSE	M3	R3
EXTERIOR MASONRY ABOVE DAMP PROOF COURSE	GENERAL PURPOSE	M3	R3
BELOW DAMP PROOF COURSE OR IN CONTACT WITH GROUND	EXPOSURE	M4	R4

M3. PROVIDE TEMPORARY PROPPING TO WALLS AS REQUIRED TO MAINTAIN STABILITY DURING CONSTRUCTION, INCLUDING THE DESIGN OF TOM AND NEEDLING WHERE REQUIRED.

M4. OBTAIN ENGINEER'S APPROVAL BEFORE COMMENCING MASONRY WALLS ON SUSPENDED SLABS.
MASONRY WALLS MUST NOT BE BUILT ON PROPPED SLABS.

M5. NO STACKED OR MASONRY IN PALLETS TO BE PLACED ON SUSPENDED FLOORS WITHOUT PROPPING TO FORMWORK ENGINEER'S APPROVAL.

M6. CUTTING AND CHASING OF MASONRY WALLS IS NOT PERMITTED WITHOUT PRIOR APPROVAL OF THE ENGINEER.

M7. IN PARTICULAR HORIZONTAL CUTTING AND CHASING OF LOADBEARING EXTRUDED BRICKS IS NOT PERMITTED.

M8. PROVIDE WATERPROOFING AND DRAINAGE TO BACK OF WALLS AS REQUIRED IN ACCORDANCE WITH ARCHITECT'S SPECIFICATION. BACK FILL RETAINING WALLS AFTER OBTAINING ENGINEER'S APPROVAL, WITH CLEAN GRANULAR FILL, FREE FROM CLAY AND OTHER ORGANIC MATTER.

M9. ALL OPENINGS IN MASONRY ARE TO BE ADEQUATELY SUPPORTED BY EITHER REINFORCED MASONRY OR STEEL LINTELS.

BRICKWORK AND UNREINFORCED CONCRETE BLOCKWORK

M10. MINIMUM STRENGTH REQUIREMENTS:

WALL TYPE	STRENGTH OF MASONRY UNIT	MORTAR CLASS #
CLAY BRICKWORK	fuc = 20 MPa	M3
CONCRETE BLOCKWORK (UNREINF)	fuc = 10 MPa	M3

UNLESS A HIGHER CLASSIFICATION IS REQUIRED FOR DURABILITY (REFER NOTE M2).

M11. PROVIDE VERTICAL CONTROL JOINTS IN MASONRY WALLS AS FOLLOWS :

WALL TYPE	JOINT WIDTH	MAX JOINT SPACING
CLAY BRICKWORK	20mm	10m
CONCRETE BLOCKWORK(UNREINF)	10mm	8m

AT CORNERS, CONTROL JOINTS SHALL BE WITHIN HALF THE SPECIFIED JOINT SPACING FROM THE CORNER. JOINTS SHALL BE SEALED WITH AN APPROVED FLEXIBLE SEALANT.
PROVIDE JOINTS TO MATCH JOINTS IN SUPPORTING SLABS.

M12. PROVIDE BED JOINT REINFORCEMENT AT 500mm MAX VERTICAL SPACING, AND 2 BED JOINTS ABOVE AND BELOW OPENINGS.

M13. PROVIDE SLIP JOINTS BETWEEN THE TOP OF LOADBEARING MASONRY WALLS AND THE UNDERSIDE OF CONCRETE SLABS. SLIP JOINTS SHALL BE 2 LAYERS OF ALCOR OR GRANOR GRAFTON SJJ-100-50 / WALL WIDTH OR APPROVED EQUIVALENT UNLESS NOTED OTHERWISE.
ENSURE TOP OF WALLS ARE FINISHED LEVEL AND SMOOTH.

M14. NON-LOADBEARING WALLS SHALL BE KEPT 20mm CLEAR OF STRUCTURE OVER. FIX TOP OF WALLS TO STRUCTURE OVER WITH MET 4-3 TIES, OR APPROVED EQUIVALENT, AT MAXIMUM 480mm CENTRES FOR BRICKWORK, 400mm CENTRES FOR BLOCKWORK CAPABLE OF VERTICAL BUT NOT HORIZONTAL MOVEMENT.

REINFORCED CONCRETE BLOCKWORK

M15. CONCRETE BLOCKS SHALL BE BORAL 'CORE FILL BLOCKS', DOUBLE-U TYPE, OR SIMILAR APPROVED.

M16. MINIMUM STRENGTH REQUIREMENTS:

WALL TYPE	STRENGTH OF MASONRY UNIT	MORTAR CLASS #
CONCRETE BLOCKWORK (REINF)	fuc = 15 MPa	M3

UNLESS A HIGHER CLASSIFICATION IS REQUIRED FOR DURABILITY (REFER NOTE M2).

M17. LAY BOTTOM COURSE OF BLOCKS ON FULL MORTAR BED. ALL PERPENDS SHALL BE FILLED WITH MORTAR, EXCEPT WEEPHOLES.

M18. ALL CORES SHALL BE GROUTED UNLESS NOTED OTHERWISE.

M19. GROUT FOR CORE FILLING SHALL BE IN ACCORDANCE WITH AS3600, WITH THE FOLLOWING PROPERTIES:
- STRENGTH GRADE S20
- MAX. AGGREGATE SIZE 10mm
- SLUMP 230mm ± 25mm
- MIN. CEMENT CONTENT 300 kg/m³

M20. PROVIDE VERTICAL CONTROL JOINTS IN MASONRY WALLS AS FOLLOWS :

WALL TYPE	JOINT WIDTH	MAX JOINT SPACING
CONCRETE BLOCKWORK (REINF)	15mm	12m

AT CORNERS, CONTROL JOINTS SHALL BE WITHIN HALF THE SPECIFIED JOINTS SPACING FROM THE CORNER. JOINTS SHALL BE SEALED WITH AN APPROVED FLEXIBLE SEALANT.
PROVIDE JOINTS TO MATCH JOINTS IN SUPPORTING SLABS.

M21. PROVIDE CLEANOUT OPENINGS AT THE BASE OF ALL REINFORCED CORES AND REMOVE ALL MORTAR PROTRUSIONS BEFORE GROUTING. ADDITIONAL CLEANOUT OPENINGS SHALL BE PROVIDED ABOVE EACH HORIZONTAL POUR BREAK.

M22. MAXIMUM HEIGHT OF POUR FOR GROUTING SHALL NOT EXCEED 3.6m FOR 190 BLOCKWORK, AND 0.8m FOR 140 BLOCKWORK. STOP POUR 50mm BELOW TOP OF BLOCK TO PROVIDE KEY FOR SUBSEQUENT POUR.

M23. GROUT SHALL BE THOROUGHLY COMPACTED IN THE CORES BY RODDING OR MECHANICAL VIBRATION.

M24. REINFORCEMENT SHALL BE SECURELY TIED IN POSITION. WHERE REINFORCEMENT IS NOT NOTED CENTRAL IN THE WALL, PROVIDE CLEAR COVER TO THE FACE OF THE SHELL AS NOMINATED ON THE DRAWINGS.

HEBEL PANEL

H1. ALL DIMENSIONS MUST BE CONFIRMED BY BUILDER OR CONSTRUCTION AUTHORITY BEFORE FABRICATION OF PANELS IS COMMENCED.

H2. PANELS MUST NOT BE CUT ON SITE, UNLESS INDICATED ON THE DRAWINGS, WITHOUT APPROVAL BY CSR HEBEL.

H3. WHERE PANELS ARE CUT ON SITE, EXPOSED ENDS OF REINFORCING BARS ARE TO BE CORROSION PROTECTED. USE ONLY ANTI-CORROSION AGENT SUPPLIED BY CSR HEBEL.

H4. ALL BEARING SURFACES FOR PANELS TO BE LEVEL AND EVEN.

H5. BEARING DIMENSIONS NOTED MUST NOT BE REDUCED WITHOUT APPROVAL BY CSR HEBEL.

H6. PROPPING OF PANELS MAY BE REQUIRED TO ACCOMMODATE MINOR MISALIGNMENTS UNTIL 3 DAYS AFTER RING ANCHOR GROUT IS POURED.

H7. NO MASONRY IS TO BE BUILT OVER PROPPED PANELS EXCEPT AT PERMANENT SUPPORTS.

H8. CSR HEBEL ACCEPTS NO RESPONSIBILITY FOR THE DESIGN OR SELECTION OF SUPPORTING WALLS, LINTELS, BEAMS, COLUMNS OR OTHER STRUCTURAL OR NON - STRUCTURAL MEMBERS.

H9. IF CERTIFICATION OF PANELS IS REQUIRED, 2 DAYS NOTICE OF POURING OF RING ANCHOR IS REQUIRED. A FEE MAY BE CHARGED.

H10. CORROSION PROTECTION OF STRUCTURAL STEELWORK IS TO BE AS SPECIFIED BY THE PROJECT ENGINEER OR ARCHITECT.

H11. DO NOT SCALE OFF DRAWING.

H12. ANY DISCREPANCIES OR CONFLICTING INFORMATION MUST BE REFERRED TO CSR HEBEL.

H13. TRAFFIC ON FLOOR PANELS IS TO BE AVOIDED FOR A PERIOD OF 24 HOURS AFTER RING ANCHOR IS POURED.

H14. REINFORCING BARS IN RING ACCORDANCE WITH AS 1302.

H15. RING ANCHOR PROFILE SHOULD BE LIGHTLY PRE - WET BEFORE POURING GROUT.

H16. RING ANCHOR GROUT SHALL HAVE 28 DAY MINIMUM STRENGTH OF 15MPa, MAXIMUM SLUMP OF 150mm AND 5mm MAXIMUM AGGREGATE SIZE

H17. ADDITIVES TO REDUCE GROUT SHRINKAGE SHALL ONLY BE USED IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS.

H18. BEARING LENGTHS.
- END BEARING 50mm MINIMUM OR L / 28 WHICHEVER IS GREATER.
- EDGE BEARING 50mm MINIMUM.

PROPRIETARY WALL SYSTEMS

WS1. CONCRETE STRENGTH AT 28 DAYS (f'c) SHALL BE AS SPECIFIED ON THE DRAWINGS.

WS2. COMPACTION OF CONCRETE AND CONCRETE MIX SHALL BE AS PER THE MANUFACTURER'S SPECIFICATIONS. THE CONCRETE MIX DESIGN (FROM CONCRETE SUPPLIER) MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

WS3. DURING CONSTRUCTION THE PROPRIETARY WALL SYSTEMS CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE WALLS IN A STABLE CONDITION AND ENSURE NO PART SHALL BE OVERSTRESSED UNDER CONSTRUCTION.

WS4. EXTERNAL PROPRIETARY WALL SYSTEMS ARE TO BE WATERPROOFED IN ACCORDANCE WITH THE ARCHITECT'S SPECIFICATION.

WS5. WALL FINISHES ARE TO BE IN ACCORDANCE WITH THE ARCHITECT'S SPECIFICATION.

WS6. BOTTOM (GUIDE) TRACKS AS SPECIFIED BY THE PROPRIETARY WALL SYSTEMS MANUFACTURER ARE NOT TO BE USED. THE WALL MANUFACTURER IS TO BE NOTIFIED OF THIS REQUIREMENT AND TO PROVIDE ACCEPTANCE IN WRITING.

WS7. DURING CONSTRUCTION, INSPECTION OF THE REINFORCEMENT MUST TAKE PLACE BY THE STRUCTURAL ENGINEER PRIOR TO THE INSTALLATION OF END CAPS/ PLATES TO THE CORNERS, JUNCTIONS, AND ENDS OF THE WALLS.

WS8. THERMAL IMAGING OF THE ENTIRE WALL SURFACES MUST BE UNDERTAKEN BY THE SPECIALIST SUB-CONTRACTOR IMMEDIATELY OR NO LATER THAN 6 HOURS AFTER POURING THE CONCRETE (TO CHECK FOR THE PRESENCE OF AIR VOIDS). THE REPORT MUST BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

REMEDIAL WORKS

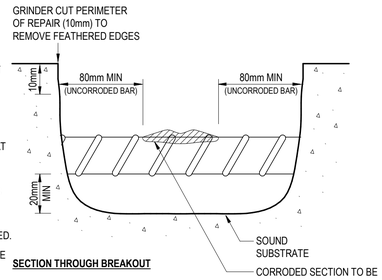
CONCRETE REPAIR TO EXISTING SPALLED CONCRETE AND RUSTED REINFORCEMENT

REMOVAL OF SPALLED CONCRETE

RE1. ANY LOOSE CONCRETE, NOT ALREADY COMPLETELY DISLODGED BY THE CORROSION MECHANISM, SHALL BE REMOVED. SPECIAL CARE SHALL BE TAKEN TO REMOVE ANY BONY CONCRETE BACK TO SOUND, DENSE MATERIAL. NO FINISHED SURFACE SHALL BE LEFT IN ANY AREA TO BE PATCHED AND ALL DEFECTIVE CONCRETE SHALL BE CUT BACK TO A SOUND BASE. ALL BREAKING OUT SHALL BE CARRIED OUT USING SHARP TOOLS TO AVOID UNNECESSARY VIBRATION AND DAMAGE TO THE STRUCTURE. FEATHERED EDGES TO REPAIRS SHALL NOT BE PERMITTED AND GRINDER CUT EDGES SHOULD BE PREPARED TO GIVE A MINIMUM 10mm PATCH REPAIR EDGE THICKNESS.

RE2. IN THE CASE OF REINFORCING BARS BEING EXPOSED ALONG THEIR AXIS, THE CONCRETE SHALL BE FURTHER CUT AWAY TO SUCH AN EXTENT AS WILL EXPOSE THE REINFORCING BAR FOR A SUFFICIENT LENGTH TO REVEAL THE EXTENT OF CORROSION, PLUS AN ADDITIONAL LENGTH OF UNCORRODED BAR AT EACH END TO PERMIT LAPPING (REFER TO TABLE R17), AND UNDERCUT SUFFICIENTLY AS TO EXPOSE THE FULL PERIPHERY OF THE BAR.

RE3. UNDERCUTTING SHALL BE SUCH AS TO PROVIDE JUST SUFFICIENT ACCESS TO CARRY OUT THE WORK, BUT IN ANY CASE NOT LESS THAN 20mm OF THE ORIGINAL BAR SIZE, WHICHEVER IS GREATER, EVERYWHERE, BUT SUCH UNDERCUTTING SHALL NOT BE GREATER THAN TWICE THE ORIGINAL BAR DIAMETER.



SECTION THROUGH BREAKOUT

TREATMENT OF REINFORCEMENT

RE4. WHERE CORROSION HAS RESULTED IN THE LOSS OF MORE THAN TEN PERCENT (10%) OF THE ORIGINAL CROSS-SECTIONAL AREA OF THE BAR, THE BAR SHOULD BE ASSESSED BY THE ENGINEER FOR INSTRUCTIONS FOR REPLACEMENT AND LAPPING. NO BARS ARE TO BE CUT OR REMOVED WITHOUT SPECIFIC INSTRUCTIONS FROM THE ENGINEER.

RE5. THE EXPOSED SECTION OF THE REINFORCING BAR(S) SHALL BE CLEANED OF ALL LOOSE RUST FOR ITS PERIPHERY AND FULL EXPOSED LENGTH BY MEANS OF GRIT BLASTING, WIRE BRUSHING, ABRADED, OR ANY OTHER METHOD IN ACCORDANCE WITH AS1627 - "METAL FINISHING PREPARATION AND PRETREATMENT OF STEEL SURFACES", CLASS 2 OR 2.5.

RE6. PREPARED CORRODED STEEL SHALL BE PRIMER COATED WITH A HIGH SOLIDS ZINC RICH COLD GALVANISING PRIMER SUCH AS **NITOPRIME ZINCRICH BY PARCHEM**.

RE7. WITHIN TWELVE (12) HOURS OF BAR PREPARATION OR FOLLOWING THE REPAIR / REPLACEMENT OF THE BAR, ALL CUT CONCRETE SURFACES SHALL BE CHECKED FOR ANY LOOSE MATERIAL AND THOROUGHLY VACUUM CLEANED AND THE BAR SHALL BE COATED WITH A COAT OF SIKA **MONOTOP-910**. APPLY A SECOND 1mm THICK COAT OF SIKA **MONOTOP-910** APPROXIMATELY FIVE (5) HOURS AFTER THE FIRST COAT. ALLOW TO CURE FOR A FURTHER FIVE (5) HOURS PRIOR TO APPLICATION OF THE BONDING BRIDGE OR OTHER WORKS TAKING PLACE.

RE8. CARE SHOULD BE TAKEN TO ENSURE ALL EXPOSED STEEL REINFORCEMENT SURFACES ARE COATED, INCLUDING BEHIND THE BARS. WHERE REINFORCEMENT REMAINS FIRMLY EMBEDDED IN SOUND ALKALINE CONCRETE, LAP THE SIKA **MONOTOP-910** ONTO THE CONCRETE BY A MINIMUM OF 20mm.

RE9. IMMEDIATELY BEFORE CARRYING OUT THE FINISHING OF THE PATCH, THE SUBSTRATE MUST BE SATURATED AND MAINTAINED AS A SATURATED SURFACE, DRY CONDITION JUST PRIOR TO APPLICATION. WET APPLICATION IS CRITICAL TO ENSURE GOOD HOMOGENEOUS BOND. CRACKS, CHECKS, PINHOLES OR SURFACE PITTING IN THE PRIMER / SIKA **MONOTOP-910** SHALL NOT BE PERMITTED OR ACCEPTABLE.

FINISHING THE PATCH

RE10. THE COATED BAR AND CUT CONCRETE SURFACES SHALL BE FILLED WITH AN APPROVED MORTAR MIX.

MORTAR MIX

RE11. THE MORTAR MIX FOR PATCHES SHALL BE SIKA **MONOTOP-615** HB HIGH BUILD REPAIR MORTAR OR SUITABLY APPROVED ALTERNATIVE. THE MIX SHALL BE TO MANUFACTURER SPECIFIED PROPORTIONS. ALL MORTAR SHALL BE MECHANICALLY MIXED IN A FORCED ACTION MIXER OR IN A CLEAN DRUM USING A LOW SPEED DRILL AND SPIRAL MIXER (500 rpm MAX.) AND SHALL BE USED WITHIN ANY SUCH TIME AS TO AVOID THE POSSIBILITY OF STIFFENING.

MORTAR PLACEMENT

RE12. THE MORTAR SHALL BE PLACED AS TO COMPLETELY SURROUND THE REINFORCING BAR, AND TO COME INTO INTIMATE AND FULL CONTACT WITH ALL CUT SURFACES OF THE CONCRETE TO THE WHOLE OF THE REPAIR SITE, AND IN SUCH A MANNER AS WILL PROMOTE FULL AND COMPLETE BOND BETWEEN THE OLD AND NEW MATERIALS. CARE SHOULD BE TAKEN TO ENSURE THAT THE MORTAR DOES NOT SLUMP AWAY FROM THE CAVITY FROM WHICH A SPALLED / CORRODED BAR HAS BEEN REMOVED.

CONCRETE REPAIR TO RECENTLY CUT CONCRETE AND EXPOSED REINFORCEMENT

TREATMENT OF EXPOSED REINFORCEMENT

TE1. THE EXPOSED SECTION OF THE REINFORCING SHALL BE CLEANED. ALL LOOSE RUST FOR ITS PERIPHERY SHALL BE FULLY EXPOSED ALONG ITS LENGTH.

TE2. EXPOSE THE STEEL TO BE CLEANED BY MEANS OF GRIT BLASTING, WIRE BRUSHING, ABRASIVE PAPER, OR ANY OTHER METHOD IN ACCORDANCE WITH AS1627 - "METAL FINISHING PREPARATION AND PRETREATMENT OF STEEL SURFACES", CLASS 2 OR 2.5.

APPLICATION

TE3. THE FRESH CUT CONCRETE SURFACE SHALL BE COATED BY APPLYING SIKA CEMENTITIOUS AND EPOXY REPAIR 'SIKA TOP - **110 EPOCEM** - EPOXY RESIN BONDING AGENT" TO THE EXPOSED AREA.

CORBEL AND HAIRPIN BARS

CH1. ALL CORBEL REINFORCEMENT IS IN ADDITION TO BARS REQUIRED BY P/T SUBCONTRACTOR.

CH2. P/T SUBCONTRACTOR TO CO-ORDINATE ALL SLAB REINFORCEMENT TO AVOID CONGESTION.

CH3. BEND CORBEL AND HAIRPIN BARS AROUND 4 x BAR DIA. PIN. **DO NOT USE U-BARS**.

CH4. ACCURATELY POSITION CORBEL REINFORCEMENT, WITH 25mm COVER TOP, BOTTOM AND SIDES. COVER IN EXCESS OF 40mm WILL BE REJECTED.

CH5. PROVIDE CHAMFERS WHERE SHOWN AT CORBEL CONNECTIONS.

GREEN STAR NOTES

Approved Document
Reference: 24025871
Version: 2.0
Date: 19/08/2024
Status: Approved

NOTE: WHERE A MINIMUM REQUIREMENT NOTE HAS NOT BEEN INCLUDED IN THE NOTES, THAT CREDIT IS EITHER NOT RELATED TO US AS STRUCTURAL/CIVIL ENGINEERS OR HAS NO MINIMUM REQUIREMENT. GREEN STAR CREDITS NOT TARGETED SHALL BE REMOVED AS REQUIRED.

GS1. THIS PROJECT SHALL COMPLY WITH THE GREEN STAR TARGETS AND REQUIREMENTS SET OUT BY THE GREEN BUILDING COUNCIL OF AUSTRALIA.

GS2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING ANY AND ALL DOCUMENTARY EVIDENCE TO PROVE COMPLIANCE WITH THE GREEN STAR CREDIT CRITERIA PERTAINING TO THE COMPLIANCE OF GREEN STAR TARGETS AND REQUIREMENTS RELEVANT TO THE STRUCTURAL OR CIVIL DESIGN OF THE BUILDING. WHERE NECESSARY DOCUMENTATION OR CALCULATIONS CAN ONLY BE ATTAINED FROM THE STRUCTURAL OR CIVIL CONSULTANT, THIS SHALL BE FORMALLY REQUESTED WITH AT LEAST 2 WEEK'S NOTICE PROVIDED.

GS3. ALL MINIMUM REQUIREMENTS OUTLINED IN THE GREEN STAR SUBMISSION GUIDELINES SHALL BE MET.

RESPONSIBLE STRUCTURE

GS4A. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, 50% OF ALL STRUCTURAL COMPONENTS BY COST SHALL MEET A RESPONSIBLE PRODUCT VALUE OF AT LEAST 10 IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES.

GS4B. WHERE AN EXCEPTIONAL PERFORMANCE IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, AT LEAST 10% OF ALL STRUCTURAL COMPONENTS BY COST SHALL MEET A RESPONSIBLE PRODUCT VALUE OF AT LEAST 15 OR AT LEAST 80% OF ALL STRUCTURAL COMPONENTS BY COST SHALL MEET A RESPONSIBLE PRODUCT VALUE OF AT LEAST 10 IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES.

EXPOSURE TO TOXINS

GS5A. WHERE THE MINIMUM EXPECTATION IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, THE BUILDING'S PAINTS, ADHESIVES, SEALANTS, CARPETS AND ENGINEERED WOOD PRODUCTS SHALL BE LOW OR NON-TOXIC IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES. ADDITIONALLY, OCCUPANTS SHALL NOT BE EXPOSED TO BANNED OR HIGHLY TOXIC MATERIALS IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES.

GS5B. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, ON-SITE TESTS SHALL BE CONDUCTED TO VERIFY THE BUILDING HAS LOW VOLATILE ORGANIC COMPOUNDS (VOC) AND FORMALDEHYDE LEVELS IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES ADDITIONAL TO ALL MINIMUM EXPECTATIONS PERTAINING TO THE EXPOSURE TO TOXINS SHALL BEING MET.

CLIMATE CHANGE ESILIENCE

GS6A. WHERE THE MINIMUM EXPECTATION IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, A CLIMATE CHANGE PRE-SCREENING CHECKLIST SHALL BE COMPLETED, AND THE BUILDING'S EXPOSURE TO CLIMATE CHANGE RISKS SHALL BE SHARED AND COMMUNICATED IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES.

GS6B. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, A PROJECT-SPECIFIC CLIMATE CHANGE RISK AND ADAPTATION ASSESSMENT FOR THE BUILDING SHALL BE COMPLETED, WITH EXTREME AND HIGH RISKS ADDRESSED, IN ADDITION TO THE MINIMUM EXPECTATIONS PERTAINING TO CLIMATE CHANGE RESILIENCE BEING MET.

OPERATIONS RESILIENCE

GS7. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, A PLAN SHALL BE IN PLACE TO ADDRESS HIGH OR EXTREME SYSTEM-LEVEL INTERDEPENDENCY RISKS AND BUILDING DESIGN SHALL MAINTAIN A LEVEL OF SURVIVABILITY AND DESIGN PURPOSE IN A BLACKOUT IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES.

UPFRONT CARBON MISSIONS

GS8A. WHERE THE MINIMUM EXPECTATION IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, MATERIALS USED IN THE CONSTRUCTION SHALL REDUCE UPFRONT CARBON EMISSIONS BY 10% WHEN COMPARED TO A REFERENCE BUILDING IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES.

GS8B. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, MATERIALS USED IN THE CONSTRUCTION SHALL REDUCE UPFRONT CARBON EMISSIONS BY 20% WHEN COMPARED TO A REFERENCE BUILDING IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES.

GS8C. WHERE AN EXCEPTIONAL PERFORMANCE IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, MATERIALS USED IN THE CONSTRUCTION SHALL REDUCE UPFRONT CARBON EMISSIONS BY 40% WHEN COMPARED TO A REFERENCE BUILDING AND DEMOLITION WORKS SHALL BE OFFSET IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES.

WATER USE

GS9A. WHERE THE MINIMUM EXPECTATION IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, THE STRUCTURE SHALL USE AT LEAST 15% LESS POTABLE WATER COMPARED TO A REFERENCE BUILDING IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES. ADDITIONALLY, THE WATER EFFICIENCY LABELLING SCHEME (WELS) STAR RATING SHALL BE 6 STAR FOR TAPS, 4 STAR FOR TOILETS, 6 STAR FOR URINALS AND 4 STAR FOR SHOWERS.

GS9B. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, THE STRUCTURE SHALL USE AT LEAST 45% LESS POTABLE WATER COMPARED TO A REFERENCE BUILDING IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES. ADDITIONALLY, THE WATER EFFICIENCY LABELLING SCHEME (WELS) STAR RATING SHALL BE 6 STAR FOR TAPS, 4 STAR FOR TOILETS, 6 STAR FOR URINALS AND 4 STAR FOR SHOWERS.

GS9C. WHERE AN EXCEPTIONAL PERFORMANCE IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, THE STRUCTURE SHALL USE AT LEAST 75% LESS POTABLE WATER COMPARED TO A REFERENCE BUILDING IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES. ADDITIONALLY, THE WATER EFFICIENCY LABELLING SCHEME (WELS) STAR RATING SHALL BE 6 STAR FOR TAPS, 4 STAR FOR TOILETS, 6 STAR FOR URINALS AND 4 STAR FOR SHOWERS.

LIFE CYCLE IMPACTS

GS10. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, A WHOLE-OF-BUILDING, WHOLE-OF-LIFE LIFE CYCLE ASSESSMENT (LCA) SHALL BE CONDUCTED FOR THE PROPOSED BUILDING, DEMONSTRATING A 30% REDUCTION OF ENVIRONMENTAL IMPACTS AGAINST A REFERENCE BUILDING IN ACCORDANCE WITH GREEN STAR SUBMISSION GUIDELINES.

IMPACTS TO NATURE

GS11A. ALL MINIMUM EXPECTATIONS OUTLINED IN THE GREEN STAR SUBMISSION GUIDELINES PERTAINING TO THE IMPACTS TO NATURE SHALL BE MET.

GS11B. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, THE BUILDING'S DESIGN AND CONSTRUCTION SHALL CONSERVE THE EXISTING NATURAL SOIL, HYDROGEOLOGICAL FLOWS AND VEGETATION ELEMENTS, AND IF DEEMED NECESSARY BY AN ECOLOGIST, SHALL RETAIN AT LEAST 50% OF THE EXISTING SITE WITH HIGH DIVERSITY ADDITIONAL TO ALL MINIMUM EXPECTATIONS PERTAINING TO THE IMPACTS TO NATURE BEING MET.

WATERWAY PROTECTION

GS12A. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, THE PROJECT SHALL ADEQUATELY DEMONSTRATE A REDUCTION IN AVERAGE STORMWATER DISCHARGE OF 50% OVER THE WHOLE SITE AND SPECIFIED POLLUTION TARGETS SHALL BE MET AS PER THE REQUIREMENTS OF THE GREEN STAR SUBMISSION GUIDELINES.

GS12B. WHERE AN EXCEPTIONAL PERFORMANCE IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, THE PROJECT SHALL ADEQUATELY DEMONSTRATE A REDUCTION IN AVERAGE STORMWATER DISCHARGE OF 80% OVER THE WHOLE SITE AND SPECIFIED POLLUTION TARGETS SHALL BE MET AS PER THE REQUIREMENTS OF THE GREEN STAR SUBMISSION GUIDELINES.

MARKET TRANSFORMATION

GS13. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, ALL REQUIREMENTS FOR A CREDIT ACHIEVEMENT OUTLINED IN THE GREEN STAR SUBMISSION GUIDELINES PERTAINING TO THE IMPACTS TO NATURE SHALL BE MET.

LEADERSHIP CHALLENGES

GS14. WHERE A CREDIT ACHIEVEMENT IS REQUIRED AS PER THE PROJECT GREEN STAR TARGETS, THE PROJECT SHALL MEET THE REQUIREMENTS OF A LEADERSHIP CHALLENGE DEVELOPED BY THE GREEN BUILDING COUNCIL OF AUSTRALIA THROUGH THE CLIMATE POSITIVE PATHWAY IN ACCORDANCE WITH THE GREEN STAR SUBMISSION GUIDELINES.

REVISIONS

No.	REVISION DESCRIPTION	DRAWN	DATE
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024

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SCALE BAR
0 10 20 30 40 50 100 mm 1:1

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PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: STRUCTURAL NOTES - SHEET 5

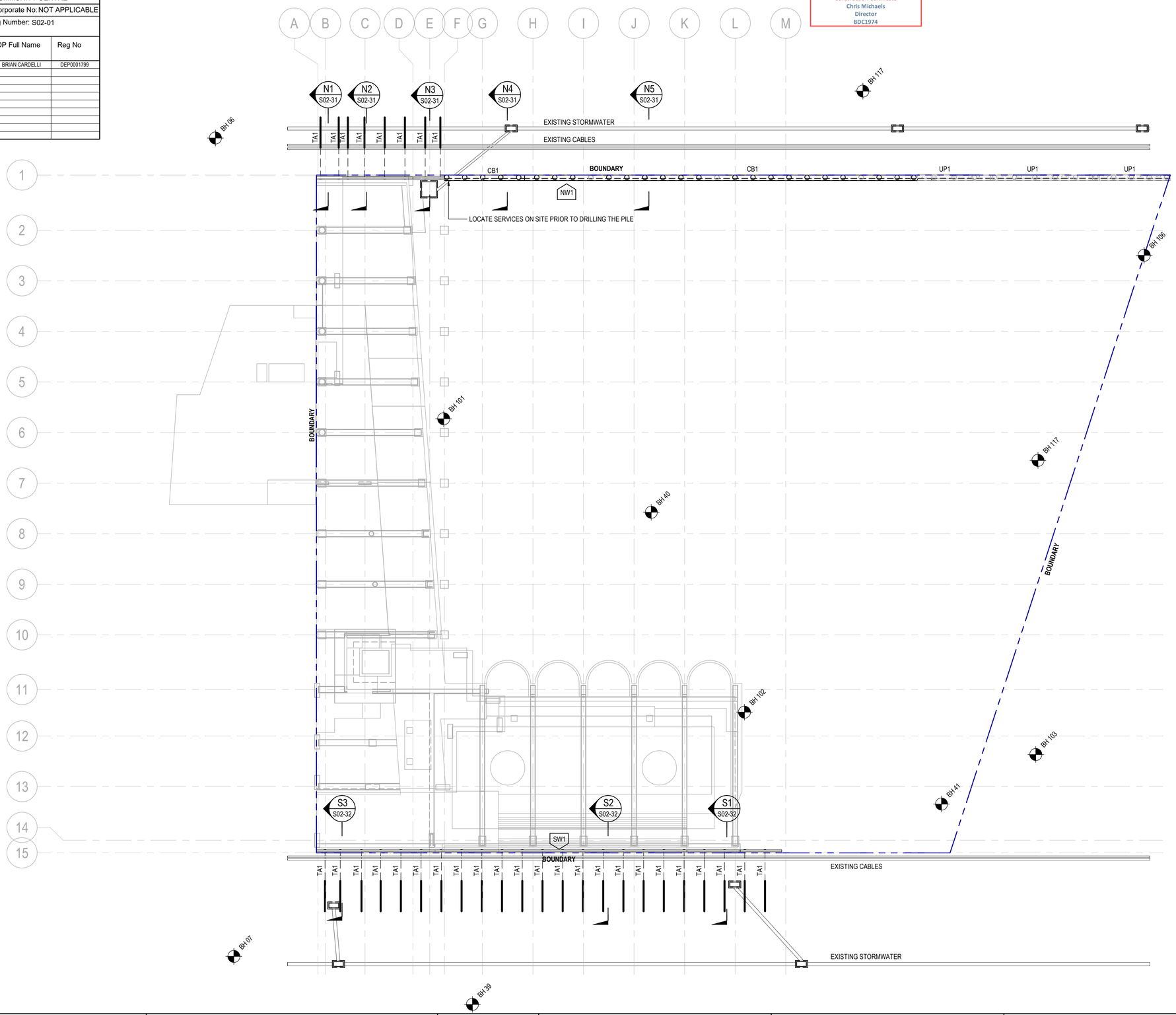
DRAWING STATUS: **CONSTRUCTION**

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.		AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S01-05	1

Regulated Design record	
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113	
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE	
Consent No: SSD 15822622 (Mod 2)	Body Corporate No: NOT APPLICABLE
Drawing Title: RETENTION PLAN	Drawing Number: S02-01

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974



RETENTION PLAN

SCALE 1 : 200

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
3. FOR ALL SET OUT DIMENSIONS, LEVELS, SET DOWNS, HOBS, KERBS AND FALLS, REFER TO ARCHITECTS DRAWINGS.

WALL PLAN LEGEND

- DENOTES LOADBEARING BRICKWORK OVER
- DENOTES 190 CORE FILLED REINF. BLOCKWORK OVER REFER DRG. No. S01-11 FOR DETAILS
- DENOTES RC WALL OR COLUMN OVER
- DENOTES LOADBEARING WALL UNDER. REFER TO PLAN OF LEVEL BELOW FOR WALL TYPE
- DENOTES RC WALL OR COLUMN UNDER AND OVER
- DENOTES NON-LOAD BEARING MASONRY WALL. REFER ARCHITECTS DRAWINGS

LEGEND:

CB_	DENOTES CAPPING BEAM. REFER DRG. No. S02-52 FOR DETAILS
UP_	DENOTES UPSTAND. REFER TO DETAIL ON DRG. S02-51

NOTE:
SERVICES LOCATION ARE INDICATIVE ONLY AND BASED ON:
REPORT NO 48905-1415 DATED 02/08/2024
AND
REPORT NO 48905-1708 DATED 24/07/2024
PREPARED BY ONLINE PIPE & CABLE LOCATING PTY LTD

ALL SERVICES LOCATIONS TO BE VERIFIED ON SITE PRIOR TO EXCAVATION COMMENCEMENT AND PRIOR TO TEMPORARY ANCHORS INSTALLATION

NOTE:
BH_ NOMINATES BOREHOLES IN ACCORDANCE WITH THE REPORT 86043.06.R.001.REV1.C2 DATED AUGUST 2021 PREPARED BY DOUGLAS AND PARTNERS

19/08/2024 2:14:58 PM

REVISIONS			
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024
No.	REVISION DESCRIPTION	DRAWN	DATE

SCALE BAR
0 10 20 30 40 50 100 mm
1:1

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N

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PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: RETENTION PLAN

DRAWING STATUS: **CONSTRUCTION**

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:200	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S02-01	1

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Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113			
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE			
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE	
Drawing Title: RETENTION ELEVATIONS - SHEET 1		Drawing Number: S02-11	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
3. FOR ALL SET OUT DIMENSIONS, LEVELS, SET DOWNS, HOBS, KERBS AND FALLS, REFER TO ARCHITECTS DRAWINGS.

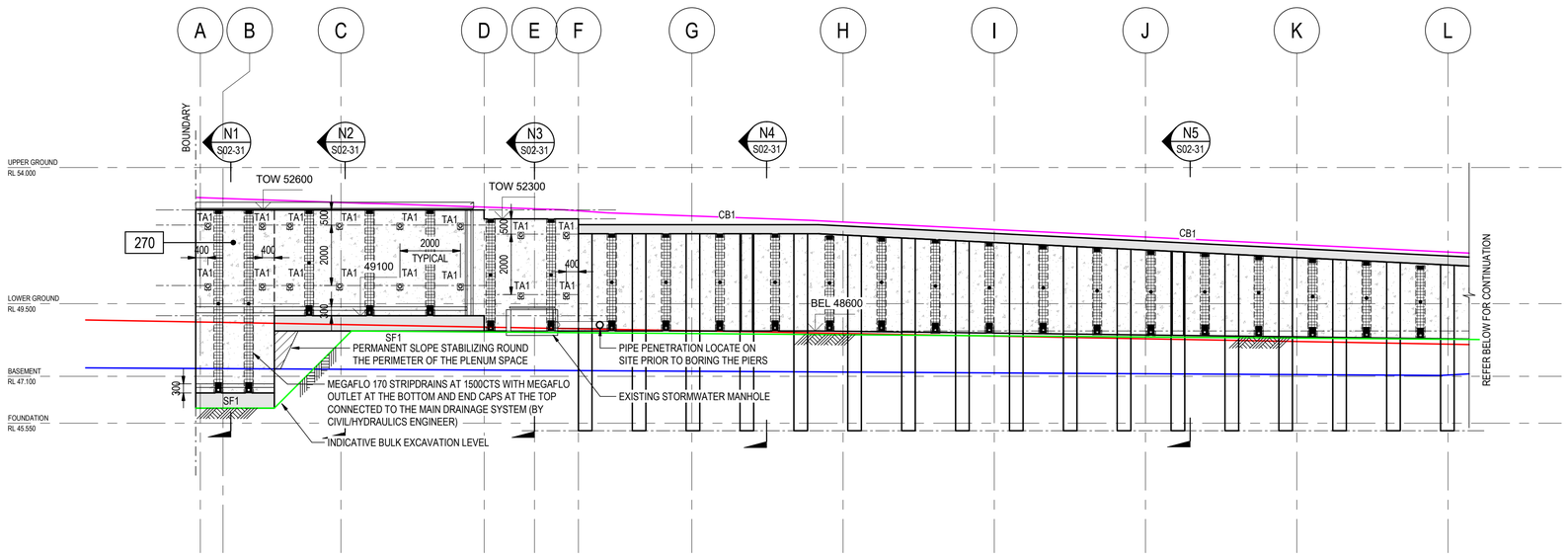
EARTHWORKS LEGEND

- DENOTES BULK-EX LEVEL
- DENOTES GROUND / FILL LEVEL
- DENOTES CLASS 2/3 ROCK LEVEL
- DENOTES CLASS 3/4 ROCK LEVEL

NOTE:
- TEMPORARY ANCHORS DESIGN BY JK GEOTECHNICS
- PILING DESIGN BY PARAGON

NOTE:
SERVICES LOCATION ARE INDICATIVE ONLY AND BASED ON:
REPORT NO 48905-1415 DATED 02/08/2024
AND
REPORT NO 48905-1708 DATED 24/07/2024
PREPARED BY ONLINE PIPE & CABLE LOCATING PTY LTD

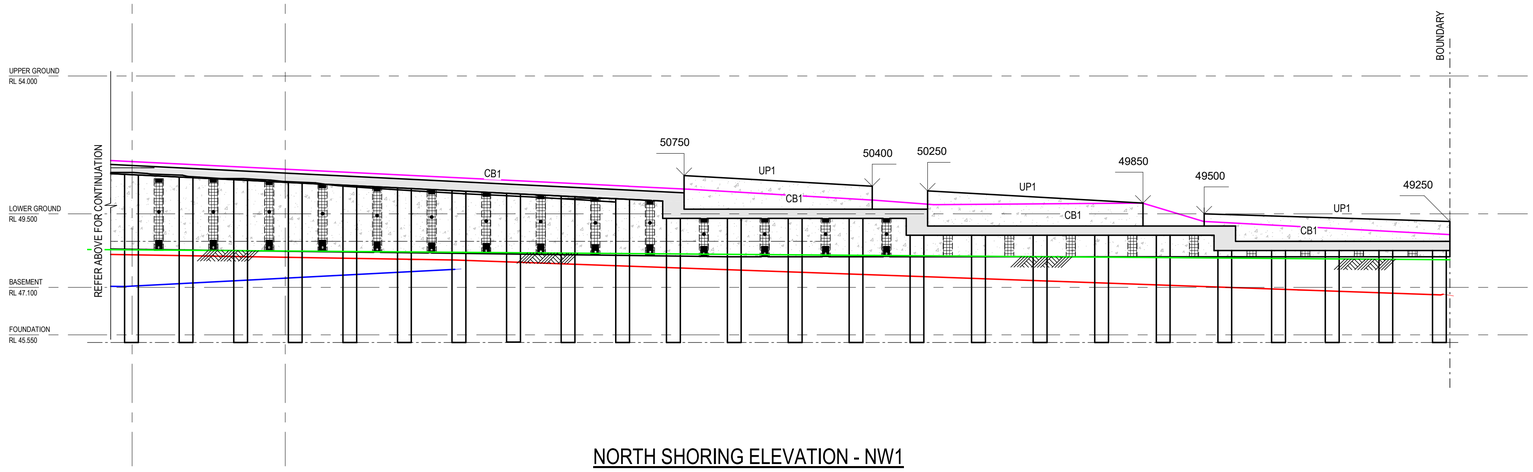
ALL SERVICES LOCATIONS TO BE VERIFIED ON SITE PRIOR TO EXCAVATION COMMENCEMENT AND PRIOR TO TEMPORARY ANCHORS INSTALLATION



NORTH SHORING ELEVATION - NW1

SCALE 1 : 100

NOTE:
200 THICK SHOT-CRETE WALL UNO.



NORTH SHORING ELEVATION - NW1

SCALE 1 : 100

NOTE:
200 THICK SHOT-CRETE WALL UNO.

REVISIONS			
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024
No.	REVISION DESCRIPTION	DRAWN	DATE

19/08/2024 2:15:03 PM

SCALE BAR
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1:1

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IF IN DOUBT - ASK.

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LEVEL 6, 39 CHANDOS STREET
SYDNEY NSW 2065
Telephone 61-2-9436 0433
www.vandermeer.com.au
van der Meer (NSW) Pty Ltd
ABN 56 158 266 301

CLIENT: Grindley CONSTRUCTION

ARCHITECT: CHROFI
3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: RETENTION ELEVATIONS - SHEET 1

DRAWING STATUS: **CONSTRUCTION**

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:100	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S02-11	1

Regulated Design record			
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113			
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE			
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE	
Drawing Title: RETENTION ELEVATIONS - SHEET 2		Drawing Number: S02-12	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
3. FOR ALL SET OUT DIMENSIONS, LEVELS, SET DOWNS, HOBS, KERBS AND FALLS, REFER TO ARCHITECTS DRAWINGS.

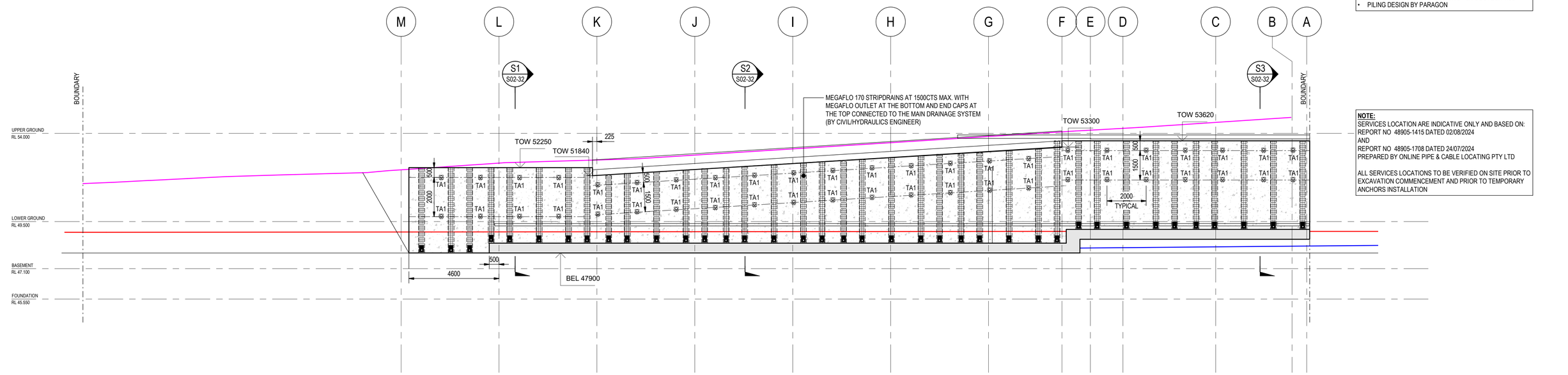
EARTHWORKS LEGEND

- DENOTES BULK-EX LEVEL
- DENOTES GROUND / FILL LEVEL
- DENOTES CLASS 2/3 ROCK LEVEL
- DENOTES CLASS 3/4 ROCK LEVEL

NOTE:
- TEMPORARY ANCHORS DESIGN BY JK GEOTECHNICS
- PILING DESIGN BY PARAGON

NOTE:
SERVICES LOCATION ARE INDICATIVE ONLY AND BASED ON:
REPORT NO 48905-1415 DATED 02/08/2024
AND
REPORT NO 48905-1708 DATED 24/07/2024
PREPARED BY ONLINE PIPE & CABLE LOCATING PTY LTD

ALL SERVICES LOCATIONS TO BE VERIFIED ON SITE PRIOR TO EXCAVATION COMMENCEMENT AND PRIOR TO TEMPORARY ANCHORS INSTALLATION



SOUTH SHORING ELEVATION - SW1

SCALE 1 : 100

NOTE:
200 THICK SHOT-CRETE WALL UNO.

REVISIONS			
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024
No.	REVISION DESCRIPTION	DRAWN	DATE

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1:1

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ABN 56 158 266 301

CLIENT
Grindley CONSTRUCTION

ARCHITECT
CHROFI
3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

PROJECT TITLE
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE
RETENTION ELEVATIONS - SHEET 2

DRAWING STATUS
CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:100	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S02-12	1

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: RETENTION SECTION - SHEET 1		Drawing Number: S02-31		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
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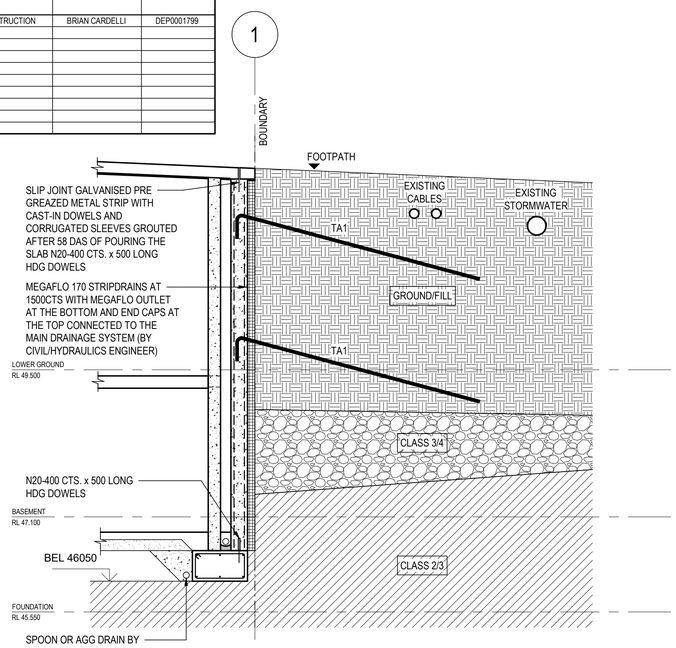
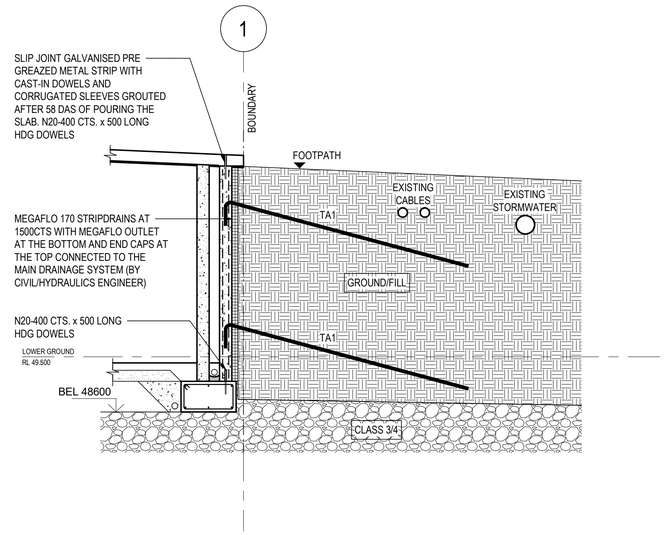
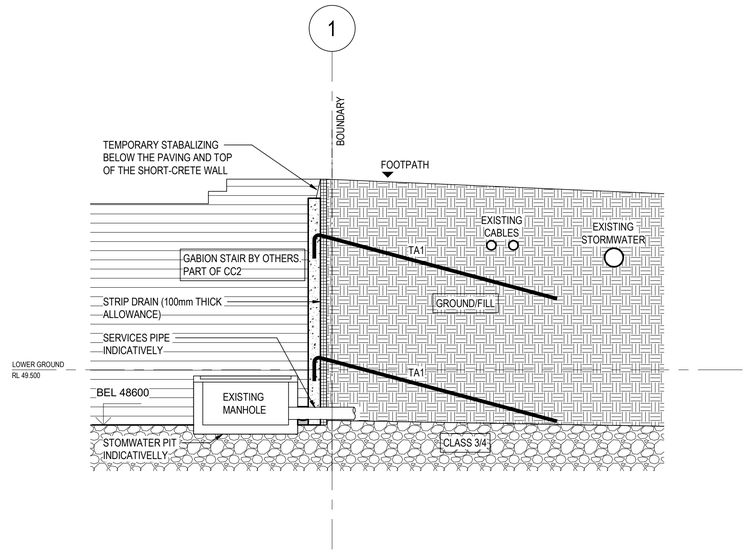


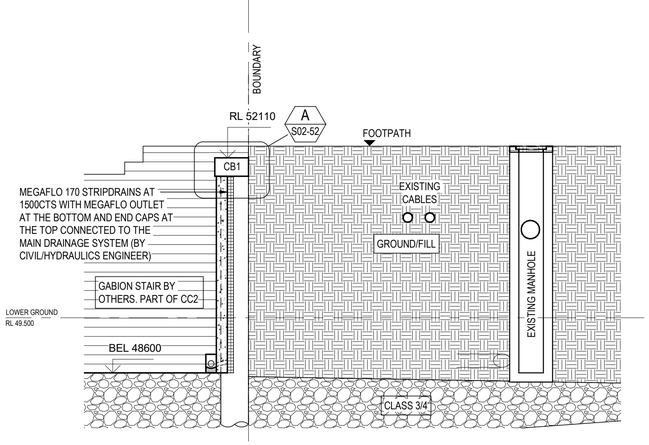
SECTION N1
SCALE 1 : 50
S02-01



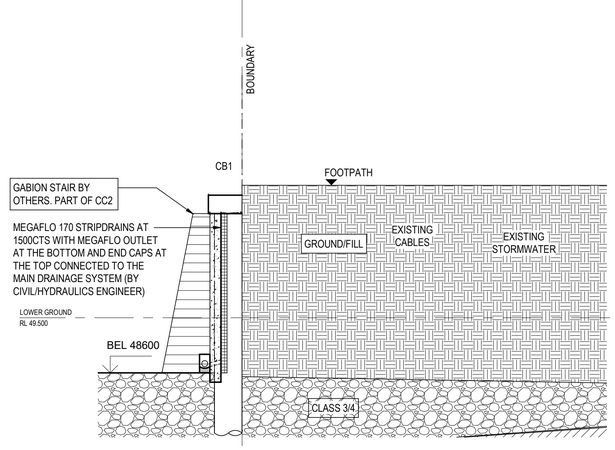
SECTION N2
SCALE 1 : 50
S02-01



SECTION N3
SCALE 1 : 50
S02-01



SECTION N4
SCALE 1 : 50
S02-01



SECTION N5
SCALE 1 : 50
S02-01

NOTE:
- TEMPORARY ANCHORS DESIGN BY JK GEOTECHNICS
- PILING DESIGN BY PARAGON

NOTE:
SERVICES LOCATION ARE INDICATIVE ONLY AND BASED ON:
REPORT NO 48905-1415 DATED 02/08/2024
AND
REPORT NO 48905-1708 DATED 24/07/2024
PREPARED BY ONLINE PIPE & CABLE LOCATING PTY LTD

ALL SERVICES LOCATIONS TO BE VERIFIED ON SITE PRIOR TO EXCAVATION COMMENCEMENT AND PRIOR TO TEMPORARY ANCHORS INSTALLATION

REVISIONS

No.	REVISION DESCRIPTION	DRAWN	DATE
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024

19/08/2024, 2:15:16 PM

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1:1

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ABN 56 158 266 301

CLIENT: Grindley CONSTRUCTION

ARCHITECT: CHROFI
3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: RETENTION SECTION - SHEET 1

DRAWING STATUS: **CONSTRUCTION**

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:50	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S02-31	1

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: RETENTION SECTION - SHEET 2		Drawing Number: S02-32		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
3. FOR ALL SET OUT DIMENSIONS, LEVELS, SET DOWNS, HOBS, KERBS AND FALLS, REFER TO ARCHITECTS DRAWINGS.

NOTE:
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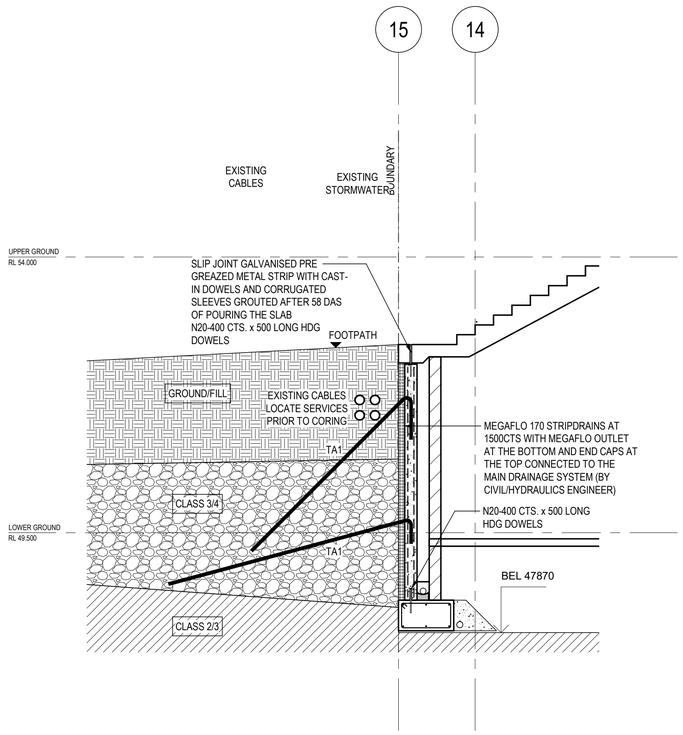
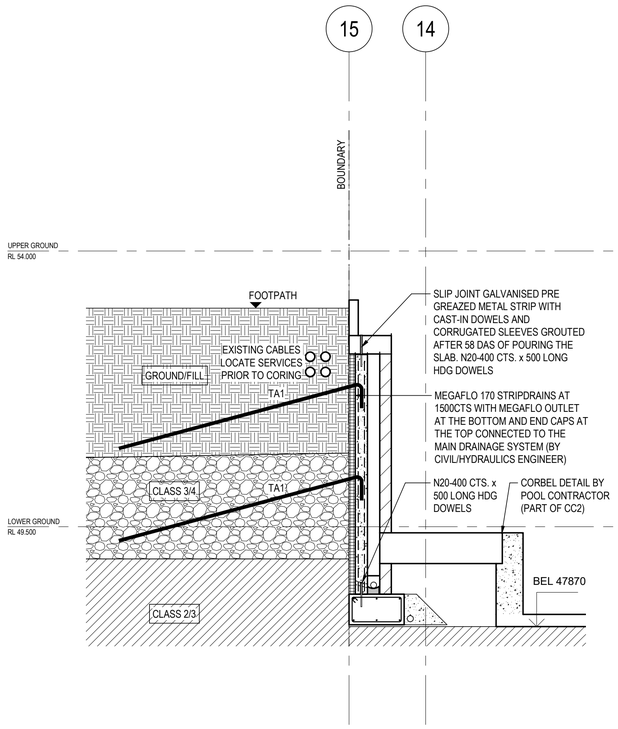
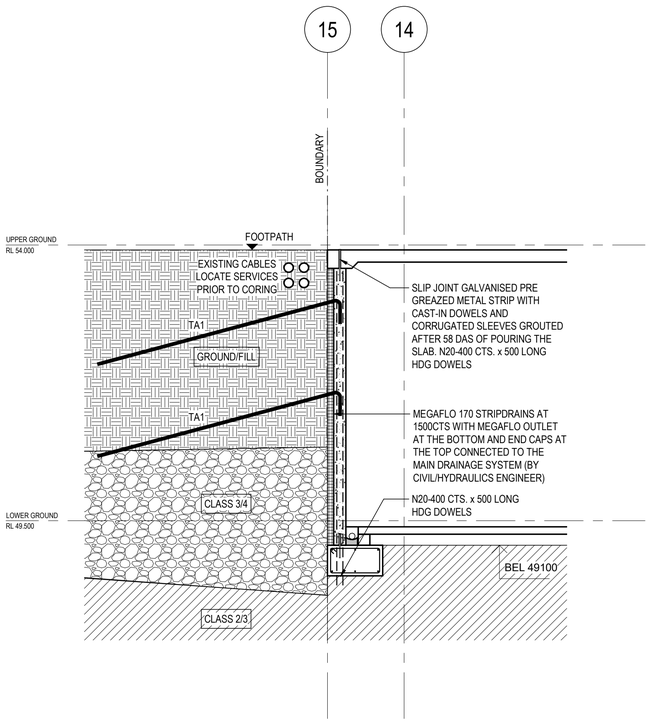


SECTION S1
SCALE 1 : 50
S02-01



SECTION S2
SCALE 1 : 50
S02-01



SECTION S3
SCALE 1 : 50
S02-01

REVISIONS			
No.	REVISION DESCRIPTION	DRAWN	DATE
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024

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CLIENT
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ARCHITECT
CHROFI
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PROJECT TITLE
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

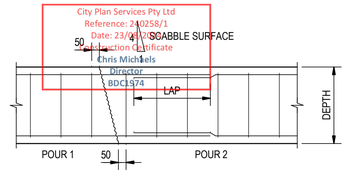
DRAWING TITLE
RETENTION SECTION - SHEET 2

DRAWING STATUS
CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:50	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S02-32	1

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: RETENTION DETAILS - SHEET 1		Drawing Number: S02-51		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/07/2024
Section 73 Certificate
Chris Michaels
Director
BDC1574



TYPICAL FOOTING BEAM CONSTRCTION JOINT DETAIL

SCALE 1:20

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
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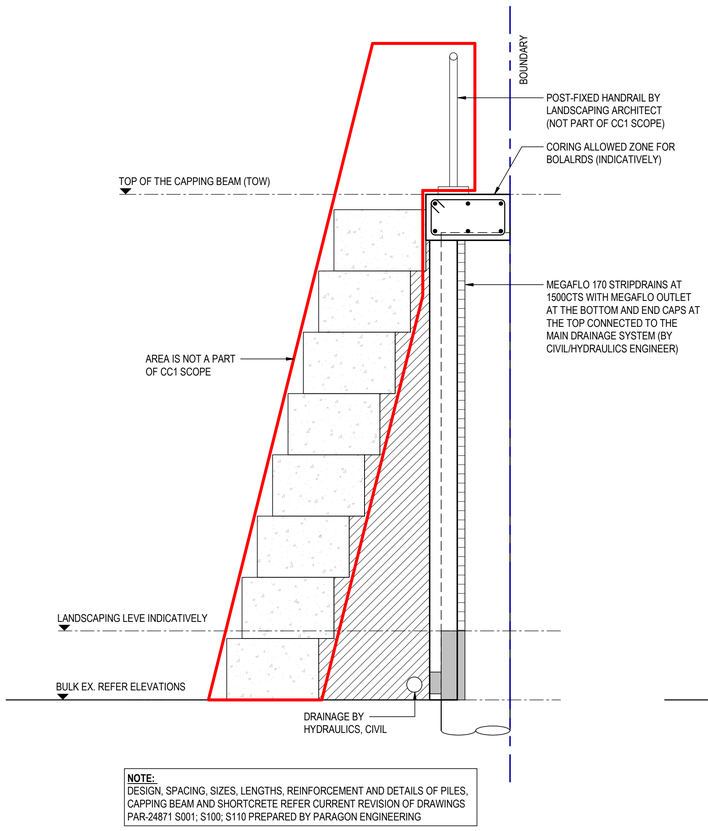
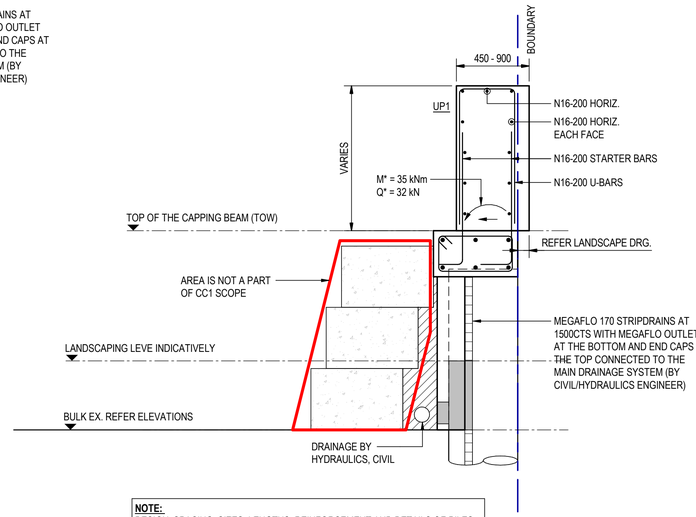


NOTE:
DESIGN, SPACING, SIZES, LENGTHS, REINFORCEMENT AND DETAILS OF PILES, CAPPING BEAM AND SHORTCRETE REFER CURRENT REVISION OF DRAWINGS PAR-24871 S001; S100; S110 PREPARED BY PARAGON ENGINEERING

PILED SHORING SECTION TYPICAL (THROUGH GABION WALL)

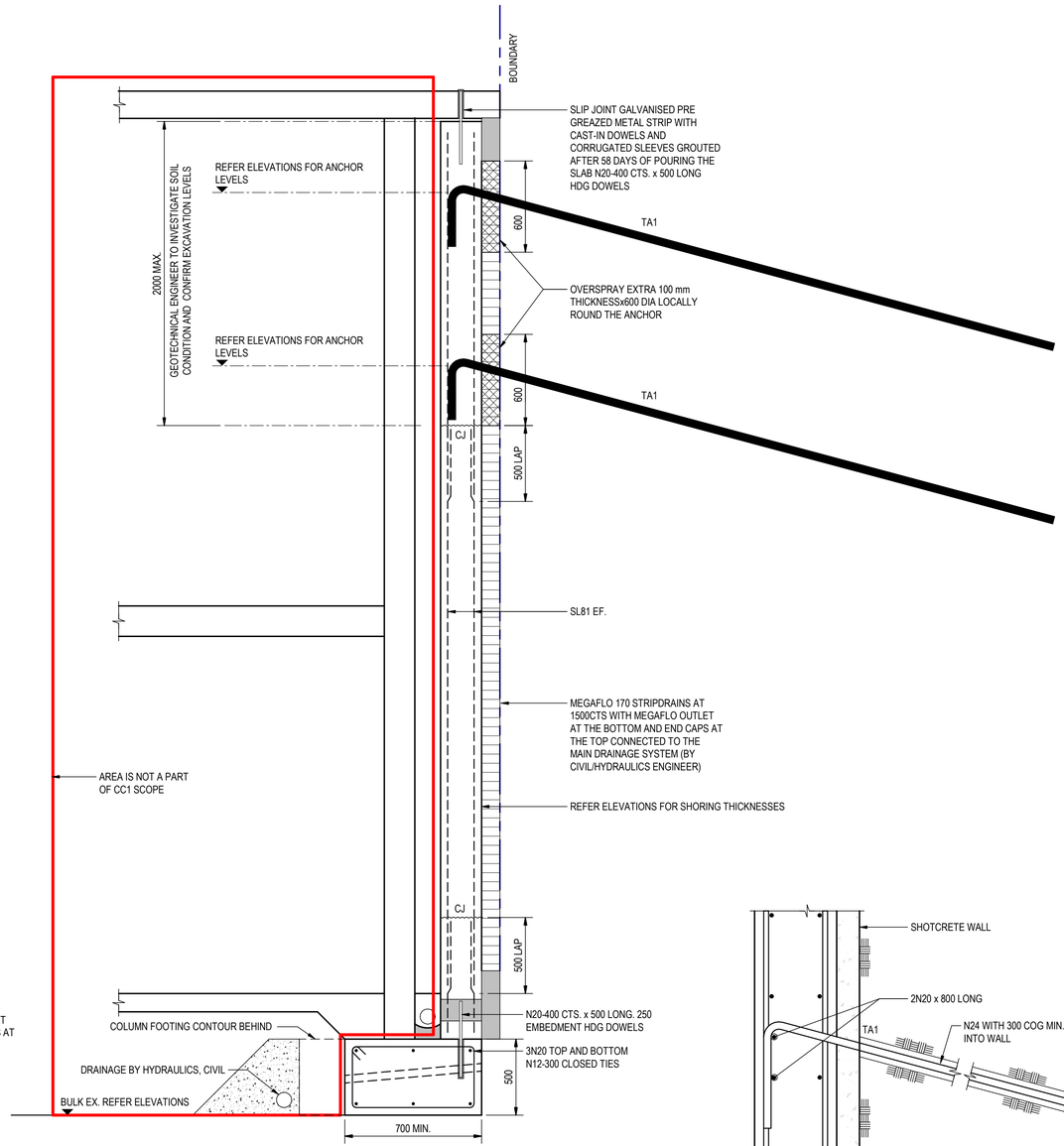
SCALE 1:20



NOTE:
DESIGN, SPACING, SIZES, LENGTHS, REINFORCEMENT AND DETAILS OF PILES, CAPPING BEAM AND SHORTCRETE REFER CURRENT REVISION OF DRAWINGS PAR-24871 S001; S100; S110 PREPARED BY PARAGON ENGINEERING

PILED SHORING SECTION TYPICAL (THROUGH IN-SITU FEATURE WALL)

SCALE 1:20



NOTE:
FOR TEMPORARY ANCHORS TA1 DESIGN, LENGTHS, SOCKETS, CORING AND GROUTING REQUIREMENTS, ANCHORS SIZES REFER CURRENT REVISION OF THE REPORT 36870YFlet MACQUARIE PARK: "TEMPORARY ROCK BOLT DESIGN AND PERMANENT SHOTCRETE ANALYSIS PROPOSED VILLAGE GREEN AND COMMUNITY CENTRE (STAGE C2) IVANHOE ESTATE (MIDTOWN), MACQUARIE PARK, NSW" PREPARED BY JK GEOTECHNICS

SHORTCRETE SECTION TYPICAL

SCALE 1:20

TYPICAL SOIL NAIL DETAIL

SCALE 1:10

REVISIONS

No.	REVISION DESCRIPTION	DRAWN	DATE
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024

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SCALE BAR
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3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

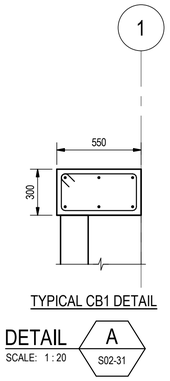
PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: RETENTION DETAILS - SHEET 1

DRAWING STATUS: **CONSTRUCTION**

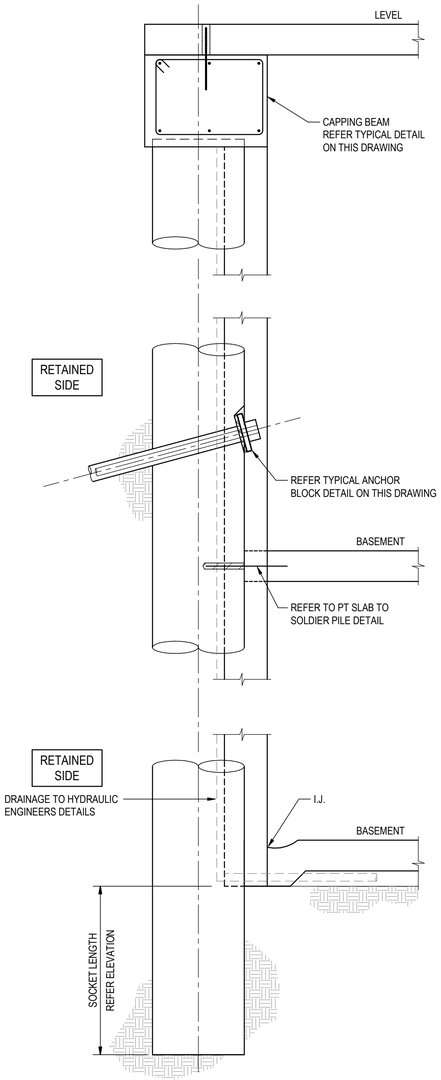
PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:10, 1:20	AUG 2024	**A1**
JOB No.	DRAWING No.	REVISION	
SY220-116	S02-51	1	

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: RETENTION DETAILS - SHEET 2		Drawing Number: S02-52		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799



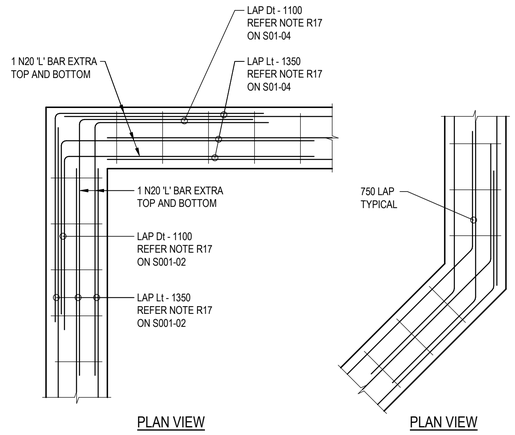
TYPICAL CB1 DETAIL

DETAIL A
SCALE: 1 : 20
S02-31



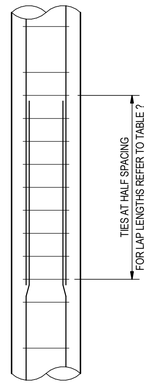
TYPICAL BP1 SOLDIER WALL SECTION

SCALE 1:20



TYPICAL CAPPING BEAM DETAILS

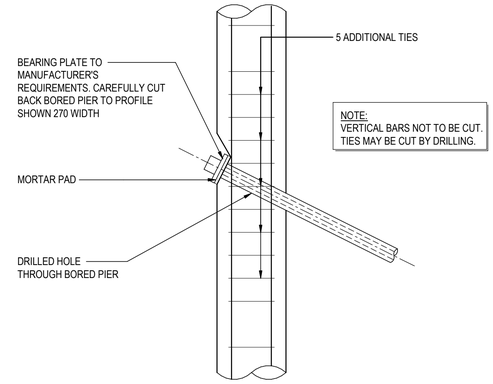
City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974



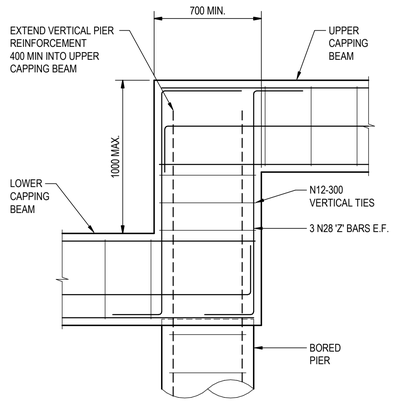
TYPICAL PILE SPLICE DETAIL

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
3. FOR ALL SET OUT DIMENSIONS, LEVELS, SET DOWNS, HOBS, KERBS AND FALLS, REFER TO ARCHITECTS DRAWINGS.



TYPICAL ANCHOR BLOCK DETAIL



ELEVATION

TYPICAL CAPPING BEAM STEP DETAIL

REVISIONS			
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
No.	REVISION DESCRIPTION	DRAWN	DATE

SCALE BAR
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1:1

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www.vandermeer.com.au
van der Meer (NSW) Pty Ltd
ABN 56 158 266 301

CLIENT: Grindley CONSTRUCTION

ARCHITECT: CHROFI
3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: RETENTION DETAILS - SHEET 2

DRAWING STATUS: **CONSTRUCTION**

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:20	AUG 2024	**A1**
JOB No.		DRAWING No.	REVISION
SY220-116		S02-52	1

19/08/2024 2:15:32 PM

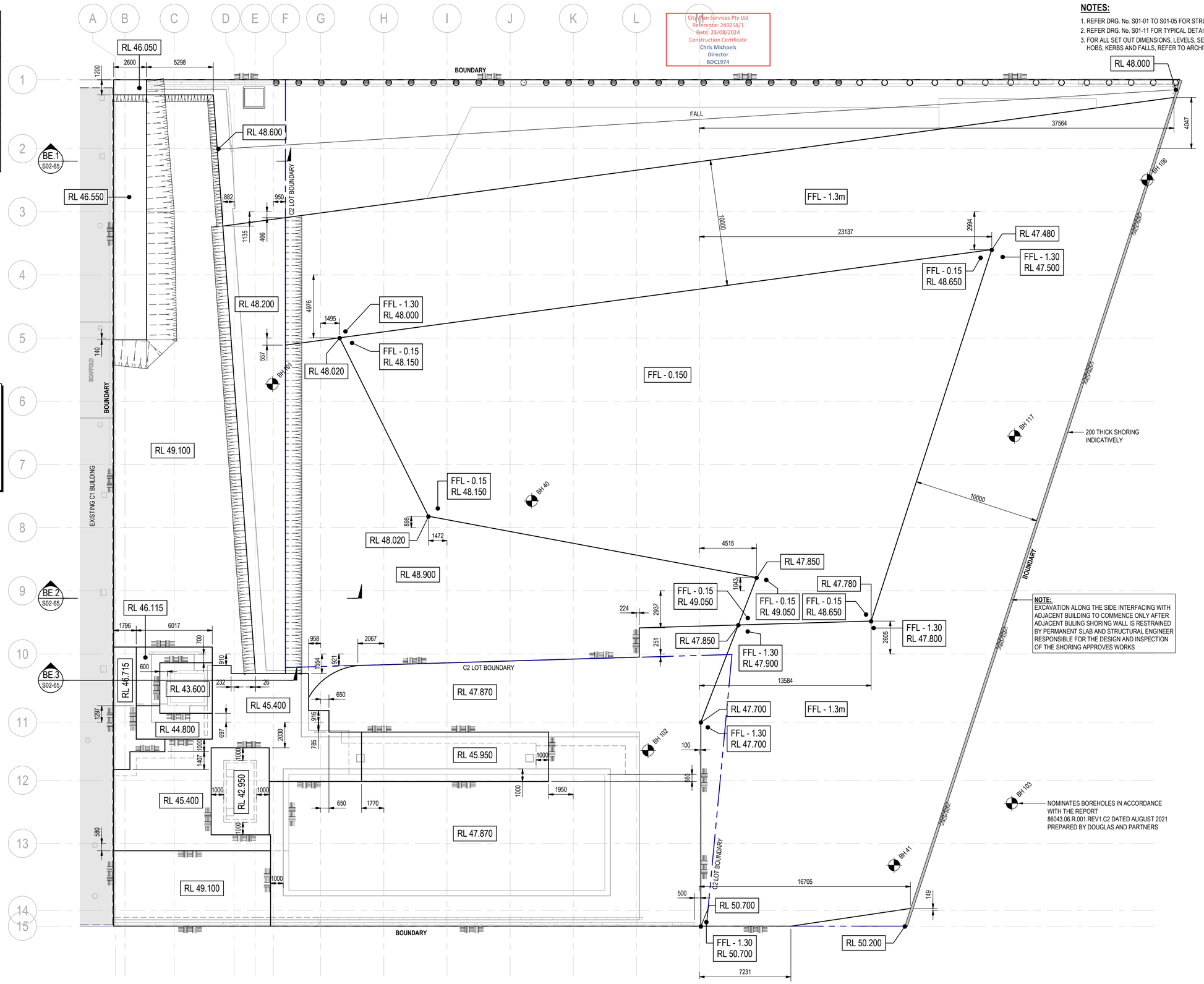
Regulated Design record	
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113	
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE	
Consent No: SSD 15822622 (Mod 2)	Body Corporate No: NOT APPLICABLE
Drawing Title: BULK EXCAVATION PLAN	Drawing Number: S02-61

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

NOTE:
DETAILED EXCAVATION LEVELS AND SETOUT DIMENSIONS ARE APPROXIMATE ONLY.
ADDITIONAL EXCAVATION MAY BE REQUIRED TO SUIT SOIL CONDITIONS AND LINE OF INFLUENCE TO ADJACENT FOOTINGS.
ADDITIONAL EXCAVATIONS REQUIRED FOR SANITARY AND STORMWATER DRAINAGE. REFER TO HYDRAULIC AND CIVIL ENGINEERS DRAWINGS FOR LOCATIONS AND LEVELS.

NOTES:
1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
3. FOR ALL SET OUT DIMENSIONS, LEVELS, SET DOWNS, HOBS, KERBS AND FALLS, REFER TO ARCHITECTS DRAWINGS. U.N.O.

CityPlan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974



BULK EXCAVATION PLAN

SCALE 1 : 150

REVISIONS			
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024
A	ISSUED FOR CC1 COORDINATION	V.N.	07-08-2024
No.	REVISION DESCRIPTION	DRAWN	DATE

SCALE BAR 0 10 20 30 40 50 100 mm 1:1

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van der Meer (NSW) Pty Ltd
ABN 56 158 266 301

CLIENT: Grindley CONSTRUCTION

ARCHITECT: CHROFI
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T +61 2 8096 8500 E info@chrofi.com

PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: BULK EXCAVATION PLAN

DRAWING STATUS: **CONSTRUCTION**

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:150	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S02-61	1

19/08/2024 2:15:37 PM

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: BULK EXCAVATION SECTION - SHEET 1		Drawing Number: S02-65		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	19.08.24	ISSUED FOR CONSTRUCTION	BRIAN CARDELLI	DEP0001799

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES:

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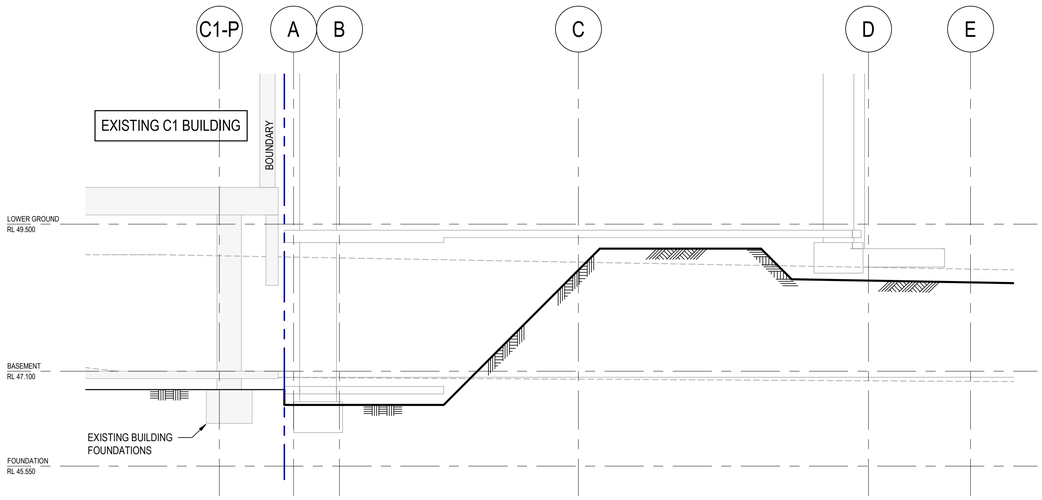
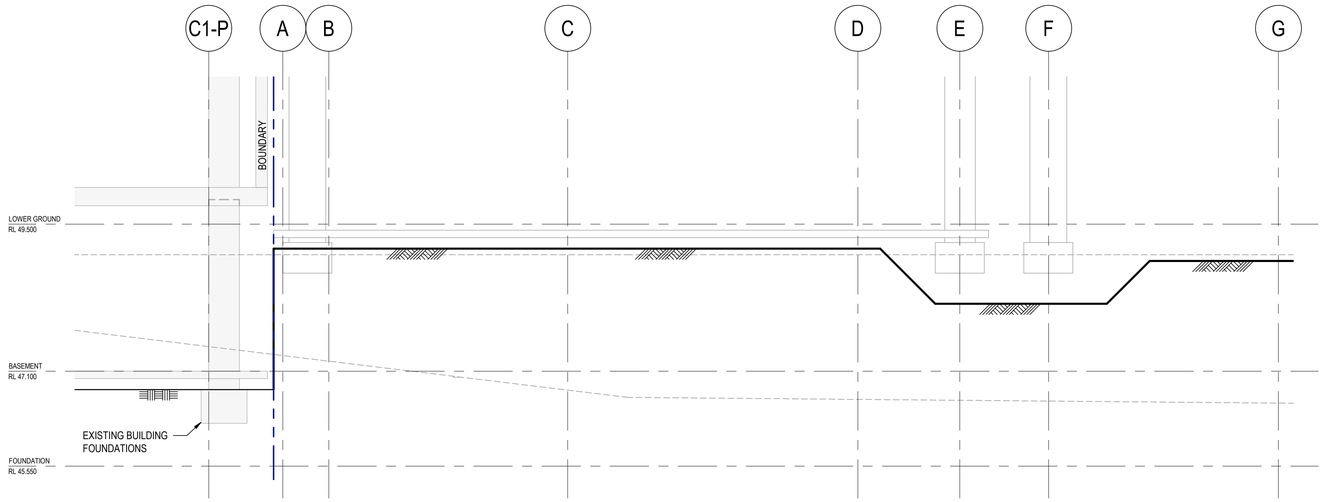
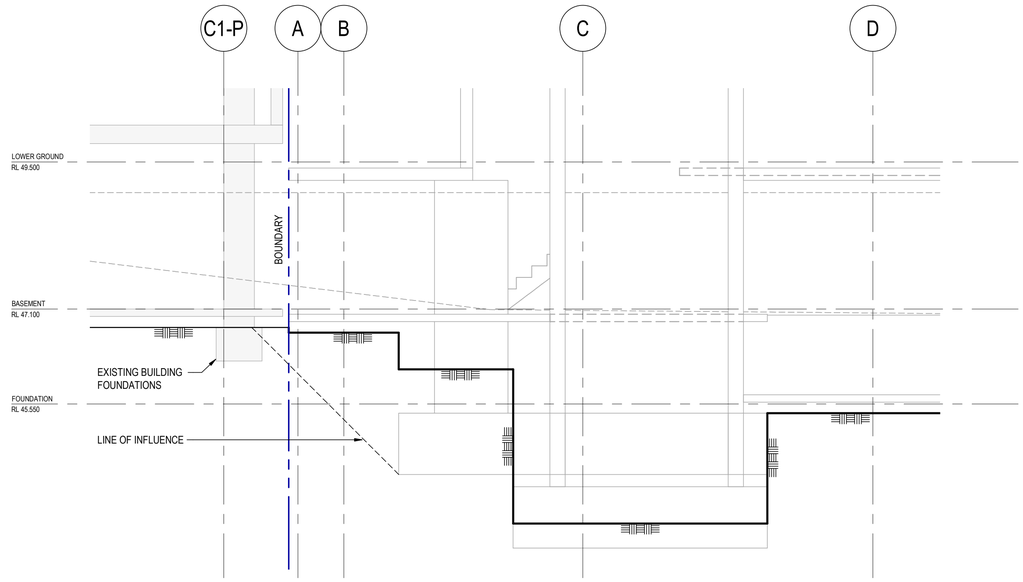


SECTION BE.1 (S02-61)
SCALE 1 : 50



SECTION BE.2 (S02-61)
SCALE 1 : 50



SECTION BE.3 (S02-61)
SCALE 1 : 50

REVISIONS

No.	REVISION DESCRIPTION	DRAWN	DATE
1	ISSUED FOR CC1 AND REGULATED DESIGN	P.T.	19-08-2024

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SCALE BAR
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1:1

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CLIENT
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ARCHITECT
CHROFI
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T +61 2 8096 8500 E info@chrofi.com

PROJECT TITLE
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE
BULK EXCAVATION SECTION - SHEET 1

DRAWING STATUS
CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:50	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S02-65	1

Regulated Design record	
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113	
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE	
Consent No: SSD 15822622 (Mod 2)	Body Corporate No: NOT APPLICABLE
Drawing Title: FOOTING PLAN - SHEET 1	Drawing Number: S03-01

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No

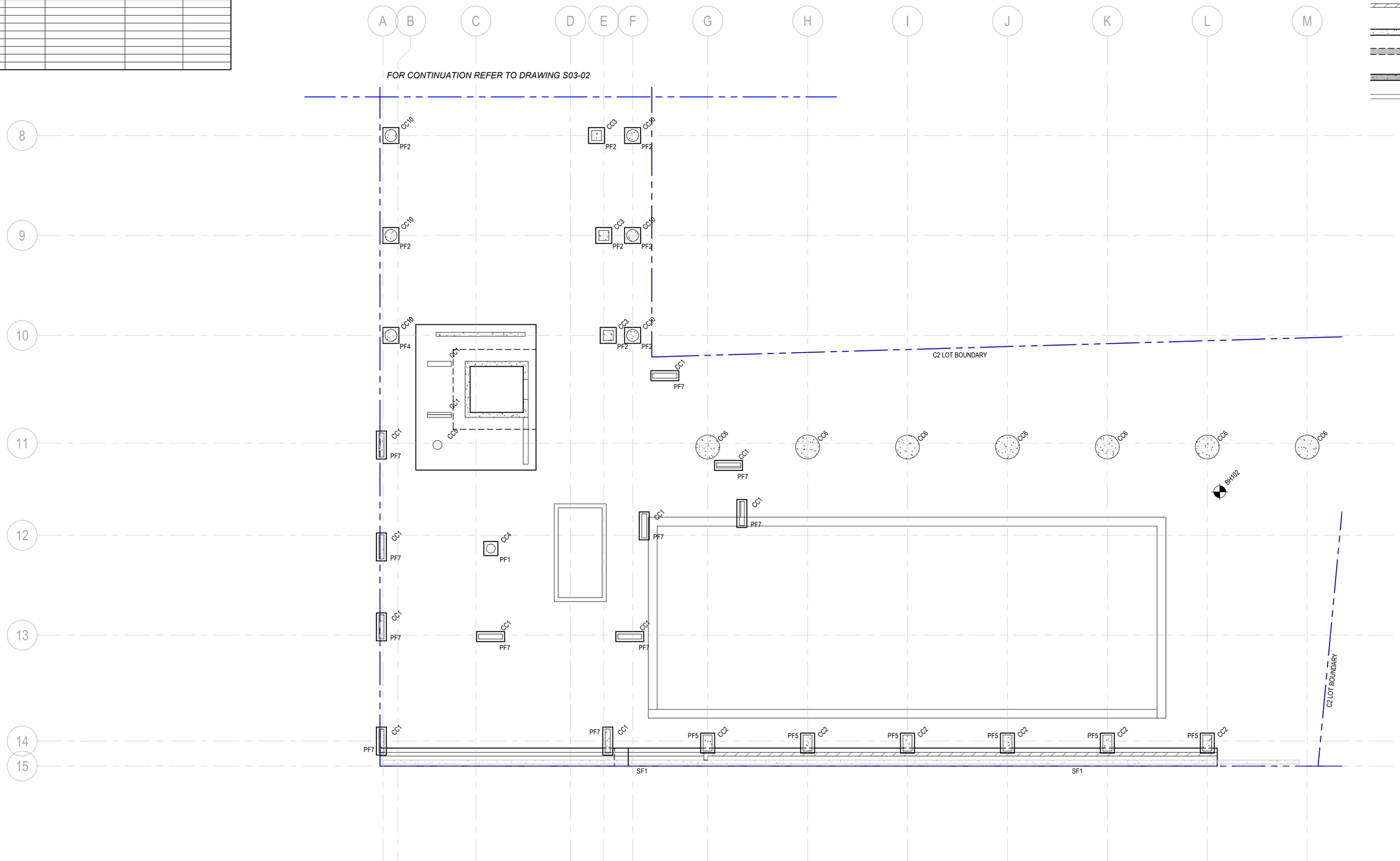
City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
3. FOR ALL SET OUT DIMENSIONS, LEVELS, SET DOWNS, HOBS, KERBS AND FALLS, REFER TO ARCHITECTS DRAWINGS.

WALL PLAN LEGEND

- DENOTES LOADBEARING BRICKWORK OVER
- DENOTES 190 CORE FILLED REINF. BLOCKWORK OVER REFER DRG. No. S01-11 FOR DETAILS
- DENOTES RC WALL OR COLUMN OVER
- DENOTES LOADBEARING WALL UNDER. REFER TO PLAN OF LEVEL BELOW FOR WALL TYPE
- DENOTES RC WALL OR COLUMN UNDER AND OVER
- DENOTES NON-LOAD BEARING MASONRY WALL. REFER ARCHITECTS DRAWINGS



FOOTING PLAN - SHEET 1

SCALE 1 : 100

REVISIONS			
No.	REVISION DESCRIPTION	DRAWN	DATE
A	ISSUED FOR INFORMATION	P.T.	19-08-2024

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SCALE BAR
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van der Meer (NSW) Pty Ltd
ABN 56 158 266 301

CLIENT
Grindley CONSTRUCTION

ARCHITECT
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T +61 2 8096 8500 E info@chrofi.com

PROJECT TITLE
IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE
FOOTING PLAN - SHEET 1

DRAWING STATUS
INFORMATION
NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:100	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S03-01	A

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: FOOTING PLAN - SHEET 2		Drawing Number: S03-02		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES:

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WALL PLAN LEGEND

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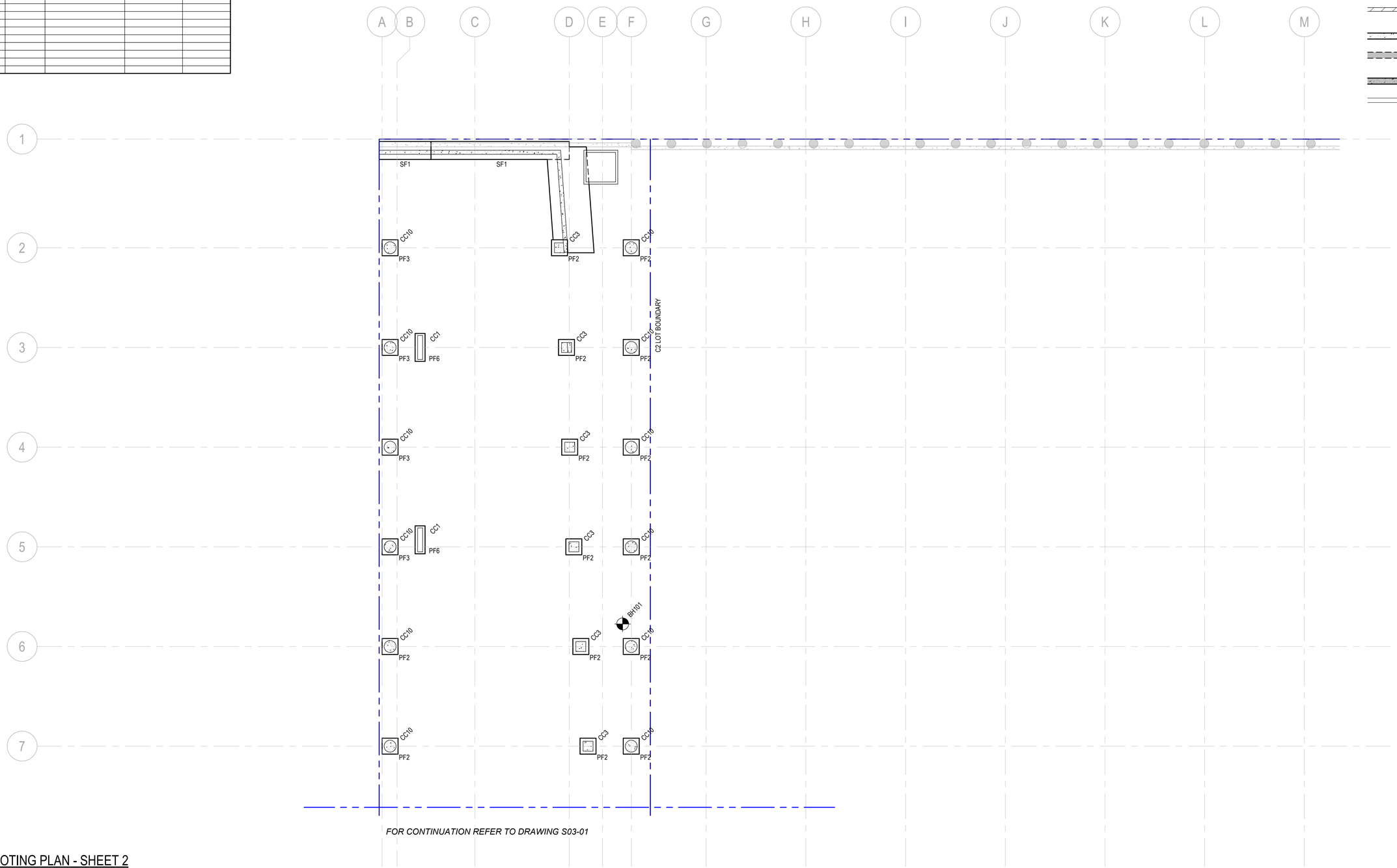
- DENOTES NON-LOAD BEARING MASONRY WALL. REFER ARCHITECTS DRAWINGS



FOR CONTINUATION REFER TO DRAWING S03-01

FOOTING PLAN - SHEET 2

SCALE 1 : 100

REVISIONS			
A	ISSUED FOR INFORMATION	P.T.	19-08-2024
No.	REVISION DESCRIPTION	DRAWN	DATE

19/08/2024 2:16:02 PM

SCALE BAR
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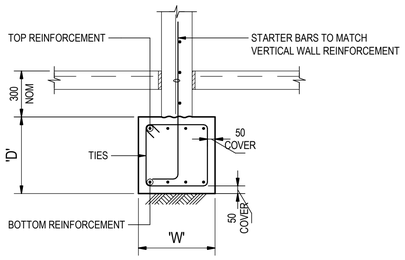
PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: FOOTING PLAN - SHEET 2

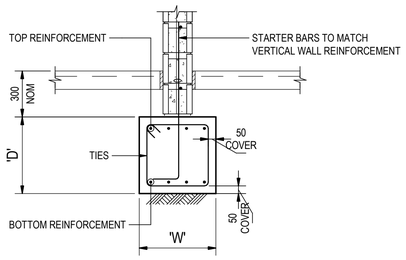
DRAWING STATUS: **INFORMATION**
NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:100	AUG 2024	A1
JOB No.	DRAWING No.	REVISION	
SY220-116	S03-02	A	

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: FOOTING DETAILS - SHEET 1		Drawing Number: S03-51		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No

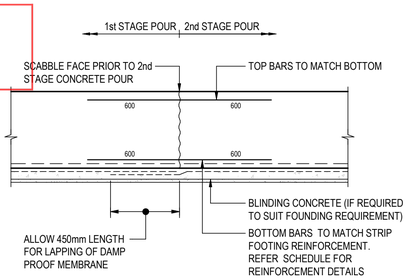


SECTION



SECTION

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974



STRIP FOOTING CONSTRUCTION JOINT DETAIL

SCALE 1:20

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
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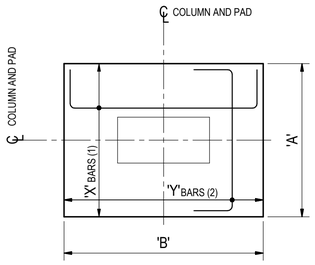


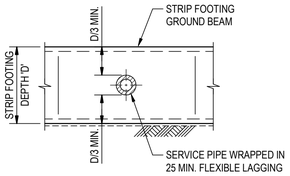
PLAN
TOP BARS NOT SHOWN FOR CLARITY

STRIP FOOTING DETAIL - SF

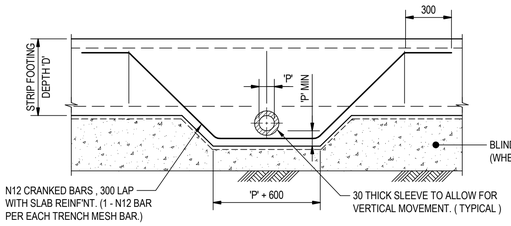
SCALE 1:20

STRIP FOOTING SCHEDULE				
FOOTING TYPE		SF1		
WIDTH ('W')		...		
DEPTH ('D')		...		
REINFORCEMENT	TOP	...		
	BOTTOM	...		
	TIES	...		

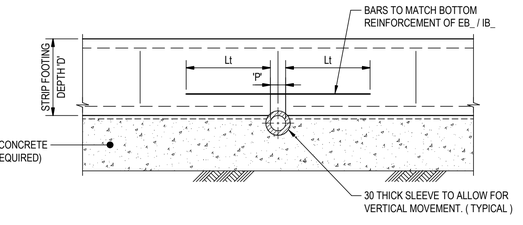
REFER NOTE F2 ON STRUCTURAL NOTES FOR ALLOWABLE BEARING CAPACITY



PENETRATION LOCATED CENTRAL TO FOOTING



PENETRATION LOCATED AT OR NEAR BASE OF FOOTING

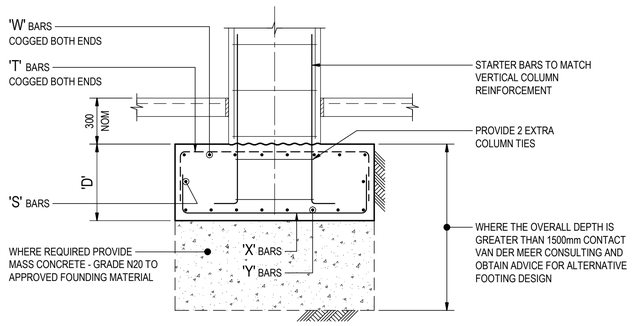


PENETRATION LOCATED AT OR NEAR BASE OF FOOTING

TYPICAL PENETRATION IN FOOTING DETAILS

SCALE 1:20

SERVICE PIPES SHALL BE ALIGNED PERPENDICULAR TO THE FOOTING



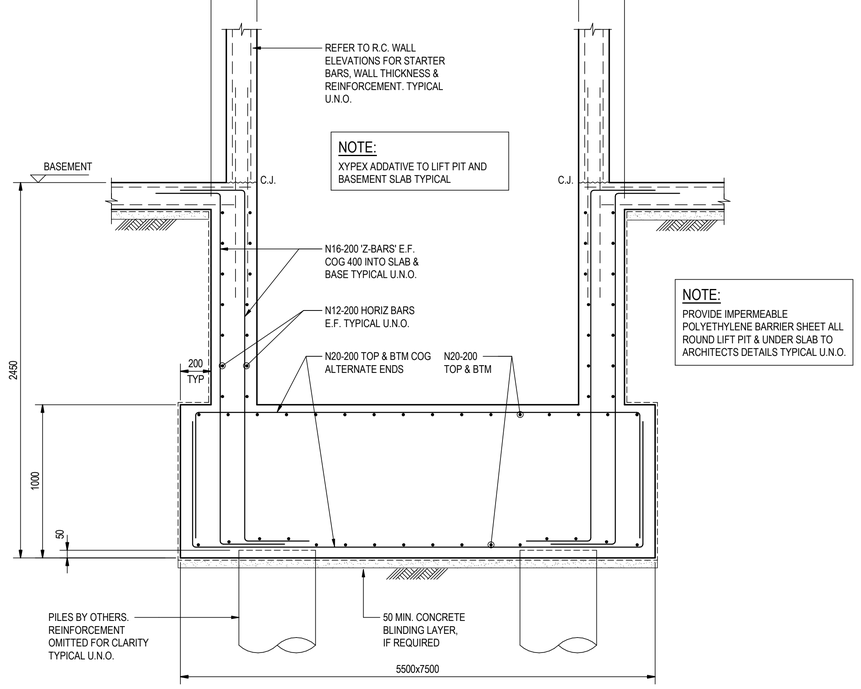
SECTION

PAD FOOTING DETAIL - PF

SCALE 1:20

PAD FOOTING SCHEDULE								
PAD TYPE		PF1	PF2	PF3	PF4	PF5	PF6	PF7
SIZE ('A' x 'B')		700x700	800x800	800x800	800x800	1000x700	1400x500	1400x500
DEPTH ('D')		600	600	600	600	600	600	600
COG		300	300	300	300	300	300	300
REINFORCEMENT	'S'	...	...	...	...	...	...	...
	'T'	...	...	...	...	...	...	...
	'W'	...	...	...	...	...	...	...
	'X'	4N16	5N16	5N16	5N16	6N16	8N16	8N16
	'Y'	4N16	5N16	5N16	5N16	4N16	3N16	3N16

REFER NOTE F2 ON STRUCTURAL NOTES FOR ALLOWABLE BEARING CAPACITY



TYPICAL LIFT PIT DETAIL

SCALE 1:20

REVISIONS

No.	REVISION DESCRIPTION	DRAWN	DATE
A	ISSUED FOR INFORMATION	P.T.	19-08-2024

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SCALE BAR
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CLIENT: Grindley CONSTRUCTION

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PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: FOOTING DETAILS - SHEET 1

DRAWING STATUS: **INFORMATION** NOT TO BE USED FOR CONSTRUCTION

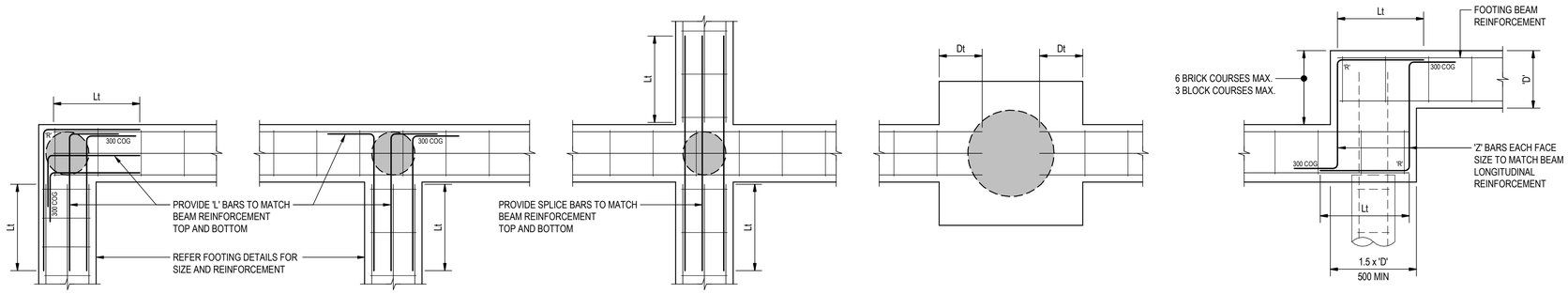
PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:20	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S03-51	A

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: FOOTING DETAILS - SHEET 2		Drawing Number: S03-52		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
3. FOR ALL SET OUT DIMENSIONS, LEVELS, SET DOWNS, HOBS, KERBS AND FALLS, REFER TO ARCHITECTS DRAWINGS.



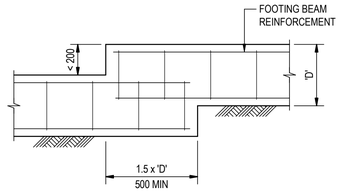
CORNER | T-INTERSECTION | INTERSECTION | AT PAD OR PILE CAP | STEP IN FOOTING

TYPICAL FOOTING BEAM DETAILS

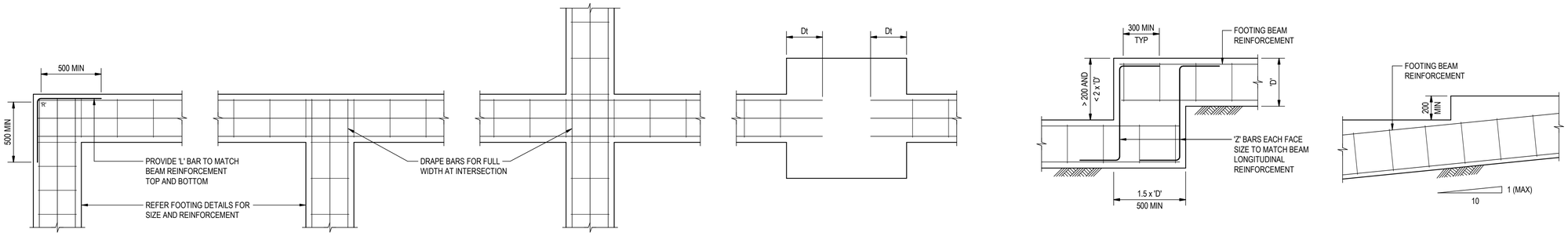
SCALE 1:20

REFER STRUCTURAL NOTES R17 FOR Lt AND Dt LENGTHS

'R' - DENOTES BEND AROUND 10 BAR DIA. MIN. PIN



< 200 STEP IN FOOTING



CORNER | T-INTERSECTION | INTERSECTION | AT PAD OR PILE CAP | > 200 STEP IN FOOTING | STEP IN SLOPING FOOTING

TYPICAL FOOTING BEAM DETAILS

SCALE 1:20

REFER STRUCTURAL NOTES R17 FOR Dt LENGTHS

'R' - DENOTES BEND AROUND 10 BAR DIA. MIN. PIN

REVISIONS

No.	REVISION DESCRIPTION	DRAWN	DATE
A	ISSUED FOR INFORMATION	P.T.	19-08-2024

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PROJECT TITLE: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: FOOTING DETAILS - SHEET 2

DRAWING STATUS: **INFORMATION** NOT TO BE USED FOR CONSTRUCTION

PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:20	AUG 2024	A1
JOB No.		DRAWING No.	REVISION
SY220-116		S03-52	A

Regulated Design record				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate No: NOT APPLICABLE		
Drawing Title: FOOTING PLAN - SHEET 2		Drawing Number: S03-02		
Rev	Date dd.mm.yy	Description	DP Full Name	Reg No

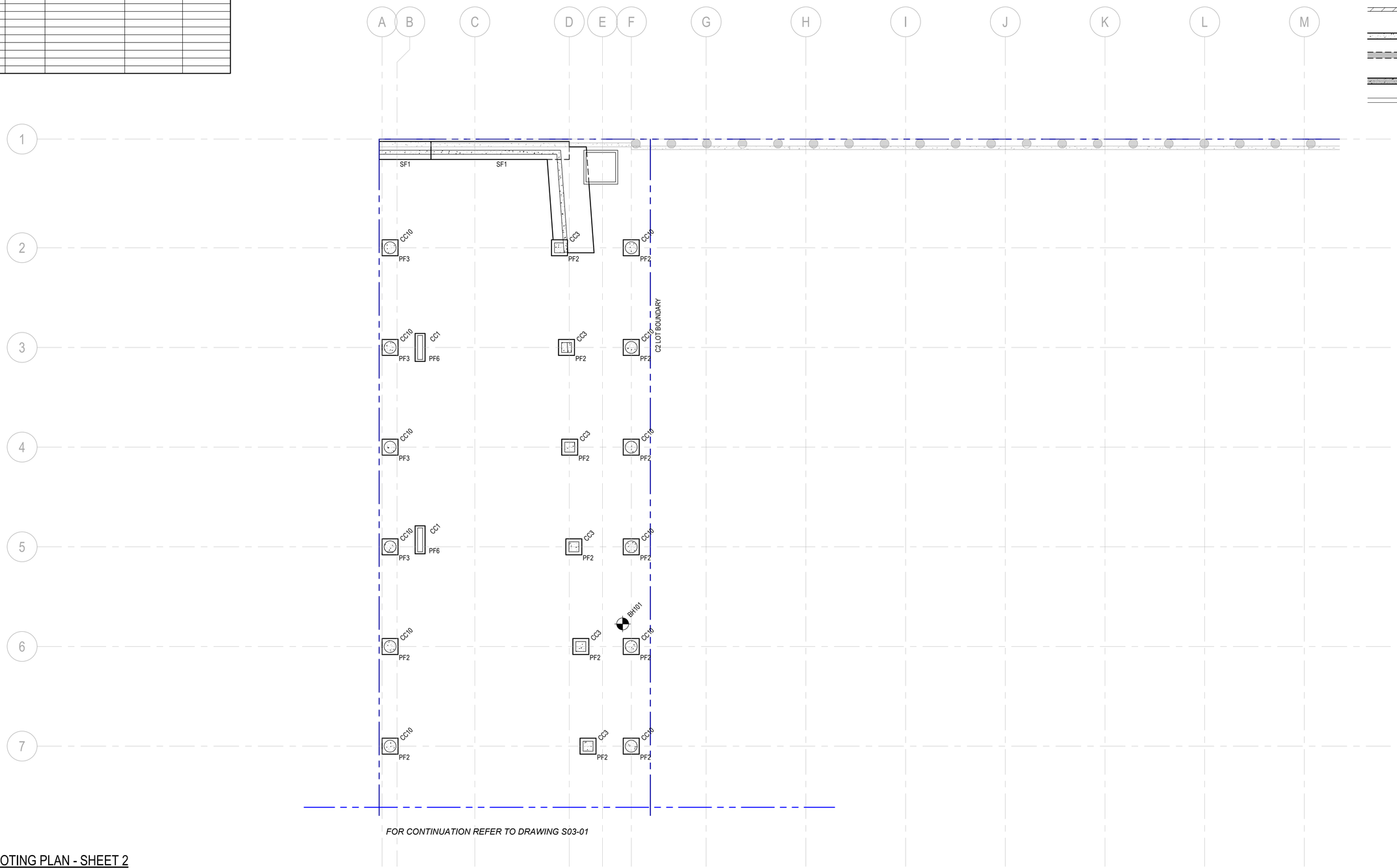
City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES:

1. REFER DRG. No. S01-01 TO S01-05 FOR STRUCTURAL NOTES
2. REFER DRG. No. S01-11 FOR TYPICAL DETAILS
3. FOR ALL SET OUT DIMENSIONS, LEVELS, SET DOWNS, HOBS, KERBS AND FALLS, REFER TO ARCHITECTS DRAWINGS.

WALL PLAN LEGEND

- DENOTES LOADBEARING BRICKWORK OVER
- DENOTES 190 CORE FILLED REINF. BLOCKWORK OVER REFER DRG. No. S01-11 FOR DETAILS
- DENOTES RC WALL OR COLUMN OVER
- DENOTES LOADBEARING WALL UNDER. REFER TO PLAN OF LEVEL BELOW FOR WALL TYPE
- DENOTES RC WALL OR COLUMN UNDER AND OVER
- DENOTES NON-LOAD BEARING MASONRY WALL. REFER ARCHITECTS DRAWINGS



FOR CONTINUATION REFER TO DRAWING S03-01

FOOTING PLAN - SHEET 2

SCALE 1 : 100

REVISIONS			
A	ISSUED FOR INFORMATION	P.T.	19-08-2024
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1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

DRAWING TITLE: FOOTING PLAN - SHEET 2

DRAWING STATUS: **INFORMATION**
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PROJECT LEADER	DESIGNER	SIGNATURE	
B.C.	S.M.		
DRAFTSPERSON	SCALE	DATE	SHEET SIZE
V.N.	1:100	AUG 2024	A1
JOB No.	DRAWING No.	REVISION	
SY220-116	S03-02	A	

REGULATED DESIGN RECORD			
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113			
Project Title: IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE			
Consent No: SSD 15822622 (Mod 2)		Body Corporate Reg No: N/A	
Drawing Title: AS SHOWN		Drawing No: H01	

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	16.08.24	CC1 ISSUE	XINJIE DING	DEP0001253

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michael
Director
BDC1974

IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE

1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

HYDRAULIC SERVICES

LEGEND

ABBREVIATIONS

AAV	AIR ADMITTANCE VALVE
AB	ACCESSIBLE BASIN
AC	AIR CONDITIONING
AV	AIR RELEASE VALVE
AWC	ACCESSIBLE TOILET (WATER CLOSET)
B	BASIN
B/CWU	BOILING/CHILLED WATER UNIT
BFW	BUNDED FLOOR WASTE
BG	BOX GUTTER
BO	BALCONY OUTLET
BT	BOUNDARY TRAP
BTFW	BUCKET TRAP FLOOR WASTE
BTH	BATH
BV	BALL VALVE
BWU	BOILING WATER UNIT
CAC	CIRCULAR ACCESS CHAMBER
CC	CIRCULAR COVER
CD	CONDENSATE DRAIN
CI	CAST IRON
CIC	CAST IN COLUMN
CIS	CAST IN SLAB
CO	CLEAR OUT
CS	CLEANERS SINK
CSO	COMBI STEAMER OVEN
CT	COOK TOP
Cu	COPPER
CW	COLD WATER
DCDV	DOUBLE CHECK DETECTOR VALVE
DCP	DISCHARGE CONTROL PIT
DF	DRINKING FOUNTAIN
DCW	DOMESTIC COLD WATER
DI	DUCTILE IRON
DP	DOWN PIPE
DRO	DOMED RAINWATER OUTLET
DST	DRAINAGE STACK
DTU	DRAINAGE TURN-UP
DW	DISHWASHER
DWG	DRAWING
e	EXISTING
ED	EFFECTIVE DEPTH
EJ	EXPANSION JOINT
Ex	EXISTING
FFL	FINISHED FLOOR LEVEL
FH	FIRE HYDRANT
FHR	FIRE HOSE REEL
FW	FLOOR WASTE
GAS	GAS SERVICE
GBP	GAS BAYONET POINT
GD	GRATED DRAIN
GDO	GRATED DRAIN OUTLET
GFW	GARBAGE FLOOR WASTE
GMS	GALVANISED MILD STEEL
GVP	GREASE WSTER VENT PIPE
GW	GREASE WASTE
GWM	GLASS WASHING MACHINE
GWS	GREASE WASTE STACK
HDC	HEAVY DUTY COVER
HDG	HEAVY DUTY GRATE
HDPE	HIGH DENSITY POLYETHYLENE
HL	HIGH LEVEL
HT	HOSE TAP
HW	HOT WATER
HWF	HOT WATER FLOW
HWR	HOT WATER RETURN
HWU	HOT WATER UNIT
IL	INVERT LEVEL
IM	ICE MACHINE
IPMF	INDUCT PIPE MICA FLAP
KIP	KERB INLET PIT
KFW	KITCHEN FLOOR WASTE
KO	KEY OPERATED
LDC	LIGHT DUTY COVER
LDG	LIGHT DUTY GRATE
LL	LOW LEVEL
LO	LOCKED OPEN
LT	LAUNDRY TUB
LPG	LIQUIFIED PETROLEUM GAS
LTG	LONGITUDINAL TRENCH GRATE
MJ/HR	MEGAJOULES PER HOUR
NG	NATURAL GAS
NPCW	NON-POTABLE COLD WATER
NPHW	NON-POTABLE HOT WATER
NTS	NOT TO SCALE
O/F	OVERFLOW
OLF	OVERLAND FLOW
ORG	OVERFLOW RELIEF GULLY
P	PENETRATION
PCW	POTABLE COLD WATER
PFS	PAN FLUSH SANITISER
PFW	PLANTROOM FLOOR WASTE
PHT	PLANTER HOSE TAP
PLRO	PLANTER RAINWATER OUTLET
PLV	PRESSURE LIMITING VALVE
PRO	PARAPET RAINWATER OUTLET
PRV	PRESSURE REDUCING VALVE
RC	REFRIGERATION CABINET
RCP	REINFORCED CONCRETE PIPE
RGB	RECESS GAS BAYONET POINT
RL	REDUCED LEVEL
RO	RAINWATER OUTLET
RPZD	REDUCED PRESSURE ZONE DEVICE
RS	RISING SHAFT
RST	RECESSED STOP TAP
RTD	RECESSED TUNDISH
RV	RELIEF VENT
RWH	RAINWATER HEAD
S	SEWER/SANITARY
SHR	SHOWER
SK	SINK
SL	SUCTION LINE
SMH	SEWER MANHOLE
SMS	SEWER MAINTENANCE SHAFT
SPO	SPOON DRAIN OUTLET
SPR	SPRINKLER SERVICE
SRA	SPRAY RINSE ARM
SRM	SEWER RISING MAIN
SRO	SQUARE RAINWATER OUTLET
SSD	SUB-SOIL DRAINAGE
SST	SOIL STACK
ST	STOP TAP
SV	STOP VALVE (ISOLATION VALVE)
STW	STORWATER
SWP	STORMWATER PIT
SWRM	STORMWATER RISING MAIN
TD	TUNDISH
TG	TRENCH GRATE
TMV	THERMOSTATIC MIXING VALVE
TOK	TOP OF KERB
TTD	TRAPPED TUNDISH
TRO	TERRACE RAINWATER OUTLET
TV	TEMPERING VALVE
TWS	TRADE WASTE STACK
TWVP	TRADE WASTE VENT PIPE
U.N.O.	UNLESS NOTED OTHERWISE
uPVC	UNPLASTICISED POLYVINYL CHLORIDE
Ur	URINAL
UV	ULTRAVIOLET
UW	UTENSIL WASHING MACHINE
VB	VANITY BASIN
VFW	VINYL FLOOR WASTE
VP	VENT PIPE
WC	TOILET SUITE (WATER CLOSET)
WM	WASHING MACHINE (CLOTHES)
WST	WASTE STACK
WW	WARM WATER
WWF	WARM WATER FLOW
WWR	WARM WATER RETURN YG YARD GULLY

ABBREVIATIONS, SYMBOLS AND LINETYPES IN THE LEGEND MAY NOT APPEAR ELSEWHERE ON THE DRAWINGS. THIS LEGEND SHOULD BE USED AS A GUIDE ONLY

SYMBOLS

- COLD WATER POINT
- HOT WATER POINT
- CONTINUATION SYMBOL (CONTINUATION OF SERVICE NOT SHOWN)
- CAPPED OFF SERVICE
- DROPPER
- RISER
- DIRECTION OF FLOW IN PIPE
- FLANGE CONNECTION
- BALANCING VALVE (STAD)
- TUNDISH
- ISOLATION VALVE
- FLEXIBLE CONNECTION
- PUMP
- METER
- TEMPERATURE GAUGE
- PRESSURE GAUGE
- THERMOSTATIC MIXING VALVE
- TEMPERING VALVE
- DOUBLE CHECK VALVE
- BACKFLOW PREVENTION DEVICE
- TWO WAY VALVE
- THREE WAY VALVE
- FLOAT VALVE
- AIR RELEASE VALVE
- CHECK VALVE (WATER SERVICE) REFLUX VALVE (DRAINAGE)
- FILTER
- VENTED GAS REGULATOR
- ELECTRICAL CONTROL PANEL
- OVERFLOW RELIEF GULLY/YARD GULLY
- SV IN PATH BOX
- GAS REGULATOR
- PRESSURE REDUCING VALVE
- PRESSURE LIMITING VALVE
- SOLENOID VALVE
- STRAINER
- DIRECTIONAL ARROW
- OVERLAND FLOW PATH
- PENETRATION
- DIRECTION OF FLOW
- SERVICE
- SIZE
- CONTINUED ON DWG HX

SYMBOLS

- FLOOR WASTE/RAINWATER OUTLET
- GARBAGE FLOOR WASTE
- STORMWATER PIT (WITH COVER)
- STORMWATER PIT (WITH GRATE)
- SQUARE RAINWATER OUTLET
- SEWER MANHOLE (CAC)
- KERB INLET PIT (SINGLE GRATE)
- KERB INLET PIT (DOUBLE GRATE)
- STORMWATER HEADWALL
- SPREADER
- BOUNDARY TRAP
- AIR ADMITTANCE VALVE
- FIRE HOSEREEL
- FIRE HYDRANT
- STANDPIPE FIRE HYDRANT (DFH)
- FIRE HYDRANT BOOSTER ASSEMBLY

LINETYPES

- SEWER DRAINAGE/SANITARY PLUMBING
- HDPE DRAINAGE
- VENT PIPE
- SEWER RISING MAIN
- STORMWATER DRAINAGE
- STORMWATER RISING MAIN
- STORMWATER OVERFLOW
- GREASE WASTE DRAINAGE
- GREASE WASTE VENT PIPE
- TRADE WASTE DRAINAGE
- TRADE WASTE VENT PIPE
- SUBSOIL DRAINAGE
- SUBSOIL RISING MAIN
- COLD WATER SERVICE
- HOT WATER FLOW
- HOT WATER RETURN
- WARM WATER FLOW
- WARM WATER RETURN
- NON-POTABLE COLD WATER
- NON-POTABLE HOT WATER
- GAS SERVICE
- FIRE HOSE REEL SERVICE
- FIRE HYDRANT SERVICE
- FIRE SPRINKLER SERVICE
- IRRIGATION SERVICE
- RECYCLED WATER
- REVERSE OSMOSIS WATER
- EXHAUST
- ELECTRICAL CONDUIT
- EXISTING SERVICE
- EXISTING SERVICE TO BE REDUNDANT

NOTES

1. DRAWINGS ARE DIAGRAMMATIC ONLY. FOR DIMENSIONS AND CONSTRUCTION DETAILS OF BUILDING REFER ARCHITECTURAL DRAWINGS AND SITE.
2. PIPEWORK SIZES ARE NOMINAL BORE FOR COPPER AND CAST IRON AND INTERNAL BORE FOR POLYMER BASED PIPEWORK. REFER SPECIFICATION FOR MATERIAL TYPE.
3. ALL PIPEWORK ON DRAWINGS IS SHOWN BELOW SLAB (OR GROUND) UNLESS NOTED OTHERWISE.
4. DRAWINGS ARE TO BE READ IN CONJUNCTIONS WITH HYDRAULIC SERVICES SPECIFICATION, ARCHITECTURAL, STRUCTURAL AND OTHER CONSULTANTS DOCUMENTATION.

DRAWING SCHEDULE

DWG No	DESCRIPTION
H01	PROJECT INFORMATION
H02	SITE PLAN
H03	BASEMENT PLAN A - DRAINAGE LAYOUT
H04	BASEMENT PLAN B - DRAINAGE LAYOUT
H05	LOWER GROUND PLAN A - DRAINAGE LAYOUT
H06	LOWER GROUND PLAN B - DRAINAGE LAYOUT
H07	UPPER GROUND PLAN A - DRAINAGE LAYOUT
H08	UPPER GROUND PLAN B - DRAINAGE LAYOUT
H09	ROOF PLANT PLAN - DRAINAGE LAYOUT
H10	ROOF PLAN A - DRAINAGE LAYOUT
H11	ROOF PLAN B - DRAINAGE LAYOUT
H12	BASEMENT PLAN A - PRESSURE SERVICES LAYOUT
H13	BASEMENT PLAN B - PRESSURE SERVICES LAYOUT
H14	LOWER GROUND PLAN A - PRESSURE SERVICES LAYOUT
H15	LOWER GROUND PLAN B - PRESSURE SERVICES LAYOUT
H16	UPPER GROUND PLAN A - PRESSURE SERVICES LAYOUT
H17	UPPER GROUND PLAN B - PRESSURE SERVICES LAYOUT
H18	ROOF PLANT PLAN - PRESSURE SERVICES LAYOUT
H19	ROOF PLAN A - PRESSURE SERVICES LAYOUT
H20	ROOF PLAN B - PRESSURE SERVICES LAYOUT
H21	COLD WATER SCHEMATIC
H22	HOT WATER SCHEMATIC
H23	DETAILS - SHEET 1
H24	DETAILS - SHEET 2
H25	DETAILS - SHEET 3

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No.	DATE	APP'D	DESCRIPTION
1	16.08.24		CC1 ISSUE

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59 Hill Street, Roseville
N.S.W. 2069
Tel 9416 1177 Fax 9416 8251 Email mail@dsc.com.au
Mechanical Electrical Hydraulic Fire Lifts

DRAWN	DATE	SCALE @ A1
JL	AUG 2024	NTS
DESIGNED	CHECKED	CAD REFERENCE
XD	RB	8314 H01 Project Information

PROJECT
IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

TITLE
HYDRAULIC SERVICES
PROJECT INFORMATION

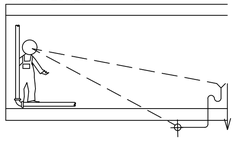
No IN SET	PROJECT No	DWG No	
HYD	8314	H01	1

F:\CAD\DRAWINGS\8314\HYDRAULICS\8314 H01 PROJECT INFORMATION.DWG 16.08.24 9:48 AM Jody Lu

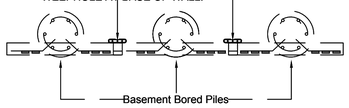
REGULATED DESIGN RECORD				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate Reg No: N/A		
Drawing Title: AS SHOWN		Drawing No:		
Rev	**Date dd.mm.yy**	**Description**	**DP Full Name**	**Reg No**
1	16.08.24	CC1 ISSUE	XINJIE DING	DEP0001253

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

STRATA ZONES



MEGAFLO® 170X40MM FLAT PANEL PIPING DRAINAGE SYSTEM TO BE PLACED AT MIDPOINT OF SHOTCRETE WALL BETWEEN PILES.
MEGAFLO® SHALL RUN FOR FULL HEIGHT OF WALL AND OUTLET THROUGH
WEEPHOLE AT BASE OF WALL.

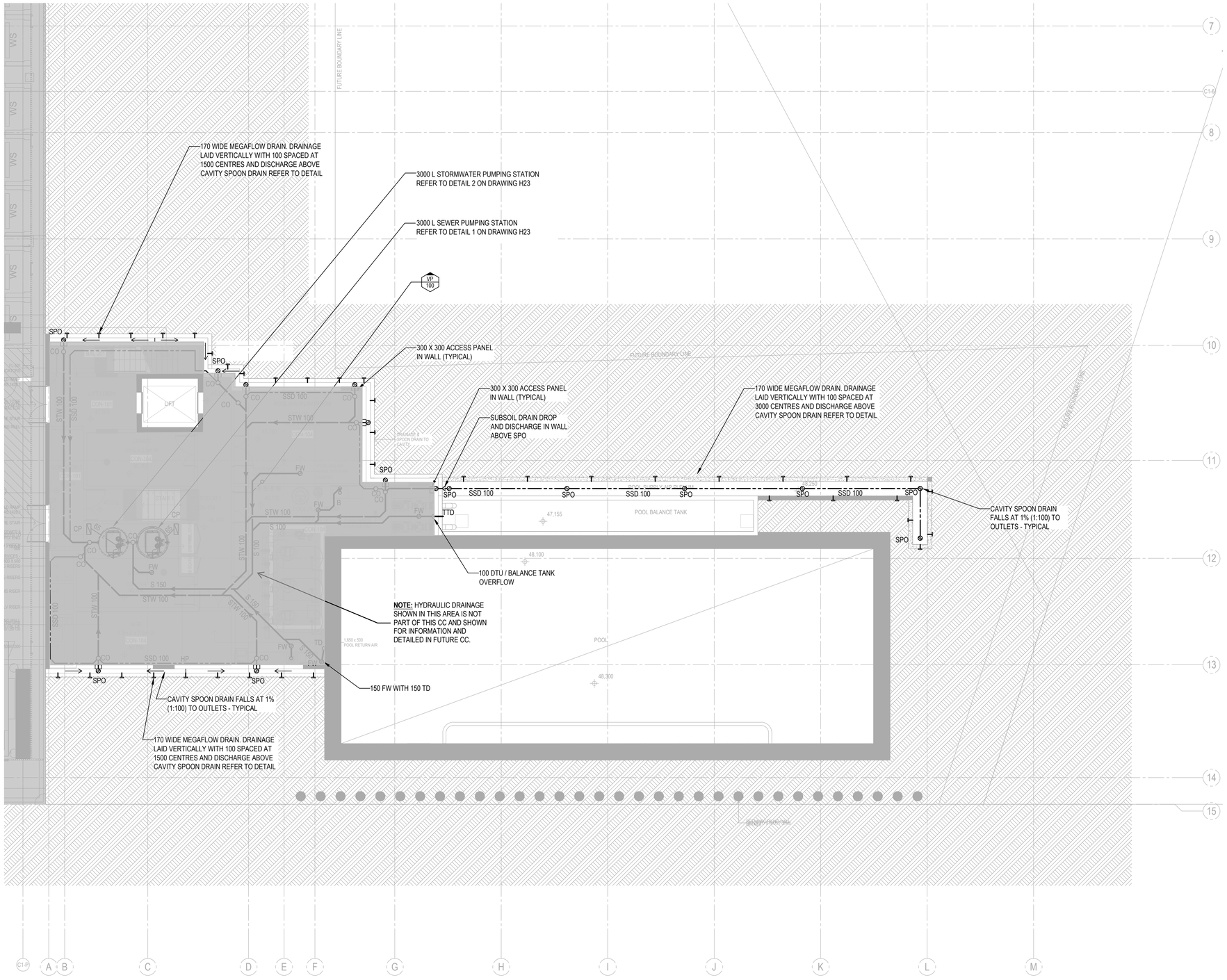


PLAN

INSTALLATION INSTRUCTIONS:

- CUT MEGAFLO® FLAT PANEL PIPING DRAINAGE SYSTEM TO REQUIRED LENGTHS TO MATCH HEIGHT OF WALL.
- AFFIX A STANDARD MEGAFLO® END CAP TO TOP END OF PRE-CUT LENGTH.
- MEGAFLO® TO BE HELD IN PLACE BY DRIVING A METAL J PIN THROUGH THE TOP AND BOTTOM OF EACH LENGTH AND INTO THE EARTH SURFACE BEHIND THE MEGAFLO®.
- ATTACH A STANDARD MEGAFLO® RIGHT OUT CONNECTOR TO THE BOTTOM OF THE PRE-CUT LENGTH.
- INSERT PRE-CUT LENGTH OF 100MM DIAMETER SMOOTH BORE ROUND PIPE INTO THE STANDARD MEGAFLO® RIGHT OUT CONNECTOR.
- PLACE AND SECURE SPECIFIED REINFORCING MESH OVER ENTIRE SURFACE.
- SPRAY SHOTCRETE AS SPECIFIED.
- CUT 100MM DIAMETER ROUND PIPE BACK TO LEVEL OF WALL SURFACE.

BASEMENT RETAINING WALL DRAINAGE



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Mechanical Electrical Hydraulic Fire Lifts

DRAWN	DATE	SCALE @ A1
JL	AUG 2024	1:100
DESIGNED	CHECKED	CAD REFERENCE
LM	RB	8314 H03 Basement Plan A - Drainage

PROJECT
IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

TITLE
HYDRAULIC SERVICES
BASEMENT PLAN A - DRAINAGE LAYOUT

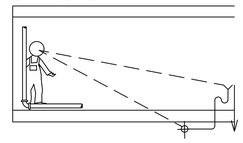
No IN SET	PROJECT No	DWG No	
HYD	8314	H03	1

F:\CAD\DRAWINGS\8314\HYDRAULICS\8314 H03 BASEMENT PLAN A - DRAINAGE.DWG 16.08.24 2:27 PM Judy Lu

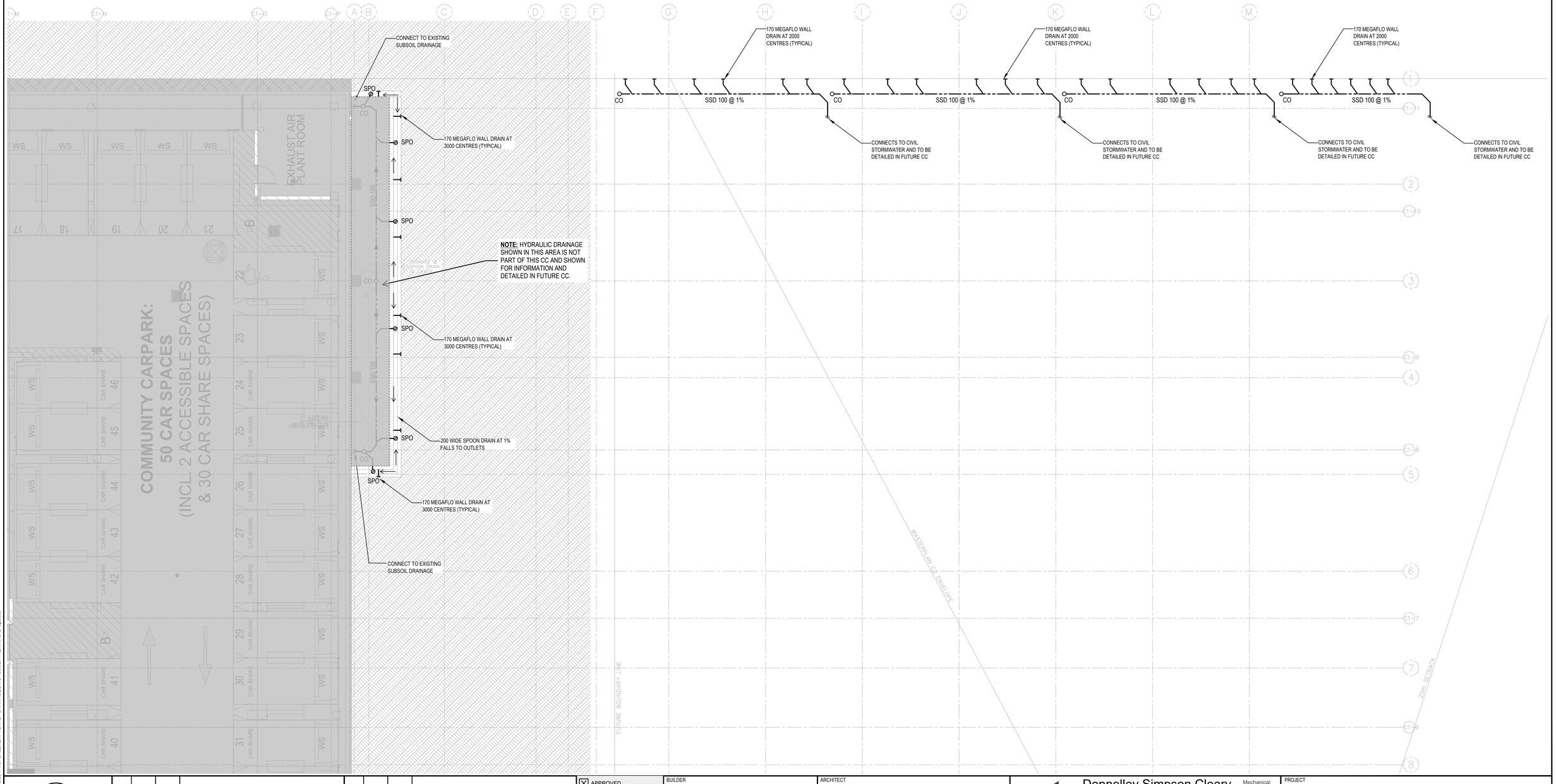
REGULATED DESIGN RECORD				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate Reg No: N/A		
Drawing Title: AS SHOWN		Drawing No:		
Rev	**Date dd.mm.yy**	**Description**	**DP Full Name**	**Reg No**

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

STRATA ZONES



HYDRAULIC SERVICES SHOWN UNDER FLOOR UNO



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Mechanical
Electrical
Hydraulic
Fire
Lifts

DRAWN	DATE	SCALE @ A1
JL	AUG 2024	1:100
DESIGNED	CHECKED	CAD REFERENCE
LM	RB	8314 H04 Basement Plan B - Drainage

PROJECT
IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

TITLE
HYDRAULIC SERVICES
BASEMENT PLAN B - DRAINAGE LAYOUT

No IN SET	PROJECT No	DWG No	
HYD	8314	H04	1

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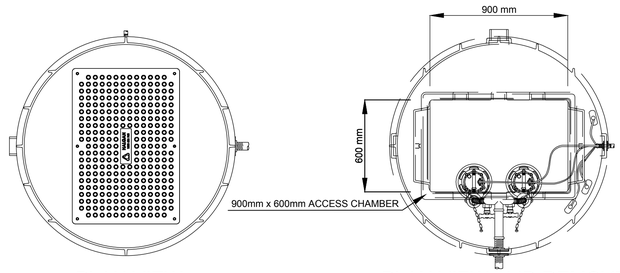
REGULATED DESIGN RECORD				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate Reg No: N/A		
Drawing Title: AS SHOWN		Drawing No:		
Rev	**Date dd.mm.yy**	**Description**	**DP Full Name**	**Reg No**
1	16.08.24	CC1 ISSUE	XINJIE DING	DEP0001253

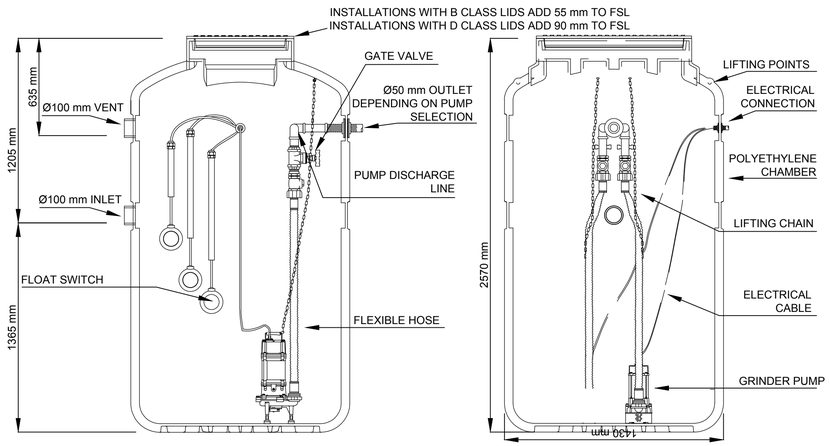
City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

HALGAN™ HPS3000 PUMP STATION DIMENSIONS				
MODEL	HEIGHT	WIDTH	VOLUME	TANK WEIGHT
HPS3000	2570 mm	1430 mm	3000 L	225 KG



PLAN VIEW

PLAN VIEW - LID REMOVED

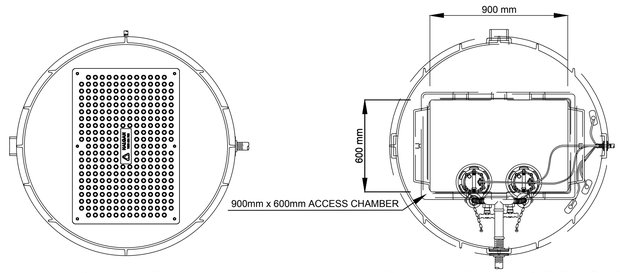


SECTIONAL SIDE ELEVATION

SECTIONAL ELEVATION

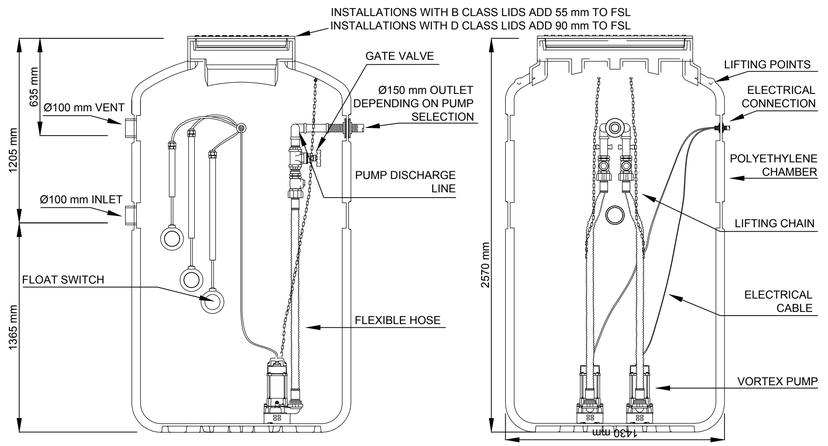
DETAIL 1
HALGAN™ HPS3000 DUAL SEWER PUMP STATION
N.T.S.

HALGAN™ HPS3000 PUMP STATION DIMENSIONS				
MODEL	HEIGHT	WIDTH	VOLUME	TANK WEIGHT
HPS3000	2570 mm	1430 mm	3000 L	225 KG



PLAN VIEW

PLAN VIEW - LID REMOVED



SECTIONAL SIDE ELEVATION

SECTIONAL ELEVATION

DETAIL 2
HALGAN™ HPS3000 DUAL VORTEX STORMWATER PUMP STATION
N.T.S.

F:\CAD\DRAWINGS\8314\HYDRAULICS\8314 H23 DETAILS - SHEET 1.DWG 16.08.24 9:53 AM Judy Lu

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Mechanical Electrical Hydraulic Fire Lifts

DRAWN	DATE	SCALE @ A1
JL	AUG 2024	NTS
DESIGNED	CHECKED	CAD REFERENCE
XD	RB	8314 H23 Details - Sheet 1

PROJECT
IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

TITLE
HYDRAULIC SERVICES
DETAILS - SHEET 1

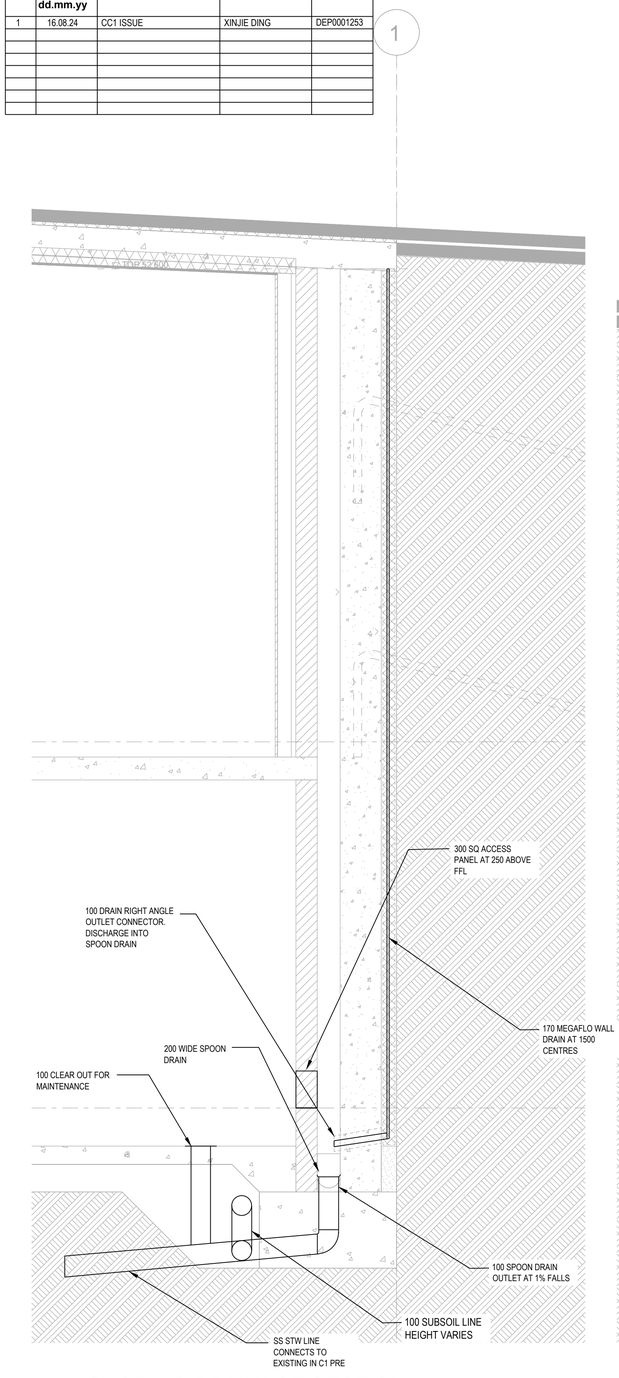
No IN SET	PROJECT No	DWG No	
HYD	8314	H23	1

REGULATED DESIGN RECORD				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate Reg No: N/A		
Drawing Title: AS SHOWN		Drawing No:		
Rev	**Date dd.mm.yy**	**Description**	**DP Full Name**	**Reg No**
1	16.08.24	CC1 ISSUE	XINJIE DING	DEP0001253

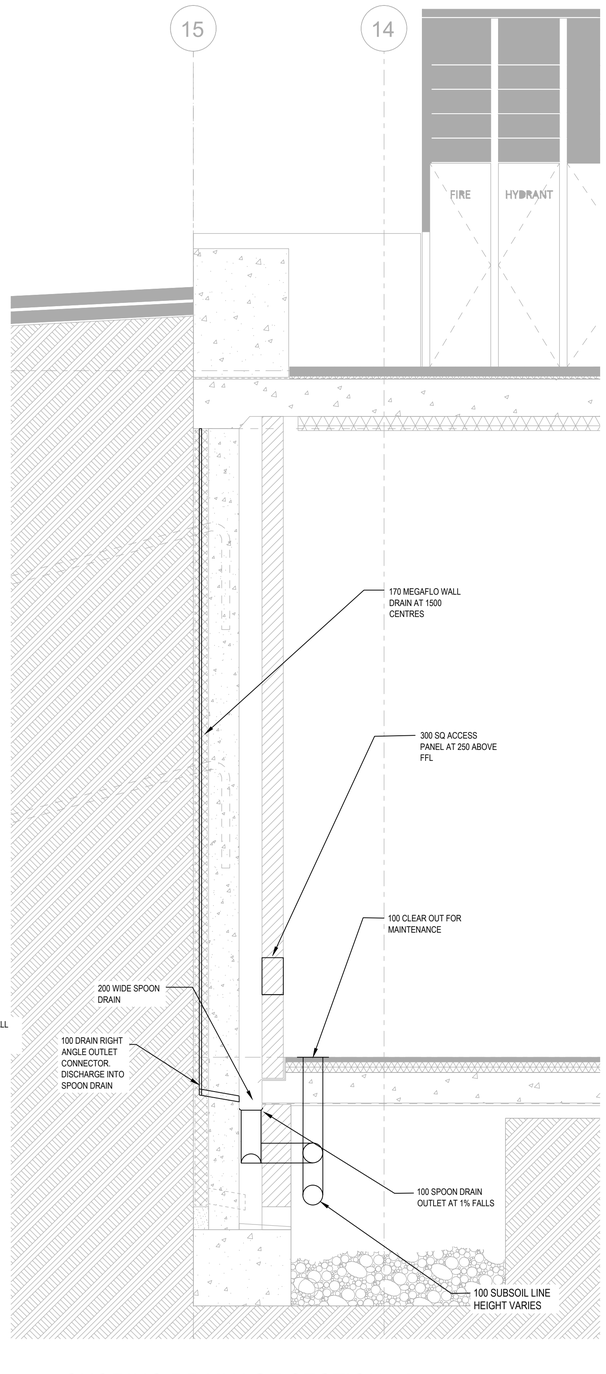
City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES

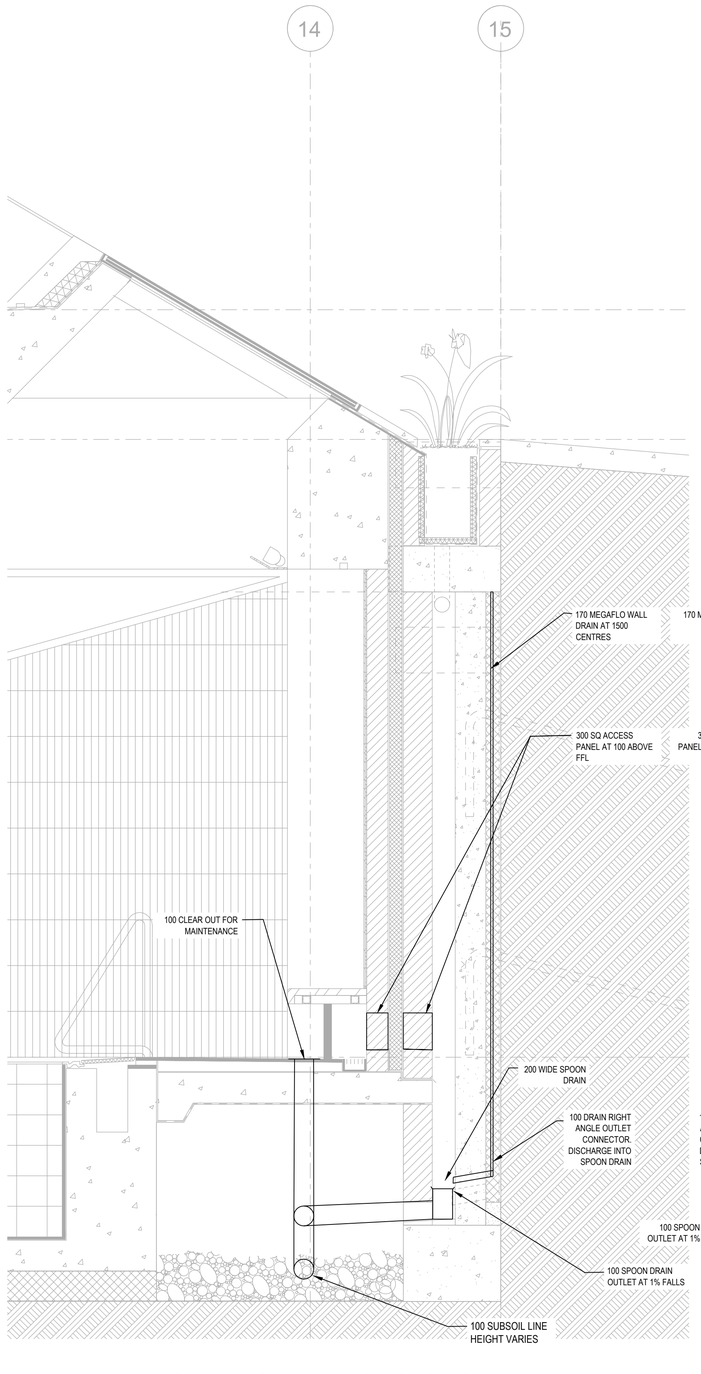
1. SECTION 8, 9,10,11 REFER TO ARCHITECTURAL DRAWING N0. A-CD-023



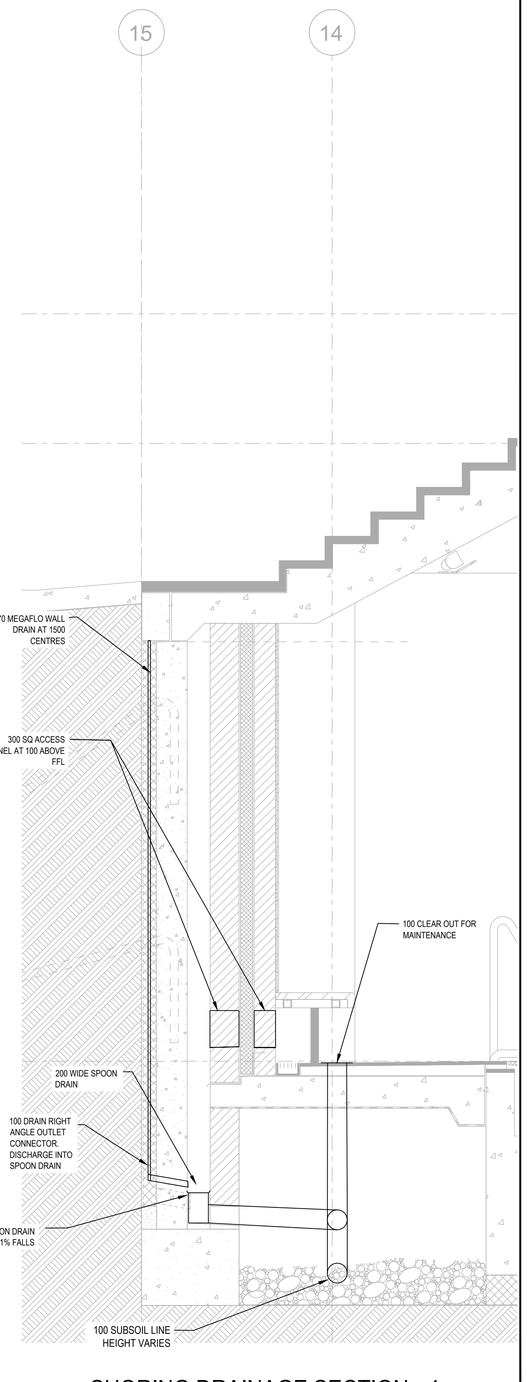
SHORING DRAINAGE SECTION - 1



SHORING DRAINAGE SECTION - 2



SHORING DRAINAGE SECTION - 3



SHORING DRAINAGE SECTION - 4

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Tel 9416 1177 Fax 9416 8251 Email mail@dsc.com.au
Mechanical Electrical Hydraulic Fire Lifts

DRAWN	DATE	SCALE @ A1
FH	AUG 2024	NTS
DESIGNED	CHECKED	CAD REFERENCE
LM	RB	8314 H24 Details - Sheet 2

PROJECT
IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

TITLE
HYDRAULIC SERVICES
DETAILS - SHEET 2

No IN SET	PROJECT No	DWG No	
HYD	8314	H24	1

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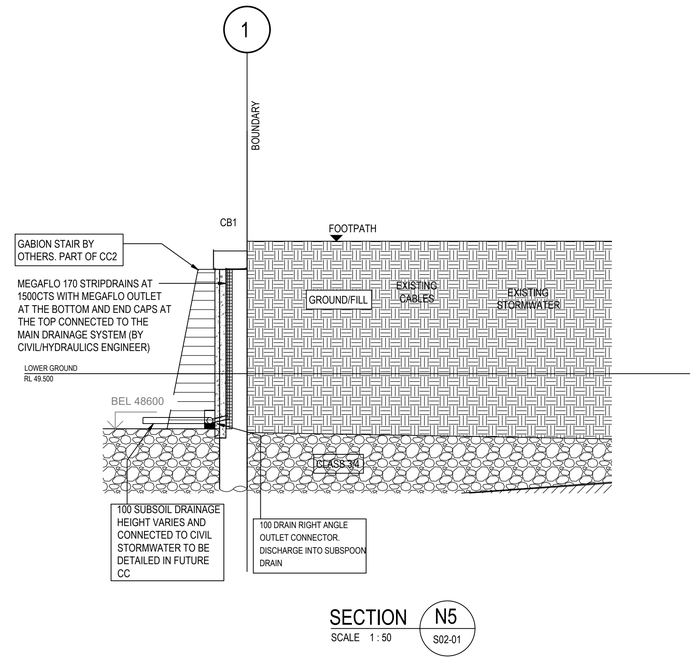
REGULATED DESIGN RECORD				
Project Address: 1 IVANHOE PLACE, MACQUARIE PARK NSW 2113				
Project Title: IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE				
Consent No: SSD 15822622 (Mod 2)		Body Corporate Reg No: N/A		
Drawing Title: AS SHOWN		Drawing No:		
Rev	**Date dd.mm.yy**	**Description**	**DP Full Name**	**Reg No**
1	16.08.24	CC1 ISSUE	XINJIE DING	DEP0001253

City Plan Services Pty Ltd
Reference: 240258/1
Date: 23/08/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTES

1. SECTION N5 REFER TO STRUCTURE DRAWING N0. SO2-31



SECTION N5 (S02-01)
SCALE 1 : 50

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Tel 9416 1177 Fax 9416 8251 Email mail@dsc.com.au
Mechanical Electrical Hydraulic Fire Lifts

DRAWN	DATE	SCALE @ A1
JL	AUG 2024	NTS
DESIGNED	CHECKED	CAD REFERENCE
LM	RB	8314 H25 Details - Sheet 3

PROJECT
IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

TITLE
HYDRAULIC SERVICES
DETAILS - SHEET 3

No IN SET	PROJECT No	DWG No	
HYD	8314	H25	1

Pre-Application Submission Form

Certificate Case NumberCFT-558345

Apply for certificate

Select the certificate action you would like to apply for	Construction certificate
Select the type of certificate you wish to apply for	Certificate for part of the development
Is the application for modification of a current construction certificate?	No
Which approval type is this certificate in relation to?	State determined (SSI / SSD)
Enter State determined number of the approval which is related to this certificate application (please include the SSD/SSI prefix)	SSD15822622
Has the SSI / SSD case been determined?	Yes
Date of determination of the state determined case	28/11/22
Is the development exempt from the *State Environmental Planning Policy (Sustainable Buildings) 2022 Chapter 3* relating to non-residential buildings, for any of the following reasons? • The DA was submitted on the NSW Planning Portal before 1st October 2023 • The DA was submitted on the NSW Planning Portal on or after 1st October 2023 but was deemed exempt due to the reasons outlined in Chapter 3.1.	Yes

Site address #	1
Street address	IVANHOE ESTATE, MACQUARIE PARK
Local government area	RYDE
Lot / Section Number / Plan	
Primary address?	Yes
Planning controls affecting property	Land Application LEP Land Zoning Height of Building Floor Space Ratio (n:1) Minimum Lot Size Heritage Land Reservation Acquisition Foreshore Building Line

Applicant details

Title	Mr
First given name	Andy
Other given name/s	
Family name	Huang
Contact number	
Email	andy.huang1@frasersproperty.com.au
Address	1C HOMEBUSH BAY DRIVE RHODES 2138
Is the applicant a company?	Yes
Name	FRASERS PROPERTY IVANHOE PTY LIMITED
ABN	23619909992
ACN	619909992

Trading Name	

Developer details

Name	FRASERS PROPERTY IVANHOE PTY LIMITED
ABN	23 619 909 992
ACN	619 909 992
Trading Name	
Email	midtownprojectteam@frasersproperty.com.au
Address	Level 2, 1C Homebush Bay Drive, Rhodes NSW 2138

Land owner details

Owner/s of the Development Site	A company, business, government entity or other similar body owns the development site
Owner Builder?	
Title	
First given name	
Other given name/s	
Family name	
Contact number	
Email	
Address	
Company name (if applicable)	
ABN/ACN	
I declare that I have shown this document, including all attached drawings, to the owner(s) of the land, and that I have obtained their consent to submit this application.	
Who will be doing the building work?	Licensed Builder

Builder or Principal contractor details

Builder Type	A Company , business , government entity or other similar body
Company Name	GRINDLEY CONSTRUCTION PTY. LIMITED
ABN	42003586687
ACN	003586687
Trading Name	
Billing Address	
Email Address	

Long Service Levy

Have you paid the Long Service Levy?	Yes
Are there any security or site conditions which may impact on the person undertaking the inspection? eg: locked gates, dogs, animals etc	Yes
Provide details	Please contact builder to arrange site access

Payer details

Payer Type	Individual
Company Name	FRASERS PROPERTY IVANHOE PTY LIMITED
ABN	23619909992
ACN	619909992
Trading Name	
Billing Address	
Email ID	
Title	Mr.
First given name	Andy

Other given name/s	
Family name	Huang
Contact number	
Email	andy.huang1@frasersproperty.com.au
Billing address	1C HOMEBUSH BAY DRIVE RHODES 2138

Proposed development details

Selected common application types	Erection of a new structure
Selected development types	Recreation facility (indoor) Swimming pool Community facility
Class of development	Class 6 Class 9b
Please provide a detailed description of the development	Excavation and bulk earthworks, construction of a community facilities building, pool, gym and village green public open space.
Estimated Development Cost	$27,142,410.00
Please provide the estimated development cost including GST	$29,856,651.00

Information to be collected for the Australian Bureau of Statistics

Total site area (m2)	5000
Existing gross floor area (m2)	0
Total Net Lettable Area (m2))	1527
Proposed gross floor area (m2)	1527
What are the current uses of all parts of the building (s)/land? (if vacant please state)	Existing social housing lots, demolished and now greenfield
What is the proposed use of all parts of the building (s)/land?	Community Facilities, Pool, Gym and Park
Is the proposed building is attached, detached (i.e. free standing) or semi-detached?	Semi-detached

Ultimate height of the development (m)	62.7
Number of pre-existing dwellings on site	0
Number of storeys proposed in the new building(s)	0
Number of proposed lots	

Fire safety measures

Are you proposing to carry out alterations/modifications to existing 'relevant fire safety systems'?	Yes
Fire Safety Measure	Access Panels, doors and hoppers to fire resisting shaft
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Automatic fail-safe devices
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Automatic fire detection and alarm system*
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Automatic fire supression system (sprinkler)*
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Emergency lighting
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Emergency lifts
Is this measure installed in the building?	No

Please enter current standard of performance	
Fire Safety Measure	Emergency warning and intercommunication system
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Exit signs
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Fire control centres and rooms
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Fire dampers
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Fire doors
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Fire hydrant systems*
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Fire seals (protecting openings in fire resisting components of building)
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Fire shutters
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Fire windows
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Hose reel systems
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Lightweight construction
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Mechanical air handling systems (smoke control)*
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Perimeter vehicle access for emergency vehicles
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Portable fire extinguishers
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Safety curtains in proscenium openings
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Smoke and Heat Vents
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Smoke dampers
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Smoke detectors and heat detectors

Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Smoke doors
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Solid-Core doors
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Standby Power Systems
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Wall wetting sprinkler and drencher systems*
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Warning and operational signs
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Other (please specify)
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Access Panels, doors and hoppers to fire resisting shaft
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Automatic fail-safe devices
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Automatic fire detection and alarm system*
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Automatic fire supression system (sprinkler)*
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Emergency lighting
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Emergency lifts
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Emergency warning and intercommunication system
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Exit signs
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Fire control centres and rooms
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Fire dampers
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Fire doors
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS

Fire Safety Measure	Fire hydrant systems*
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Fire seals (protecting openings in fire resisting components of building)
Is this measure installed in the building?	Yes
Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Fire shutters
Is this measure installed in the building?	No
Please enter current standard of performance	
Fire Safety Measure	Fire windows
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Fire Safety Measure	Hose reel systems
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Fire Safety Measure	Lightweight construction
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Fire Safety Measure	Smoke detectors and heat detectors
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Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Warning and operational signs
Is this measure installed in the building?	Yes

Please enter current standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Other (please specify)
Is this measure installed in the building?	No
Please enter current standard of performance	
Are proposed fire safety measures to be installed in the building?	Yes
Fire Safety Measure	Access Panels, doors and hoppers to fire resisting shaft
Is this measure installed in the building?	No
Please enter proposed standard of performance	
Fire Safety Measure	Automatic fail-safe devices
Is this measure installed in the building?	No
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Please enter proposed standard of performance	
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Please enter proposed standard of performance	
Fire Safety Measure	Fire windows
Is this measure installed in the building?	No
Please enter proposed standard of performance	
Fire Safety Measure	Hose reel systems
Is this measure installed in the building?	No

Please enter proposed standard of performance	
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Please enter proposed standard of performance	
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Please enter proposed standard of performance	
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Is this measure installed in the building?	No
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Is this measure installed in the building?	No
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Please enter proposed standard of performance	
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Please enter proposed standard of performance	
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Please enter proposed standard of performance	
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Please enter proposed standard of performance	
Fire Safety Measure	Warning and operational signs
Is this measure installed in the building?	No
Please enter proposed standard of performance	
Fire Safety Measure	Other (please specify)
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Please enter proposed standard of performance	
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Is this measure installed in the building?	No
Please enter proposed standard of performance	

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Fire Safety Measure	Warning and operational signs
Is this measure installed in the building?	Yes
Please enter proposed standard of performance	BCA/RELEVANT AS
Fire Safety Measure	Other (please specify)
Is this measure installed in the building?	No
Please enter proposed standard of performance	

Registered certifier

The applicant has selected the following certifying organisation to assess this application

Company name	CITY PLAN SERVICES PTY LIMITED
Trading name	
ABN	30075223353
ACN	075 223 353
Address	Level 6, 120 Sussex Street Sydney NSW 2000
Email	reception@cityplan.com.au

Principal certifier

The applicant has selected the following certifying organisation to assess this application

Company name	CITY PLAN SERVICES PTY LIMITED
Trading name	
ABN	30 075 223 353
ACN	075 223 353
Address	Level 6, 120 Sussex Street Sydney NSW 2000
Email	reception@cityplan.com.au

Declarations

I declare that all the information in the application and checklist is, to the best of my knowledge, true and correct	Yes
I agree to the appropriately delegated assessment officers attending the site for the purpose of inspection	Yes
I/we own the subject land, consent to this application and consent to Council officers entering the premises	

during normal office hours for the purpose of conducting inspections relative to this application. I accept that all communication regarding this application will be through the nominated applicant. In the case of an owners corporation, a seal is required, or if crown land, written authorisation of the relevant statutory authority.	Yes
I have read and agree to the collection and use of my personal information as outlined in the Privacy Notice.	Yes
I declare that all works that are the subject of the relevant consent have been completed and that all conditions that are required to be satisfied prior to the issue of this certificate have been satisfied	Yes
I agree to pay any required NSW Planning Portal Service Fee/s specified under Part 9, Schedule 4 of the Environmental Planning and Assessment Regulation 2021 to the Department of Planning, Housing and Infrastructure.	Yes

Review of application

What is the outcome of your review?	Accept application
Additional certifier comments	.
Certifier reference number	240258/1
Has the applicant paid the application fees?	Yes
Enter the date the application was lodged into the certifier's system	23/08/24

CHROFI

3/1 The Corso
Manly NSW 2095
02 8096 85 00
sydney@chrofi.com
www.chrofi.com

Friday 16th August, 2024

Mr. Chris Michaels
City Plan
Suite 6.02, 120 Sussex Street
Sydney NSW 2000

1 Ivanhoe Place, Macquarie Park
Construction Certificate 1 (CC1) - Architectural Design Statement

CHROFI is the architect for Building C2 located at 1 Ivanhoe Place, Macquarie Park.

1. For the purposes of the Construction Certificate 1 (CC1) submission, CHROFI confirms that, unless otherwise noted, the following drawings are generally consistent with the Development Consent SSD 15822622 dated 28.11.2022 as modified by S4.55 Modification No. SSD 15822622 MOD 2 dated 05.08.2024:

   - Cover Page, drawing number A-CD-001 Revision 04
   - Site Plan, drawing number A-CD-002 Revision 02
   - Grid Setout Plan, drawing number A-CD-010 Revision 02
   - Bulk Ex & Shoring Reference Plan - Basement, drawing number A-CD-020 Revision 02
   - Bulk Ex & Shoring Reference Plan - Lower Ground, drawing number A-CD-021 Revision 02
   - Shoring Wall Sections, drawing number A-CD-023 Revision 01

2. The Architectural drawings that have been prepared for CC1 are consistent with the following DA Conditions:
   B20 Gross Floor Area
   Documentation has been based on achieving a minimum Gross Floor Area (GFA) for the Building C2 Community Facility of 700m2.
   B21 Maximum Height
   Documentation has been based on the maximum height of Building C2 will not exceed RL 62.7 AHD.
   B29 Ecologically Sustainable Development
   CC1 documentation has been based on the environmental sustainability objectives, measures and initiatives outlined in the Midtown Stage 2 Sustainability Report prepared by Frasers Property, dated July 2021, specific to the C2 building.

It is noted that this statement applies to the architectural documentation presented in the submitted CC1 documentation and does not account for changes or substitutions that may occur during any ongoing design work and/or construction.

This statement does not cover specialist design services beyond the architectural documentation and is to be read in conjunction with the other relevant consultant design statements.

Yours sincerely

Steven Fighera
DIRECTOR

Fair Trading

Design compliance declaration - single regulated design

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation.
This form is approved under clause 11(1) of the *Design and Building Practitioners Regulation 2021*.

Instructions for completing this form

You must complete all parts of this form.

Please note that under *s77 of the Design and Building Practitioners Act 2020*, Fair Trading has the power to request additional information or records from registered practitioners for an authorised purpose, such as an audit or investigation. You may therefore be requested to provide further information or records to support any declaration made on this form.

Where this form indicates that material must be attached to the form, you must number each attachment sequentially and identify the number of that attachment in the relevant answer.

The plan/drawing/specification/report title, number and revision should correspond with the detail in the title block for each design to which this declaration relates.

Part 1. Details

Please insert the building project address to which this declaration relates

1 Ivanhoe Place Macquarie Park

For registered body corporates, give full names of registered individuals and the corporation on behalf of which the declaration is made.

Design practitioner name

Steven Fighera

Registration number of design practitioner

DEP0001770

Class of registration (applicable to this declaration)

Design Practitioner - Architectural

Body corporate name (if applicable)

Not Applicable

Registration number of body corporate (if applicable)

Not Applicable

Email address

steven@chrofi.com

Contact number

0413 598 095

ABN/ACN

ABN 22 365 257 187

Part 1. Details (continued)

Q1. Is this a regulated design prepared for a Ⓟ performance solution for building work?

Yes, (also includes a building element, proceed to Question 2)

Yes, (only for a performance solution, proceed to Question 3)

✔ No, (proceed to Question 2)

Q2. Is this a regulated design prepared for a building element for building work? If yes, please select one

Ⓕ Fire safety systems

Ⓦ Waterproofing

✔ Ⓛ Load-bearing

Ⓑ Building enclosure

Ⓢ (Building) services

Q3. The design compliance declaration (DCD) number is made up of two parts:

a) the number (starting at DCD-001) is the number of DCD made. Subsequent numbers are DCD-002, DCD-003, etc.
b) the letter denotes what type of design the declaration relates to. Use one of the letters from above (P, F, W, L, B, S) e.g. DCD-001W

DCD-_001_Ⓛ (this is the DCD number)

Q4. Is this a regulated design prepared for an 'architectural / building design general' document by the design practitioner class of architectural for the building element of 'load-bearing' or 'building services?

Refer to Design Practitioners Handbook for explanation of 'architectural / building design general' design document.

✔ Yes

No

Part 1. Details (continued)

Please group each type of document (e.g. plans/drawings/specifications/reports) together. Note that the information provided in the table should match the title block information.

If you have more than 30 items, please provide on a separate attachment using the same headings in the table below.

	Plan/drawing/specification/report title which is part of the "regulated design" being declared	Plan/drawing/specification/ report reference number	Revision number
1.	Grid Setout Plan	A-CD-010	02
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
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27.			
28.			
29.			
30.			

Number of attachments to the certificate (if applicable)

Part 2. Declaration matters

I, Steven Fighera

Insert full name acting on behalf of

Not Applicable

Design Practitioner - Architectural

Insert registered body corporate name (if relevant)

Insert class of registration

have prepared the attached regulated design.
Declare:

1. The regulated design for which this design compliance declaration is being made complies with the requirements of the *Building Code of Australia*.

   Yes

   No

✔ There are no applicable *Building Code of Australia* requirements

If there are no applicable requirements BCA, please provide further details below

This regulated design is in relation to Grid Setout to inform bulk excavation and shoring/piling setouts for a stage construction certificate. There is no applicable BCA requirement.

2. The regulated design for which this design compliance declaration is being made integrates details of other aspects of building work to which the design relates, and other regulated designs for the work, as far as is reasonably practicable.

✔ Yes

No

If yes, by providing a brief description, please list the other aspects of building work and the other regulated designs that have been integrated into the regulated design for which this design compliance declaration is being made.

Bulk Excavation, Piling & Shoring design by Van der Meer structural engineers, Design Practitioner: Brian Cardelli (DEP0001799), DCD-001L, Drawings S02-01_1, S02-11_1, S02-12_1, S02-31_1, S02-32_1, S02-51_1, S02-61_1, S02-65_1,
Subsoil Hydraulic Drainage design by DSC Consulting Engineers, Design Practitioner: Xinjie Ding (DEP 0001253), DCD-001S, Drawings H01, H03, H04, H23, H24, H25.

3. Standards, codes and requirements (other than the requirements referenced in the B*uilding Code of Australia*) have been applied in preparing the regulated design for which this design compliance declaration is being made. E.g. a requirement under a development consent.

✔ Yes

No

If yes, please list or attach information about the standards, codes or requirements that have been applied.

Development Consent requirements listed in Consent SSD 15822622 (Mod 2) dated 05.08.2024

4. Any building product referred to in preparing the regulated design or which this design compliance declaration is being made would, if used in a manner consistent with the design, achieve compliance with the *Building Code of Australia*.

Yes

✔ No

Part 2. Declaration matters (continued)

5. I have sought and considered specialist advice in preparing the regulated design.

✔ Yes

No

If yes, please provide a brief explanation of the parts of the regulated design which have been based on the specialist advice from another person other than the person making this declaration.

Bulk excavation levels and shoring design by Van der Meer structural engineers
Subsoil drainage by DSC Consulting Engineers
Swimming pool plant, balance tank and back wash tank sizes as advised by Crystal Pools
BCA advice received by AED Consulting
Landscape design advice from Site Design & Studios

6. The regulated design involves a performance solution.

Yes

✔ No

If yes, and the performance solution is not itself the regulated design identified in part 1 of this form, please provide a brief description of the performance solution, the performance solution report identifier (reference number, date and version), and the name and contact details of the person who prepared the performance solution report.

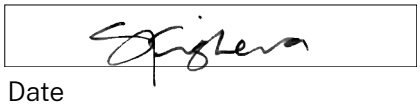
7. The regulated design accords with the Regulated Design Guidance Material relevant to the design, as per clause 9(1(c)) of the Design and Building Practitioners Regulation 2021.

✔ Yes

No

Part 3. Signature

Signature



Date

16.08.2024

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation. For more information visit NSW Fair Trading

This form relates to obligations under the Design and Building Practitioners Act 2020 and supporting Regulation

Instructions for completing this form
You must complete all Parts of this form.

Use this form in designs that consist of independent schedules, specifications or reports.

Attach the completed form to the front of the schedule, specification or report as a separate page before uploading to the NSW Planning Portal. Do not insert this form as an image or resize the form.

Regulated Design Record				
Project Address: 1 Ivanhoe Place, Macquarie Park, NSW				
Project Title: Ivanhoe Village Green and Community Centre				
Consent No: SSD 15822622			Body Corporate Reg No: Not Applicable	
Drawing Title: Not Applicable			Drawing No: Not Applicable	
Rev	Date (dd.mm.yy)	Description	DP Full Name	Reg No
1	16 August 2024	Temp. Rock Bolt Design&Shotcrete Analysis	Woodie Theunissen	DEP0001308

Date: 16 August 2024
Ref: 36870YFletRev1

Square Civil Pty Ltd t/a Chalouhi
22 Centenary Avenue
MOOREBANK NSW 2170

Attention: Gary Tang
Email: gary@chalouhi.com.au

TEMPORARY ROCK BOLT DESIGN AND PERMANENT SHOTCRETE ANALYSIS
PROPOSED VILLAGE GREEN AND COMMUNITY CENTRE (STAGE C2)
IVANHOE ESTATE (MIDTOWN), MACQUARIE PARK, NSW

1 INTRODUCTION

We have been commissioned to carry out a slope stability assessment on the northern and southern shoring walls for the proposed C2 Stage at the Village Green and Community Centre located within Frasers Property Australia's Ivanhoe Estate (Midtown) Development, Macquarie Park, which is near the corner of Epping Road and Herring Road within the Ryde Local Government Area (LGA). The objective of the analysis is to assess the stability of the rock face and provide a design for temporary rock bolt installation. The permanent shotcrete design will be by Van Der Meer who will utilise the results of our analysis in their design. This letter summarises the assumptions and methodology adopted to carry out the analysis. The results of the analysis are also presented in this document.

2 AVAILABLE INFORMATION

The analysis has been carried out based on the information provided in the following supplied documents.

- Geotechnical Investigation Report prepared by Douglas Partners (Project 86043.6, dated August 2021) [DP2021].
- Annotated Northern Shoring Elevations and Sections prepared by Van Der Meer Consulting (Project No. SYD 220-016 Sketch No. NSH01 to NSH04 dated 11 July 2024).
- Annotated Southern Shoring Elevations and Sections prepared by Van Der Meer Consulting (Project No. SYD 220-016 Sketch No. SSH01 to SSH06 dated 15 July 2024).
- Structural drawings prepared by Van Der Meer, Job No. SY220-166, Dwg. S01-00 to 05, S02-01, S02-11, S02-12, S02-31, S02-32, S02-51, S02-52, S02-61 and S02-65, Rev 1 dated 15 August 2024.

3 PROPOSED RETENTION

We understand that the development will comprise excavation to a depth of about 6.5m below existing surface levels. The upper portion of the excavation is expected to expose soil and low to medium strength bedrock, which will require support from a series of staggered rock bolts. The reinforced shotcrete mesh is currently 200mm and 270mm thick for the southern and northern elevations, respectively. The lower portion of the excavation is expected to be within the better-quality medium to high strength bedrock and, subject to geotechnical inspections, can be left unsupported. Notwithstanding this, for maintenance purposes, the lower better quality bedrock will be protected with shotcrete and mesh to prevent fretting and spalling of the cut faces.

4 DEVELOPMENT OF THE GEOTECHNICAL MODEL

The geotechnical model was developed at three nominated sections (i.e. Sections N1, S1 and S3) and was based on the subsurface conditions provided in the geotechnical investigation report (DP2021). The location of the analysed sections are shown in the attached Figure 1.

The stability analyses were carried out using the 2D finite element computer program SLOPE/W. Effective stress (drained) stability analyses were carried out on each section and circular failures were analysed using the Morgenstern-Price method of slices. A user defined grid of the centres of possible circular failures was drawn for each section and the failure circle with the minimum FOS was generated. Groundwater was not included in the models based on the monitoring completed and the presence of a nearby basement that acts as a sump and drains the surrounding ground.

Following the stability analyses, we then carried out a 2D finite element analysis using PLAXIS 2D to analyse the structural forces of the proposed permanent shotcrete wall to assist VDM in their design.

The adopted geotechnical model for Sections N1, S1 and S3 are presented in the attached Figures 2 to 4.

5 SUBSURFACE CONDITIONS

The following table summarises the adopted subsurface conditions for the analysis sections, taking into account the top of shotcrete levels described in Section 6 below:

Shoring Wall Elevation	Analysis Section	Relevant Borehole	Reduced Level of the Top of Unit (mAHD)			
			Soil	Class V Sandstone	Class III/IV Sandstone	Class II/III Sandstone
Northern	N1	06	52.6	-	50.95	49.0
Southern	S1	102	-	52.25	51.3	49.7
Southern	S3	07	-	53.6	-	53.1

6 MODEL GEOMETRY AND STAGES

The geometry of the models at the section locations were obtained from the supplied structural drawings. Section N1 was taken from the northern shoring wall drawings while Sections S1 and S3 were taken from the southern shoring wall drawings. The top of shotcrete and Bulk Excavation Levels (BEL) for each section are tabulated below.

Shoring Wall Elevation	Analysis Section	Top of Shotcrete (mAHD)	BEL (mAHD)
Northern	N1	52.6	46.05
Southern	S1	52.25	47.87
Southern	S3	53.62	47.87

A 10kPa surcharge has been applied for a 1m distance back from the cut face, where then a 20kPa surcharge is applied, to account for construction and long-term surcharges as per advice provided by Gary Tang of Chalouhi in an email dated 25 July 2024. On the final model stage for the long-term case, the 20kPa surcharge has been extended to the top of the cut face and shotcrete.

Both the SlopeW and Plaxis analysis has been completed in a staged manner to replicate the anticipated construction staging. While this staging is generally the same for both analyses, SlopeW has been used to analyse the temporary support, the rock bolts and their design while Plaxis has been used to model the permanent support, the shotcrete and mesh facing. Consequently, for the staging set out below the SlopeW staging is the same as that for Plaxis with the exception of the final stages (i.e. stages 9 and 10 for the northern elevation and stages 8 and 9 for the southern elevation).

Northern Elevation

The following modelling staging was adopted for Section N1 on the northern elevation.

1. Model the existing conditions
2. Excavate to 0.5m below the top rock bolt row.
3. Install the rock bolt and shotcrete
4. Excavate to the top of bedrock and shotcrete the remaining height of the soils.
5. Excavate to 0.5m below the second rock bolt row.
6. Install the rock bolt.
7. Excavate in maximum 2.4m depth increments and install shotcrete.
8. Excavate to bulk excavation level
9. Construct the permanent floor slabs.
10. Deactivate the temporary rock bolts.

Southern Elevation

The following staging was adopted for Sections S1 and S3 on the southern elevation.

1. Model the existing conditions
2. Excavate to 0.5m below the top rock bolt row.
3. Install the rock bolt and shotcrete
4. Excavate to 0.5m below the second rock bolt row.
5. Install the rock bolt.
6. Excavate in maximum 2.4m depth increments and install shotcrete.
7. Excavate to bulk excavation level
8. Construct the permanent floor slabs.
9. Deactivate the temporary rock bolts.

7 MODEL PARAMETERS

7.1 Geotechnical Parameters

The following soil parameters were adopted for the analyses:

Material	Effective Cohesion, c' (kPa)	Effective Friction Angle, ϕ'	Bulk Unit Weight, γ (kN/m3)
Fill/Natural Soils	1	28	18
Class V Sandstone	30	32	22
Class III/IV Sandstone	100	35	22
Class II/III Sandstone	400	38	24

All sections have modelled a potential adversely orientated 45° joint that extends from the top of Class III/II bedrock to the surface of the bedrock.

Based on the borehole information presented in DP2021, Section S3 appears to be predominantly better-quality bedrock from the crest of the cut and can, subject to geotechnical inspections, be left unsupported. Therefore, support of this section does not appear to be required and as a result we have not provided a design for it. Further discussion of this is provided in Section 9 below.

For sections N1 & S1, the rock bolt design and parameters adopted are tabulated below in Section 7.2.

7.2 Structural Properties and Geometry

The properties and geometry for the rock bolts are tabulated below.

Shoring Wall Elevation	Section	Row No.	Anchor RL	Anchor Inclination (°)	Hole Diameter (mm)	Anchor Length (m)	Pullout Resistance (kPa)	Tensile Capacity (kN)	Horizontal Spacing (m)
Northern	N1	1	52.1	20	90	5	20	100	2
		2	50.1	20	90	3	100	100	2
Southern	S1	1	51.75	20	90	3	100	100	2
	S3	2	50.3	20	90	3	100	100	2

We have adopted an elastic modulus for the shotcrete of 20,000MPa. Additionally, we have adopted a permanent shotcrete thickness of 270mm and 200mm for the northern and southern elevations, respectively.

We note that it is possible that during drilling of the rock bolts that more competent bedrock will be encountered than assumed for in the design, or the pull-out test results indicate higher pull-out resistances than those adopted. In these cases, the design could be revised, which may result in a possible reduction in the length of the rock bolts.

8 COMMENTS AND RECOMMENDATIONS

8.1 Northern Elevation

We recommend that the temporary rock bolts comprise the following:

- Two rows of fully grouted 'N24' steel bars with a minimum working load of 100kN. The bars shall be cogged a minimum 300mm length to connect into the permanent reinforced shotcrete, which will be designed by VDM.
- The upper and lower rows should be installed at RL52.1m, i.e. 0.5m below the top of shotcrete, and RL50.1m, pending inspection of the cut face by a geotechnical engineer, and at a maximum horizontal spacing of 2m.
- Prior to grouting, all holes must first be flushed with water to remove all rock cuttings.
- All bolts should be fully grouted into 90mm diameter drill holes that are orientated down from the horizontal at approximately 20°.
- All rock bolts must be centrally spaced within the drill holes.
- Grout to have a minimum 28-day strength of 20MPa.
- All bolts to be grouted from the bottom up.

The following table summarises the maximum structural forces developed within the proposed permanent shotcrete and mesh panels. While for the design of the rock bolts we have assumed that a 45° joint is present in the rock mass for the design of the shotcrete and mesh, which is the permanent support we have assumed

that such a joint is not present. This has been assumed on the basis that regular geotechnical inspections of the cut face will be completed during excavation such that should such a defect be present it will be identified. Where such a defect is present the shotcrete and mesh design will need to be updated. This updated design will be based on new design actions that will be provided by this office. Reference should also be made to the attached Figures 5, 6 and 7 for model displacements, structural forces and normal stress of the shotcrete.

Northern Elevation	Maximum Axial Force (kN/m)	Maximum Shear Force (kN/m)	Maximum Bending Moment (kN.m/m)
270mm Thick Shotcrete	-14.7[1]	16.7	8.6

Notes

[1] Negative equals in compression

The following table summarises the reaction forces of the permanent floor slabs that will support the reinforced shotcrete in the long-term:

Permanent Restraint	Reduced Level (mAHD)	Reaction Force (kN/m)
Basement	46.05	4.5
Upper Ground	52.6	16.7

Strip drains (Megaflo 170 or a similarly approved strip drain) must be provided behind the shotcrete and should comprise prefabricated geofabric wrapped drainage strips at about 2m centres. The strip drains must discharge at the base of the shotcrete and mesh panels and into the groundwater drainage system , which is assumed to comprise dish drains at the toe of the cut face. Care must be taken that the ends of the strip drains are not covered with shotcrete and that discharge from them is not obstructed.

For the northern elevation, given the presence of soils that may be between 1.5m to 2m deep, no surcharges (temporary exclusion zone) within 2m of the cut face must be allowed until the top rock bolt row has been installed (and at strength) and the construction of the reinforced shotcrete over the full height of the soils has been complete. If the soils are excavated vertically, there will be risk of localised failures and slumping occurring particularly if the soils have a higher sand content. Therefore, once the top of bedrock is encountered, excavation should cease and the shotcrete panel installed over the full soil height. Safe work methods must be adopted during the installation of bolts, mesh and shotcrete such that the works do not pose an acceptable risk of injury to personnel.

8.2 Southern Elevation

For Section S1 at the south-eastern end of the Southern Elevation it is expected there will only be about 0.5m of Class V bedrock overlying the good quality bedrock that will be suitable to be excavated vertically and left unsupported provided it is free from adverse defects. As such, we anticipate that stabilisation measures will not be required on the basis that a permanent shotcrete and mesh wall will be progressively constructed as

the excavation progresses and will provide the necessary support to the Class V bedrock during construction and in the long-term. Notwithstanding this, a geotechnical inspection should be required to confirm the expected subsurface conditions. At this stage it is not possible to determine where along the Southern Elevation these better quality conditions will extend to and therefore an inspection by a geotechnical engineer must be undertaken to assess where support in the form of rock bolts will be required. Where such support is required the following temporary rock bolt design must be adopted.

For Sections S1 and S3, we recommend that the temporary rock bolts comprise the following:

- Two rows of fully grouted 'N24' steel bars with a minimum working load of 100kN. The bars shall be cogged a minimum 300mm length to connect into the permanent reinforced shotcrete, which will be designed by VDM.
- The upper and lower rows should be installed at RL51.75m, i.e. 0.5m below the top of shotcrete, and RL50.3m, pending inspection of the cut face by a geotechnical engineer, and at a maximum horizontal spacing of 2m.
- Prior to grouting, all holes must first be flushed with water to remove all rock cuttings.
- All bolts should be fully grouted into 90mm diameter drill holes that are orientated down from the horizontal at approximately 20°.
- All rock bolts must be centrally spaced within the drill holes.
- Grout to have a minimum 28-day strength of 20MPa.
- All bolts to be grouted from the bottom up.

We note the above is not required from a geotechnical stability perspective for Section S3. However, we have included as we understand the bolts are necessary for the temporary support of the permanent shotcrete wall until such time as the permanent lateral restraints are constructed.

The following table summarises the maximum structural forces developed within the proposed permanent shotcrete and mesh panels. While for the design of the rock bolts we have assumed that a 45° joint is present in the rock mass for the design of the shotcrete and mesh, which is the permanent support we have assumed that such a joint is not present. This has been assumed on the basis that regular geotechnical inspections of the cut face will be completed during excavation such that should such a defect be present it will be identified. Where such a defect is present the shotcrete and mesh design will need to be updated. This updated design will be based on new design actions that will be provided by this office. Reference should also be made to the attached Figures 8 to 12 for model displacements, the structural forces and normal pressures of the shotcrete for Section S1 and S3.

Southern Elevation	Section	Maximum Axial Force (kN/m)	Maximum Shear Force (kN/m)	Maximum Bending Moment (kN.m/m)
200mm Thick Shotcrete	S1	-13.8[1]	6.8	4.8
	S3	16.1	5.1	1.7

Notes

[1] Negative equals in compression

We understand that due existing services that the top anchor row of the southern elevation may need to be steepened, which is generally considered acceptable, although our preference is for 20° angled bolts to maximise the benefit of the lateral restraint provided by the rock bolts. Regardless, the location and angle of the rock bolts should be checked against clashes with existing services

The following table summarises the reaction forces of the permanent floor slabs that will support the reinforced shotcrete in the long-term:

Section	Permanent Restraint	Reduced Level (mAHD)	Reaction Force (kN/m)
S1	Basement	47.9	2.8
	Upper Ground	52.25	7.0
S3	Basement	47.9	1.4
	Upper Ground	53.6	1.5

Strip drains (Megaflo 170 or a similarly approved strip drain) must be provided behind the shotcrete and should comprise prefabricated geofabric wrapped drainage strips at about 2m centres. The strip drains may discharge down the rock face or into drainage at BEL. Care must be taken that the ends of the strip drains are not covered with shotcrete.

We understand that preference is to excavate in 2.4m depth increments prior to construction of the permanent shotcrete wall due to the steel reinforcement mesh standard size. Provided the top and bottom rows of rock bolts have been installed, we consider excavation in such depth increments to be feasible, provided an inspection of the cut face by a geotechnical engineer is carried out to assess its stability to ensure there is no risk to personnel working at the toe of the cut face.

8.3 Design of Shotcrete Panels Below Bottom Row of Rock Bolts

Below the bottom row of rock bolts where the bedrock is of better quality, we understand that a permanent shotcrete wall will be constructed that will extend to bulk excavation level. In this area we consider it feasible to simply install temporary dowels into the good quality bedrock at regular spacing such that the reinforced shotcrete wall is capable of withstanding a 10kPa surcharge, which should account for any small scale adverse defects. In the long term permanent support of the shotcrete panels must be provided by the slabs of the built structure.

Where larger scale defects are present further support will be required. In this regard the above approach may only be adopted provided the cut faces are inspected every 1.5m of vertical excavation by a geotechnical engineer.

For the temporary dowels we recommend the following.

- The dowels must be installed at no greater than 1.5m horizontal and vertical spacing.
- Th dowels may comprise of fully grouted/epoxied 'N16' steel bars with a minimum 0.6m embedment into the rock face. The bars shall be cogged a minimum 100mm length to connect into the permanent reinforced shotcrete, which will be designed by VDM. VDM should also confirm the 'N16' bars are suitable to support the shotcrete weight.
- Prior to grouting, all holes must first be flushed with water/air to remove all rock cuttings.
- All bolts should be fully grouted into a minimum 30mm diameter drill holes.
- All dowels must be centrally spaced within the drill holes.

9 GENERAL

This letter has been prepared for the particular project described and no responsibility is accepted for the use of any part of this letter in any other context or for any other purpose. If there is any change in the proposed development described in this letter then all recommendations should be reviewed. Copyright in this letter is the property of JK Geotechnics. We have used a degree of care, skill and diligence normally exercised by consulting engineers in similar circumstances and locality. No other warranty expressed or implied is made or intended. Subject to payment of all fees due for the investigation, the client alone shall have a licence to use this letter. The letter shall not be reproduced except in full.

Should you require any further information regarding the above, please do not hesitate to contact the undersigned.

Yours faithfully
For and on behalf of
JK GEOTECHNICS



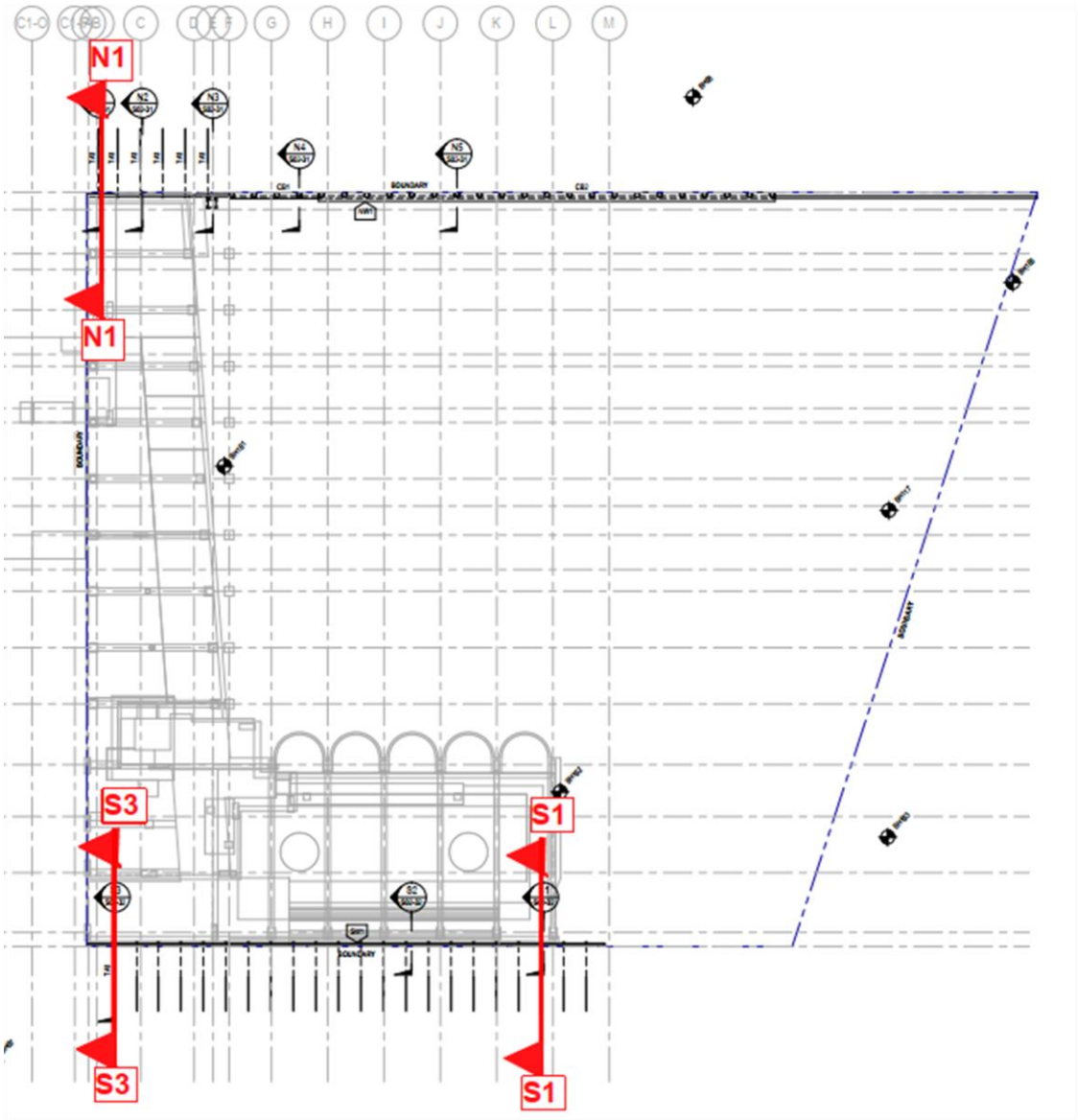
Owen Fraser
Associate | Geotechnical Engineer

Reviewed by:



Woodie Theunissen
Principal | Geotechnical Engineer

Encl: Figures 1 to 10



SECTION LOCATION PLAN

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Report No. 36870YF Figure No. 1

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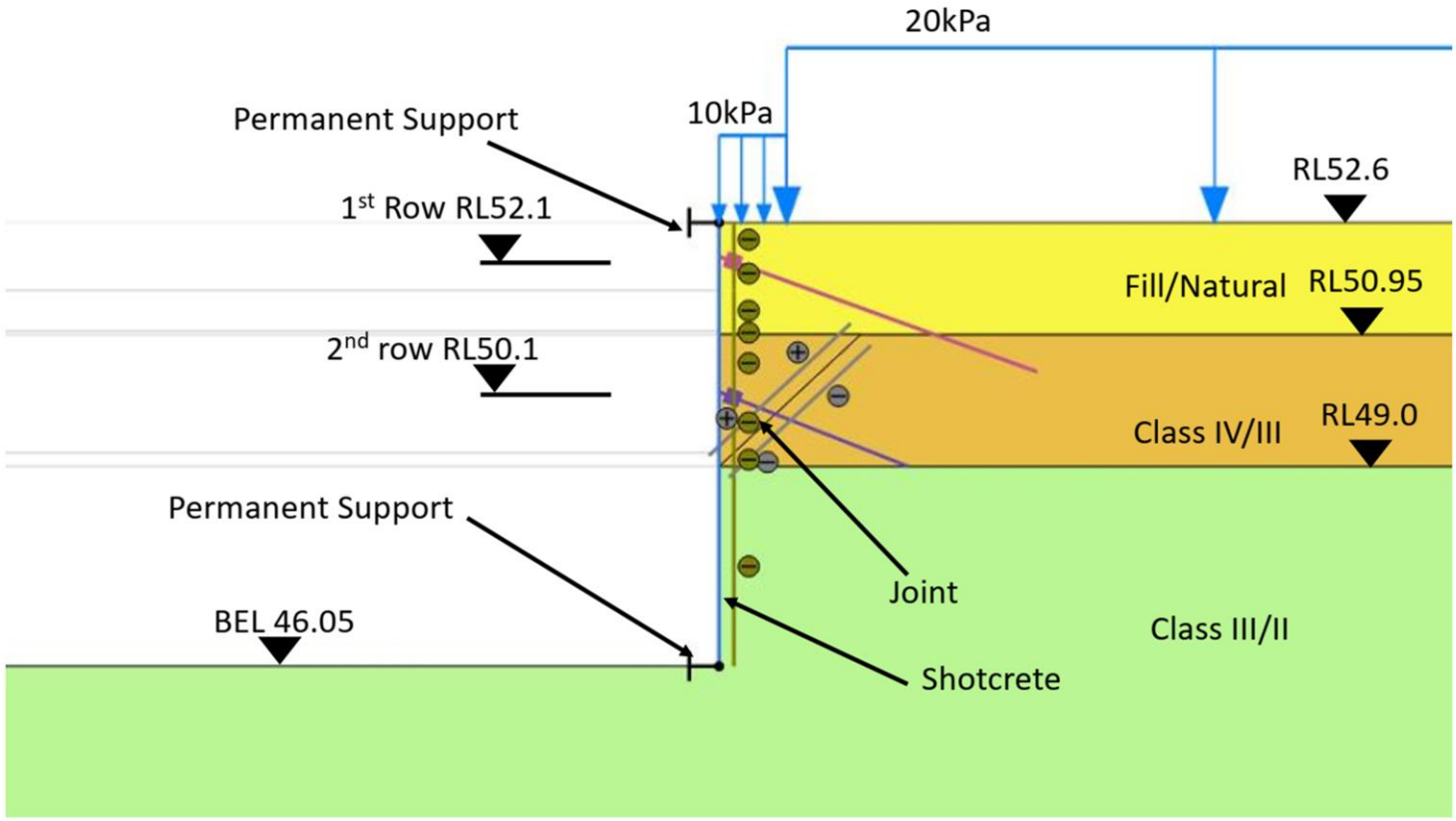

SECTION N1 - NORTHERN ELEVATION MODEL

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Report No. 36870YF Figure No. 2

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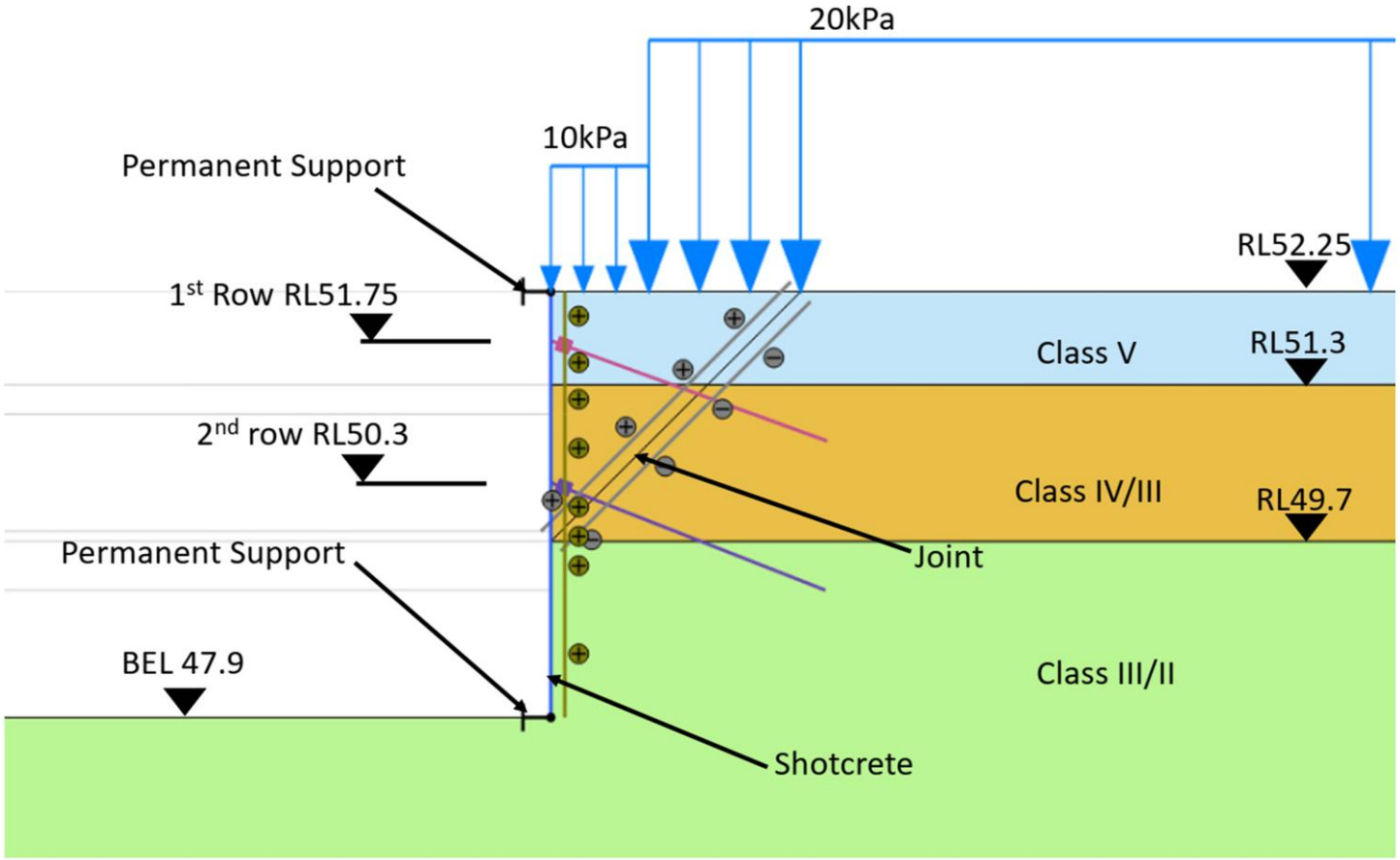

SECTION S1 – SOUTHERN ELEVATION MODEL

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Report No. 36870YF Figure No. 3

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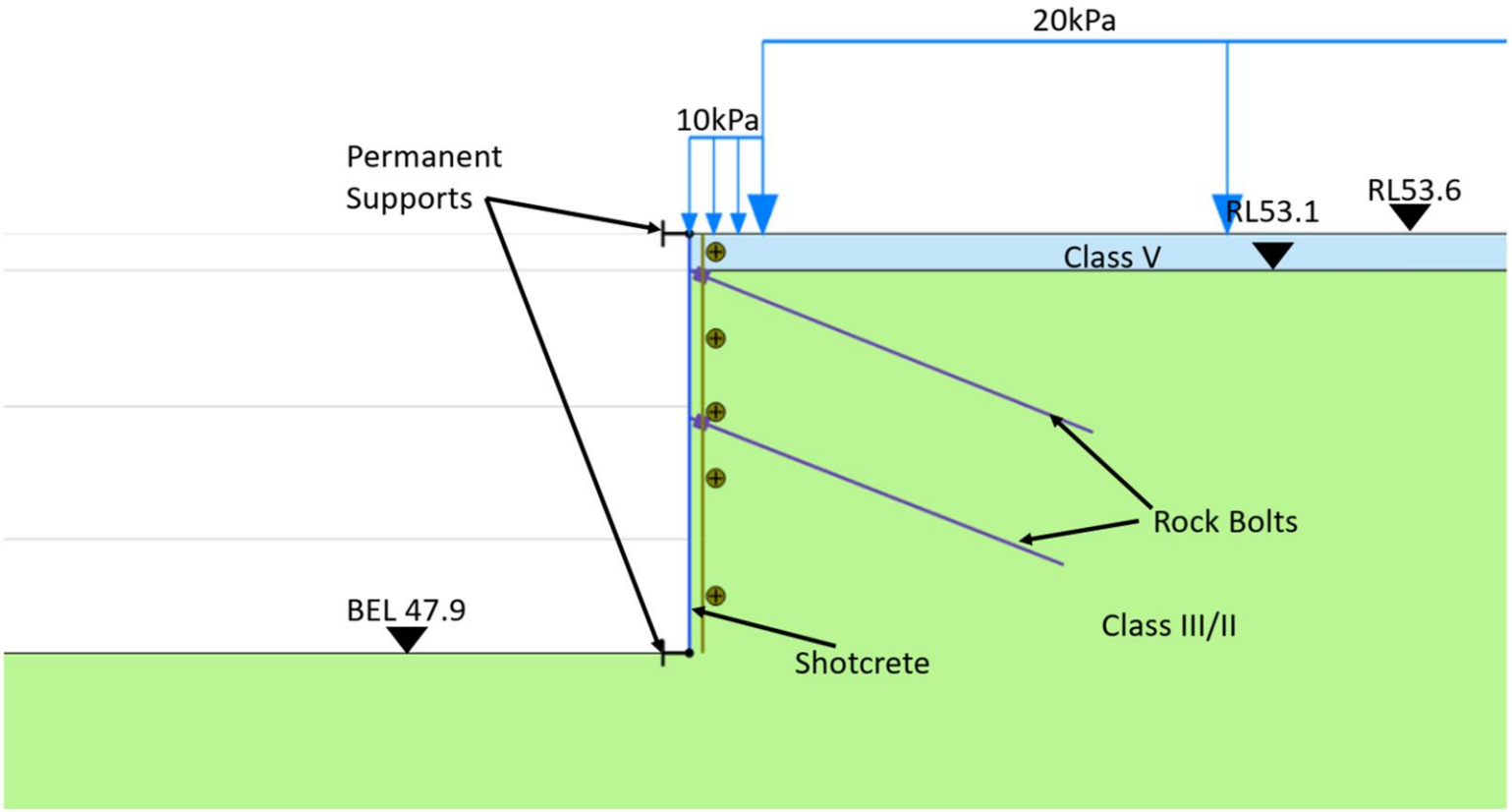

SECTION S3 – SOUTHERN ELEVATION MODEL

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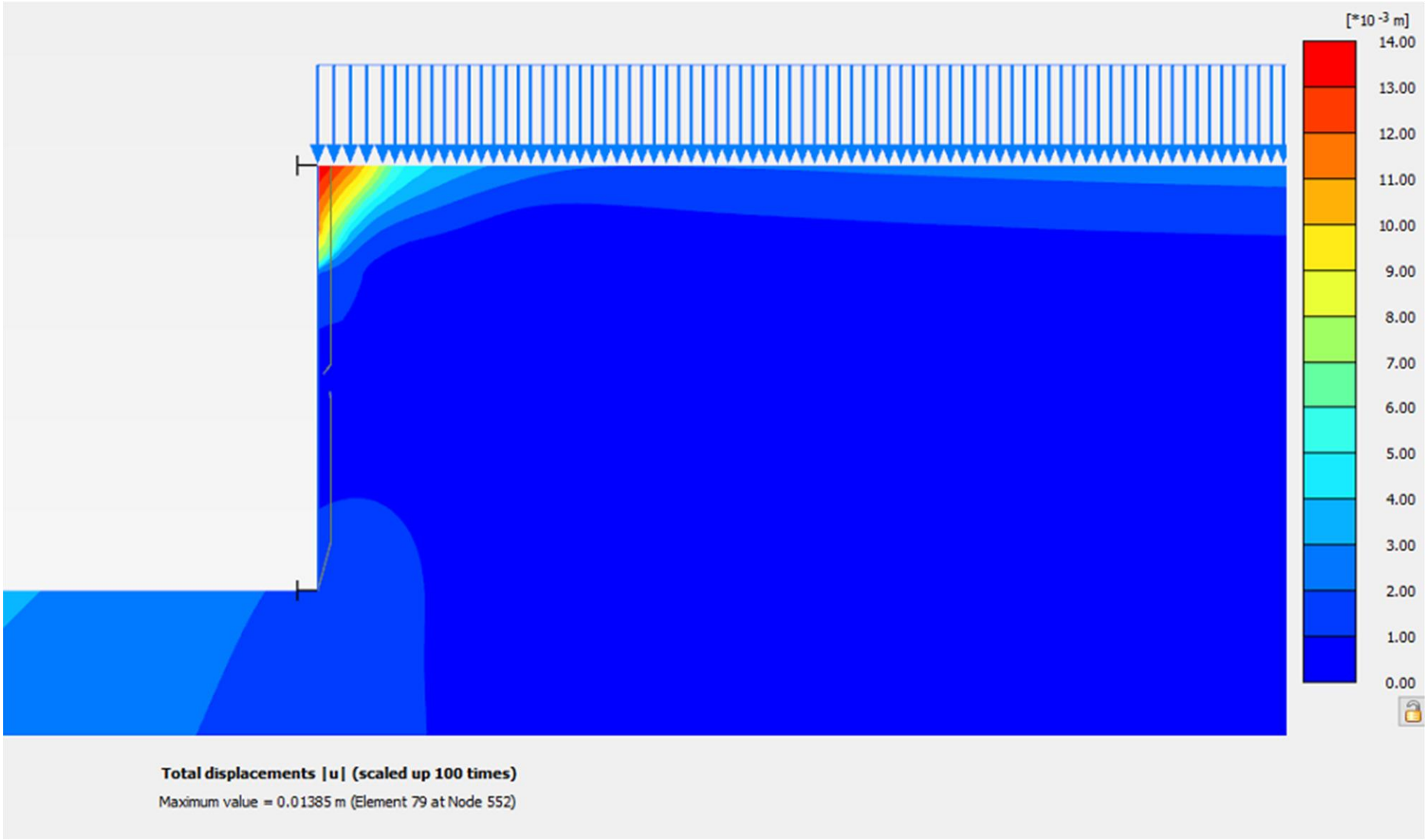
Report No. 36870YF Figure No. 4



SECTION N1 - NORTHERN ELEVATION MODEL

TOTAL DISPLACEMENTS HEATMAP – AFTER REMOVAL OF ROCK BOLTS

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Report No. 36870YF Figure No. 5

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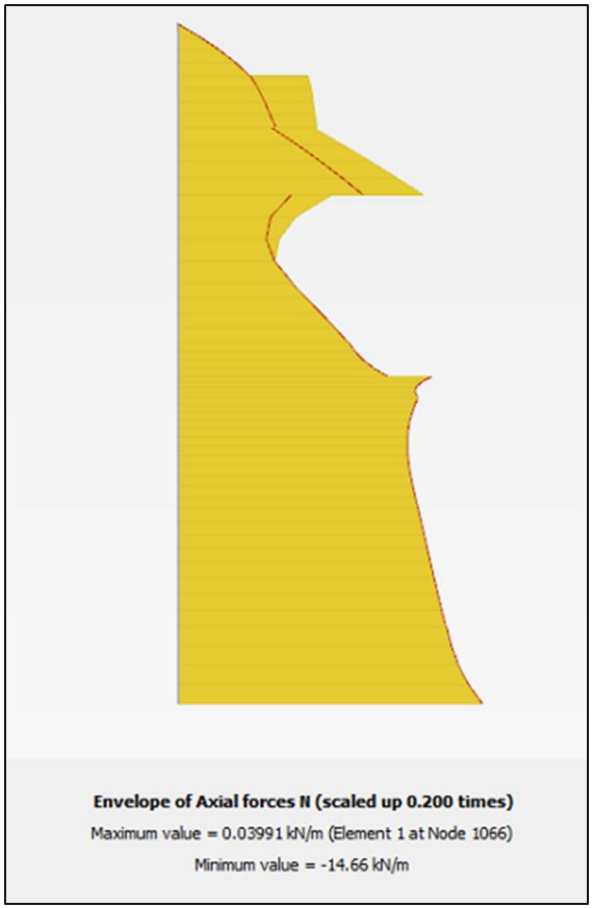

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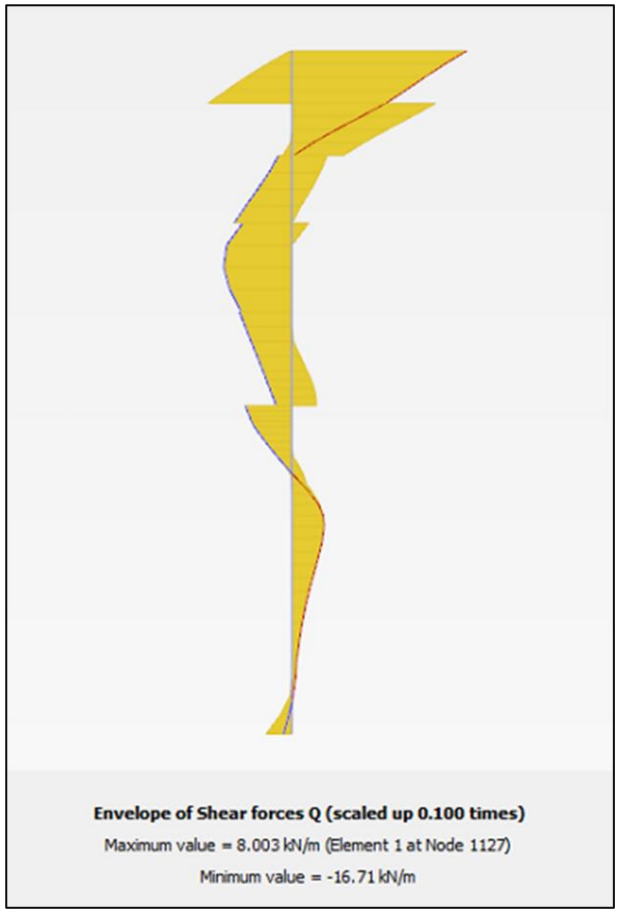
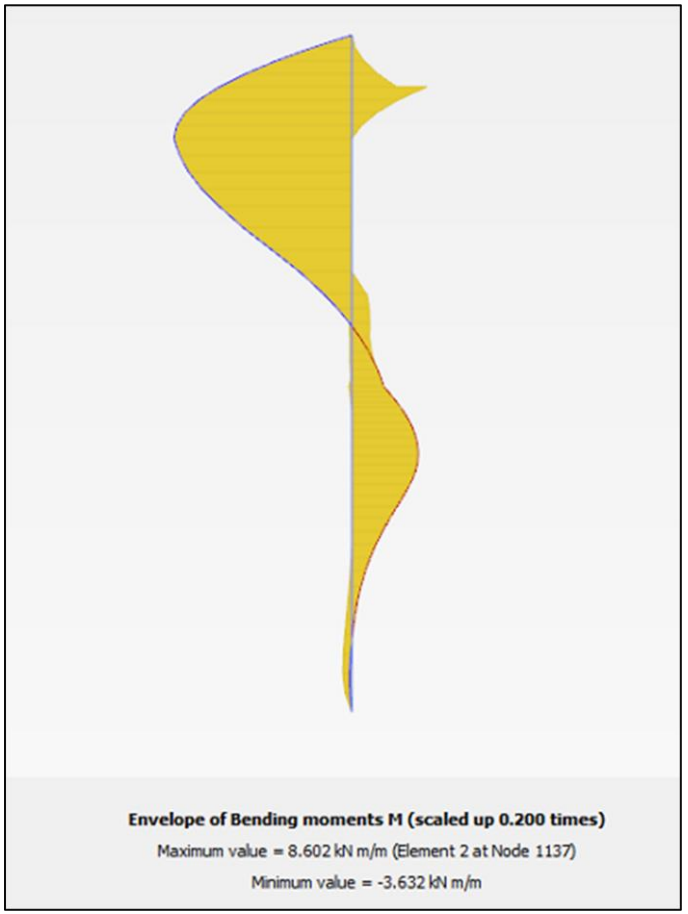
Minimum value = -14.66 kN/m



Envelope of Shear forces Q (scaled up 0.100 times)

Maximum value = 8.003 kN/m (Element 1 at Node 1127)

Minimum value = -16.71 kN/m



Envelope of Bending moments M (scaled up 0.200 times)

Maximum value = 8.602 kN m/m (Element 2 at Node 1137)

Minimum value = -3.632 kN m/m

SECTION N1 - NORTHERN ELEVATION MODEL

SHOTCRETE STRUCTURAL FORCES

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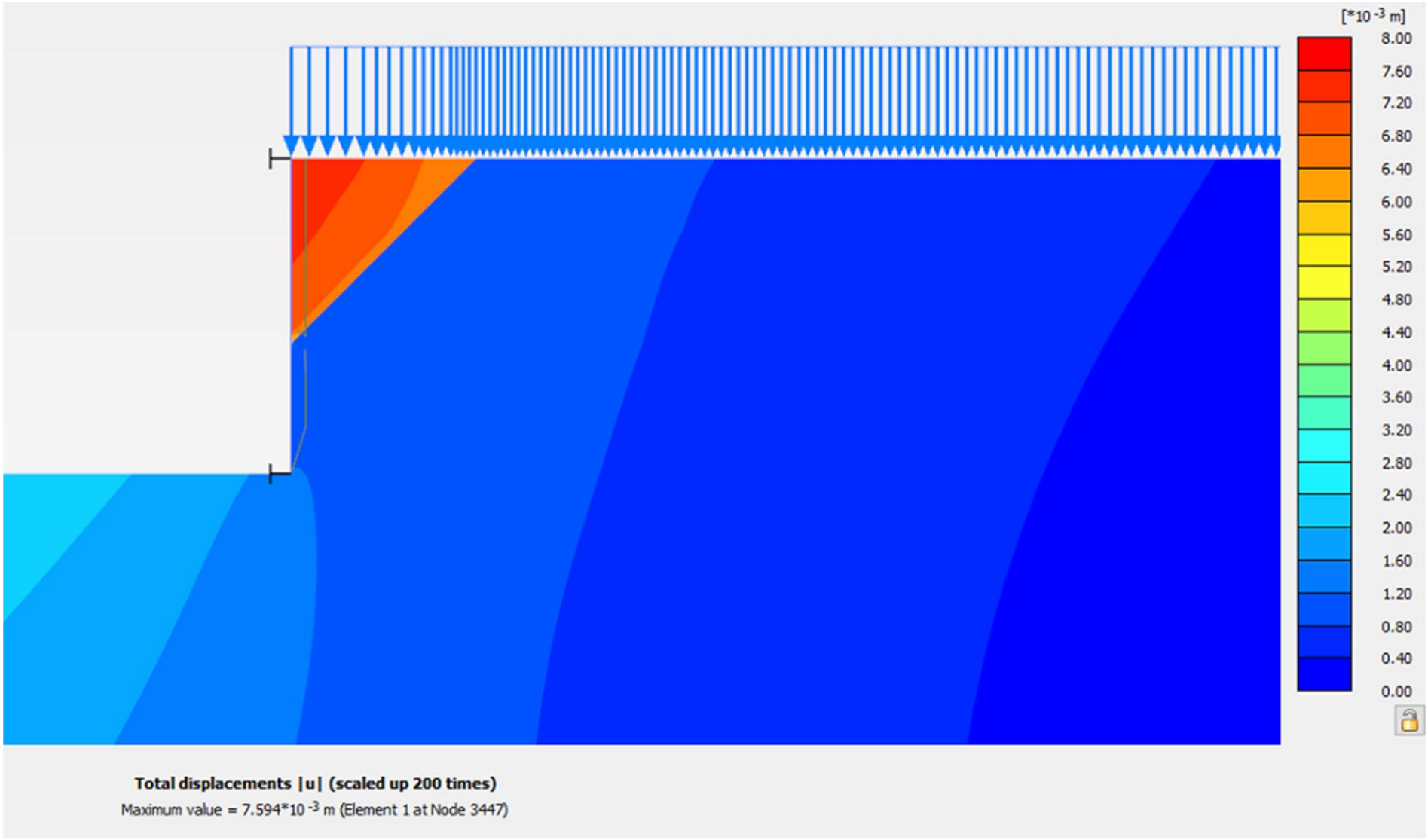

SECTION S1 - SOUTHERN ELEVATION MODEL

TOTAL DISPLACEMENTS HEATMAP – AFTER REMOVAL OF ROCK BOLTS

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Report No. 36870YF Figure No. 7

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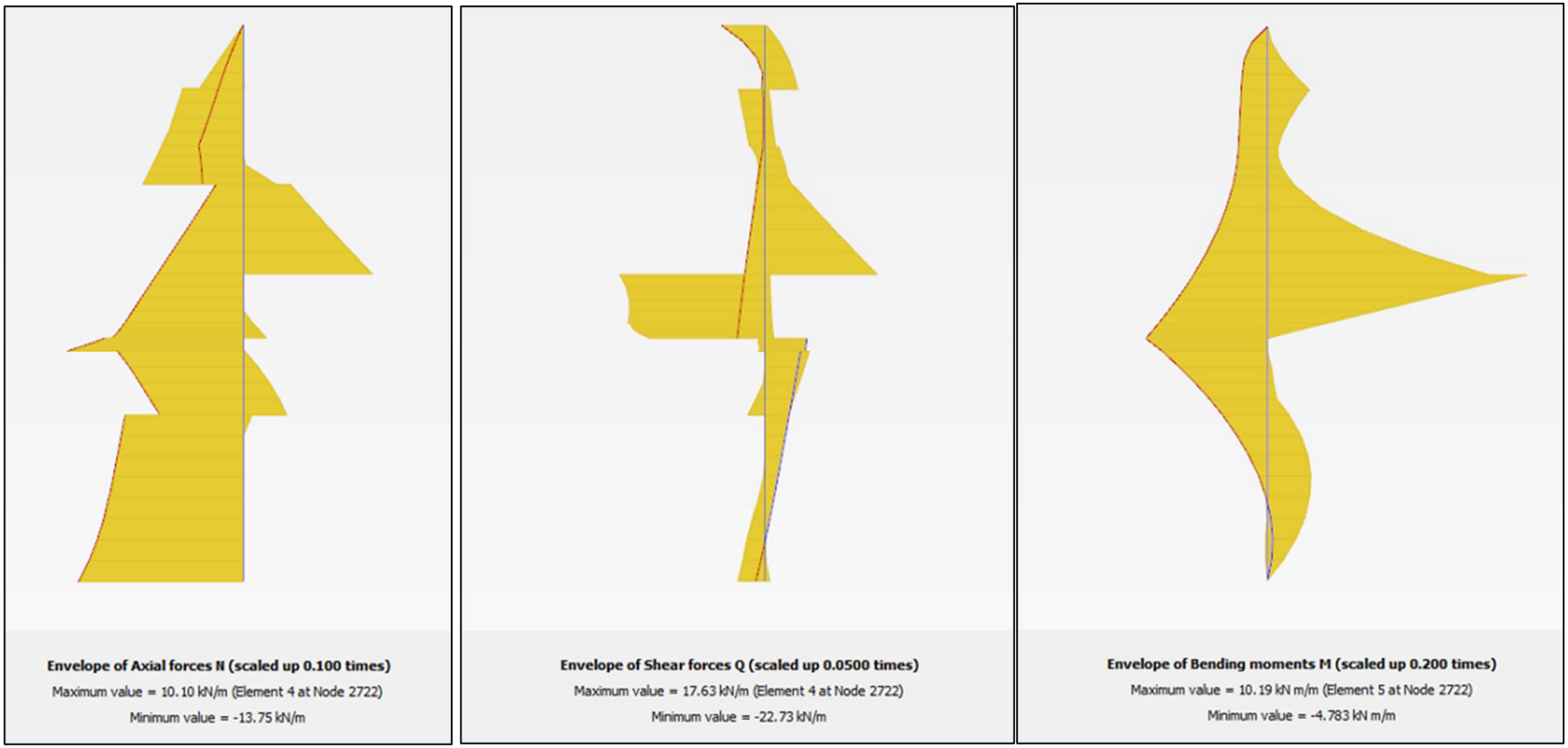

SECTION S1 - SOUTHERN ELEVATION MODEL

SHOTCRETE STRUCTURAL FORCES

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Report No. 36870YF Figure No. 8

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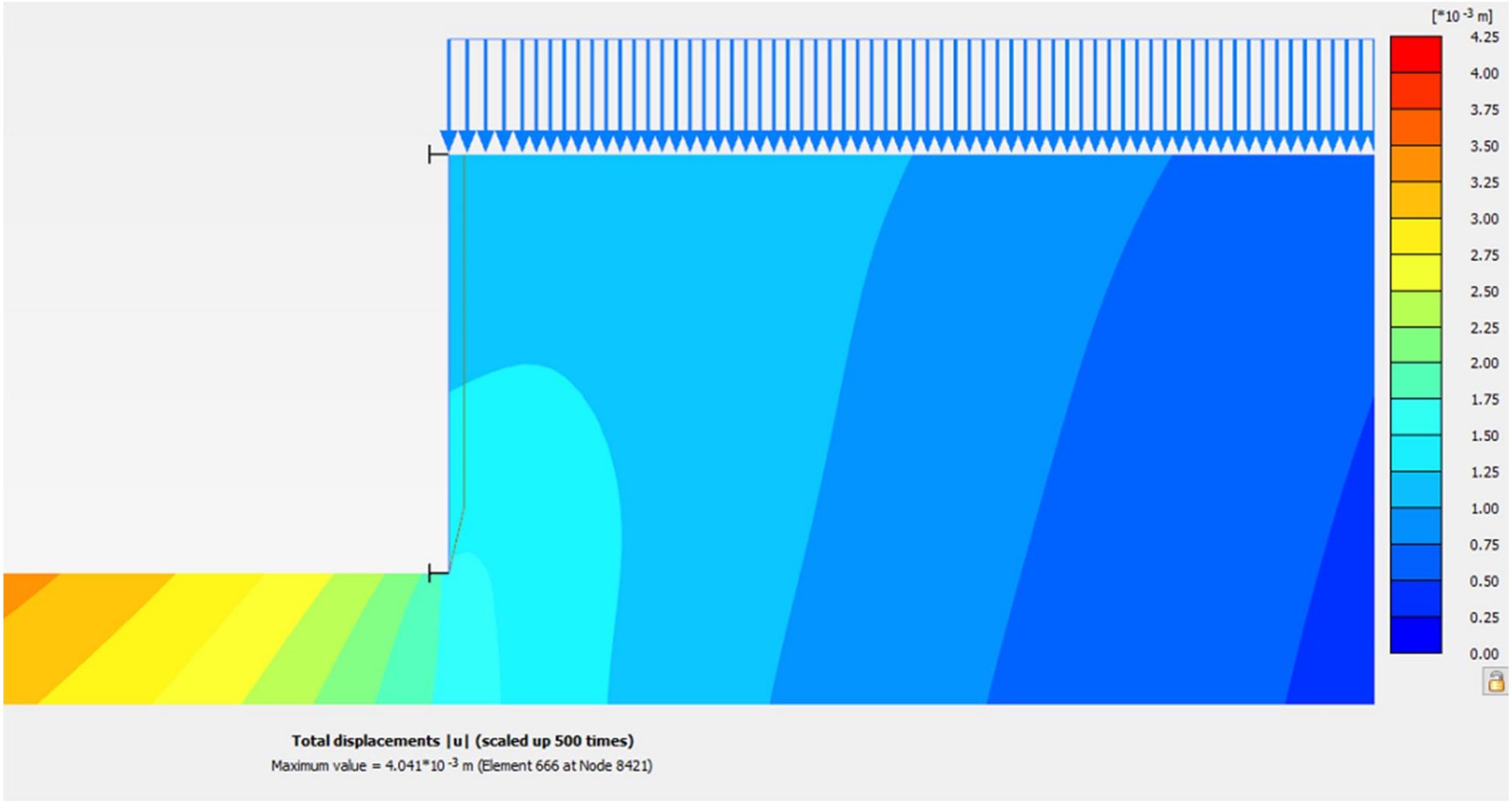

SECTION S3 - SOUTHERN ELEVATION MODEL

TOTAL DISPLACEMENTS HEATMAP – AFTER REMOVAL OF ROCK BOLTS

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Report No. 36870YF Figure No. 9

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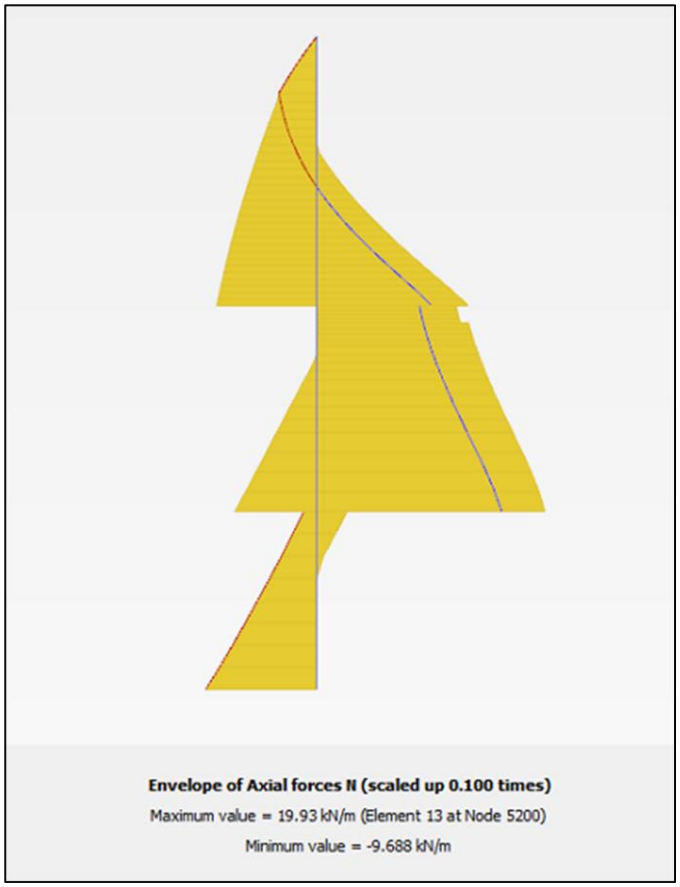

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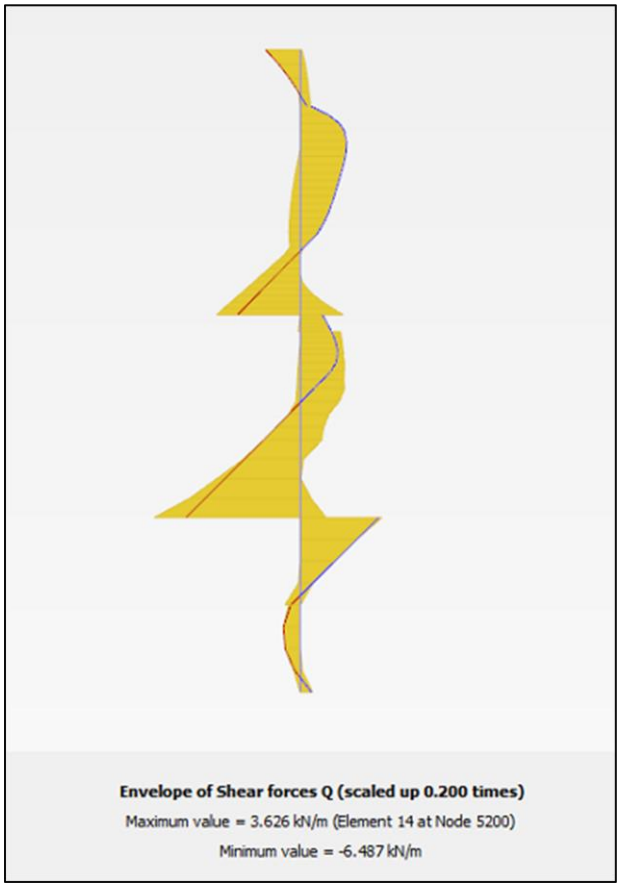

Envelope of Shear forces Q (scaled up 0.200 times)
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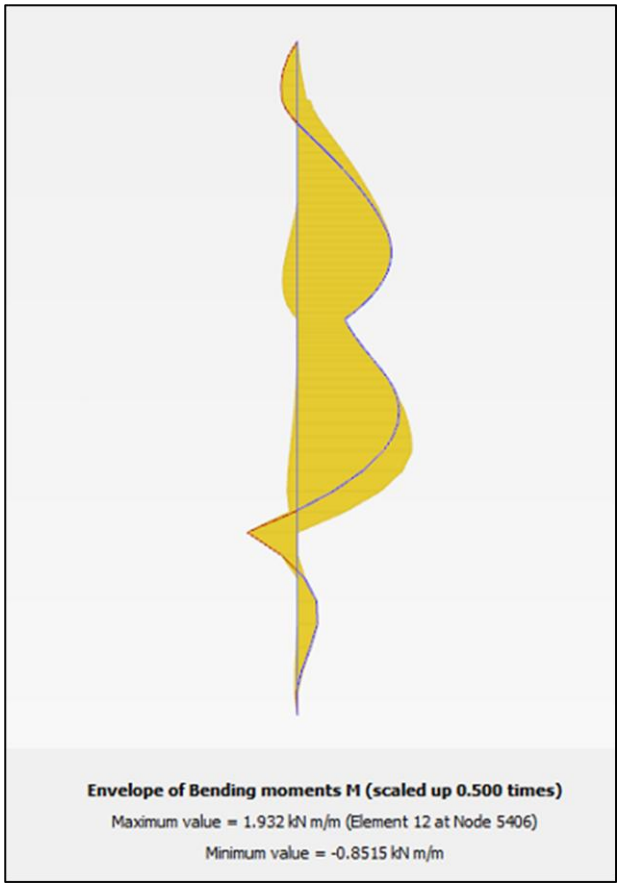
Minimum value = -6.487 kN/m



Envelope of Bending moments M (scaled up 0.500 times)
Maximum value = 1.932 kN m/m (Element 12 at Node 5406)
Minimum value = -0.8515 kN m/m

SECTION S3 - SOUTHERN ELEVATION MODEL
SHOTCRETE STRUCTURAL FORCES

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Fair Trading

Design compliance declaration - single regulated design

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation.
This form is approved under clause 11(1) of the *Design and Building Practitioners Regulation 2021*.

Instructions for completing this form

You must complete all parts of this form.

Please note that under *s77 of the Design and Building Practitioners Act 2020*, Fair Trading has the power to request additional information or records from registered practitioners for an authorised purpose, such as an audit or investigation. You may therefore be requested to provide further information or records to support any declaration made on this form.

Where this form indicates that material must be attached to the form, you must number each attachment sequentially and identify the number of that attachment in the relevant answer.

The plan/drawing/specification/report title, number and revision should correspond with the detail in the title block for each design to which this declaration relates.

Part 1. Details

Please insert the building project address to which this declaration relates

1 Ivanhoe Place, Macquarie Park, NSW

For registered body corporates, give full names of registered individuals and the corporation on behalf of which the declaration is made.

Design practitioner name

Woodie Theunissen

Registration number of design practitioner

PDP0001308

Class of registration (applicable to this declaration)

Geotechnical

Body corporate name (if applicable)

NA

Registration number of body corporate (if applicable)

NA

Email address

wtheunissen@jkgeotechnics.com.au

Contact number

02 9888 5000

ABN/ACN

17 003 550 801

Part 1. Details (continued)

Q1. Is this a regulated design prepared for a Ⓟ performance solution for building work?

- Yes, (also includes a building element, proceed to Question 2)
- Yes, (only for a performance solution, proceed to Question 4)
- ✔ No, (proceed to Question 2)

Q2. Is this a regulated design prepared for a building element for building work? If yes, please select one

- Ⓕ Fire safety systems
- Ⓦ Waterproofing
- Ⓛ Load-bearing
- Ⓑ Building enclosure
- Ⓢ (Building) services

Q3. The design compliance declaration (DCD) number is made up of two parts:

a) the number (starting at DCD-001) is the number of DCD made. Subsequent numbers are DCD-002, DCD-003, etc.
b) the letter denotes what type of design the declaration relates to. Use one of the letters from above (P, F, W, L, B, S) e.g. DCD-001W

DCD- 001 Ⓛ (this is the DCD number)

Q4. Is this a regulated design prepared for an 'architectural / building design general' document by the design practitioner class of architectural for the building element of 'load-bearing' or 'building services?

Refer to Design Practitioners Handbook for explanation of 'architectural / building design general' design document.

- Yes
- ✔ No

Part 1. Details (continued)

Please group each type of document (e.g. plans/drawings/specifications/reports) together. Note that the information provided in the table should match the title block information.

If you have more than 30 items, please provide on a separate attachment using the same headings in the table below.

	Plan/drawing/specification/report title which is part of the "regulated design" being declared	Plan/drawing/specification/ report reference number	Revision number
1.	Temp. Rock Bolt Design&Perm. Shotcrete Analyi	Ref: 36870YFlet, dated 16/8/24	Rev1
2.			
3.			
4.			
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28.			
29.			
30.			

Number of attachments to the certificate (if applicable) NA

Part 2. Declaration matters

I, Woodie Theunissen

Insert full name acting on behalf of

JK Geotechnics Pty Ltd | geotechnical

Insert registered body corporate name (if relevant) | Insert class of registration

have prepared the attached regulated design.
Declare:

1. The regulated design for which this design compliance declaration is being made complies with the requirements of the *Building Code of Australia*.

   Yes

   No

✔ There are no applicable *Building Code of Australia* requirements

If there are no applicable requirements BCA, please provide further details below

The Compliance Declaration is for geotechnical temporary anchor design for which there are no applicable BCA requirements. Therefore Question 4 in Part 2 below has also been left blank as it is not applicable to this geotechnical design component.

2. The regulated design for which this design compliance declaration is being made integrates details of other aspects of building work to which the design relates, and other regulated designs for the work, as far as is reasonably practicable.

   Yes

✔ No

If yes, by providing a brief description, please list the other aspects of building work and the other regulated designs that have been integrated into the regulated design for which this design compliance declaration is being made.

3. Standards, codes and requirements (other than the requirements referenced in the B*uilding Code of Australia*) have been applied in preparing the regulated design for which this design compliance declaration is being made. E.g. a requirement under a development consent.

✔ Yes

   No

If yes, please list or attach information about the standards, codes or requirements that have been applied.

AS4678-2002 Earth Retaining Structures

4. Any building product referred to in preparing the regulated design or which this design compliance declaration is being made would, if used in a manner consistent with the design, achieve compliance with the *Building Code of Australia*.

   Yes

   No

Part 2. Declaration matters (continued)

5. I have sought and considered specialist advice in preparing the regulated design.

✔ Yes

No

If yes, please provide a brief explanation of the parts of the regulated design which have been based on the specialist advice from another person other than the person making this declaration.

The shotcrete design has been prepared by the structural engineers. This regulated design is for the geotechnical component of the rock bolt design only. The allowable bond stress values adopted in this regulated design are taken from the information extracted from the Douglas Partners Report (Project: 86043.06, dated August 2021.

6. The regulated design involves a performance solution.

Yes

✔ No

If yes, and the performance solution is not itself the regulated design identified in part 1 of this form, please provide a brief description of the performance solution, the performance solution report identifier (reference number, date and version), and the name and contact details of the person who prepared the performance solution report.

7. The regulated design accords with the Regulated Design Guidance Material relevant to the design, as per clause 9(1(c)) of the Design and Building Practitioners Regulation 2021.

✔ Yes

No

Part 3. Signature

Signature

Date

16/08/2024

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation. For more information visit NSW Fair Trading

GARY TANG

CHALOUHI
DEMOLITION • EXCAVATION • CIVIL CONSTRUCTION

22 Centenary Avenue, Moorebank NSW 2170
P: 02 9790 3799
W: www.chalouhi.com.au

Ref: PAR-24871-SD-DC [3]
16 August 2024

1 Ivanhoe Place, Macquarie Park
Shoring Wall | Design Certificate

Dear Sir,

This is to certify that the design of the shoring wall to Mahogany Avenue – North Private Roads for the above project complies with the Relevant Standards, Specifications, Rules, Codes of Practice or other publications including the following:

Australian Standards and Codes:

- The relevant Structural requirements of Section B Part B1 of the Building Code of Australia 2022 and the applicable Australian Standards as listed in Section B Part 1 of the BCA;
- Australian Standards AS 1170.0-2002 Structural Design Actions;
- Australian Standards AS 1170.1-2002 (R2016) – Structural Design Actions (Part 1: Permanent, imposed or other actions).
- Australian Standards AS4678-2002, Earth-retaining structures;
- Australian Standards AS2159-2009, Piling – Design and installation.
- Australian Standards AS3600-2018, Concrete Structures.
- The relevant Structural requirements of the Development Consent SSD 15822622 (Mod 2) condition A8.

Project Relevant Documents:

- Vandermeer Structural Drawings (Ref: S02-01, S02-11, S02-12, S02-31, S02-32) received via email on 19/07/2024.
- Vandermeer, Structural loads/surcharge applied on the shoring received via email on 25/07/2024.
- Vandermeer detailed shoring sections markup received via email on 13/08/2024.
- Douglas Partners Geotechnical Report (Ref: 86043.06. R.001.Rev1) issued on 04/08/2021
- JK Temporary Rock bolt Design and Permanent Shotcrete Analysis Report (Ref: 36870YFlet1) issued on 26/07/2024.

Paragon Design Documents:

- Paragon Shoring System Design Drawings, dated 15th of August 2024 (Ref: Shoring Wall Design- Macquarie Park-Par-24871-240815).

Paragon confirms that the structural design proposed for the shoring system consists of the following:

- The design of the shoring is adequate, satisfactory and comply with the relevant Australian Codes and Standards.
- The design of the shoring adequately protects and supports the work in the adjacent road and the adjoining land from possible damage due to the proposed excavation work with no additional work (such as underpinning of adjacent footing).

I hereby certify that I am appropriately qualified and competent person practicing in the relevant area of work. My employer holds appropriate current professional indemnity insurance to the satisfaction of the building owner or the principal authorising the design work being certified.

Yours sincerely,



Gus Habeeb, MEngSc FIEAust CPEng NER RPEQ IntPE(Aus)
Principal Engineer
Paragon Engineering Pty Ltd
admin@paragonengineering.com.au | 0401 701 774

Fair Trading

Design compliance declaration - single regulated design

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation.
This form is approved under clause 11(1) of the *Design and Building Practitioners Regulation 2021*.

Instructions for completing this form

You must complete all parts of this form.

Please note that under *s77 of the Design and Building Practitioners Act 2020*, Fair Trading has the power to request additional information or records from registered practitioners for an authorised purpose, such as an audit or investigation. You may therefore be requested to provide further information or records to support any declaration made on this form.

Where this form indicates that material must be attached to the form, you must number each attachment sequentially and identify the number of that attachment in the relevant answer.

The plan/drawing/specification/report title, number and revision should correspond with the detail in the title block for each design to which this declaration relates.

Part 1. Details

Please insert the building project address to which this declaration relates

1 Ivanhoe Place, Macquarie Park

For registered body corporates, give full names of registered individuals and the corporation on behalf of which the declaration is made.

Design practitioner name

Ghassan Habeeb

Registration number of design practitioner

DEP0001307

Class of registration (applicable to this declaration)

Structural Engineering

Body corporate name (if applicable)

-

Registration number of body corporate (if applicable)

-

Email address

gh@paragonengineering.com.au

Contact number

02 7227 7775

ABN/ACN

26 620 154 949

Part 1. Details (continued)

Q1. Is this a regulated design prepared for a Ⓟ performance solution for building work?

- ☐ Yes, (also includes a building element, proceed to Question 2)
- ☐ Yes, (only for a performance solution, proceed to Question 3)
- ☑ No, (proceed to Question 2)

Q2. Is this a regulated design prepared for a building element for building work? If yes, please select one

- ☐ Ⓕ Fire safety systems
- ☐ Ⓦ Waterproofing
- ☑ Ⓛ Load-bearing
- ☐ Ⓑ Building enclosure
- ☐ Ⓢ (Building) services

Q3. The design compliance declaration (DCD) number is made up of two parts:

a) the number (starting at DCD-001) is the number of DCD made. Subsequent numbers are DCD-002, DCD-003, etc.
b) the letter denotes what type of design the declaration relates to. Use one of the letters from above (P, F, W, L, B, S) e.g. DCD-001W

DCD-_002_Ⓛ (this is the DCD number)

Q4. Is this a regulated design prepared for an 'architectural / building design general' document by the design practitioner class of architectural for the building element of 'load-bearing' or 'building services?

Refer to Design Practitioners Handbook for explanation of 'architectural / building design general' design document.

- ☑ Yes
- ☐ No

Part 1. Details (continued)

Please group each type of document (e.g. plans/drawings/specifications/reports) together. Note that the information provided in the table should match the title block information.

If you have more than 30 items, please provide on a separate attachment using the same headings in the table below.

	Plan/drawing/specification/report title which is part of the "regulated design" being declared	Plan/drawing/specification/ report reference number	Revision number
1.	Notes Sheet	Par- 24871-S001	D
2.	Shoring Plan	Par- 24871-S100	D
3.	Shoring Elevation and Details	Par- 24871-S110	D
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Number of attachments to the certificate (if applicable)

Part 2. Declaration matters

I, Ghassan Habeeb

Insert full name acting on behalf of

\- Structural Engineering

Insert registered body corporate name (if relevant) Insert class of registration

have prepared the attached regulated design.
Declare:

1. The regulated design for which this design compliance declaration is being made complies with the requirements of the *Building Code of Australia*.

☑ Yes

☐ No

☐ There are no applicable *Building Code of Australia* requirements

If there are no applicable requirements BCA, please provide further details below

2. The regulated design for which this design compliance declaration is being made integrates details of other aspects of building work to which the design relates, and other regulated designs for the work, as far as is reasonably practicable.

☑ Yes

☐ No

If yes, by providing a brief description, please list the other aspects of building work and the other regulated designs that have been integrated into the regulated design for which this design compliance declaration is being made.

-Vandermeer Structural Drawings (Ref: S02-01, S02-11, S02-12, S02-31, S02-32) received via email on 19/07/2024.
-Vandermeer, Structural loads/surcharge applied on the shoring received via email on 25/07/2024.
- Vandermeer detailed shoring sections markup received via email on 13/08/2024.

3. Standards, codes and requirements (other than the requirements referenced in the B*uilding Code of Australia*) have been applied in preparing the regulated design for which this design compliance declaration is being made. E.g. a requirement under a development consent.

☑ Yes

☐ No

If yes, please list or attach information about the standards, codes or requirements that have been applied.

-AS 1170.0-2002 Structural Design Actions;
-AS 1170.1-2002 (R2016) – Structural Design Actions (Part 1: Permanent, imposed or other actions).
-AS 4678-2002, Earth-retaining structures;
-AS 2159-2009, Piling – Design and installation.
-AS 3600-2018, Concrete Structures and AS 4100-2020, Steel Structures.

4. Any building product referred to in preparing the regulated design or which this design compliance declaration is being made would, if used in a manner consistent with the design, achieve compliance with the *Building Code of Australia*.

☑ Yes

☐ No

Part 2. Declaration matters (continued)

5. I have sought and considered specialist advice in preparing the regulated design.

- [x] Yes
- [ ] No

If yes, please provide a brief explanation of the parts of the regulated design which have been based on the specialist advice from another person other than the person making this declaration.

- Douglas Partners Geotechnical Report (Ref: 86043.06. R.001.Rev1) issued on 04/08/2021
- JK Temporary Rock bolt Design and Permanent Shotcrete Analysis Report (Ref: 36870YFlet1) issued on 26/07/2024.

6. The regulated design involves a performance solution.

- [ ] Yes
- [x] No

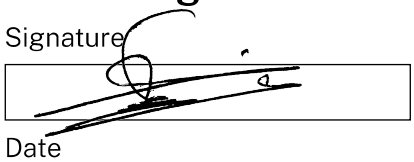
If yes, and the performance solution is not itself the regulated design identified in part 1 of this form, please provide a brief description of the performance solution, the performance solution report identifier (reference number, date and version), and the name and contact details of the person who prepared the performance solution report.

7. The regulated design accords with the Regulated Design Guidance Material relevant to the design, as per clause 9(1(c)) of the Design and Building Practitioners Regulation 2021.

- [x] Yes
- [ ] No

Part 3. Signature

Signature



Date

16/08/2024

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation. For more information visit NSW Fair Trading

Our Ref: SY220116

19 August 2024

Grindley Construction
Ground Floor, 55 Grandview Street
PYMBLE NSW 2073

Attention: **Maria Pennisi**

RE: **IVANHOE VILLAGE GREEN AND COMMUNITY CENTRE (IVANHOE C2 STAGE)**
1 IVANHOE PLACE, MACQUARIE PARK, NSW

This is to confirm that our company has carried out structural design for the above project, as documented on the following drawings prepared by us:

- S01-00_1
- S01-01_1
- S01-02_1
- S01-03_1
- S01-04_1
- S01-05_1
- S02-01_1
- S02-11_1
- S02-12_1
- S02-31_1
- S02-32_1
- S02-51_1
- S02-52_1
- S02-61_1
- S02-65_1

We certify that the structural design, as documented on the above drawings, is in accordance with accepted engineering practice and is in accordance with the relevant provisions of the following:

- The National Construction Code 2022 (Volume One). Part B (Structural Provisions)
- Relevant Australian Standards
  - as referenced in Part B1 and Schedule 2 of the NCC, including but not limited to:
    AS1170.0:2002
    AS1170.1:2002
    AS1170.2:2021
    AS1170.4:2007
    AS2159:2009
    AS3600:2018
    AS4678:2002
- Geotechnical report 86043.06.R.001.Rev1.C2 dated 4 August 2021 prepared by Douglas Partners and letter 36870YFlet1 dated 16 August 2024 by JK Geotechnics.

The following elements have been designed and certified by others, and are excluded from this certification:

- Temporary Shortcrete anchors (Design by JK Geotechnics)
- Cantilevered Shoring piles (Designed and documented by Paragon)

We confirm that the design of the above elements has been carried out in accordance with the requirements of the following conditions of consent and outlined in Development Consent SSD 15822622 issue by Minister of Planning and associated stamped approved plans:

- A12 Structural Adequacy – In accordance with the relevant requirement of the BCA/NCC.
- B29 Ecologically sustainable Development – Incorporates the environmental sustainability objectives, measures and initiatives outlined in the Midtown Stage 2 Sustainability Report, prepared by Frasers Property, dated July 2021.
- B42 Design of Retaining Walls – Proposed retaining walls have been designed in accordance with the requirements of the detailed geotechnical report.

We have assessed existing structures and roadways beyond the site boundary, but within the line of influence. We confirm that all existing structures and roadways have not been adversely affected by the design.

I am a Professional Engineer with appropriate experience and competence in this field.

Yours faithfully
van der Meer Consulting



BRIAN CARDELLI
Senior Associate
BE MProfEngLead
MIEAust CPEng NER(Struct) 2499706
APEC Engineer IntPE(Aus) RPEQ
DEP0001799
PRE0001245

Fair Trading

Design compliance declaration - single regulated design

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation.
This form is approved under clause 11(1) of the *Design and Building Practitioners Regulation 2021*.

Instructions for completing this form

You must complete all parts of this form.

Please note that under *s77 of the Design and Building Practitioners Act 2020*, Fair Trading has the power to request additional information or records from registered practitioners for an authorised purpose, such as an audit or investigation. You may therefore be requested to provide further information or records to support any declaration made on this form.

Where this form indicates that material must be attached to the form, you must number each attachment sequentially and identify the number of that attachment in the relevant answer.

The plan/drawing/specification/report title, number and revision should correspond with the detail in the title block for each design to which this declaration relates.

Part 1. Details

Please insert the building project address to which this declaration relates

1 Ivanhoe Place, Macquarie Park NSW 2113

For registered body corporates, give full names of registered individuals and the corporation on behalf of which the declaration is made.

Design practitioner name

Brian Cardelli

Registration number of design practitioner

DEP0001799

Class of registration (applicable to this declaration)

Structural Engineering Design Practitioner

Body corporate name (if applicable)

n/a

Registration number of body corporate (if applicable)

n/a

Email address

brian.cardelli@vandermeer.com.au

Contact number

(02) 9436 0433

ABN/ACN

ABN 56 158 266 301

Part 1. Details (continued)

Q1. Is this a regulated design prepared for a Ⓟ performance solution for building work?

- ☐ Yes, (also includes a building element, proceed to Question 2)
- ☐ Yes, (only for a performance solution, proceed to Question 3)
- ☑ No, (proceed to Question 2)

Q2. Is this a regulated design prepared for a building element for building work? If yes, please select one

- ☐ Ⓕ Fire safety systems
- ☐ Ⓦ Waterproofing
- ☑ Ⓛ Load-bearing
- ☐ Ⓑ Building enclosure
- ☐ Ⓢ (Building) services

Q3. The design compliance declaration (DCD) number is made up of two parts:

a) the number (starting at DCD-001) is the number of DCD made. Subsequent numbers are DCD-002, DCD-003, etc.
b) the letter denotes what type of design the declaration relates to. Use one of the letters from above (P, F, W, L, B, S) e.g. DCD-001W

DCD-_001_Ⓛ (this is the DCD number)

Q4. Is this a regulated design prepared for an 'architectural / building design general' document by the design practitioner class of architectural for the building element of 'load-bearing' or 'building services?

Refer to Design Practitioners Handbook for explanation of 'architectural / building design general' design document.

- ☑ Yes
- ☐ No

Part 1. Details (continued)

Please group each type of document (e.g. plans/drawings/specifications/reports) together. Note that the information provided in the table should match the title block information.

If you have more than 30 items, please provide on a separate attachment using the same headings in the table below.

	Plan/drawing/specification/report title which is part of the "regulated design" being declared	Plan/drawing/specification/ report reference number	Revision number
1.	Cover Sheet	S01-00	1
2.	Structural Notes - Sheet 1	S01-01	1
3.	Structural Notes - Sheet 2	S01-02	1
4.	Structural Notes - Sheet 3	S01-03	1
5.	Structural Notes - Sheet 4	S01-04	1
6.	Structural Notes - Sheet 5	S01-05	1
7.	Retention Plan	S02-01	1
8.	Retention Elevations - Sheet 1	S02-11	1
9.	Retention Elevations - Sheet 2	S02-12	1
10.	Retention Section - Sheet 1	S02-31	1
11.	Retention Section - Sheet 2	S02-32	1
12.	Retention Details - Sheet 1	S02-51	1
13.	Retention Details - Sheet 2	S02-52	1
14.	Bulk Excavation Plan	S02-61	1
15.	Bulk Excavation Section - Sheet 1	S02-65	1
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Number of attachments to the certificate (if applicable)

Part 2. Declaration matters

I, Brian Cardelli

Insert full name acting on behalf of

van der Meer Consulting (NSW)

Insert registered body corporate name (if relevant)

Structural Engineering
Design Practitioner

Insert class of registration

have prepared the attached regulated design.
Declare:

1. The regulated design for which this design compliance declaration is being made complies with the requirements of the *Building Code of Australia*.

- [x] Yes
- [ ] No
- [ ] There are no applicable *Building Code of Australia* requirements

If there are no applicable requirements BCA, please provide further details below

2. The regulated design for which this design compliance declaration is being made integrates details of other aspects of building work to which the design relates, and other regulated designs for the work, as far as is reasonably practicable.

- [x] Yes
- [ ] No

If yes, by providing a brief description, please list the other aspects of building work and the other regulated designs that have been integrated into the regulated design for which this design compliance declaration is being made.

Architectural drawings by CHROFI, DCD-001L.
Geotechnical report by JK Geotechnics, DCD-001L
Shoring drawings by Pragon Engineering , DCD-002L

3. Standards, codes and requirements (other than the requirements referenced in the B*uilding Code of Australia*) have been applied in preparing the regulated design for which this design compliance declaration is being made. E.g. a requirement under a development consent.

- [x] Yes
- [ ] No

If yes, please list or attach information about the standards, codes or requirements that have been applied.

AS1170.0:2002, AS1170.1:2002, AS1170.2:2021, AS1170.4:2007, AS2159:2009, AS3600:2018, AS4678:2002

4. Any building product referred to in preparing the regulated design or which this design compliance declaration is being made would, if used in a manner consistent with the design, achieve compliance with the *Building Code of Australia*.

- [x] Yes
- [ ] No

Part 2. Declaration matters (continued)

5. I have sought and considered specialist advice in preparing the regulated design.

- [x] Yes
- [ ] No

If yes, please provide a brief explanation of the parts of the regulated design which have been based on the specialist advice from another person other than the person making this declaration.

Douglas Partners report 86043.06.R.001.Rev1.C2 dated 4 August 2021.
JK Geotechnics letter 36870YFlet1 dated 16 August 2024.

6. The regulated design involves a performance solution.

- [ ] Yes
- [x] No

If yes, and the performance solution is not itself the regulated design identified in part 1 of this form, please provide a brief description of the performance solution, the performance solution report identifier (reference number, date and version), and the name and contact details of the person who prepared the performance solution report.

7. The regulated design accords with the Regulated Design Guidance Material relevant to the design, as per clause 9(1(c)) of the Design and Building Practitioners Regulation 2021.

- [x] Yes
- [ ] No

Part 3. Signature

Signature



Date

19/08/2024

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation. For more information visit NSW Fair Trading

Donnelley Simpson Cleary
Consulting Engineers Pty Ltd

Building Services Consulting Engineers
59 Hill Street (PO Box 40) Roseville NSW 2069
Tel (02) 9416 1177 Fax (02) 9416 8251
A.B.N. 19 050 611 437

DESIGN CERTIFICATION

Development Details

Project : Ivanhoe Village Building C2 **Job No :** 8314

Address : 1 Ivanhoe Place **Date :** 16.08.2024

Suburb : Macquarie Park **State :** NSW **P'code :** 2113

Description : For the purposes of the Construction Certificate 1 (CC1) submission as modified by S4.55 Modification No. SSD 15822622 MOD 2 dated 05.08.2024

Design Certification

Donnelley Simpson Cleary certifies that the services/work to be installed and/or constructed at the above address have been designed by engineers suitably qualified in their respective disciplines, in accordance with the applicable Deemed-to-Satisfy Provisions of the National Construction Code (NCC) 2022, the relevant Australian Standards (unless otherwise noted), as indicated on the following schedules, and covering :

- ~~Essential Fire Safety Measures – Schedule A~~
- General Building Services – Schedule B

And by:

Hydraulic Services, Fire Hydrant, hose reels and portable fire extinguishers – Xinjie Ding

- Diploma of Hydraulic Services (Plumbing)

C14, 15 & 16 Certification



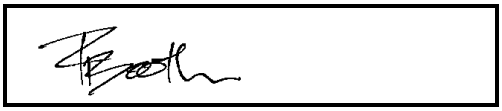
For the systems listed below :

☐	Mechanical Systems	☒	Hydraulic Systems
☐	Electrical Systems	☐	Fire Protection Systems
☐	Fire Detection Systems	☐	Lift Systems

And defined in the documentation listed in Schedule C

Signature

Name : Rod Booth **Position :** Principal

Signature :  **Date :** 16.08.2024

DESIGN CERTIFICATION

Essential Fire Safety Measures — Schedule A

Proposed Items of Work or Services	NCC 2022 Volume 1 Reference	Australian Standard Reference	Australian Standard Year	Design by DSC	Refer Note
1 Smoke detection and alarm systems	Spec 20 S20C4	AS1670.1 Amdt 1 AS1670.3 Amdt 1	2018 2018	☐	
2 Automatic fire suppression system – sprinklers	E1D4	AS 2118.1 Amdt 1 & 2	2017	☐	
3 Automatic fire suppression system – wall wetting sprinklers		AS 2118.2	2010	☐	
4 Emergency and exit lighting	E4D2, E4D3, E4D4 E4P1	AS/NZS 2293.1 Amdt 1 AS 2293.3	2018 2018	☐	
5 EWIS	E4D9	AS 1670.4 Amdt 1	2018	☐	
6 Exit signs	E4D5, E4D6, E4D8 E4P2,	AS/NZS 2293.1 Amdt 1 AS 2293.3	2018	☐	
7 Fire Control Centres (services only)	E1D15			☐	
8 Fire dampers	C4D15	AS 1668.1	2015	☐	
9 Fire hose reel systems	E1D3	AS 2441	2005	☐	
10 Fire hydrant systems	E1D2	AS 2419.1	2021	☐	
11 Lift Services - emergency	E3D5	AS 1735.11	1986	☐	
12 Carpark Ventilation	Part E2	AS 1668.1 Amdt. 1	2015	☐	
13 Impulse / Jet Fans	-	AS 1668.1 Amdt. 1 AS1670.1 Amdt 1	2015 2018	☐	
14 Portable fire extinguishers	E1D14	AS 2444	2001	☐	
15 Smoke Alarms	Spec 20	AS 3786 Amdt 1 & 2 AS 1670.6	2014 1997	☐	
16 Smoke management system (system shutdown)	Part E2	AS 1668.1 Amdt. 1	2015	☐	
17 Smoke and heat vents	Part E2	AS 1668.1 Amdt. 1	2015	☐	
18 Smoke dampers	C3D6	AS 1668.1 Amdt. 1	2015	☐	
19 Stair pressurisation systems	Part E2	AS 1668.1 Amdt. 1	2015	☐	
20 Warning and operational signs		AS 1345 AS 2419.1	1995 2021	☐	

Notes :

1. This service has not been designed to fully comply with the Deemed-to-Satisfy Provisions of the BCA and the relevant Australian Standards. The service is the subject of an Alternative Solution). The service has been documented in accordance with our understanding of the requirements of the Alternative Solution.
2. The system is existing and is to be modified as part of the works. This certification covers only the modified portions of the system.

DESIGN CERTIFICATION

General Building Services — Schedule B

Proposed Items of Work or Services	NCC 2022 Volume 1 Reference	NCC 2022 Volume 3 Reference	Australian Standard Reference	Australian Standard Year	Design by DSC	Refer Note
~~1 Mechanical Systems~~	~~NSW F6D6, F6D11, F6D12, J5D6, Part J6, Part J9~~		~~AS 1668.2~~ ~~AS 1170.4~~	~~2012~~ ~~2007~~	☐	
~~2 Electrical Systems incl. Artificial Lighting~~	~~F6D5~~		~~AS/NZS 3000~~ ~~AS/NZS 1680.0~~	~~2018~~ ~~2009~~	☐	
~~3 Cold water Services~~		~~B1D1, B3D2, B1D5, D1D2~~	~~AS 3500.1~~ ~~AS 1170.4~~ ~~Amdt 1 & 2~~	~~2021~~ ~~2007~~	☐	
~~4 Hot water services~~	~~Part J8~~	~~B2D2, B2D4, D1D2~~	~~AS 3500.4~~ ~~AS 1170.4~~ ~~Amdt 1 & 2~~	~~2021~~ ~~2007~~	☐	
~~5 Sanitary plumbing & drainage~~		~~C1D2, C2D2~~	~~AS 3500.2~~ ~~AS 1170.4~~ ~~Amdt 1 & 2~~	~~2021~~ ~~2007~~	☐	
~~6 Gas services~~			~~AS 5601~~ ~~AS 1170.4~~ ~~Amdt 1 & 2~~	~~2013~~ ~~2007~~	☐	
7 Stormwater drainage	F1D3 Part 3.3	D1P2	AS 3500.3	2021	☒	
~~8 Lift Systems~~	~~Part E3~~		~~AS 1735.1~~ ~~AS 1735.12~~ ~~AS 1170.4~~ ~~Amdt 1 & 2~~	~~2016~~ ~~1999~~ ~~2007~~	☐	

DESIGN CERTIFICATION

Document Register — Schedule C

Doc No	Rev	Drawing/Specification Title	Doc No	Rev	Drawing/Specification Title
Hydraulic Services					
H01	1	PROJECT INFORMATION			
H03	1	BASEMENT PLAN A - DRAINAGE LAYOUT			
H04	1	BASEMENT PLAN B - DRAINAGE LAYOUT			
H23	1	DETAILS SHEET 1			
H24	1	DETAILS SHEET 2			
H25	1	DETAILS SHEET 3			

Fair Trading

Design compliance declaration - single regulated design

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation.
This form is approved under clause 11(1) of the *Design and Building Practitioners Regulation 2021*.

Instructions for completing this form

You must complete all parts of this form.

Please note that under *s77 of the Design and Building Practitioners Act 2020*, Fair Trading has the power to request additional information or records from registered practitioners for an authorised purpose, such as an audit or investigation. You may therefore be requested to provide further information or records to support any declaration made on this form.

Where this form indicates that material must be attached to the form, you must number each attachment sequentially and identify the number of that attachment in the relevant answer.

The plan/drawing/specification/report title, number and revision should correspond with the detail in the title block for each design to which this declaration relates.

Part 1. Details

Please insert the building project address to which this declaration relates

1 Ivanhoe Place, Macquarie Park, NSW, 2113

For registered body corporates, give full names of registered individuals and the corporation on behalf of which the declaration is made.

Design practitioner name

Xinjie Ding

Registration number of design practitioner

DEP0001253

Class of registration (applicable to this declaration)

Hydraulics

Body corporate name (if applicable)

Not Applicable

Registration number of body corporate (if applicable)

Not Applicable

Email address

xinjie.ding@dsc.com.au

Contact number

(02) 9416 1177

ABN/ACN

190050611437

Part 1. Details (continued)

Q1. Is this a regulated design prepared for a Ⓟ performance solution for building work?

Yes, (also includes a building element, proceed to Question 2)

Yes, (only for a performance solution, proceed to Question 3)

✔ No, (proceed to Question 2)

Q2. Is this a regulated design prepared for a building element for building work? If yes, please select one

Ⓕ Fire safety systems

Ⓦ Waterproofing

Ⓛ Load-bearing

Ⓑ Building enclosure

✔ Ⓢ (Building) services

Q3. The design compliance declaration (DCD) number is made up of two parts:

a) the number (starting at DCD-001) is the number of DCD made. Subsequent numbers are DCD-002, DCD-003, etc.
b) the letter denotes what type of design the declaration relates to. Use one of the letters from above (P, F, W, L, B, S) e.g. DCD-001W

DCD-_001_Ⓢ (this is the DCD number)

Q4. Is this a regulated design prepared for an 'architectural / building design general' document by the design practitioner class of architectural for the building element of 'load-bearing' or 'building services?

Refer to Design Practitioners Handbook for explanation of 'architectural / building design general' design document.

✔ Yes

No

Part 1. Details (continued)

Please group each type of document (e.g. plans/drawings/specifications/reports) together. Note that the information provided in the table should match the title block information.

If you have more than 30 items, please provide on a separate attachment using the same headings in the table below.

Plan/drawing/specification/report title which is part of the "regulated design" being declared	Plan/drawing/specification/ report reference number	Revision number
1. PROJECT INFORMATION	H01	1
2. BASEMENT PLAN A - DRAINAGE LAYOUT	H03	1
3. BASEMENT PLAN B - DRAINAGE LAYOUT	H04	1
4. DETAILS SHEET 1	H23	1
5. DETAILS SHEET 2	H24	1
6. DETAILS SHEET 3	H25	1
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30.		

Number of attachments to the certificate (if applicable)

Part 2. Declaration matters

I, Xinjie Ding

Insert full name acting on behalf of

Not Applicable

Insert registered body corporate name (if relevant)

Design Practitioner - Hydraulics

Insert class of registration

have prepared the attached regulated design.
Declare:

1. The regulated design for which this design compliance declaration is being made complies with the requirements of the *Building Code of Australia*.

✔ Yes

No

There are no applicable *Building Code of Australia* requirements

If there are no applicable requirements BCA, please provide further details below

2. The regulated design for which this design compliance declaration is being made integrates details of other aspects of building work to which the design relates, and other regulated designs for the work, as far as is reasonably practicable.

✔ Yes

No

If yes, by providing a brief description, please list the other aspects of building work and the other regulated designs that have been integrated into the regulated design for which this design compliance declaration is being made.

Bulk Excavation, Piling & Shoring design by Van der Meer structural engineers, Design Practitioner: Brian Cardelli (DEP0001799), DCD-001L, Drawings S02-01_1, S02-11_1, S02-12_1, S02-31_1, S02-32_1, S02-51_1, S02-61_1, S02-65_1,
Architectural Grid Set Out Plan by CHROFI Design Practitioner: Steven Fighera (DEP0001770), DCD-001L, Drawing: A-CD-010_02

3. Standards, codes and requirements (other than the requirements referenced in the B*uilding Code of Australia*) have been applied in preparing the regulated design for which this design compliance declaration is being made. E.g. a requirement under a development consent.

✔ Yes

No

If yes, please list or attach information about the standards, codes or requirements that have been applied.

AS 3500.3 -2021 - Stormwater Drainage

4. Any building product referred to in preparing the regulated design or which this design compliance declaration is being made would, if used in a manner consistent with the design, achieve compliance with the *Building Code of Australia*.

✔ Yes

No

Part 2. Declaration matters (continued)

5. I have sought and considered specialist advice in preparing the regulated design.

✔ Yes

No

If yes, please provide a brief explanation of the parts of the regulated design which have been based on the specialist advice from another person other than the person making this declaration.

BBulk excavation levels and shoring design by Van der Meer structural engineers
Architectural set out by CHORFI Architects
Swimming pool plant, balance tank and back wash tank sizes as advised by Crystal Pools
BCA advice received by AED Consulting
Landscape design advice from Site Design & Studios

6. The regulated design involves a performance solution.

Yes

✔ No

If yes, and the performance solution is not itself the regulated design identified in part 1 of this form, please provide a brief description of the performance solution, the performance solution report identifier (reference number, date and version), and the name and contact details of the person who prepared the performance solution report.

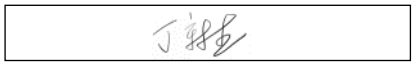
7. The regulated design accords with the Regulated Design Guidance Material relevant to the design, as per clause 9(1(c)) of the Design and Building Practitioners Regulation 2021.

✔ Yes

No

Part 3. Signature

Signature



Date

16.08.2024

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation. For more information visit NSW Fair Trading

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MGAC
A Jensen Hughes Company

Liz Yao
Development Manager
Frasers Property Australia
Level 7/343 George Street
Sydney NSW 2000

16th May 2023

Dear Liz,

RE: Project Name – S4.55 Access Statement

This letter has been prepared by Morris Goding Access Consulting (MGAC) for Frasers Property Australia to support the S4.55 application for the construction of the Building C2 located at Ivanhoe Village Green & Community Centre.

MGAC has reviewed and assessed the following drawings prepared in respect of the S4.55 application submission.

Drawing Number	Drawing Name	Revision
A-CD-101	Basement Plan A	K-WIP
A-CD-102	Basement Plan B	K-WIP
A-CD-103	Lower Ground Plan A	K-WIP
A-CD-104	Lower Ground Plan B	K-WIP
A-CD-105	Upper Ground Plan A	K-WIP
A-CD-106	Upper Ground Plan B	K-WIP
A-CD-107	Roof Plant Plan	K-WIP
A-CD-108	Roof Plan A	K-WIP
A-CD-109	Roof Plan B	K-WIP

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MGAC
A Jensen Hughes Company

The MGAC Report (DA V2) dated 28th June 2021 that supported the original Project Application concluded that the accessibility for the Building C2 located at Ivanhoe Village Green & Community Centre will be able to achieve the accessibility design requirements as set out in the DDA Access to Premises Standards.

On this basis, MGAC is of the opinion that the proposed S4.55 drawings do not require any additional supporting information, analysis or commentary at this stage of the design and compliance with DDA Premises Standards and Australian Standards can be achieved.

Prepared by

DocuSigned by:
Andrew Shomar
BB9C8948B4FF47F...

Andrew Shomar

Senior Access Consultant

Morris Goding Access Consulting

Reviewed by

DocuSigned by:
Anthony Leuzzi
C7E1E55B20864D3...

Anthony Leuzzi

Associate Director

Morris Goding Access Consulting

Morris Goding
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C2- Ivanhoe Village Green and Community Centre

DA Review – Final V2

28 June 2021

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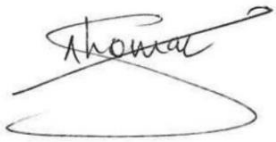
REPORT REVISIONS		
Date	Version	Drawing No / Revision
19/05/2021	Draft	Pre-DA drawing set– Issued for Review (rev 02 – 11/5/2021)
01/06/2021	Final	Pre-DA drawing set- issued for Review (rev 05 – 31/05/2021)
28/06/2021	Final V2	DA Drawing set: Issue 4-Issued for Review (Rev 06- 23/06/2021)

This report prepared by:



Andrew Shomar
Access Consultant
Morris Goding Accessibility Consulting

Morris Goding
Access Consulting

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Morris Goding
Access Consulting

1. Executive Summary

The Access Review Report is a key element in the of Building C2, Ivanhoe Village Green & Community Centre, and an appropriate response to the AS1428 series, Building Code of Australia (BCA), DDA Access to Premises Standards (including DDA Access Code) and ultimately the Commonwealth Disability Discrimination Act (DDA).

Morris-Goding Accessibility Consulting has prepared the Access Report to provide advice and strategies to maximise reasonable provisions of access for people with disabilities.

The review will ensure that ingress and egress, paths of travel, circulation areas, and sanitary facilities comply with relevant statutory guidelines, and in addition, compliance with a higher level of accessibility and inclusiveness benchmarks set by the project.

Morris Goding
Access Consulting

2. Introduction

2.1 Background

CHROFI has engaged Morris-Goding Access Consulting, to provide a design review of C2, Ivanhoe Village Green & Community Centre

The proposed development falls under a number of BCA classifications:

- Class 5 (commercial / office)
- Class 6 (retail)
- Class 10a (gymnasium)
- Class 10b (swimming pool)

The requirements of the investigation are to:

- Review supplied drawings of the proposed development;
- Provide a report that will analyse the provisions of disability design of the development, and
- Recommend solutions that will ensure the design complies with the Disability Discrimination Act (DDA), Building Code of Australia (BCA), relevant Australian Standards, and enhanced benchmark requirements set by the project.

2.2 Objectives

The Report seeks to ensure compliance with statutory requirements and enhanced benchmark requirements set by the project. The Report considers user groups, who include students, staff, and members of the public. The Report attempts to deliver equality, independence and functionality to people with a disability inclusive of:

- People with a mobility impairment (ambulant and wheelchair);
- People with a sensory impairment (hearing and vision); and
- People with a dexterity impairment

The Report seeks to provide compliance the Disability Discrimination Act 1992. In doing so, the report attempts to eliminate, as far as possible, discrimination against persons on the ground of disability.

2.3 Limitations

This report is limited to the accessibility provisions of the building in general. It does not provide comment on detailed design issues, such as: internals of accessible/ambulant toilet, fit-out, lift specification, slip resistant floor finishes, door schedules, hardware and controls, glazing, luminance contrast, stair nosing, TGSIs, handrail design, signage etc. that will be included in construction documentation.

2.4 Accessibility of Design

The proposed design will utilise the Federal Disability Discrimination Act (DDA), Disability (Access to Premises – Buildings) Standards 2010, BCA/DDA Access Code, Universal Design principles, the AS 1428 Series, and other design guidelines, to develop appropriate design documentation, to provide reasonable access provisions for people with disabilities.

The Project Architect and an appropriately qualified accessibility consultant will examine key physical elements during design development stage, to identify physical barriers and incorporate solutions as a suitable response to disability statutory regulations and other project objectives.

The design will be developed to ensure the principles of the DDA are upheld. Under the DDA, it is unlawful to discriminate against people with disabilities in the provision of appropriate access, where the approach or access to and within a premise, makes it impossible or unreasonably difficult for people with disabilities to make use of a particular service or amenity.

The design will comply with the requirements of the DDA Access to Premises Standards and include requirements for accessible buildings, linkages and the seamless integration of access provisions compliant with AS1428.1. The developed design will consider all user groups, who include members of the public, visitors, students and staff members.

2.5 Statutory Requirements

The statutory and regulatory guidelines to be encompassed in the developed design to ensure effective, appropriate and safe use by all people including those with disabilities will be in accordance with:

- Federal Disability Discrimination Act (DDA);
- Disability (Access to Premises – Buildings) Standards 2010;
- Building Code of Australia (BCA) Part D3, F2, E3;
- AS 1428.1:2009 - (General Requirement of Access);
- AS 1735.12:1999 - (Lift Facilities for Persons with Disabilities);
- City of Ryde Development Control Plan 2014- Part 9.2 Access for People with Disabilities

Please note that there are also additional advisory standards (not currently referenced by BCA or DDA Premises Standards) as well as other relevant guidelines that will be considered, as relevant to promote equity and dignity in line with over-arching DDA principles and aspirational objectives. These include:

- Universal Design Principles;
- Human Rights Commission (HEREOC)
- Advisory Note February 2013 on streetscape, public, outdoor areas, fixtures, fittings and furniture;
- AS1428.2:1992 Enhanced and Additional requirements;
- AS1428.4.1 Draft Way-finding Standard;
- AS3745:2010 – Planning for Emergencies in Facilities (to assist with design strategies for provision for escape for people with disability that may require assistance)

Morris Goding
Access Consulting

3. General Access Planning Considerations

The Disability Discrimination Act 1992 (DDA) is a legislative law that protects the rights of all people. The Act makes disability discrimination unlawful and promotes equal rights, equal opportunity and equal access for people with disabilities. The Australian Human Right Commission is the governing body who control and enforce DDA compliance.

Nevertheless, building elements that provide insufficient accessible provisions for people with disabilities remain subject to the DDA. The improvement of non-compliant building elements and areas to meet current access requirements will mitigate the risk of a DDA complaint be made against the building owner.

Since the 1st May 2011, the Commonwealth's Disability (Access to Premises – Buildings) Standards 2010 (DDA Premises Standards) apply to all new building works and to affected parts of existing buildings.

The DDA Premises Standards' requirements (DDA Access Code) are mirrored in the access provisions of the BCA. New building work and affected parts must comply with the DDA Premises Standards and AS1428.1-2009 in the same manner as they would comply with the BCA by meeting deemed-to-satisfy provisions or by adopting an alternative solution that achieves the relevant performance requirements.

By utilizing AS 1428 suite of Standards, the overall aim is to provide continuous accessible paths of travel to connect the proposed development to and through public domain areas and between associated accessible buildings in accordance with the DDA Access Code.

MGAC supports the use and consideration of universal design (UD) principles into the design to maximize access for all people. We will assist the design team to incorporate UD principles where possible within the project, while still meeting mandatory compliance requirements.

A UD approach has numerous benefits for the client as an education provider, for businesses within the building, for individual users and for society in general. An inclusive environment that can be accessed, understood and used by as many people as possible, is good business sense, is more sustainable and is socially progressive, in line with the aims of the DAP.

Universal design principles consider the needs of a broad range of people including older people, families with children and pushing prams, people from other cultures and language groups, visitors in transit and people with disability. By considering the diversity of users, the design will embed access into and within it, so that benefits can be maximized, without adding on specialized 'accessible' features that can be costly, visually unappealing and may perpetuate exclusion and potential stigma.

The seven key Universal design principles to consider in the on-going design include:

- Principle 1: Equitable Use
- Principle 2: Flexibility in Use
- Principle 3: Simple and Intuitive Use
- Principle 4: Perceptible Information
- Principle 5: Tolerance for Error
- Principle 6: Low Physical Effort
- Principle 7: Size and Space for Approach and use

Morris Goding
Access Consulting

4. Ingress & Egress

4.1 External Linkages

The BCA and DDA Premises Standards contain requirements for site approaches for the use of persons with disabilities. These requirements can be summarised as follows:

- It will be necessary to provide an accessible path of travel from main pedestrian entry points at the site allotment boundary to all building entrances compliant with AS1428.1:2009.
- An accessible path of travel between buildings (or parts of buildings) that are connected by a pedestrian linkage, within the site allotment boundary, compliant with AS1428.1:2009 is also required.
- An accessible path of travel to building entrances (required to be accessible) from associated accessible car-parking bays, compliant with AS1428.1:2009 is required.

Assessment

MGAC has reviewed the drawings and documentation in relation to the aforementioned requirements.

On the basis of the current level of detail all access requirements appear capable of achieving compliance subject to further detail demonstrating the accessible path of travel from the site boundary and an accessible path of travel between parking bays to main pedestrian entry (i.e., Lift Lobby).

Further work will be required during design development stage to ensure appropriate outcomes are achieved.

4.2 Entrances

The BCA and DDA Premises Standards contain requirements for building entry for the use of persons with disabilities. These requirements can be summarised as follows:

- Access is required through at least 50% of entrances, including the principal pedestrian entrance/s to all buildings or parts of buildings (ie. when they have a separate function and/or use eg. external retail tenancy). Note it is preferred that all entrances are accessible.
- A non-accessible entry cannot be located more than 50m distance from an accessible entry (for buildings greater than 500m2).
- All accessible doors to have 960mm min. clear width opening and suitable door circulation area, compliant with AS1428.1:2009 and City of Ryde DCP. Note: Manual doors require lightweight door forces to be operable by people with disabilities (20N max.). We recommend that main entrances include automated sliding doors to be used where possible. Revolving doors are not accessible, if maintained an alternate accessible door is required adjacent.

- An accessible path of travel eg. ramp or lift needs to be provided adjacent (or in reasonable proximity) to any stair access. Note: providing choice of access route directly adjacent so that people can start and finish in the same location/travel similar route promotes inclusion and UD principles.

Assessment

MGAC has reviewed the drawings and documentation in relation to the aforementioned requirements.

On the basis of the current level of detail all access requirements appear capable of achieving compliance subject to the provisions of compliant 960mm clear door openings to the building entrances and compliant door circulation to the building entrances.

Further work will be required during design development stage to ensure appropriate outcomes are achieved.

4.3 Emergency Egress

BCA 2016 Part D2.17 has requirements for all fire-isolated egress stairs from areas required to be accessible (not communication stairs) to include at least one continuous handrail designed to be compliant with AS1428.1 Clause 12. Provision of an off-set tread at the base of stair flights or an extended mid-landing that will allow a 300mm extension clear of egress route is considered appropriate for achieving a consistent height handrail (without vertical or raked sections). Such an off-set tread configuration has been shown at the majority of stairs and would appear to be possible elsewhere, subject to further detail design.

Where fire-isolated egress stairs will also be used for communication stair purposes between levels, they should be designed to meet AS1428.1:2009. Confirmation is required on the likely use of certain stairs for this purpose.

There is currently no mandatory requirement within BCA or DDA Premises Standards for provision of independent accessible egress for people with a disability in accordance AS1428.1 and this remains an important DDA issue. Consideration of an accessible egress strategy with emergency evacuation plan will be needed as a minimum starting point.

Consideration of waiting spaces within fire-stairs should be strongly considered for people with mobility impairment. The current configuration of stairs suggests the spatial requirements would not be incorporated without layout amendments, but if provided with future design development these would generally require:

- 850mm min. clear width egress door and 510mm min. external door circulation area, compliant with AS1428.1:2009;
- Wheelchair space (800mm W x 1300mm L min. dimensions) within fire-isolated stair, outside of the required egress path, that can be accessed on a continuous path of travel.
- Alternative evacuation means eg. emergency passenger lift/s could be provided instead of/or only in addition to ‘waiting spaces’ in line with ABCB Handbook and/or

consideration of stair evacuation devices (with appropriate storage and staff training) within fire stairs.

5. Paths of Travel

5.1 Circulation Areas

The BCA and DDA Premises Standards contain requirements for circulation areas for the use of persons with disabilities. These requirements can be summarised as follows:

- Wheelchair passing bays (1800mm width x 2000 length) are also required when a direct line of sight is not available and are to be provided at 6m max. intervals along access-ways in accordance with City of Ryde DCP.
- Turning spaces (at least 1540mm W x 2070mm L) are required within 2m of every corridor end and at 20m.max intervals along all access-ways. This is needed for wheelchairs to make a 180 degree turn, compliant with AS1428.1:2009.
- All common-use doors (ie. not excluded under Part D3.4) to have 960mm min. clear width opening (each active door leaf) and suitable door circulation area, compliant with AS1428.1:2009 and City of Ryde DCP.
- All common-use corridors and accessible paths of travel to be at least 1200mm min. in accordance with Ryde Access DCP). Note: Increased clear width paths of travel required for doorway circulation, turning areas etc.

Assessment

MGAC has reviewed the drawings and documentation in relation to the aforementioned requirements.

On the basis of the current level of detail all access requirements appear capable of achieving compliance subject to:

- The included provision of 960mm clear door openings for common-use doors and compliant door circulation (I.e., 1450mm depth and 510mm/ 530mm latch side clearances).
- The provision of a level threshold into the bin room with a 1540 x 2070mm circulation space in front of large bins.
- Confirmation of exempt areas under BCA 3.4 – See MGAC Mark-ups.
- The provision of a 1200mm path of travel in accordance with City of Ryde DCP- section 9.2

Further work will be required during design development stage to ensure appropriate outcomes are achieved.

5.2 Passenger Lifts

The BCA and DDA Premises Standards contain requirements for passenger lifts and circulation areas for the use of persons with disabilities. These requirements can be summarised as follows:

- Passenger lifts to have min. internal size at floor of 1400mm width x 1600mm depth, compliant with BCA/DDA Access Code Part E3.6 and AS1735.12.
- All lift lobbies and main corridors on each level to have 1800mm min. clear width to allow two wheelchairs ability to space pass each other.

Assessment

MGAC has reviewed the drawings and documentation in relation to the aforementioned requirements.

On the basis of the current level of detail all access requirements appear capable of achieving compliance.

Further work will be required during design development stage to ensure appropriate outcomes are achieved.

5.3 Stairs, Ramps and Walkways

The BCA and DDA Premises Standards contain requirements for stairs and ramps for the use of persons with disabilities. These requirements can be summarised as follows:

- Ramps are to have maximum 1:14 gradient with landings at no more than 9 metre intervals
- Ramps are to have handrails on both sides with minimum 1 metre clearance in accordance with AS1428.1
- Landings are to have 1200mm length with 1500mm length at 90 degree turns
- Stairs are to have handrails on both sides in accordance with AS1428.1 and City of Ryde DCP.
- Stairs and ramps are to be offset to ensure no encroachment of handrail extensions into from transverse path of travel at top and bottom of stair/ramp

Assessment

MGAC has reviewed the drawings and documentation in relation to the aforementioned requirements.

On the basis of the current level of detail all access requirements appear capable of achieving compliance subject to:

- The installation of the stairs 900mm min. from the site boundary for the compliant provision of TGSI's and handrail extension
- The provision of 1200mm deep landings at walkways where gradients are between 1:20 – 1:33.
- The identification of gradients and walkways/ramps within the Passive Seating Area

Further work will be required during design development stage to ensure appropriate outcomes are achieved.

Morris Goding
Access Consulting

6. Facilities & Amenities

6.1 Sanitary Facilities

The BCA and DDA Premises Standards contain requirements for sanitary facilities suitable for the use of persons with disabilities. These requirements can be summarised as follows:

- For Class 5, 6, 7a, 9b: Provide at least 1 unisex accessible toilet, adjacent to every bank of toilets (where provided) on each storey, compliant with AS1428.1 under BCA/DDA Access Code part F2.4. If more than 1 toilet bank provided on each level, accessible toilet is required at 50% min. of toilet banks at each level.
- For Class 9b: If common-use change facilities provided (ie. both toilets and showers) a separate combined accessible WC/shower adjacent to male and female change rooms is required, compliant with AS1428.1 under BCA/DDA Access Code Part F2.4.
- An even number of left hand (LH) and right hand (RH) transfer WC pans (accessible toilets) is required within the building. Alternating LH/RH layouts on each subsequent level is the most appropriate and inclusive approach.
- Accessible WC requires 2300mm x 1900mm around the pan with the basin to sit outside this area in accordance with AS1428.1.
- An ambulant cubicle is required within every standard toilet bank adjacent to an accessible toilet under DDA Access Code Part F2.4 compliant with AS1428.1:2009.

Assessment

MGAC has reviewed the drawings and documentation in relation to the aforementioned requirements.

On the basis of the current level of detail all access requirements appear capable of achieving compliance subject to:

The provision of 50% alternation between LH and RH transfer Accessible WCs as identified on the attached marked-up drawings

The provision of 960mm wide clear doors to and within the Acc WC as required under City of Ryde DCP- Section 9.2.

Further work will be required during design development stage to ensure appropriate outcomes are achieved.

6.2 Common Areas

The BCA and DDA Premises Standards contain requirements for common use areas suitable for the use of persons with disabilities. These requirements can be summarised as follows:

- For class 2 and class 3 buildings, access is required to a unique common use facility such as swimming pool, sauna, common laundry, entertainment rooms.
- For swimming pools, a means of access is required into the pool in accordance with DDA Premises Standards
- Accessibility is required to common use courtyards within buildings
- Mailboxes and garbage rooms within residential buildings require appropriate accessibility.
- Wheelchair access is required to any external and outdoor terrace areas including roof terraces compliant with AS1428.1.

Assessment

MGAC has reviewed the drawings and documentation in relation to the aforementioned requirements.

On the basis of the current level of detail all access requirements appear capable of achieving compliance, subject to the provision of providing compliant access to and within the swimming pool and gymnasiums facilities (for gymnasiums refer to entrances).

Further work will be required during design development stage to ensure appropriate outcomes are achieved.

6.3 Car Parking

The BCA and DDA Premises Standards contain requirements for parking which are applicable to this project. These requirements can be summarised as follows:

- Class 5 commercial, 9b development: Provide 1 accessible car bay for every 100 car bays or part thereof, compliant with AS2890.6.
- Class 6 retail development: Provide 1 accessible car bay for every 50 car bays or part thereof, compliant with AS2890.6.
- Class 3 residential. Number of accessible car bays based on total number of car bays multiplied by percentage of accessible SOU to the total SOUs.
- Accessible car bays require 2.4 metre with 2.4 metre shared area.
- Class 2 residential. Provide an adaptable unit car bay for each adaptable unit. These car bays can have 3.8 metre width or 2.4 m with 2.4 metre shared zone
- All accessible car bays to be located near relevant lifts and/or associated building entry points to minimise distance to relevant lift and ensure accessible path of travel between these areas.
- Ensure 2.5m min. height clearance, compliant with AS2890.6 fig 2.7 over accessible car bays with 2.2 m min. vertical clearance leading to the accessible and adaptable unit car bays (Note: consideration for 2.3 or 2.4m min. height preferred for higher vans/adapted vehicles is recommended as good practice).

Assessment

MGAC has reviewed the drawings and documentation in relation to the aforementioned requirements. On the basis of the current level of detail all access requirements appear capable of achieving compliance subject to the provision of plans of Basement 3 to review:

- Size of Accessible Car Parking bays and
- The accessible path of travel to the lifts from the parking bays

Further work will be required during design development stage to ensure appropriate outcomes are achieved.

Morris Goding
Access Consulting

7. Conclusion

MGAC has assessed the proposed scheme for C2, Ivanhoe Village Green & Community Centre. The proposed drawings indicate that accessibility requirements, pertaining to external site linkages, building access, common area access, sanitary facilities and parking can be readily achieved. It is advised that MGAC will work with the project team as the scheme progresses to ensure appropriate outcomes are achieved in building design and external domain design.

Receipt No.L0000156469

Levy Receipt

Date: 27/06/2024

Development Applicant

FRASERS PROPERTY IVANHOE PTY LIMITED
1C HOMEBUSH BAY DR RHODES NSW 2138 AU

Development Details

Application Type:	Government Development Application
Application No.:	SSD15822622 - BW-2024-1045
Approving Authority:	DEPT OF PLANNING, INDUSTRY & ENVIRONMENT
Site Address:	1 IVANHOE PL MACQUARIE PARK NSW 2113

Levy Details

Levy No.:	L0000156469
Cost of Works (incl. GST):	$29,856,650.73
Levy Payable:	$74,641.00
Total Amount Paid (excl. Surcharge):	**$74,641.60**

9 Mahogany Avenue, Macquarie Park NSW 2113

Community Facilities Building C2

SSD 15822622 (Condition B6 & B7)

Pre-Construction Compliance Report

Job No:6410



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1. Introduction

The Pre-Construction Compliance Report (PCCR) has been prepared for the work occurring under SSD15822622, at 9 Mahogany Avenue, Macquarie Park NSW 2113, Stage 2 Community facility building Project (the Project).

The site (Building C2 / C2 / Village Green & Community Centre) is located within Frasers Property Australia's Ivanhoe Estate (Midtown) Development, located in Macquarie Park near the corner of Epping Road and Herring Road within the Ryde Local Government Area (LGA). Building C2 is located centrally within the Ivanhoe Estate; and will be situated between Buildings C1 & C3.

1.1 Project Description

The Works will involve a Design and Construct Contract (AS4902 modified) for the Design and Construction Works of the C2 building. The works included in SSD 15822622 consists of the construction of a Community Centre, local café, gym and pool facilities, and a local village green park area including:

- Construction of plant room areas.
- Construction of cold-shell gym tenancies on the ground floor plane, including all services and elements required to enable issuance of an Occupation Certificate of the cold-shell tenancy upon Practical Completion.
- Construction of pool and adjoining facilities in accordance with the preliminary design.
- Landscape works are to include park areas and playground areas as noted in the preliminary design.
- Public domain areas located on the ground plane adjacent the C2 building boundary.
- An extension of the neighboring residential tower noted as Building C1 which was subject to a respective FEBQ and FER.
- Utilities Services and Infrastructure

1.2 Background:

Project Application Number:	SSD 15822622
Project Name:	Ivanhoe Estate, Macquarie Park
Description of Project:	Construction of Community Building C2
Project Address:	1 Ivanhoe Place Macquarie Park NSW
Expected Date of Construction Commencement:	27.08.2024

1.3 Purpose of this report

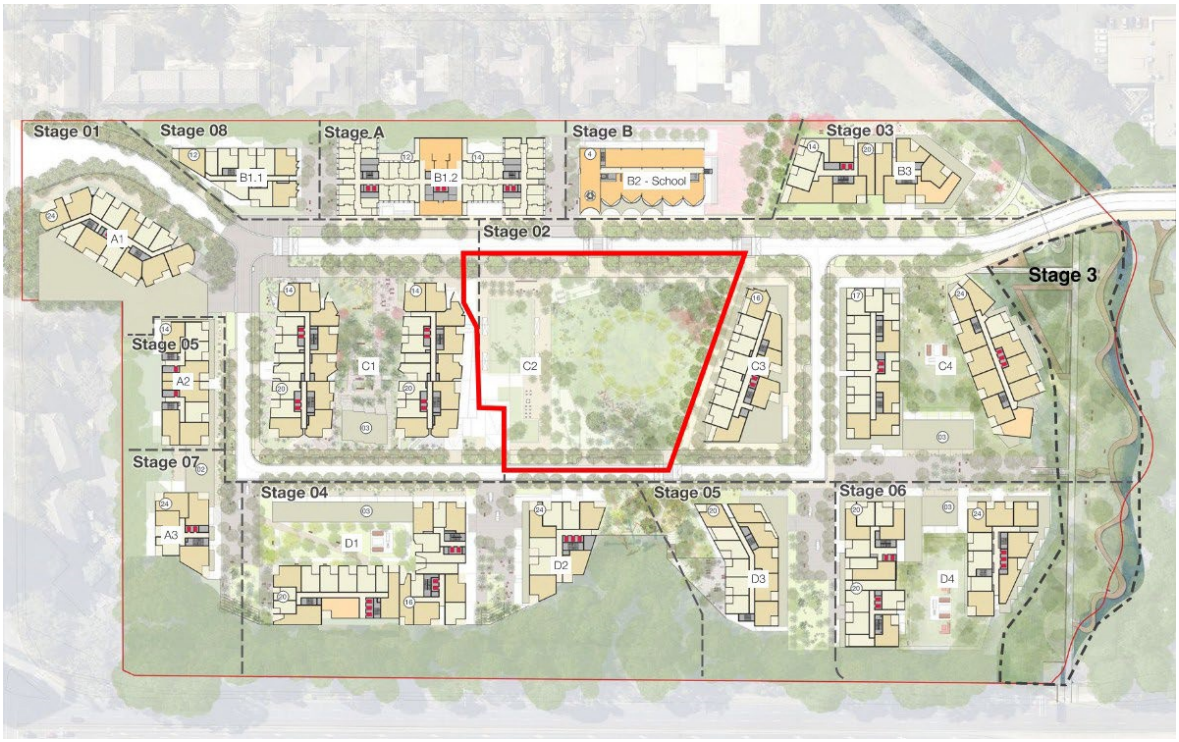
The Pre-Construction Compliance Report addresses all requirements needing to be satisfied prior to the commencement of Construction and in accordance with Compliance Reporting Post Approval Requirements. The requirements of the PCCR related to planning conditions B6 to B8 are provided below in Table 1.

Table 1 – Compliance Reporting

Condition	Condition Requirement	How Addressed
B6.	A Pre-Construction Compliance Report must be prepared for the development and submitted to the Certifying Authority for approval before the commencement of construction. A copy of the endorsed compliance report must be provided to the Department at compliance@planning nsw.gov.au before the commencement of construction.	This Pre-Construction Compliance Report has been submitted to the Secretary and Certifying Authority before the commencement of construction. Record Keeping System for communications with Certifying Authority.
B7.	The Pre-Construction Compliance Report must include: (a) details of how the terms of this consent that must be addressed before the commencement of construction have been complied with; and (b) the expected commencement date for construction.	This Pre-Construction Compliance Report has been submitted to the Secretary and Certifying Authority before the commencement of construction. Record Keeping System for communications with Certifying Authority. Details of this consent are identified in the compliance status table.
B8.	Construction Compliance Reports must be submitted to the Department at compliance@planning.nsw gov.au for information every six months from the date of the commencement of construction, for the duration of construction. The Construction Compliance Reports must provide details on the compliance performance of the development for the preceding six months and must be submitted within one month following the end of each six-month period for the duration of construction of the development, or such other timeframe as required by the Planning Secretary.	Record Keeping System for submission to Planning Secretary

1.3 Staging of the Works

The Works are being carried out in a single stage with relation to Building C2 while maintaining access for works undertaken on the remainder of the site and ensuring an efficient construction methodology.



Site Location Plan

Below is an indicative program for Crown Certificates/Construction Certificates (CC) in line with the construction program:

Table 2 – CC Application Program

Construction Certificate No.1 - 23.08.2024
Piling, earthworks, stormwater and demolition
Construction Certificate No.2 - 22.10.2024
Full above ground Structure to roof, base build services
Construction Certificate No.3 - 16.01.2025
Façade, external works, public domain and landscaping and updates to BCA, DDA & FER & JV3 as required

1.4 Key Project Personnel

All employees, contractors (and their sub-contractors) have been made aware of, and have been instructed to comply with, the conditions of consent relevant to activities they carry out in respect of the development as per Condition A2.

Organisation	Position	Representative	Contact Details
Head Contractor Grindley	Construction Manager	Evan Graves	0404321756 egraves@grindley.com.au
Project Manager Grindley	Project Director	Peter Wilson	0414 914 514 pwilson@grindley.com.au

1.5 Reporting Timing

This Compliance Report is to be submitted to the Planning Secretary prior to commencement of construction. Construction works for the Project are notified to be commencing 27th August 2024.

The Reporting Period for this Pre-Construction Compliance Report is from the granting of consent on the 28th of November 2022 to the proposed notified date of commencement of Construction.
The Schedule of Compliance reporting is presented in Table 4 below; Construction Start Date: 27th August 2024.

Table 3 - Compliance Reporting Program

Report	Timing	Anticipated Lodgment Date
Pre-Construction Compliance Report (B6)	No later than 48 hours prior to commencement of construction	No later than 20th August 2024
Construction Compliance Report #1	26 weeks intervals from date of commencement of construction	No later than 8th January 2025
Construction Compliance Report #2	26 weeks intervals from date of commencement of construction	No later than 9th July 2025
Construction Compliance Report #3	26 weeks intervals from date of commencement of construction	No later than 7th January 2026
Construction Compliance Report #4	26 weeks intervals from date of commencement of construction	No later than Not applicable
Pre-Operation Compliance Report (B28b)	Prior to the commencement of Operation	No later than 16th January 2026
Operations Compliance Reports	At intervals, no greater than 52 weeks from the date of commencement of operations	*Operation date to be confirmed. 10th January 2027

Note 1: *Condition B5:notification 48 hours prior to construction start is 23.08.2024*
Note 2*: Works are assumed to be completed 'target' program 20.3.26.*
Note 3: *The anticipated date of Compliance Reporting is the approximate date nominated for lodgment of the Compliance Reports and may vary according to any changes in date of commencement of Construction and date of commencement of Operation..*

2 Previous Reports Actions

This Pre-Construction Compliance Report is the first compliance Report for SSD 15822622 as set out in Compliance Monitoring and Reporting Program.

3 Modifications Undertaken

One modification has been lodged since consent was granted. Documents relating to the assessment and determination of the Project and its modifications are located at the Department's major projects website, refer https://www.planningportal.nsw.gov.au/major-projects/projects/mod-2-amendments-building-c2-and-stratum-subdivision-updates-conditions-consent

SSD-15822622-Mod-2 approval includes the following changes:

Location	Item
Basement	Basement layout revised and extent of excavation reduced.
Lower Ground	Curved glazing and circular stair removed. Stairs relocated around lift.
Lower Ground - Gym	Gym sliding glass doors replaced with fixed windows.
Lower Ground - Gym	Gym amenities layout revised.
Lower Ground - Pool	Pool amenities layout revised.
Lower Ground - Pool	Pool sliding glass doors replaced with fixed windows.
Lower Ground - Pool	Pool shifted west to reduce extent of pool by one bay and increase landscaping.
Lower Ground - Landscape	Reflective pond and fence removed to be replaced with bioswale.
Upper Ground - Cafe	Skylight removed.
Upper Ground - Cafe	Glazed hob replaced with solid upstand at North and East facades.
Upper Ground - Community	Community Room 1 facade revised glazed hob replaced with solid upstand.
Upper Ground - Community	Community Room 2 facade revised to have less glazing and more solid.
Upper Ground - Gardens	Extent of balcony planters above pool reduced.
Roof - Pergola	Pergola extent reduced.
Roof - Pergola	Pergola planter and maintenance walkway removed.
Roof - Plant	Rooftop plant lift access replaced with stair access only.
Roof - Lift	Reduce height of lift structure.

4 Compliance Status Summary

Details and Status of Compliance to each of the Conditions of Consent are recorded in the Table of Compliance provided in Appendix A.

Table 3 – Summary of Status Descriptors

Status	Descriptor
Compliant	The proponent has collected sufficient verifiable evidence to demonstrate that all elements of the requirement have been complied with.
Non-Compliant	The proponent has identified a non-compliance with one or more elements of the requirement.
Not Triggered	A requirement has an activation or timing trigger that has not been met at the phase of the development when the compliance assessment is undertaken, therefore an assessment of compliance is not relevant

Table 4 – Detail of Non-Compliance

CC ID	Condition Requirement	Reason for Non-Compliance	Action / recommendation

Pre-Construction Compliance Report will be lodged no later than 48 hours prior to commencement of construction. Anticipated lodgment date for this report will be no later than 10th July 2024.

5 Incidents

A register of all incidents, as defined by the conditions of consent, is to be maintained with the following information:

a. The cause and nature of the incident, the date it occurred and the date it was identified;
b. Location of the incident;
c. How the incident was identified;
d. The agency, or agencies to whom the incident was reported;
e. Details of any corrective and preventative action required by agencies and any undertaken by the proponent; and
f. The response to the incident, including details of timing for undertaking such actions (i.e. that corrective and preventative action is not required, has commenced or is completed).

6 Complaints

Getting in touch

Call: 13 38 38

Email: midtowncommunityfeedback@frasersproperty.com.au

Visit: 1 Ivanhoe Place, Macquarie Park NSW 2086

A list or table of complaints received, as defined by the Conditions is to be maintained with the following information:

- The number of complaints received; and
- A summary of the main areas of the complaint.

The below table will be maintained for all complaints received. Grindley have received no complaints to date.

Date of Complaint	Date of Response	Method of Complaint	Nature of Complaint	Project Response	Complaint Status

In accordance with Condition B11– A complaints register will be maintained and updated monthly on the Project website.

7 Construction Environmental Management plan (CEMP) Condition B9 (c)

The Construction Environmental Management Plan has not received any reviews within the reporting period. This is a pre-construction compliance report, and no construction has been carried out during the reporting period.

Appendix A

Compliance Table

Please see the below Compliance Table.

ITEM	CONDITION	EVIDENCE/ COMMENTS	COMPLIANCE STATUS
PART A - ADMINISTRATIVE CONDITIONS			
OBLIGATION TO MINIMISE HARM TO THE ENVIRONMENT			
A1	In addition to meeting the specific performance measures and criteria in this consent, all reasonable and feasible measures must be implemented to prevent, and if prevention is not reasonable and feasible, minimize, any material harm to the environment that may result from the construction and operation of the development, and any rehabilitation required under this consent.	Contained within current Management Plans. Commitment that Management plans will be complied with throughout the duration of works under this Consent, with evidence to be provided throughout works such as: Monitoring records, Site Inspection Records Environmental Action Registers, Incident reports, Management plan/s review tracking, and Audit results and close outs	Compliant
TERMS OF CONSENT			
A2	The development may only be carried out: (a) in compliance with the conditions of this consent; (b) in accordance with all written directions of the Planning Secretary; (c) in accordance with the EIS, Response to Submissions and additional information; (d) in accordance with the approved plans in the table below. (e) in accordance with the following modification applications: (i) the Section 4.55(1A) application prepared by Ethos Urban dated 13 September 2023 appendices. (ii)the Section 4.55(1A) application prepared by Ethos Urban dated 14 September 2023, as modified by the submissions reports dated 6 February 2024 and 19 April 2024.	a) Pre-Construction Compliance Report (this Report) Refer to details contained within this table for Compliance to Conditions b) Record of written direction No directions received from the Planning Secretary to date c) Current Management plans and Sub-plans In accordance with the EIS and Response to Submissions d) Check of Current Plans Approved plans are in place for Construction	Compliant
A3	Consistent with the requirements in this consent, the Planning Secretary may make written directions to the Applicant in relation to: (a) the content of any strategy, study, system, plan, program, review, audit, notification, report or correspondence submitted under or otherwise made in relation to this consent, including those that are required to be, and have been, approved by the Planning Secretary; and (b) the implementation of any actions or measures contained in any such document referred to in Condition A3(a).	Record of Written direction. Record of implementation of any written direction and or response to written direction	Not Triggered
A4	The conditions of this consent and directions of the Planning Secretary prevail to the extent of any inconsistency, ambiguity or conflict between them and a document listed in Condition A2(c) or Condition A2(d). In the event of an inconsistency, ambiguity or conflict between any of the documents listed in Condition A2(c) and Condition A2(d), the most recent document prevails to the extent of the inconsistency, ambiguity or conflict.	Review & Cross Check Requirements (General Note)	Compliant

LIMIT OF CONSENT			
A5	This consent will lapse five years from the date of the consent unless the works associated with the development have physically commenced.	Front page of SSD 15822622 with evidence of date of the Works associated with the development.	Compliant
PRESCRIBED CONDITIONS			
A8	The Applicant must comply with all relevant prescribed conditions of development consent under Part 6, Division 8A of the EP&A Regulation.	a) Erection of Site Signage – Erected signage b) Residential building work – Note c) Entertainment venues – N/A d) Signage for maximum number of persons – N/A e) Shoring and adjoining properties Sandstone crescent has shoring walls which are adjacent to road, this road is owned by the person having the benefit of the development consent. This condition is not applicable.	Compliant
LONG SERVICE LEVY			
A9	For work costing $25,000 or more, a Long Service Levy must be paid. For further information please contact the Long Service Payments Corporation on their Helpline 13 1441.	LSL paid - Refer to Receipt L0000156469 on 27.6.24	Compliant
LEGAL NOTICES			
A10	Any advice or notice to the consent authority must be served on the Planning Secretary.	No legal notices to date	Not Triggered
EVIDENCE OF CONSULTATION			
A11	Where conditions of this consent require consultation with an identified party, the Applicant must: (a) consult with the relevant party prior to submitting the subject document to the Planning Secretary for approval; and (b) provide details of the consultation undertaken including: (i) the outcome of that consultation, matters resolved and unresolved; and (ii) details of any disagreement remaining between the party consulted and the Applicant and how the Applicant has addressed the matters not resolved.	Record keeping for communications with Certifier. Record keeping for communications with Council and Transport for New South Wales	Compliant
STRUCTURAL ADEQUACY			
A12	All new buildings and structures, and any alterations or additions to existing buildings and structures, that are part of the development, must be constructed in accordance with the relevant requirements of the BCA/NCC.	Structural Design Certificates confirming design to BCA issued by Van Der Meer Engineers for CC1. CC2 & CC3 will follow.	Compliant
DESIGN INTEGRITY			
A13	Necessary arrangements must be implemented by the Applicant to ensure Chrofi (Building C2), Studio Johnston (Building C3) and Cox Architecture (Building C4) are engaged in the design documentation phase to ensure the integrity design quality of the development is maintained through the construction phase to completion of the building works.	General note - Verification Letter provided	Compliant
OPERATION OF PLANT AND EQUIPMENT			

A14	All plant and equipment used on site, or to monitor the performance of the development must be: (a) maintained in a proper and efficient condition; and (b) operated in a proper and efficient manner.	Plant equipment records to be maintained. Plant prestart checks and authorisations with evidence of plant operator competence (tickets, licenses etc).	Not Triggered

APPLICABILITY OF GUIDELINES			
A15	References in the conditions of this consent to any guideline, protocol, Australian Standard or policy are to such guidelines, protocols, Standards or policies in the form they are in as at the date of this consent.	Record keeping systems for communications with the Planning Secretary. Management Plans e.g. CEMP contain guidelines, AS and protocols as current to date of this Consent.	Compliant
A16	However, consistent with the conditions of this consent and without altering any limits or criteria in this consent, the Planning Secretary may, when issuing directions under this consent in respect of ongoing monitoring and management obligations, require compliance with an updated or revised version of such a guideline, protocol, Standard or policy, or a replacement of them.	Monitoring reports and audit reports	Not Triggered
MONITORING AND ENVIRONMENTAL AUDITS			
A17	Any condition of this consent that requires the carrying out of monitoring or an environmental audit, whether directly or by way of a plan, strategy or program, is taken to be a condition requiring monitoring or an environmental audit under Division 9.4 of Part 9 of the EP&A Act. This includes conditions in respect of incident notification, reporting and response, non-compliance notification and independent environmental auditing.	Monitoring reports and audit reports	Not Triggered
INCIDENT NOTIFICATION, REPORTING AND RESPONSE			
A18	The Department must be notified in writing to compliance@planning.nsw.gov au immediately after the Applicant becomes aware of an incident. The notification must identify the development (including the development application number and the name of the development if it has one), and set out the location and nature of the incident.	No Incident to date	Not Triggered
A19	Subsequent notification must be given, and reports submitted in accordance with the requirements set out in Appendix 1.	No Incident to date	Not Triggered
NON-COMPLIANCE NOTIFICATION			
A20	The Department must be notified in writing to compliance@planning nsw.gov.au within seven days after the Applicant becomes aware of any non-compliance. The Certifying Authority must also notify the Department in writing to compliance@planning.nsw.gov.au within seven days after they identify any non-compliance.	No Non-Compliance to date	Not Triggered
A21	The notification must identify the development and the application number for it, set out the condition of consent that the development is non-compliant with, the way in which it does not comply and the reasons for the non-compliance (if known) and what actions have been, or will be, undertaken to address the non-compliance.	No Non-Compliance to date	Not Triggered
A22	A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.	No Non-Compliance to date	Not Triggered
REVISION OF STRATEGIES, PLANS AND PROGRAMS			

A23	Within three months of: (a) the submission of a compliance report under Condition B6 and B8; (b) the submission of an incident report under Condition A18; (c) the approval of any modification of the conditions of this consent; or (d) the issue of a direction of the Planning Secretary under Condition A3 which requires a review, the strategies, plans and programs required under this consent must be reviewed, and the Department must be notified in writing that a review is being carried out.	Notification to Department and Certifier, that a review is being undertaken. Any change to be provided to the satisfaction of the Certifier.	Not Triggered
A24	If necessary to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Planning Secretary. Where revisions are required, the revised document must be submitted to the Planning Secretary for approval within six weeks of the review.	Notification to Department and Certifier, that a review is being undertaken. Any change to be provided to the satisfaction of the Certifier.	Not Triggered
A25	SWIMMING POOL The public swimming pool must be designed, installed and operated in accordance with the: (a) Swimming Pools Act 1992 & Swimming Pools Regulation 2018 (b) Australian Standard AS 1926.1-2012 Swimming Pool Safety (c) Public Health Act 2010 & Public Health Regulation 2012	This will be addressed in CC2.	Not Triggered
PART B - PRIOR TO COMMENCEMENT OF WORKS			
CROWN BUILDING WORK			
B1	Crown building work cannot be commenced unless the relevant Crown Building work is certified by or on behalf of the Crown to comply with the technical provisions of the State's building laws in force as at: (a) the date of the invitation for tenders to carry out Crown building work; or (b) in the absence of tenders, the date on which the Crown building work commences or a Construction Certificate is issued.	Note - CC1 not issued yet	Not Triggered
NOTIFICATION OF COMMENCEMENT			
B2	The Department must be notified in writing of the dates of commencement of physical work and operation at least 48 hours before those dates.	Note - CC1 not issued yet	Not Triggered
B3	If the construction or operation of the development is to be staged, the Department must be notified in writing at least 48 hours before the commencement of each stage, of the date of commencement and the development to be carried out in that stage.	Note - CC1 not issued yet	Not Triggered
BUILDING CODE OF AUSTRALIA COMPLIANCE			

B4	The approved works must comply with the applicable performance requirements of the BCA/NCC to achieve and maintain acceptable standards of structural sufficiency, safety (including fire safety), health and amenity for the ongoing benefit of the community. Compliance with the performance requirements can only be achieved by: (a) complying with the deemed to satisfy provisions; or (b) formulating an alternative solution which: (i) complies with the performance requirements; or (ii) is shown to be at least equivalent to the deemed to satisfy provision; or (iii) a combination of (a) and (b).	Design Certificates confirming design to BCA issued by Consultants and Engineers issued for CC1. CC2 & CC3 will follow.	Compliant
ACCESS TO INFORMATION			
B5	At least 48 hours before the commencement of construction until the completion of all works under this consent, or such other time as agreed by the Planning Secretary, the Applicant must: (a) make the following information and documents (as they are obtained or approved) publicly available on its website: (i) the documents referred to in condition A2 of this consent; (ii) all current statutory approvals for the development; (iii) all approved strategies, plans and programs required under the conditions of this consent; (iv) regular reporting on the environmental performance of the development in accordance with the reporting arrangements in any plans or programs approved under the conditions of this consent; (v) a comprehensive summary of the monitoring results of the development, reported in accordance with the specifications in any conditions of this consent, or any approved plans and programs; (vi) a summary of the current stage and progress of the development; (vii) contact details to enquire about the development or to make a complaint; (viii) a complaints register, updated monthly ; (ix) audit reports prepared as part of any independent environmental audit of the development and the Applicant's response to the recommendations in any audit report; (x) any other matter required by the Planning Secretary; and (b) keep such information up to date, to the satisfaction of the Planning Secretary.	Closed out For Items: (a) (i), (ii), (iii) and (vii) Measures in place for Record keeping and communications with the Certifier.	Compliant
COMPLIANCE REPORTING			
B6	A Pre-Construction Compliance Report must be prepared for the development, and submitted to the Certifying Authority for approval before the commencement of construction. A copy of the endorsed compliance report must be provided to the Department at compliance@planninq nsw.gov.au before the commencement of construction.	This pre-construction compliance report will be issued to the Department of Planning	Compliant

B7	The Pre-Construction Compliance Report must include: (a) details of how the terms of this consent that must be addressed before the commencement of construction have been complied with; and (b) the expected commencement date for construction.	A Pre-Construction Compliance Report will be submitted to the Planning Secretary prior to commencement of construction i.e. CC1 works.	Compliant
B8	Construction Compliance Reports must be submitted to the Department at compliance@planning.nsw gov.au for information every six months from the date of the commencement of construction, for the duration of construction. The Construction Compliance Reports must provide details on the compliance performance of the development for the preceding six months and must be submitted within one month following the end of each six-month period for the duration of construction of the development, or such other timeframe as required by the Planning Secretary.	Noted as above	Not Triggered
B9	The Construction Compliance Reports must include: (a) a results summary and analysis of environmental monitoring; (b) the number of any complaints received, including a summary of main areas of complaint, action taken, response given and proposed strategies for reducing the recurrence of such complaints; (c) details of any review of the CEMP and the Environmental Management Strategy and associated sub-plans as a result of construction carried out during the reporting period; (d) a register of any modifications undertaken and their status; (e) results of any independent environmental audits and details of any actions taken in response to the recommendations of an audit; (f) a summary of all incidents notified in accordance with this consent; and (g) any other matter relating to compliance with the terms of this consent or requested by the Planning Secretary.	Record Keeping System for submission to Planning Secretary. Noted - Will include as part of the 6 monthly compliance report submission.	Not Triggered
COMPLIANCE			
B10	The Applicant must ensure that all of its employees, contractors (and their sub-contractors) are made aware of, and are instructed to comply with, the conditions of this consent relevant to activities they carry out in respect of the development.	Instructions to comply with the conditions included in the tender process. Consent conditions included in tender packages	Compliant
COMPLAINTS AND ENQUIRIES PROCEDURE			
B11	Prior to the commencement of construction works for each building, or as otherwise agreed by the Planning Secretary, the following must be made available for community enquiries and complaints for the duration of construction: (a) a toll-free 24-hour telephone number(s) on which complaints and enquiries about the carrying out of any works may be registered; (b) a postal address to which written complaints and enquiries may be sent; and (c) an email address to which electronic complaints and enquiries may be transmitted.	Refer to complaints section of this report for details	Compliant
COMMUNITY COMMUNICATION STRATEGY			

B12	A community Communication Strategy must be prepared to provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction.	Complaints and enquiries procedure set up. Record keeping system for the development to be ongoing. Refer to complaints section of this report for details	Compliant
B13	The Community Communication Strategy must: (a) identify people to be consulted during the design and construction phases; (b) include the telephone number, postal address and email required in Condition B11 (c) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development; (d) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development; (e) set out procedures and mechanisms: (i) through which the community can discuss or provide feedback to the Applicant; (ii) through which the Applicant will respond to enquiries or feedback from the community ; and (iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.	Complaints and enquiries procedure set up. Record keeping system for the development to be ongoing. Refer to complaints section of this report for details	Compliant
B14	Details demonstrating compliance with Condition B11 and Condition B12 must be submitted to the Certifying Authority and the Planning Secretary no later than one month before the commencement of any work.	Record Keeping System for submission to Planning Secretary and Certifying Authority no later than one month before the commencement of any work.	Compliant
EXTERNAL WALLS AND CLADDING			
B15	The external walls of all buildings must comply with the relevant requirements of the BCA/NCC.	Record keeping for communications with the Certifier. Condition not applicable for CC1.	Not Triggered
B16	Before the issue of a Crown Building Works Certificate or Construction Certificate and an Occupation Certificate, the Applicant must provide the Certifying Authority with documented evidence that the products and systems proposed for use or used in the construction of external walls including finishes and claddings such as synthetic or aluminum composite panels comply with the requirements of the BCA/NCC.	Note - Refer comment above	Not Triggered
B17	The Applicant must provide a copy of the documentation given to the Certifying Authority to the Planning Secretary within seven days after the Certifying Authority accepts it.	Record keeping system for submission to the Certifying Authority and Planning Secretary	Not Triggered
PRE-CONSTRUCTION DILAPIDATION REPORT			
B18	The Applicant is to engage a suitably qualified structural engineer to prepare a Pre-Construction Dilapidation Report, detailing the current structural condition of all existing adjoining buildings, infrastructure and roads, being Building C1 and the surrounding road network, noting that if they remain under construction at the time of the preparation of such report, that the report will	Report submitted to Certifying Authority and Council	Compliant

	provide a record of the condition of the building/road at that point in time. The report shall be submitted to the Certifying Authority and Council, prior to issue of a Crown Building Works Certificate or Construction Certificate, or any works commencing, whichever is earlier.		
GROSS FLOOR AREA (GFA) CERTIFICATION			
B19	The GFA of Building C2 must not exceed 1,527 m2. Details confirming compliance must be submitted to the Certifying Authority prior to the issue of any Crown Building Works Certificate or Construction Certificate for each building.	Confirmation submitted to confirm the GFA to the Certifying Authority.	Compliant
B20	Prior to the issue of the first Crown Building Works Certificate, or the first construction certificate, for the Community Facility the Applicant must provide the Certifying Authority with evidence that demonstrates, to the satisfaction of the Certifying Authority, that the GFA of the Community Facility across both Building C1 (approved under SSD 8903) and Building C2 will be at least 700 m+.	Confirmation submitted to confirm the GFA to the Certifying Authority	Compliant
GROSS FLOOR AREA (GFA) CERTIFICATION			
B21	The maximum height of Building C2 must not exceed RL 64.7 m AHD. The measurement of maximum height excludes plant and lift overruns, communication devices, antennae, satellite dishes, masts, flagpoles, chimneys, flues and the like. Details confirming compliance must be submitted to the Certifying Authority prior to the issue of any Crown Building Works Certificate or Construction Certificate.	Elevations submitted to confirm the maximum height of Building C2 does not exceed RL 64.7 m AHD., to the Certifying Authority.	Compliant
B22	The maximum height of Building C3 must not exceed RL 105.9 m AHD. The measurement of maximum height excludes plant and lift overruns, communication devices, antennae, satellite dishes, masts, flagpoles, chimneys, flues and the like. Details confirming compliance must be submitted to the Certifying Authority prior to the issue of any Crown Building Works Certificate or Construction Certificate.	Not applicable for C2 Building.	Not Triggered
B23	The maximum height of Building C4 must not exceed RL 101.4 m AHD to the top of the north-western tower, RL 121.6 m AHD to the top of the south-eastern tower, and RL 58.68 m AHD to the top of the three story townhouses. The measurement of maximum height excludes plant and lift overruns, communication devices, antennae, satellite dishes, masts, flagpoles, chimneys, flues and the like. Details confirming compliance must be submitted to the Certifying Authority prior to the issue of any Crown Building Works Certificate or Construction Certificate.	Not applicable for C2 Building.	Not Triggered
TREE PLANTING			

B24	A minimum of 280 new trees are to be planted comprising: (a) 90 trees within the Building C2 and Village Green site (b) 20 frees within the Building C3 site (c) 170 trees within the Building C4 site. Details demonstrating compliance must be submitted to the Certifying Authority prior to the commencement of the relevant works.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
SCHEDULE OF MATERIALS			
B25	Prior to the commencement of works for each building, a list of the final schedule of materials shall be submitted to the Planning Secretary. The Applicant shall also submit a copy of the schedule of materials to the Certifying Authority with the application for the relevant Crown Building Works Certificate or Construction Certificate for each building.	Record keeping system for submission to the Certifying Authority and Planning Secretary. Not applicable to CC1 will be closed as part of Future CC2 and CC3.	Not Triggered
COMPLIANCE WITH ACOUSTIC ASSESSMENT			
B26	All performance parameters, requirements, engineering assumptions and recommendations contained in the Acoustic Assessment, prepared by Acoustic Logic, dated 16 July 2021, revision 7, must be implemented as part of the detailed design assessment and implemented into the design drawings for each building. Details demonstrating compliance must be submitted to the Certifying Authority.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
B27	Prior to the commencement of construction work for each building, plans shall be submitted to the Certifying Authority demonstrating compliance with the recommendations of the Environmental Noise Impact Assessment (prepared by Acoustic Logic, reference number 2021325.1/1607AR7/GW, dated 16 July 2021) with regard to construction methodology.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
COMPLIANCE WITH WIND IMPACT ASSESSMENT			
B28	Prior to the commencement of relevant construction work for each residential building, plans shall be submitted to the Certifying Authority demonstrating compliance with the recommendations of Environmental Wind Tunnel Study, prepared by SLR, reference number 610.30337-R02-v1.0, dated 24 December 2021.	Not applicable to C2 Building	Not Triggered
ECOLOGICALLY SUSTAINABLE DEVELOPMENT			
B29	The detailed design of the development must incorporate the environmental sustainability objectives, measures and initiatives outlined in the Midtown Stage 2 Sustainability Report, prepared by Frasers Property, dated July 2021. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Record keeping system for submission to the Certifying Authority.	Compliant
B30	The Applicant must submit to the satisfaction of the Certifying Authority evidence demonstrating that the development will achieve a minimum 5 Star Green Star rating in accordance with the Green Star Design and As-Built V.1.3 (Green Building Council Australia). Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered

	Crown Building Works Certificate or Construction Certificate.		
ABORIGINAL CULTURAL HERITAGE			
B31	Prior to the commencement of construction work, a copy of the final Aboriginal Cultural Heritage Assessment Report must be provided to all Registered Aboriginal Parties.	Copy of records/ certificates of Compliance. Record Keeping for communications with Aboriginal Parties.	Compliant
REFLECTIVITY			
B32	The visible light reflectivity from building materials used for each building shall reflect the assumptions made within the Solar Reflection Screening Analysis prepared by RWDI (dated 8 July 2021) being a maximum of 20% for gazing, between 20% and 80% for glass railings and other materials having negligible specular reflectivity and shall be designed so as to minimise glare. A report/documentation demonstrating compliance with these requirements is to be submitted to the Certifying Authority prior to the commencement of the relevant works for each building.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
OUTDOOR LIGHTING			
B33	All outdoor lighting within \the site shall comply with, where relevant, AS/NZ1 58.3. 1999 Pedestrian Area (Category P) Lighting and AS4282: 1997 Control of the Obtrusive E/leers of Outdoor Lighting. Details demonstrating compliance with these requirements are to be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate for each building.	Lighting strategy Occupation Certificate issuance. Submission to the Certifying Authority	Not Triggered
ROAD OCCUPANCY LICENCE			
B34	Where required, a Road Occupancy Licence (ROL) must be obtained from the relevant road authority under section 138 of the Roads Act Y993 for any activity that may impact on the operation of the road network. The ROL allows the Applicant to use a specified road space at approved times, provided certain conditions are met. The Applicant must allow a minimum of 10 working days for processing ROL applications. Traffic Control Plans are to accompany each ROL application(s) for any such activities.	Acquire Road Occupancy Permit. Issue TCP with submission. Not applicable for CC1.	Not Triggered
CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN			
B35	Prior to the commencement of any works, the Applicant shall prepare and implement a Construction Environmental Management Plan (CEMP) for the development and be submit(ed to the Certifying Authority. The CEMP must be prepared in consultation with Council.	Copy of records/ certificates of Compliance. Record Keeping for communications with certifier.	Compliant
CONSTRUCTION PEDESTRIAN AND TRAFFIC MANAGEMENT PLAN			
B36	Prior to the commencement of any works, a Construction Pedestrian and Traffic Management Plan (CPTMP) prepared by a suitably qualified person shall be endorsed by TfNSW (Sydney Coordination Office) and submitted to the Certifying Authority. The CPTMP must be prepared in	Construction Traffic & Pedestrian Management Plan prepared in accordance with condition requirements. Record of communications with Council &	Compliant

	consultation with Council, TfNSW (Sydney Coordination Office), and TfNSW (RMS).	TfNSW. Issued to Certifier, Council & TfNSW.	
CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN			
B37	Prior to the commencement of any works, a Construction Noise and Vibration Management Plan (CNVMP) prepared by a suitably qualified person shall be submitted to the Certifying Authority. The CNVMP must be prepared in consultation with, and address the relevant requirements of the EPA.	Copy of records/ certificates of Compliance. Record Keeping for communications with certifier.	Compliant
AIR QUALITY AND ODOUR MANAGEMENT PLAN			
B38	Prior to the commencement of any works, an Air Quality and Odour Management Plan (AQOMP) must be prepared and submitted to the Certifying Authority. The AQOMP must recommend measures to minimise and manage any odors arising from excavation, stockpiling and removal of contaminated soils.	Copy of records/ certificates of Compliance. Record Keeping for communications with certifier.	Compliant
CONSTRUCTION WASTE MANAGEMENT PLAN			
B39	Prior to the commencement of any works and prior to the issue of any Crown Building Works Certificate or Construction Certificate for each building, the Applicant must prepare a Construction Waste Management Plan (CWMP). A copy of the plan must be provided to the Certifying Authority and Council. The CWMP must include, but is not limited to, the following information:	Copy of records/ certificates of Compliance. Record Keeping for communications with certifier and council.	Compliant
CONSTRUCTION SOIL AND WATER MANAGEMENT PLAN			
B40	A Construction Soil and Water Management Plan (CSWMP) must be prepared prior to the commencement of works to manage soil and water impacts during construction of the development. The CSWMP must be prepared in consultation with Council and a copy provided to Council, prior to the issue of a Crown Building Works Certificate or Construction Certificate for each building.	Copy of records/ certificates of Compliance. Record Keeping for communications with certifier and council.	Compliant
GEOTECHNICAL DESIGN, CERTIFICATION AND MONITORING PLAN			
B41	B41. The development of Building C3 and Building C4 involves the construction of subsurface structures and excavation that has potential to adversely impact neighboring property if undertaken in an inappropriate manner. To ensure there are no adverse impacts arising from such works, the Applicant must engage a suitably qualified and practicing Engineer having experience in the geotechnical and hydrogeological fields, to design, certify and oversee the construction of all subsurface structures associated with the development.	Not applicable to C2 Building	Compliant
DESIGN OF RETAINING WALLS			
B42	Any proposed retaining wall must be designed in accordance with the requirements of the detailed geotechnical report. All proposed retaining walls including the footings, shall be located within private property and not be located within any proposed public road corridor. Details confirming compliance must be submitted to the Certifying Authority prior to the issue of the relevant	Copy of records/ certificates of Compliance. Record Keeping for communications with certifier and council.	Compliant

	Crown Building Works Certificate or Construction Certificate for each building.		
UTILITY SERVICES			
B43	Prior to the commencement of work for each building, the Applicant is to negotiate with the utility authorities (e.g. Ausgrid and Telecommunications Carriers) in connection with the relocation and/or adjustment of the services affected by the construction of the underground structure, if required.	Compliance Certificate for water and sewerage infrastructure servicing of the site under section 73.	Compliant
B44	Prior to the commencement of work for each building, written advice or certified designs must be obtained from the electricity supply authority, an approved telecommunications carrier and an approved gas carrier (where relevant) stating that satisfactory arrangements have been made to ensure provision of adequate services.	Record keeping for communications with the Certifier & and other agencies as relevant.	Compliant
CRIME PREVENTION THROUGH ENVIRONMENTAL DESIGN (CPTED)			
B45	To minimise the opportunity for crime in accordance with CPTED principles, the recommendations provided in the CPTED Report, prepared by Ethos Urban, dated July 2021, shall be incorporated in the architectural plans prior to the prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate for each building.	Copy of records/ certificate of compliance. Not applicable to CC1.	Not Triggered
CONTAMINATION			
B46	Prior to the commencement of any works, an Unexpected Contamination Finds Protocol (UFP), prepared by a suitably qualified and experienced expert, shall be provided to the Certifying Authority. The UFP must be implemented for the duration of construction works.	Addressed in Grindley Site specific management plan	Compliant
NO OBSTRUCTION OF THE PUBLIC DOMAIN WITHOUT A WORKS PERMIT			
B47	Prior to the issue of a Subdivision Works Certificate, Crown Building Works Certificate or Construction Certificate if required, the Applicant must obtain a Work Permit to occupy the public way, footpaths, road reserves and the like, which must not be obstructed by any mobile cranes, materials, vehicles, refuse, skips or the like, under any circumstances, unless in accordance with the Works Permit. Non-compliance with this requirement will result in the issue of a notice by the Authority to stop all work on the site.	Record keeping for communications with the Certifier & Council and other agencies as relevant.	Compliant
BASIX CERTIFICATION			
B48	The development must be implemented and all BASIX commitments thereafter maintained in accordance with: (a) Building C3: BASIX Certificate No. 1207739M 05 (b) Building C4: BASIX Certificate No. 1199962M 06. An updated certificate must be issued if amendments are made. The BASIX certificate must be submitted to the Certifying Authority with all commitments clearly shown on the Crown Building Works Certificate or Construction Certificate plans for each building.	Not applicable to C2 Building	Not Triggered

SYDNEY WATER REQUIREMENTS			
B49	An application shall be made to Sydney Water for a Certificate under Part 6, Division 9, section 73 of the Sydney Water Act 1994 (Compliance Certificate) prior to the issue of any Crown Building Works Certificate or Construction Certificate for each building,	Compliance Certificate for water and sewerage infrastructure servicing of the site under section 73.	Not Triggered
INSTALLATION OF WATER EFFICIENT FIXTURES AND FITTINGS			
B50	All toilets installed as part of the approved works must be of water efficient dual-flush capacity with at least 4-star rating under the Water Efficiency and Labelling Scheme (WELS). The details must be submitted to the Certifying Authority prior to the commencement of the relevant works.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
B51	All taps and shower heads installed as part of the approved works must be water efficient with at least a 3-star rating under the Water Efficiency and Labelling Scheme (W ELS), where available. The details must be submitted to the Certifying Authority prior to the commencement of the relevant works.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
B52	New urinal suites, urinals and urinal flushing control mechanisms installed as part of the approved works must demonstrate that products have been selected with at least a 4-star rating under the Water Efficiency and Labelling Scheme (WELS). The details must be submitted to the Certifying Authority prior to the commencement of the relevant works.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
B53	Urinals must include 'smart controls' to reduce unnecessary flushing in publicly accessible bathrooms. Continuous flushing urinal systems are not approved. Details demonstrating compliance with the requirement are to be submitted to the Certifying Authority prior to the commencement of the relevant works.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
SANITARY FACILITIES FOR DISABLED PERSONS			
B54	The Applicant shall ensure that the provision of sanitary facilities for disabled persons complies with Section F2.4 of the BCA/NCC. Plans demonstrating compliance with this condition shall be submitted to the Certifying Authority prior to the commencement of the relevant works.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
ADAPTABLE HOUSING			
B55	Prior to issue of the relevant Crown Building Works Certificate or Construction Certificate for each building, the Certifying Authority is to ensure that the overall Stage 2 development has been designed to accommodate a minimum of 5% adaptable residential apartments/dwellings (excluding social dwellings) and that the requirements are referenced on the relevant Crown Building Works Certificate drawings. In addition, information shall be provided confirming: (a) the required number of units are able to be adapted for people with a disability in accordance with the BCA/NCC; and (b) compliance with Australian Standard A54299 — Adaptable Housing.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
ACCESS FOR PEOPLE WITH DISABILITIES			

B56	Access and facilities for people with disabilities must be designed in accordance with the BCA/NCC. Prior to the commencement of the relevant works, a certificate certifying compliance with this condition from an appropriately qualified person must be provided to the Certifying Authority.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
MECHANICAL VENTILATION			
B57	All mechanical ventilation systems shall be designed and installed in accordance with the BCA/NCC and shall comply with Australian Standards AS1668.2 and AS3666 - Microbial Control of Air Handling and Water Systems of Building, to ensure adequate levels of health and amenity to the occupants of the buildings and to ensure environment protection. Details demonstrating compliance shall be submitted to the Certifying Authority prior to the commencement of relevant works.	Submission of information for occupation certificate. Record keeping system for submission to the Certifying Authority. Not applicable to CC1	Not Triggered
NUMBER OF CAR PARKING SPACES			
B58	A minimum of 19 car parking spaces are to be provided for Building C2 within the Building C1 basement approved under SSD 8903, consisting of 12 car parking spaces for the pool and gym and 7 car parking spaces for the community facility. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Not applicable to C2 Building	Not Triggered
B59	A maximum of 145 residential car parking spaces, 8 visitor car parking spaces and 10 retail car parking spaces are to be provided for Building C3. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Not applicable to C2 Building	Not Triggered
B60	A maximum of 396 residential car parking spaces (263 market and 108 social), including 25 visitor car parking spaces are to be provided for Building C4. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Not applicable to C2 Building	Not Triggered
LAYOUT OF INTERNAL PARKING AREAS			
B61	The layout of the proposed car parking areas within each residential building (including, driveways, grades, turn paths, sight distance requirements in relation to landscaping and/or fencing, aisle widths, aisle lengths, and parking bay dimensions) must be in accordance with AS 2890.1- 2004, AS2890.6-2009 and AS 2890.2 — 2018. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue o(the relevant Crown Building Works Certificate or Construction Certificate.	Not applicable to C2 Building	Not Triggered
NUMBER OF BICYCLE PARKING SPACES			
B62	The minimum number of bicycle parking spaces to be provided for the development shall comply with the table below. Details confirming the bicycle parking numbers	Submission of information for occupation certificate. Record keeping system for submission to the Certifying Authority. Not applicable to CC1.	Not Triggered

	must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate.		
FACILITIES FOR CYCLISTS			
B63	The layout, design and security of bicycle facilities either on-street or off-street must comply with the minimum requirements of Australian Standard AS 2890.3 - 2015. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate for each building.	Submission of information for occupation certificate. Record keeping system for submission to the Certifying Authority. Not applicable to CC1.	Not Triggered
WASTE STORAGE ROOMS			
B64	The waste storage rooms within each residential building shall be constructed to comply with all the relevant provisions of Council's Development Control Plan 2014, including: (a) the size being large enough to accommodate all waste generated on the premises, with allowances for the separation of waste types and bulky materials; (b) the floor being graded and drained to an approved drainage outlet connected to the sewer and having a smooth, even surface, coved at all intersections with walls; (c) the walls being cement rendered to a smooth, even surface and coved at all intersections; (d) cold water being provided in the room with the outlet located in a position so that il cannot be damaged and a hose fitted with a nozzle being connected to the outlet; (e) the room shall be adequately ventilated (either natural or mechanical) in accordance with the Building Code of Australia. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate for each building.	Not applicable to C2 Building	Not Triggered
GARBAGE CHUTES			
B65	All garbage chutes must be designed in accordance with the requirements of the BCA/NCC and the Department of Environment and Climate Change Better Practice Guide for Waste Management in Multi-Unit Dwelling 9 Details demonstrating9 compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate for each residential building.	Not applicable to C2 Building	Not Triggered
GROUNDWATER DESIGN			

B66	The method of disposal of pumped water shall be nominated (i.e. reinjection, drainage to the stormwater system or discharge to sewer) and a copy of the written permission from the relevant controlling authority shall be provided in a report to be provided to NRAR with the application for the authorisation. The disposal of any contaminated pumped groundwater (sometimes called "tailwater") must comply with the provisions of the Protection of the Environment Operations Act 1997 and any requirements of the relevant controlling authority. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate for each building. Contaminated groundwater—i.e. constituent concentrations above appropriate National Environment Protection (Assessment of Site Contamination) Measure (NEPM 2013) thresholds—shall not be reinjected into any geological formation. The reinjection system design, if proposed, and treatment methods to remove contaminants shall be nominated and included in a report to be provided to NRAR with the application for the authorisation. The quality of any pumped water that is to be reinjected must be demonstrated to be compatible with, or improve, the intrinsic or ambient groundwater in the vicinity of the reinjection site. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate for each building.	Ground water not anticipated for C2 Building, Record keeping for communications to the satisfaction of the Certifier.	Compliant
GROUNDWATER TAKE AND LICENSING			
B67	Water access licences and sufficient water entitlements must be held prior to the commencement of any works which would result in the groundwater take exceeding 3ML exemption limit. This includes both permanent entitlements for ongoing water take, and entitlements for any additional lake during construction. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Ground water not anticipated for C2 Building, Record keeping for communications to the satisfaction of the Certifier.	Compliant
LANDSCAPING			
B68	A Bush Regenerator shall review the proposed planting palettes/schedules for the development to ensure the site landscaping/planting associated with Building C2, Building C3 and Building C4 uses native species of local provenance. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Record keeping for communications to the satisfaction of the Certifier.	Not Triggered

B69	Detailed landscape plans and details drawn to scale, and technical specification, by a registered landscape architect must be prepared and submitted to the Planning Secretary. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Record keeping for communications to the satisfaction of the Certifier.	Not Triggered
VERTICAL TRANSPORTATION SERVICES DESIGN REQUIREMENTS			
B70	The vertical transportation services within Building C4 shall be designed to comply with the average waiting times and handling capacities as summarised in the Traffic Analysis Outcome Performance Levels for Building C4 table, prepared by Donnelley Simpson Cleary, dated 5 August 2020, reference 8162/AB1. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Not applicable for C2 building.	Not Triggered
BUILDING C4 AMENDMENTS			
B71	Prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate, amended architectural plans for Building C4, prepared in consultation with the Government Architect NSW, shall be submitted to and approved by the Planning Secretary, addressing the following: (a) centrally locate the office/reception desk in Lobby B of Building C4.2, to provide a direct line of sight from the lobby entrance (b) amend the structural wall in Lobby A of Building C4.2 to columns, to provide greater flexibility and use of space (c) provide a breakout area from the corridor on Levels 4, 7, 10, 13, 16, 19, 20 of Building C4.1, to improve the amenity of the corridor (d) provide high level glazing to the bathrooms of Building C4.2 at the north/west brick blade element with consideration of public artwork (e) provision of a covered communal open space on the rooftop of Building C4.2 (f) investigate opportunity to improve access to the office/reception desk in Lobby B, for residents in the northern side of Building C4.2 (g) include sliding screens and/or fencing to the terraces of Unit C4.2-LG.03 and Unit C4.2-GF.02 to provide visual privacy and screening for the occupants of the studio units. (h) include sliding screens and/or fencing to the terrace of Unit C4.2-LG.01 to provide visual privacy and screening from the central courtyard and pathways. (i) include details of landscape buffering lo provide visual screening and privacy to the ground floor units Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant	Not applicable for C2 building.	Not Triggered

	Crown Building Works Certificate or Construction Certificate.		
WASTE MANAGEMENT			
B72	Prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate, amended plans and amended Waste Management Plans, prepared in consultation with Council, shall be submitted to and approved by the Planning Secretary, addressing the following: (a) Provide a bin holding room for bins awaiting collection adjacent to the loading dock of Building C3, that does not impede truck access and/or maneuvering. (b) Details of where bulky waste material will be stored in Building C3 when awaiting collection and how bulky waste material will be taken up to the loading dock for collection. (c) Provide a bin holding room for bins awaiting collection capable of accommodating the required bin allocation for Building C4. (d) Provide two rooms on each floor of the Market Tower of Building C4. (e) Detail where bulky waste material will be stored while awaiting collection on Basement Level 1 for the Market Tower of Building C4. (f) Detail where the tug will be stored in Building C4. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate	Not applicable to C2 Building	Not Triggered
PUBLIC ART PLAN			

B73	Prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate, a Public Art Plan will be submitted to and approved by the Planning Secretary. The Public Art Plan will explore opportunities for public art within the Village Green, and Building C4 with reference to the Connecting with Country Strategy (prepared by The Fulcrum Agency, dated 21 June 2021, revision C). Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Document to be prepared in consultation with Council and approved by the Planning Secretary. Not applicable for CC1.	Not Triggered
PUBLIC DOMAIN/VILLAGE GREEN			
B74	All public domain areas are subject to the standards and requirements of Council's DCP 2014 Part 4.5 Macquarie Park Corridor and Part 8.5 Public Civil Works, and Council's Public Domain Technical Manual Section 6 - Macquarie Park Corridor. In the event of any inconsistency, the Concept Approval, and the approved plans under Stage 1 SSD 8903 and Stage 2 SSD 15822622 are to prevail. Details demonstrating compliance must be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate.	Record keeping for communications with Certifier, Council, Planning Secretary and other agencies as relevant.	Not Triggered
B75	For any staging of the Village Green, a detailed construction management and staging plan must be prepared in consultation with Council. Details demonstrating compliance must be submitted to the Certifying Authority and Council prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate for each building or Subdivision Works Certificate.	Record keeping for communications with Certifier, Council, Planning Secretary and other agencies as relevant. Village Green is not staged.	Not Triggered
VEHICLE FOOTPATH CROSSING AND GUTTER CROSSOVER			

B76	Any new vehicle footpath crossings and associated gutter crossover shall be designed for the approved vehicular access location/s. The reconstruction of this infrastructure may be required in order that it has a service life that is consistent with that of the development. The location, design and construction shall be in accordance with Stage 1 Public Domain Drawings and Australian Standard AS2890.1 — 2004 Offs/reel Parking. The drawings shall be prepared by a suitably qualified Civil Engineer using the standard B99 vehicle profile. The drawings shall show the proposed vehicle footpath crossing width, alignment, and any elements impacting design such as service pits, underground utilities, power poles, signage and/or trees. In addition, a benchmark (to Australian Height Datum) that will not be impacted by the development works shall be included. All grades and transitions shall comply with Australian Standard AS 2890.1-2004 Off street Parking. The width of the new crossing shall be sufficient to accommodate turning maneuvers of the largest vehicle requiring access to the site as demonstrated by swept paths submitted to and reviewed by Council. The driveway must be designed without splays and shall be constructed at right angle to the alignment of the kerb and gutter, and located no closer than 1m from any power pole and 3m from any street tree. Details demonstrating compliance must be submitted to the Certifying Authority and Council prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate for each building.	Not Applicable to C2 Building	Not Triggered
ANTICIPATED ASSETS REGISTER			
B77	In the case that public infrastructure improvements are required, the developer is to submit a listing of anticipated infrastructure assets to be constructed on Council land or dedicated to Council as part of the development works. The new elements may include but are not limited to new road pavements, new Multi-Function Poles (MFPs), new concrete or granite footways, new street trees and tree pits, street furniture, bus shelters, kerb and gutter and driveways. This information should be presented via the Anticipated Asset Register file available from Council's Assets and Infrastructure Department. The listings should also include any assets removed as part of the works. The Anticipated Asset Register is to assist with council's future resourcing to maintain new assets. There is potential for the as-built assets to deviate from the anticipated asset listing, as issues are resolved throughout the public domain assessment and Roads Act Approval process. Following completion of the public infrastructure works associated with the development, a Final Asset Register is to be submitted to Council, based upon the Village Green Works-As-Executed plans.	Record keeping for communications with Certifier, Council, Planning Secretary.	Compliant
VILLAGE GREEN			

B78	Prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate, detailed landscape drawings (prepared by a registered landscape architect) for the Village Green will be submitted to the Certifying Authority.	Record keeping for communications with Certifier, Council, Planning Secretary. Future CC not part of CC1	Not Triggered
FLOOD AND OVERLAND FLOW PROTECTION			
B79	A certificate from a suitably qualified Chartered Civil Engineer (registered on the NER of Engineers Australia), or equivalent, shall be submitted to the Certifying Authority stating compliance with this condition prior to the issue of the of the relevant Crown Building Works Certificate or Construction Certificate	Record keeping for communications with Certifier.	Compliant
STORMWATER - COUNCIL DRAINAGE - REFLUX VALVE			
B80	A design certificate from a suitably qualified Chartered Professional Civil Engineer (CPEng) or Registered Professional Civil Engineer (RPEng), or equivalent, shall be provided to the Certifying Authority, prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate, confirming that the site drainage outlet pipe has been designed with a reflux valve in order to stop any backwater effect from Council's stormwater system for events up to the 1% AEP (100 year ARI).	Record keeping for communications with Certifier.	Not Triggered
STORMWATER - COUNCIL DRAINAGE - CREEK DISCHARGES			
B81	The proposed site drainage discharge to the creek shall be made as per the standard detail in Council's DCP (2014) Part 8.2 Stormwater and Stormwater Management Technical Manual. Amended stormwater plans complying with this condition shall be submitted to the Certifying Authority prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate. The plans shall be prepared by a Chartered Professional Civil Engineer (CPEng) or Registered Professional Civil Engineer (RPEng)	Record keeping for communications with Certifier.	Compliant
STORMWATER - COUNCIL DRAINAGE - STRUCTURAL ADEQUACY			
B82	Council stormwater pits which are being connected into shall be surveyed and confirmed to be capable as being structurally adequate for receiving the upstream connection from the development and satisfy durability requirements. If il is deemed appropriate to replace the pit, kerb inlet pits shall be cast in-situ and conforming to Council's standard drainage pit details. A certificate from a suitably qualified Structural Engineer (registered on the NER of Engineers Australia), or equivalent, shall be submitted to the Certifying Authority, prior to the commencement of any works, certifying compliance with this condition.	Record keeping for communications with Certifier.	Compliant

Appendix B

Compliance Declaration

Compliance Report Declaration Form

Project Name	Ivanhoe C2
Project Application Number	SSD 15822622
Description of Project	Stage C2 of precinct development – Design and Construction of Building C2 and surrounding works
Project Address	9 Mahogany Avenue, Macquarie Park NSW 2113,
Proponent	Grindley
Title of Compliance Report	SSD 15822622 Condition B6 & B7
Date	16h August 2024

I declare that I have reviewed the contents of the attached Compliance Report and to the best of my knowledge:

i. the Compliance Report has been prepared in accordance with all relevant conditions of consent;

ii. the Compliance Report has been prepared in accordance with the Compliance Reporting Requirements;

iii. the findings of the Compliance Report are reported truthfully, accurately and completely;

iv. due diligence and professional judgement have been exercised in preparing the Compliance Report; and

v. the Compliance Report is an accurate summary of the compliance status of the development.

Notes:

- Under section 10.6 of the Environmental Planning and Assessment Act 1979 a person must not include false or misleading information (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is false or misleading in a material respect. The proponent of an approved project must not fail to include information in (or provide information for inclusion in) a report of monitoring data or an audit report produced to the Minister in connection with an audit if the person knows that the information is materially relevant to the monitoring or audit. The maximum penalty is, in the case of a corporation, $1 million and for an individual, $250,000; and
- The Crimes Act 1900 contains other offences relating to false and misleading information: section 307B (giving false or misleading information – maximum penalty 2 years' imprisonment or 200 penalty units, or both).

Name of Authorised Reporting Officer	Peter Wilson
Title	Project Director
Signature	
Qualification	Bachelor of Construction Management (Building) Green Star Accredited Building Supervision, Advanced Certificate Carpentry and Joinery Certificate
Company	Grindley Construction
Company Address	55 Grandview Street, Pymble NSW 2073



Community Communication Strategy - Stage 2

Midtown Estate
1 Ivanhoe Place, Macquarie Park NSW 2113

Frasers Property Australia (ABN 89 600 448 726)
Level 2, 1C Homebush Bay Dr, Rhodes NSW 2138

7 November 2023

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1. Introduction

1.1 Document summary

This Community Communication Strategy (Strategy) has been prepared in accordance with the relevant conditions of the Ivanhoe Stage 2 Development Consent.

The Strategy provides an overarching framework for communicating with the community as the project moves towards and through the delivery of Stage 2. The Strategy outlines who the community stakeholders are and how to communicate about project milestones and construction impacts, as well as how to share relevant project information and respond to dynamic community feedback.

The objective of this Strategy is to build on the confidence within the community that the urban renewal of Ivanhoe Estate will redefine the way social, affordable and market housing are integrated together to provide a sustainable and inclusive neighbourhood for people from all walks of life.

The objectives of the Strategy will be supported with specific implementation plans, providing concrete information about how the approach outlined herein applies to project phases.

1.2 Background

The Ivanhoe Estate project will transform over 8-hectares at the corner of Herring Road and Epping Road, drawing together world-class urban design, quality facilities and public open spaces to create a sustainable community where people want to live.

The redevelopment of the Ivanhoe Estate is part of the NSW Government Communities Plus program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

Community consultation over the past three years has contributed to the revised masterplan. The revised masterplan features:

» approximately 3,300 new homes

» approximately 6,000 sqm of open space

» the retention of 94 per cent of the existing ecological community along Epping Road

» the protection of Shrimptons Creek

» revised building heights

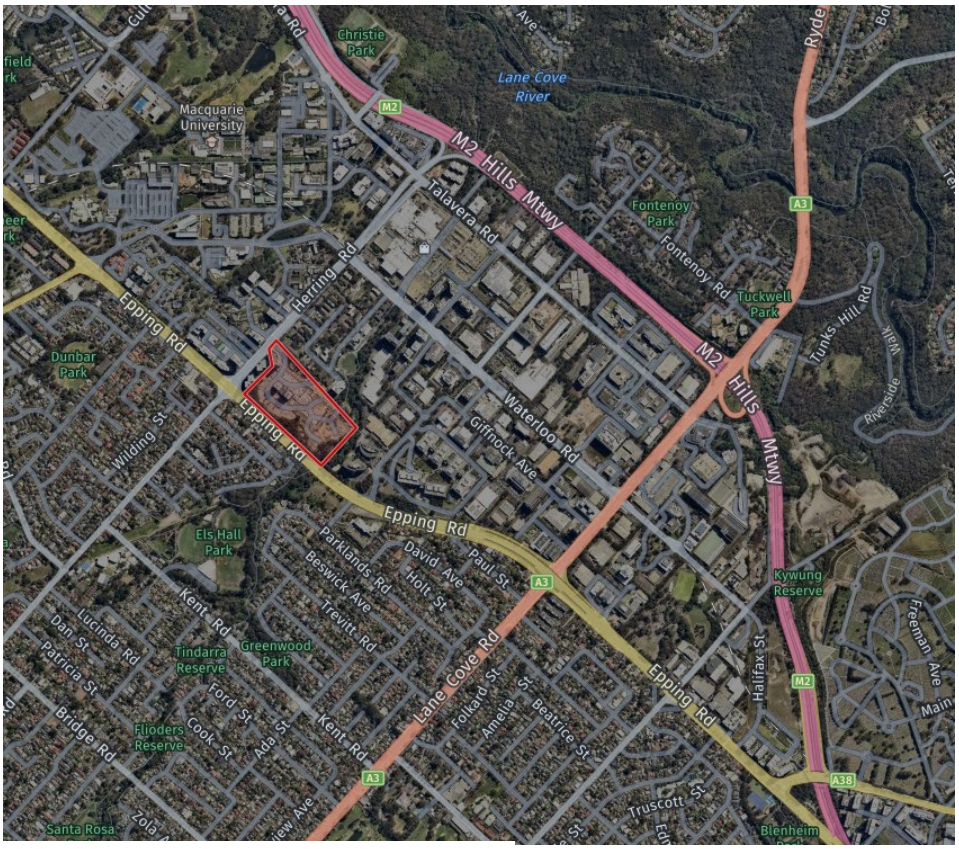
» the realignment of private apartments adjacent to the existing ecology community

» greater amenity

» improved integration with the existing community.

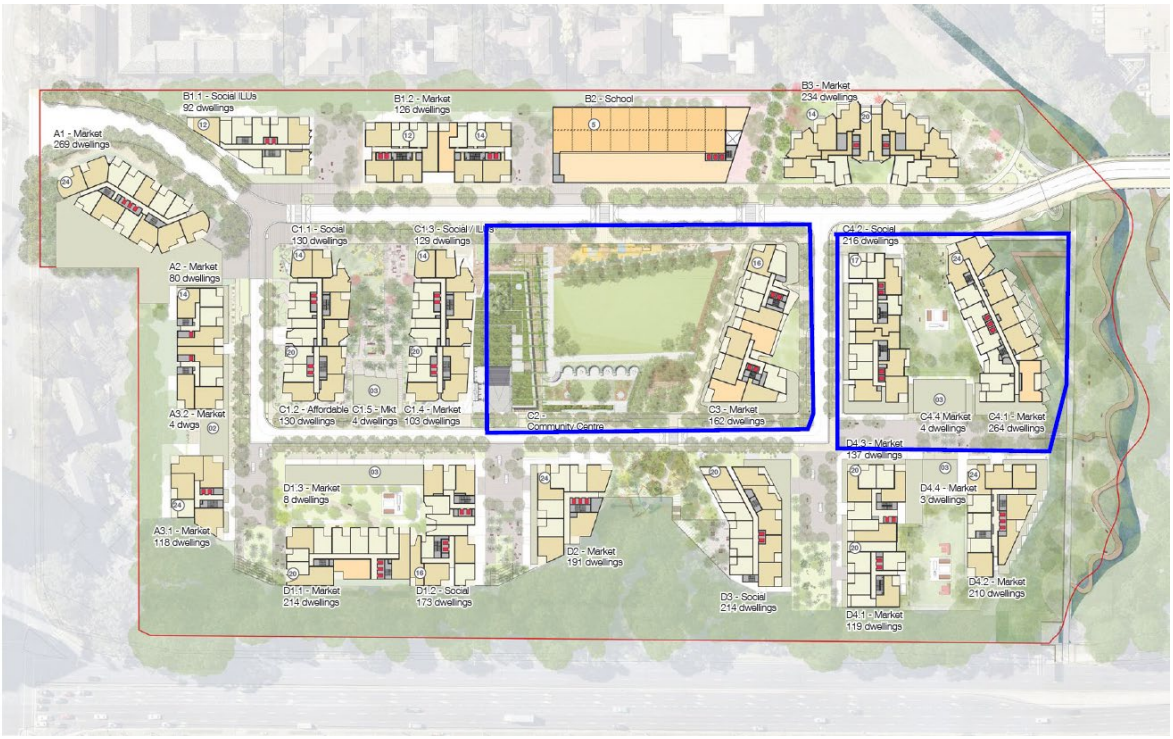
Other features of the urban renewal project include a new primary school, two childcare centres, community centre, gym and pool, a supermarket, cafes and specialty retail shops, nature-based playgrounds and exercise stations and community gardens.

Figure 1: Aerial Photograph of Midtown Estate



Source: Frasers Property

Figure 2: Masterplan – Stage 2 Outlined



1.3 About Stage 2

The Stage 2 plans for the former Ivanhoe Estate were approved in November 2022 by the Minister for Planning and Public Spaces. The Development Consent (SSD-15822622) has been issued, prompting the preparation of this Strategy.

Approved Stage 2 works include:

> excavation and earthworks

> construction of a community facilitates building (Building C2) and two residential apartment buildings (Building C3

> and Building C4) with basement car parking:

- Building C3 with 162 dwellings, 163 car parking spaces and ground floor retail
- Building C4 with 488 dwellings and 396 car parking spaces

> construction of Village Green public open space

> utilities, services infrastructure and public domain areas. tree removal

1.4 About the Community Communication Strategy (Strategy)

This Community Communication Strategy (Strategy) has been developed in response to conditions B12 and B13 of the Development Consent. The Development Consent stipulates the preparation and publishing of a Community Communication Strategy (Strategy) that spans the design and construction of Stage 2, as well as the first 12 months following completion of construction. In line with conditions, this Strategy:

a. identifies the people who need to be consulted and communicated with during design and construction

b. set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;

c. provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;

d. set out procedures and mechanisms:

(i) through which the community can discuss or provide feedback to the Applicant;

(ii) through which the Applicant will respond to enquiries or feedback from the community; and

(iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.

2. Stakeholders and community

Table 1 Development Consent (COMMUNITY COMMUNICATION STRATEGY)

B11. A Community Communication Strategy must be prepared to provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction.

B12. The Community Communication Strategy must:

» identify people to be consulted during the design and construction phases

This Strategy pertains to communications with the community, relating specifically for Stage 2 works. This Strategy expands on the engagement and consultation undertaken with Council and community to date, throughout the planning process and in the lead up to the approvals for Stage 2. The project anticipates a greater emphasis on construction impacts and environmental management as the project shifts from planning to the construction of Stage 2.

'Community' encompasses the following stakeholder groups: [Ref. Table 2]

Table 2 Community stakeholder matrix

Stakeholder category	Likely level of interest	Specific Stage 2 interest	Participation Spectrum [Ref IAP2]
Existing, returning and future social housing residents and staff at Ivanhoe Estate	High	» Delivering socially integrated housing » Staging and timing of Stage 2 construction » High amenity and services » Community involvement	Involve
Existing and prospective market housing owners and renters	High	» Delivering socially integrated housing » Staging and timing of Stage 2 construction » High amenity and services » Community involvement	Involve

Stakeholder category	Likely level of interest	Specific Stage 2 interest	Participation Spectrum [Ref IAP2]
Local Government (General Managers and Elected Representatives – Mayors)	High	» Service delivery » Infrastructure provision » Urban form and density » Delivering a socially integrated community » Impact on existing community, services and infrastructure » Community partnership program and opportunities	*Engagement to be undertaken by consortium and engagement specialists – outside of general community communications
Media and social media	Moderate – High	» Delivering socially integrated housing » Environmental management and construction impacts » Community partnership program and opportunities	Inform
Macquarie University	Moderate	» Delivering socially integrated housing » Environmental management and construction impacts » Community partnership program and opportunities	Consult
Business Councils Chambers of Commerce Business District – including Macquarie Connect	Moderate	» Delivering socially integrated housing » Environmental management and construction impacts » Impact on existing community, services and infrastructure » Community partnership program and opportunities » Staging and timing of Stage 2 construction	Consult

Stakeholder category	Likely level of interest	Specific Stage 2 interest	Participation Spectrum [Ref IAP2]
Neighbours	Moderate – High	» Urban form and management of density impacts » Management of construction impacts on neighbouring road networks and infrastructure » Impact on community, services and programs	Consult
Local businesses (in vicinity of the precinct)	Moderate – High	» Urban form and management of density impacts » Impact on existing community, services and infrastructure » Community partnership program and opportunities » Business expansion	Involve
Community service providers	Moderate – High	» Delivering socially integrated housing » Environmental management and construction impacts » Community partnership program and opportunities	Involve
Businesses within Macquarie University	Moderate – High	» Delivering socially integrated housing » Environmental management and construction impacts » Community partnership program and opportunities	Involve
Local community and residents' groups (including environmental groups)	Moderate – High	» Urban form and management of density impacts » Environmental management and construction impacts » Impact on community, services, infrastructure and programs	Consult

Stakeholder category	Likely level of interest	Specific Stage 2 interest	Participation Spectrum [Ref IAP2]
Local education providers	Moderate – High	» Delivering socially integrated housing » Community partnership program and opportunities	Consult
Transport providers	Moderate – High	» Community partnership program and opportunities	Consult
Aged care / disability care providers (including those operating in the local are)	Moderate – High	» Community partnership program and opportunities	Consult
Community service providers	Moderate – High	» Community partnership program and opportunities	Involve
Childcare providers in the local area	Moderate – High	» Community partnership program and opportunities	Involve
Aboriginal Land Councils	Moderate – High	» Community partnership program and opportunities	Involve

3. Communication approach

Table 3 Development Consent (COMMUNITY COMMUNICATION STRATEGY)

B13. The Community Communication Strategy must:

- » set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development
- » provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development
- » set out procedures and mechanisms

through which the community can discuss or provide feedback to the Applicant

through which the Applicant will respond to enquiries or feedback from the community

to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.

3.1 Objectives of communication and engagement approach

The objectives of the communication approach outlined in this Strategy include:

- » providing accessible, easy-to-understand information about the project to interested stakeholders, including impacted residents and site neighbours
- » listening to and considering a range of stakeholder and community ideas about how the project can deliver a sustainable, cohesive community that is a desirable place to live
- » building and strengthening stakeholder relationships that have been supported throughout the planning phases of the project
- » reinforcing the commitment to delivering world-class urban design, quality facilities and public open spaces in a way that fosters community development
- » meeting and exceeding statutory requirements for notification periods relating to construction impacts and project milestones
- » promoting ongoing opportunities for engagement as the project progresses through and beyond Stage 2.

The objective of this Strategy is to build on the confidence within the community that the urban renewal of Ivanhoe Estate will redefine the way social, affordable and market housing are integrated together to provide a sustainable and inclusive neighbourhood for people from all walks of life.

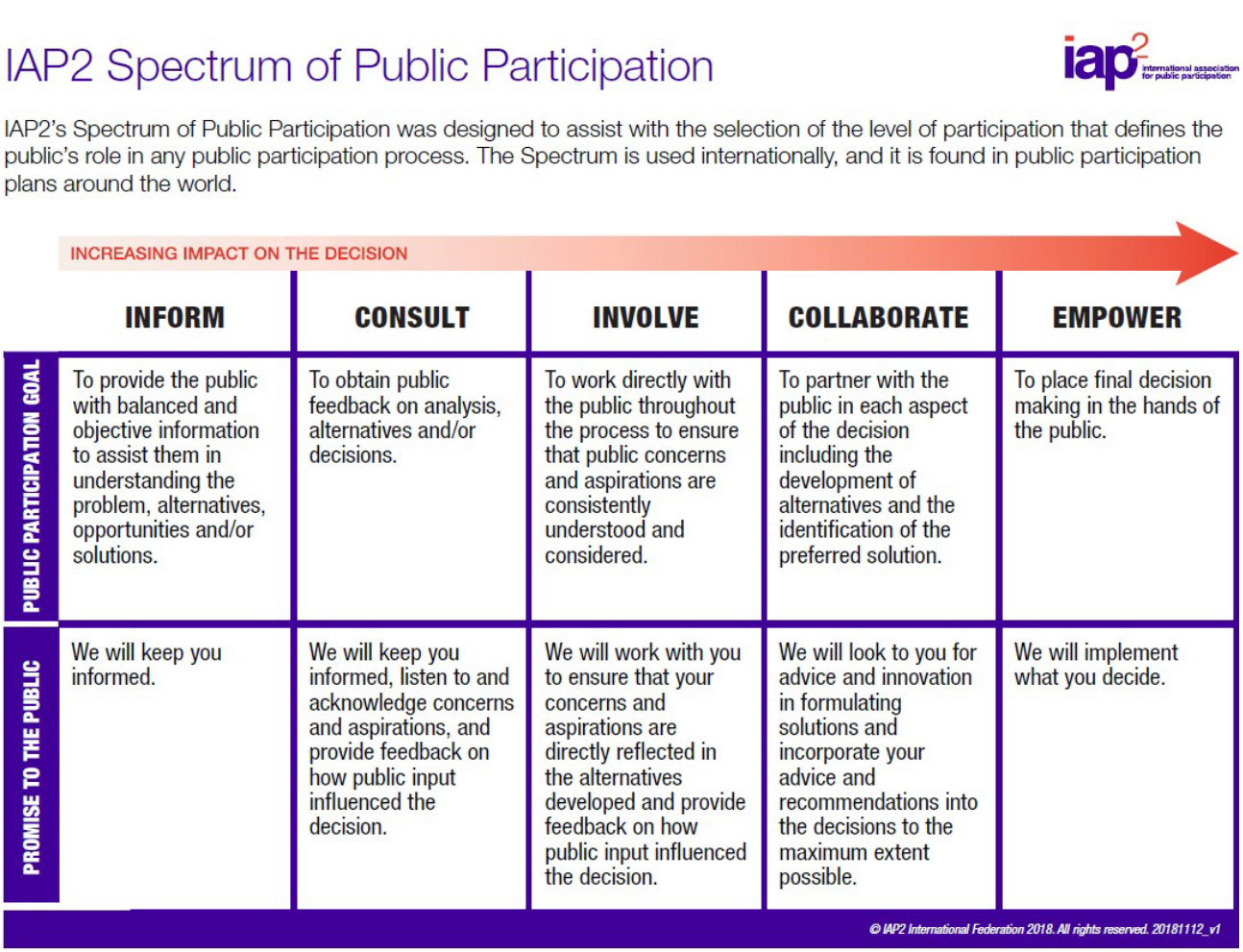
This Strategy will advance the engagement objectives that have guided communications throughout planning and initial phases, including:

- » the establishment of an open and transparent communication process
- » to gain insight into community sentiment as early as possible
- » develop relationships with the community and stakeholders as early as possible
- » to understand the aspirations of different stakeholders towards the future use of the site
- » to communicate the project's benefits
- » identify and mitigate concerns or risks before the master plan is submitted
- » build a sense of confidence and excitement about the site's renewal
- » commit to ongoing engagement

IAP2 public participation spectrum

The International association for public participation (IAP2) public participation spectrum will be the framework for the engagement approach, as required by the Green Star accreditation. The approach outlined in this Strategy combines techniques that inform, consult, involve and/or collaborate with the community.

Figure 1 IAP2 Spectrum of Public Participation [Ref iap2.org.au/resources/spectrum/]



IAP2 Spectrum of Public Participation

IAP2's Spectrum of Public Participation was designed to assist with the selection of the level of participation that defines the public's role in any public participation process. The Spectrum is used internationally, and it is found in public participation plans around the world.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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3.2 Feedback and enquiries loop



Figure 2 Feedback and enquiries loop – listening to the community and responding proactively

Receiving and responding to community and stakeholder input

The feedback and enquiries loop illustrates how the communication channels and engagement mechanisms outlined in this Strategy enable the community to discuss and provide feedback on the project to the Project Team. The Project Team will provide relevant and accessible information as is required and will respond to feedback and comments from the community in a timely fashion.

Sharing information and receiving and responding to feedback

Table 4 Procedures to distribute accessible information

This table maps foreseeable project events that warrant communication with community stakeholders against the requisite communication channel.

Event (trigger)	Assessment of interest	Communication channel
Planning approval	High level of interest amongst all stakeholders	» Website » Letter » Newsletter » Media release » Facebook post (linking to website text)

Event (trigger)	Assessment of interest	Communication channel
Construction commences (Stage 2)	High level of interest amongst all stakeholders, especially site neighbours	» Website » Newsletter » Media release » Facebook post (linking to website text) » Equip 1800-number and project email
Construction activities (impactful)	High level of interest amongst site neighbours and local residents	» Website » Newsletter (project notification) » Equip 1800-number and project email » Newspaper advertisement
Project milestones	High level of interest amongst all stakeholders	» Community-based forum » Website » Newsletter » Media release
Key environmental management issues for development	High level of interest amongst environmental groups and site neighbours	» Mobilise dedicated community-based forum, as required » Direct email correspondence to mailing list of interested stakeholders

^In addition to regularly updated information that is always available on the project website

3.3 Mechanisms to distribute information about the development

Table 5 Communication channels

There are several communication channels employed by the Project Team to build and maintain effective communications with the community. This table outlines what the communication channels are and when they will be applied.

Channel	Audience	Details
Community-based forum (aka drop-in Community Information Session)	All stakeholders	» Community-based forum hosted on or near the site to provide project information in a relaxed, face-to-face environment » Exchange project information and feedback from the community and other stakeholders » Accommodate heightened interest in environmental management

Channel	Audience	Details
Website	All stakeholders	» One-stop shop for all project information » 24/7 feedback and ideas portal
Letter	Current Ivanhoe residents	» Providing residents with projects updates, including construction of Stage 2 news » Invitations to community-based forums (as and if required)
Newsletter	Residents proximal to the site	» Project update, including scheduled construction activity (relating to Stage 2) » Invitation to community-based forums (Community Information Session) » Details about how to provide feedback » Project notifications are a short-form newsletter, focusing on immediate project activity and upcoming construction impacts
Fact sheet	Project facts and benefits	» Available on the website, and hardcopy fact sheets distributed at face-to-face forums
Project email and phone number	All stakeholders, especially local residents (enquiries and complaints regarding construction)	» Community can make enquiries, provide feedback and seek information about Stage 2 construction activities » [Email] Disseminate project information, including virtual newsletter distribution and details about upcoming community-based forums (Community Information Sessions). Use database of previous consultation participants
Media release	Wider community	» Relevant project updates » Notification of upcoming community-based forums (Community Information Session) » Details on how to provide feedback and ideas, and promote public communication channels for enquiries and feedback
Ad in local newspapers	Wider community	» Notification of upcoming community-based forums (Community Information Session) » Details on how to provide feedback and ideas, and promote public communication channels for enquiries and feedback
Facebook	Wider community	» Direct construction and development enquiries to website, 1800-number or project email, understanding Facebook is predominantly used as a marketing tool

About the communication channels

Community-based forum

Community-based forums, or Community Information Sessions, are held as relaxed drop-in sessions near the Ivanhoe Estate site. Interested stakeholders, including site neighbours and former residents, can attend at any point to view large information displays and talk about the project with representatives of the project team.

Forums are valuable ways to build stakeholder relationships and to address sensitive issues, such an environmental impacts. Targeted sessions can be held, as required, with a focus on specific elements of planning and construction, including environmental management.

Website

ivanhoeestate.com.au https://www.frasersproperty.com.au/NSW/Midtown

The established project website provides up-to-date information about the project, including planning developments and construction information and progress, with the commencement of Stage 2 works.

Visitors to the website can navigate between information about the Masterplan and contact information to raise specific project enquiries.

The website includes a page that encourages residents to provide ideas about how to make the community a great place to live and ways to connect with the dedicated Community Development Team.

Letter

Letters provide directly impacted stakeholders with important information, customised to their particular interest in the project, in addition to information provided on the website and shared with the wider community. Mail outs alleviate the possibility of correspondence being overlooked in local press or cluttered inboxes, and overcome challenges relating to an individual's internet access.

Newsletter

Newsletters provide project updates at notable delivery milestones or when there is important information to share with the community about activities on site, including construction activities during Stage 2. Project newsletters collate contact information for the project and can promote upcoming community-based forums. Like mail-outs, newsletters alleviate the possibility of correspondence being overlooked in local press or cluttered inboxes, and overcome challenges relating to an individual's internet access.

Fact sheet

Fact sheets present information about the project under areas of interest for the wider community and local residents, such as environment, project staging, Masterplan information and resident relocation. Fact sheets provide more detail about specific aspects of the proposal, rather than an overview, such as on the project website or newsletter.

Project email and phone

The dedicated project email, midtowncommunityfeedback@frasersproperty.com.au and 13 38 38 number provide the community with easy-access, 24/7 platforms to provide comment or ask questions about the project. These communication channels can become more heavily used during construction activities, and this is anticipated during Stage 2 works.

In accordance with Condition B11 - the dedicated postal address for written complaints and enquiries may be sent to 1 Ivanhoe Place Macquarie Park. This postal address shall be noted on the Midtown Macpark website.

Emails are an effective way to disseminate project information to people who've registered interest in the project, including virtual newsletter distribution and details about upcoming community-based forums (Community Information Sessions).

Media release

Media releases provide accurate information about project developments and milestones that may be in the public interest. Possible media coverage provides a platform for reaching a wide local audience with details of engagement opportunities, such as community-based forums, and publishing media releases on the project website can be an effective way to create a single-source-of-truth if misinformation is gaining traction.

Advertisements in local newspapers

Advertisements in local newspapers can promote engagement opportunities and inform a wider local audience about upcoming activities on the site, including construction impacts.

Facebook [social media]

Community building is a core objective of the project, and early community building is happening online, with a project page that provides interested community members with a platform to ask questions, make comments, share ideas and request more information about engagement activities and planning and construction progress.

3.4 Dispute resolution and mediation

In the first instance, the communication and engagement team will identify a prospective or actualised dispute requiring resolution and/or mediation. If or when a dispute has been identified, the communication and engagement specialist will promptly escalate the dispute to the Project Team Lead. In consultation with the communication and engagement specialist, the Project Team Lead will prepare an immediate written response to the stakeholder or stakeholders involved and prepare a clear action plan to achieve timely resolution, in consultation with the project's legal representatives, if required. This action plan should include face-to-face meetings, where possible, that are attended by no less than two project representatives, to ensure accurate minutes are recorded.

3.5 Maintaining a complaint register

B5. At least 48 hours before the commencement of any construction until the completion of all works, the following documents will be made available:

(vii) contact details to enquire about the development or to make a complaint

(viii) a complaints register, updated monthly

All comments, feedback and complaints received from the community through communication channels outlined above, including the 13 38 38 -number and project email (midtowncommunityfeedback@frasersproperty.com.au), will be logged in a complaints register. A report of registered complaints will be prepared monthly to satisfy condition B5 of the Planning Consent.

4 Strategic communications

4.1 Key messages

Project key messages should be used to maintain clear, consistent project messaging. These will be updated throughout Stage 2, and the life of the project, to reflect the changing status of the project and community responsiveness.

Project overview

» The Ivanhoe Estate at the corner of Herring and Epping roads is set to become a vibrant, sustainable community where people want to live.

» Set over 8-hectares, Ivanhoe Estate will draw together world-class urban design, quality facilities and public open spaces.

» The redevelopment of the Ivanhoe Estate is part of the NSW Government Communities Plus program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

» Community consultation over the past three years has contributed to the revised masterplan. The revised masterplan features:

> approximately 3,300 new homes

> approximately 6000 sqm of open space

> the retention of 94 per cent of the existing ecological community along Epping Road

> the protection of Shrimptons Creek

> revised building heights

> the realignment of private apartments adjacent to the existing ecology community

> greater amenity

> improved integration with the existing community.

» Other features of the urban renewal project include a new primary school, two childcare centres, community centre, gym and pool, a supermarket, cafes and specialty retail shops, nature-based playgrounds and exercise stations and community gardens.

The Stage 2 plans for the former Ivanhoe Estate were approved in November 2022 by the Minister for Planning and Public Spaces. The Development Consent (SSD-15822622) has been issued, prompting the preparation of this Strategy.

Approved Stage 2 works include:

> excavation and earthworks

> construction of a community facilitates building (Building C2) and two residential apartment buildings (Building C3

> and Building C4) with basement car parking:

- Building C3 with 162 dwellings, 163 car parking spaces and ground floor retail
- Building C4 with 488 dwellings and 396 car parking spaces

> construction of Village Green public open space

> utilities, services infrastructure and public domain areas. tree removal

Frasers Property Australia and Mission Australia Housing remain dedicated to the project vision for a socially cohesive and sustainable world-class precinct at Ivanhoe Estate, and will continue to work towards this vision.

4.2 Holding statement

NSW Land and Housing Corporation (LAHC) has been working with Frasers Property Australia and Mission Australia Housing since 2017 to transform the former Ivanhoe Estate at the corner of Herring and Epping roads into a vibrant and sustainable community.

The urban renewal project was one of the first projects to progress through the NSW Government's Planning System Acceleration Program, and in May 2020 the revised Masterplan and Stage 1 plans were approved.

Stage 2 marks the next phase of Ivanhoe Estate redevelopment which will see the delivery of market, affordable and social housing, community centre, gym, pool, cafes, retail and public amenity.

The redevelopment of the Ivanhoe Estate is proudly the first major project being delivered under the NSW Government's Future Directions Policy and the Communities Plus Program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

From:	Maria Pennisi
To:	cityofryde@ryde.nsw.gov.au
Cc:	Peter Wilson; Michael Jones; Jeff Jackson
Subject:	Application Number: SSD15822622 - Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), DA Condition B18- Preconstruction Dilapidation report
Date:	Wednesday, 7 August 2024 10:32:00 AM
Attachments:	image010.png image016.png

Dera Sir/Madam

As required DA Condition B18- Preconstruction Dilapidation report must be submitted to Council prior to issue of CC.

Below is a link to the Dilapidation reports fort councils' records.

https://vandermeer.workplace.datto.com/filelink/42b3f-484f654d-8fca9923a7-2

Regards

Maria Pennisi
Pre-Construction Manager
m. 0404 837 451 t. (02) 9497 9842 Ext: 142 f. (02) 9988 3575
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Date 16/08/2024

Mr Chris Michaels
City Plan
Suite 6.02, 120 Sussex Street
Sydney NSW 2000

Ref: 2060.0010523.000
Re: Ivanhoe C2 – CC1 Compliance Check

Dear Chris:

Introba is the ESD consultant for Building C2 located at 1 Ivanhoe Place, Macquarie Park.

We have reviewed the requirements of DA Condition B29 - Ecological Sustainable Developments Frasers Midtown Sustainability Report - Stage 2 dated July 2021. It notes 3 key sustainability commitments

- Deliver 5 Star Green Star Design & As Built v1.3 minimum for all buildings
- Deliver 6 Star Green Star Communities v1 for the Midtown precinct
- Deliver an integrated infrastructure solution via 'Real Utilities'

Our engagement is to lead the team in the delivery of the 5 Star Green Star Design & As Built v1.3 rating for C2. In support of this effort we have:

- Leveraged the existing scorecards and work from earlier design phases to inform our Green Star Pathway
- Held two kickoff workshops to review and relay the Green Star Pathway to the team
- Updated the scorecard based on the current projected points total
- Ongoing support to the design team to ensure the Green Star requirements are understood and achievable.

Our opinion is that the project is on track to meeting its obligation to achieve a 5 Star Green Star Design & As Built rating (noting that final certification and approval sits with the Green Building Council of Australia) and that the CC1 targets addressing DA condition B29 have been satisfied.

Yours sincerely,



Alex Krickx
Associate Principal
alex.krickx@introba.com

From:	Aaron Olsen
Cc:	Balazs Hansel
Bcc:	"officeadmin@metrolalc.org.au"; "cazadirect@live.com"; "butuheritage@gmail.com"; "justinecoplin@optusnet.com.au"; "didgengunawalclan@yahoo.com.au"; "gulagachts@gmail.com"; "philipkhan.acn@live.com.au"; "ngambaaculturalconnections@hotmail.com"; "danny@tocomwall.com.au"
Subject:	Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Final Report
Date:	Thursday, 1 February 2024 7:22:00 AM
Attachments:	image001.png image002.png image003.png image004.png image005.png image006.png

Good morning

We refer to the Aboriginal Cultural Heritage Assessment (ACHA) of the Ivanhoe Estate, Macquarie Park, for which you have previously registered.

We now provide a final copy of the ACHA report for your records, which can be downloaded using the following link:

https://acrobat.adobe.com/link/track?uri=urn:aaid:scds:US:cec09155-a592-3d96-830e-09b702d0532e

If you have any questions, please do not hesitate to contact us.

Kind regards

Aaron

AARON OLSEN
SENIOR CONSULTANT

D +61 2 8233 9957
E aolsen@urbis.com.au

SHAPING CITIES AND COMMUNITIES

URBIS

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ABORIGINAL CULTURAL HERITAGE ASSESSMENT

IVANHOE ESTATE,
MACQUARIE PARK

Prepared for
FRASERS PROPERTY AUSTRALIA
6 August 2021

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GLOSSARY

Term	Definition
Aboriginal cultural heritage	The tangible (objects) and intangible (dreaming stories, legends and places) cultural practices and traditions associated with past and present-day Aboriginal communities.
Aboriginal object(s)	As defined in the NPW Act, any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.
Aboriginal place	As defined in the NPW Act, any place declared to be an Aboriginal place (under s.84 of the NPW Act) by the Minister administering the NPW Act, by order published in the NSW Government Gazette, because the Minister is of the opinion that the place is or was of special significance with respect to Aboriginal culture. It may or may not contain Aboriginal objects.
ACHA	Aboriginal Cultural Heritage Assessment
ACHAR	Aboriginal Cultural Heritage Assessment Report
AHIMS	Aboriginal Heritage Information Management System: a register of previously reported Aboriginal objects and places managed by the DPC
AHIP	Aboriginal Heritage Impact Permit. A permit issued under Section 90, Division 2 of Part 6 of the *NPW Act.*
Archaeology	The scientific study of human history, particularly the relics and cultural remains of the distant past.
Art	Art sites can occur in the form of rock engravings or pigment on sandstone outcrops or within shelters. An engraving is some form of image which has been pecked or carved into a rock surface. Engravings typically vary in size and nature, with small abstract geometric forms as well as anthropomorphic figures and animals also depicted. Pigment art is the result of the application of material to a stone to leave a distinct impression. Pigment types include ochre, charcoal and pipeclay.
Artefact	An object made by human agency (e.g. stone artefacts).
Consultation Requirements	*Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010).
DCP	Development Control Plan
DECCW	Department of Environment, Climate Change and Water NSW.
DPC	Department of Premier and Cabinet

Term	Definition
EP&A Act	*NSW Environmental Planning and Assessment Act 1979.*
Grinding Grooves	The physical evidence of tool making, or food processing activities undertaken by Aboriginal people. The manual rubbing of stones against other stones creates grooves in the rock; these are usually found on flat areas of abrasive rock such as sandstone.
Harm	As defined in the NPW Act, to destroy, deface, damage or move an Aboriginal object or destroy, deface or damage a declared Aboriginal place. Harm may be direct or indirect (e.g. through increased visitation or erosion). Harm does not include something that is trivial or negligible.
Isolated find	A single artefact found in an isolated context.
LALC	Local Aboriginal Land Council: corporate body constituted under the *Aboriginal Land Rights Act 1983*, having a defined boundary within which it operates.
LEP	Local Environment Plan.
Midden	Midden sites are indicative of Aboriginal habitation, subsistence and resource extraction. Midden sites are expressed through the occurrence of shell deposits of edible shell species often associated with dark, ashy soil and charcoal. Middens may or may not contain other archaeological materials including stone tools.
NPW Act	*National Parks and Wildlife Act 1974*
NPW Regulation	*National Parks and Wildlife Regulation 2019*
PAD	Potential archaeological deposit. A location considered to have a potential for subsurface archaeological material.
RAPs	Registered Aboriginal Parties: Aboriginal persons or organisation who have registered to be consulted on the Project in accordance with the Consultation Requirements.
Scarred / Modified Trees	Trees which display signs of human modification in the form of scars left from intentional bark removal for the creation of tools, or which are carved for ceremonial purposes.
SU	Survey Unit

EXECUTIVE SUMMARY

Urbis has been engaged by Frasers Property Australia ('the Proponent') to conduct an Aboriginal Cultural Heritage Assessment (ACHA) of the Ivanhoe Estate, Macquarie Park, NSW, 2113 ('the subject area'), which comprises Ivanhoe Place (Lot 100 in DP1262209) and 2-4 Lyon Park Road (Lot 101 in DP 1263727).

The present Aboriginal Cultural Heritage Assessment Report (ACHAR) is based on the ACHA and has been produced to accompany an Environmental Impact Statement (EIS) in support of State Significant Development Applications for the subject area.

The ACHA has been carried out in accordance with Part 6 of the *National Parks and Wildlife Act 1974* and Part 5 of the *National Parks and Wildlife Regulation 2019*. The ACHAR was prepared according to the guidelines that accompany the NPW Act including:

- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (Department of Environment, Climate Change and Water (DECCW), 2010) (the Consultation Guidelines).
- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (Office of Environment and Heritage 2011) (the Assessment Guidelines).
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010).
- *The Australia ICOMOS Charter for Places of Cultural Significance, The Burra Charter, 2013* (Burra Charter).

The ACHA concluded that:

- No Aboriginal objects or places are registered within the curtilage of the subject area.
- Within the regional context of the subject area, registered Aboriginal sites tend to be located near waterways.
- Archaeological reports from other sites near the present subject area indicate that archaeological potential may be significantly reduced by historical ground disturbing activity, despite proximity to waterways.
- A due diligence assessment (Eco Logical Australia, 2017) relating directly to the subject area indicates that the portion of the subject area west of Shrimptons Creek is highly disturbed and has low to nil archaeological potential.
- The subject area does not include any topographic features that are indicative of archaeological potential.
- The majority of subject area has been subjected to a high degree of ground disturbance, which is likely to significantly reduce archaeological potential.
- The shallow natural soil profile in areas of moderate ground disturbance (SU3) would reduce archaeological potential in those areas.
- The entirety of SU1 is considered to contain nil subsurface archaeological potential. No Aboriginal sites were identified in SU1.
- The entirety of SU2 is considered to contain nil to low subsurface archaeological potential. No Aboriginal sites were identified in SU2.
- The entirety of SU3 is considered to contain nil to low subsurface archaeological potential. No Aboriginal sites were identified in SU3.
- The entirety of SU4 is considered to contain nil subsurface archaeological potential. No Aboriginal sites were identified in SU4.
- Based on the above considerations, the archaeological potential of the subject area is determined to be nil to low.
- Kamilaroi Yankuntjatjara Working Group (KYWG) consider the subject area culturally significant due to landscape features such as proximity to water and connection to Country. The cultural value of the subject area is considered moderate.

Based on the conclusions of this assessment there is no further investigation warranted and the proposed activity can proceed under the following recommendations:

Recommendation 1 – Aboriginal Cultural Heritage Induction

It is recommended that induction materials be prepared for inclusion in site inductions for any contractors working at the subject area. The induction material should include an overview of the types of sites to be aware of (i.e. artefact scatters or concentrations of shells that could be middens), obligations under the NPW Act, and the requirements of an archaeological finds' procedure (refer below). This should be prepared for the project and included in any site management plans.

The induction material may be paper based, included in any hard copy site management documents; or electronic, such as "PowerPoint" for any face to face site inductions.

Recommendation 2 – Archaeological Chance Find Procedure

Although considered highly unlikely, should any archaeological deposits be uncovered during any site works, a procedure must be implemented. The following steps must be carried out:

1. All works stop in the vicinity of the find. The find must not be moved 'out of the way' without assessment.
2. Site supervisor, or another nominated site representative must contact either the project archaeologist (if relevant) or DPC to contact a suitably qualified archaeologist.
3. The nominated archaeologist examines the find, provides a preliminary assessment of significance, records the item and decides on appropriate management, in conjunction with the RAPs for the project. Such management may require further consultation with DPC, preparation of a research design and archaeological investigation/salvage methodology and preparation of AHIMS Site Card.
4. Depending on the significance of the find, reassessment of the archaeological potential of the subject area may be required, and further archaeological investigation undertaken.
5. Reporting may need to be prepared regarding the find and approved management strategies. Any such documentation should be appended to this ACHAR and revised accordingly.
6. Works in the vicinity of the find can only recommence upon relevant approvals from DPC.

Recommendation 3 – Human Remains Procedure

In the unlikely event that human remains are uncovered during any site works, the following must be undertaken:

1. All works within the vicinity of the find immediately stop.
2. Site supervisor or other nominated manager must notify the NSW Police and DPC.
3. The find must be assessed by the NSW Police, and may include the assistance of a qualified forensic anthropologist.
4. Management recommendations are to be formulated by the Police, DPIE and site representatives.
5. Works are not to recommence until the find has been appropriately managed.

Recommendation 4 – RAP consultation

A copy of the final ACHAR must be provided to all RAPs. Ongoing consultation with RAPs should occur as the project progresses, to ensure ongoing communication about the project and key milestones, and to ensure the consultation process does not lapse, particularly with regard to consultation should the CFP be enacted.

1. INTRODUCTION

Urbis has been engaged by Frasers Property Australia ('the Proponent') to conduct an Aboriginal Cultural Heritage Assessment (ACHA) of the Ivanhoe Estate, Macquarie Park, NSW, 2113 ('the subject area'), which comprises Ivanhoe Place (Lot 100 in DP1262209) and 2-4 Lyon Park Road (Lot 101 in DP 1263727). The present Aboriginal Cultural Heritage Assessment Report (ACHAR) is based on that ACHA and has been produced to accompany an Environmental Impact Statement (EIS) in support of State Significant Development Applications for the subject area.

1.1. SUBJECT AREA DESCRIPTION

The subject area is located within the City of Ryde Local Government Area (LGA), approximately 12.5km north-west of the Sydney CBD (Figure 1 and Figure 2). It is located on the southern fringe of Macquarie Park, and is within approximately 500 metres of both Macquarie Shopping Centre and Macquarie University. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings. The subject area is approximately 8.2ha and is irregular in shape. It has frontages on Epping Road to the south, Lyon Park Road to the east and Herring Road to the west. It is further bounded to the west and north by mixed use and lots and parkland and to the east by commercial lots. The subject area previously accommodated 259 social housing dwellings comprising a mix of townhouse and apartment buildings set around a cul-de-sac street layout, with all dwellings now demolished.

1.2. PROPOSED DEVELOPMENT

The subject area is being redeveloped as part of the NSW Government's 'Communities Plus' program, which seeks to deliver new communities with good access to transport, employment, improved facilities, and open space through leveraging the expertise and capacity of the private and non-government sectors. Development delivered under Communities Plus is mixed tenure, combining both social and market housing.

Consent was granted by the Minister for Planning and Public Spaces on 30 April 2020 for the Ivanhoe Estate - Concept Masterplan (SSD-8707) and for the first stage of physical works (SSD-8903) referred to as Stage 1.

The present ACHAR relates to subsequent State Significant Development Applications (SSDA) for the Ivanhoe Estate redevelopment (including but not limited to Stage 2). These SSDAs will be pursuant to the approved Ivanhoe Estate Concept Masterplan (SSD-8707) and subsequent to the approved Stage 1 works (SSD-8903).

Stage 2 of the proposed redevelopment comprises the Village Green and Community Centre (C2), and residential buildings C3 and C4 (Figure 3). The Stage 2 application will include the following works, noting site preparation works, roads, servicing and public domain works across the site have already been approved under SSD-8903:

- The detailed design, construction, and operation of:

  C2 composing the community centre, pool, gym and Village Green central open space area.

  C3 comprising a 17-storey mixed use building with approximately 170 market housing residential apartments and ground floor retail uses.

  C4 comprising a 24-storey building with 268 market apartments and 4 x 3-storey market townhouses and a 17-storey building comprising 216 social housing apartments

- Excavation of basements for Buildings C3 and C4, and detailed earthworks to achieve the required levels for the community centre and Village Green.
- Utilities and services infrastructure to tie-into the detailed requirements of the proposed buildings.
- New driveways and public domain areas to tie-into the approved internal road network and road reserves.
- Stratum subdivision to correspond with the proposed buildings.

The capital investment value of Stage 2 is over $30 million and is carried out on behalf of the NSW Land and Housing Corporation, as such is classified as State Significant Development (SSD) in accordance with Clause 10, Schedule 2 of State Environmental Planning Policy (State and Regional Development) 2011 (SEPP SRD).

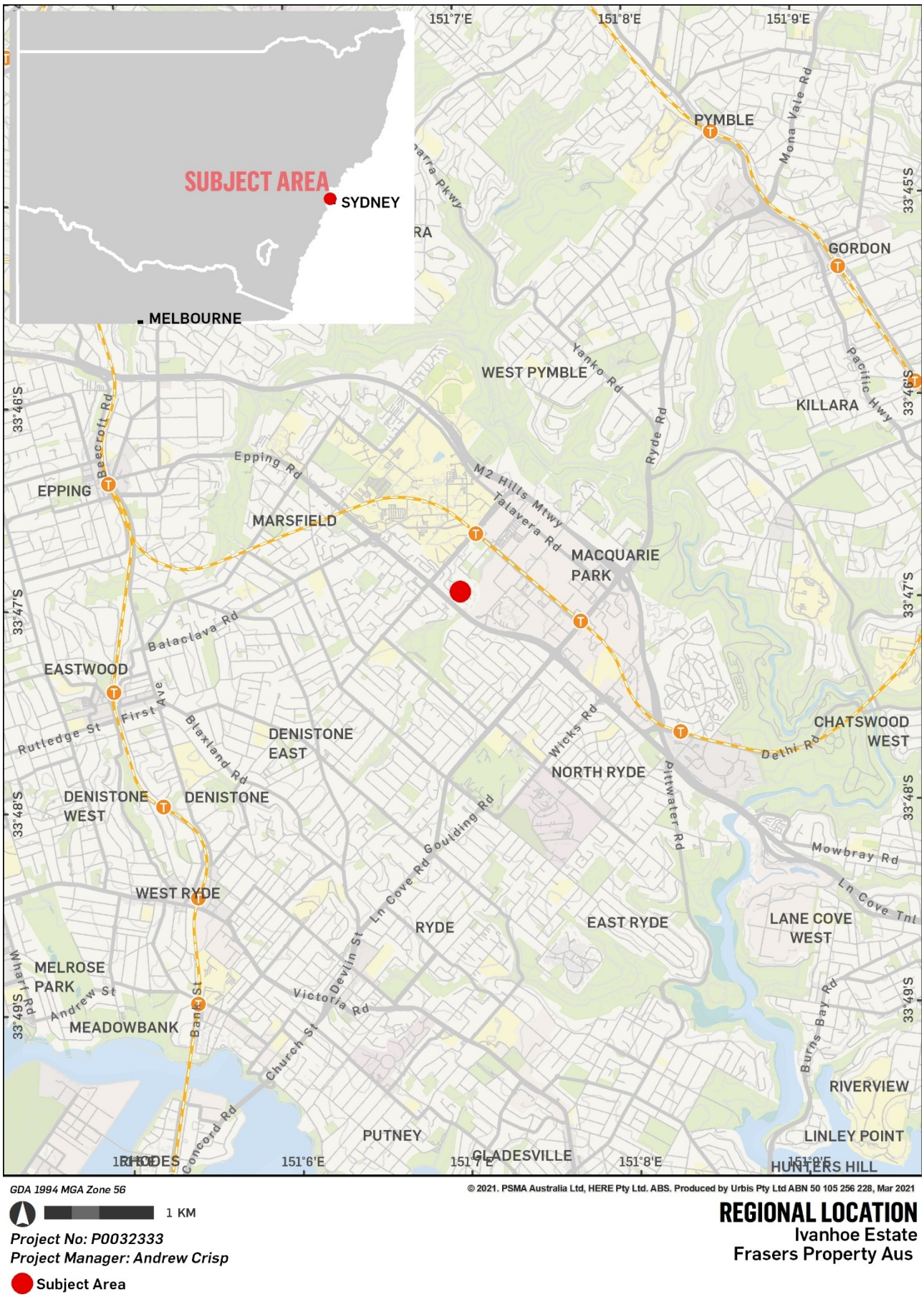

Figure 1 – Regional location



Figure 2 – Location of the subject area

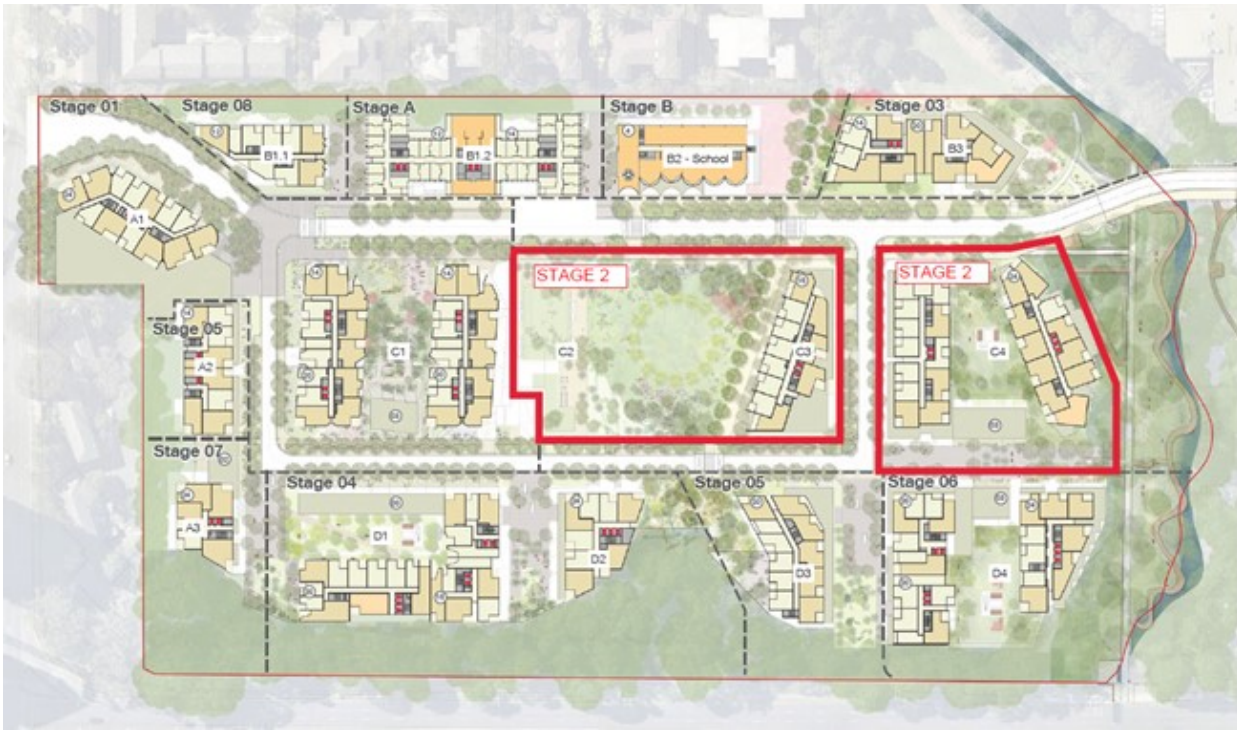

Figure 3 – Ivanhoe Masterplan
Source: Ethos Urban

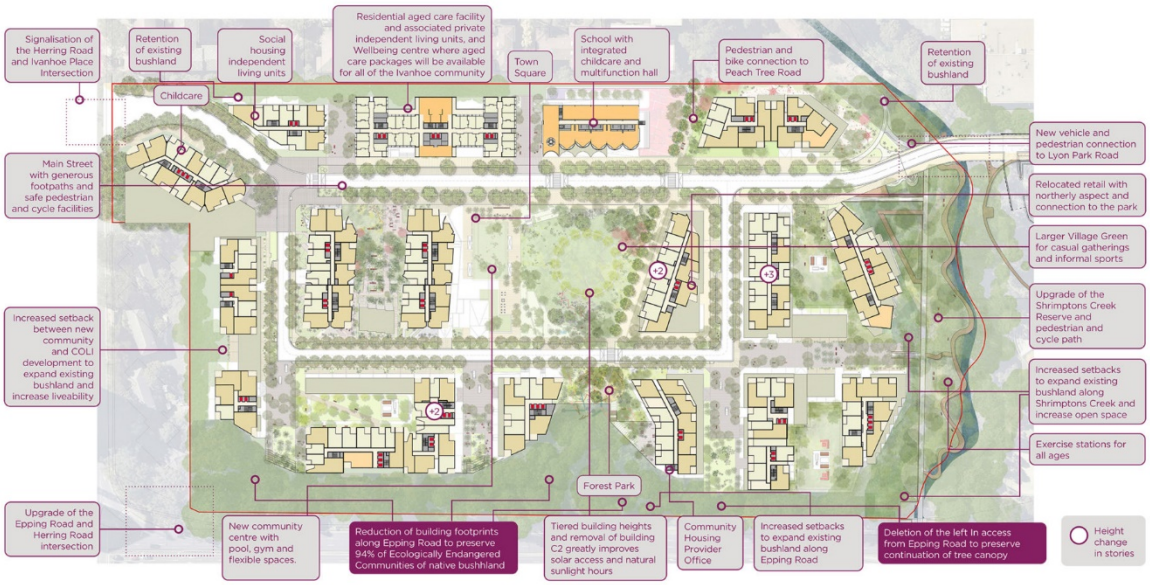

Figure 4 – Ivanhoe Masterplan
Source: Ethos Urban

1.3. RESPONSE TO SEARS

The ACHAR has been guided by the anticipated Secretary's Environmental Assessment Requirements (SEARs) for all SSDAs relating to Stage 2 and subsequent stages of the proposed development. The SEARs for this project are anticipated to include requirements for heritage and archaeology identified in Table 1 below. The section of the present ACHAR in which those requirements are addressed is also indicated in Table 1.

Table 1 – Anticipated SEARs and relevant report sections

Anticipated SEARs	Section of Report
Identify and describes the Aboriginal cultural heritage values that exist across the site.	Sections 2, 4 and 5
Undertake surface surveys and test excavations where necessary.	Section 3.3
Incorporate consultation with Aboriginal people in accordance with *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (DECCW, 2010).	Section 4
Document the significance of cultural heritage values of Aboriginal people who have a cultural association with the land.	Section 5
Identify, assess, and document all impacts on the Aboriginal cultural heritage values.	Section 6
Demonstrate attempts to avoid any impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR and EIS must outline measures proposed to mitigate impacts. Any objects recorded as part of the assessment must be documented and notified to the Environment, Energy and Science Group of the Department of Planning, Industry and Environment.	Section 6

1.4. THE CURRENT ASSESSMENT REPORT

1.4.1. Objectives

The objectives of the ACHA are to:

- Investigate the presence, or absence, of Aboriginal objects and/or places within and in close proximity to the subject area, and whether those objects and/or places would be impacted by the proposed development.
- Investigate the presence, or absence, of any landscape features that may have the potential to contain Aboriginal objects and/or sites and whether those objects and/or sites would be impacted by the proposed development.
- Document the nature, extent and significance of any Aboriginal objects and/or place and sites that may located within the subject area.
- Document consultation with the Registered Aboriginal Parties (RAPs) with the aim to identify any spiritual, traditional, historical or contemporary associations or attachments to the subject area and any Aboriginal objects and/or places that might be identified within the subject area.
- Provide management strategies for any identified Aboriginal objects and/or places or cultural heritage values.
- Provide recommendations for the implementation of the identified management strategies.
- Prepare a final ACHAR to accompany an EIS in support of State Significant Development Applications for the subject area.

1.4.2. Assessment and Reporting

The ACHA on which the present report is based has been carried out in accordance with Part 6 of the NPW Act and Part 5 of the NPW Reg.

The ACHAR was prepared according to the guidelines that accompany the NPW Act including:

- *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (Department of Environment, Climate Change and Water (DECCW), 2010) (the Consultation Guidelines).
- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (Office of Environment and Heritage 2011) (the Assessment Guidelines).
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010) (the Code of Practice).
- *The Australia ICOMOS Charter for Places of Cultural Significance, The Burra Charter, 2013* (Burra Charter).

Section 3.1 of the Assessment Guidelines specifies the content requirements of an ACHAR, which includes the requirements of Regulation 61 of the NPW Reg. The requirements are listed in Table 2 below, together with the sections of the present ACHAR in which they are addressed.

Table 2 – ACHAR Requirements

Requirement	Section of Report
A description of the Aboriginal objects and declared Aboriginal places located within the area of the proposed activity	Section 2
A description of the cultural heritage values, including the significance of the Aboriginal objects and declared Aboriginal places, that exist across the whole area that will be affected by the proposed activity and the significance of these values for the Aboriginal people who have a cultural association with the land	Section 5
How the requirements for consultation with Aboriginal people have been met (as specified in clause 80C of the NPW Regulation)	Section 4
The views of those Aboriginal people regarding the likely impact of the proposed activity on their cultural heritage (if any submissions have been received as a part of the consultation requirements, the report must include a copy of each submission and your response)	Section 4, Section 5 & Appendix C
Actual or likely harm posed to the Aboriginal objects or declared Aboriginal places from the proposed activity, with reference to the cultural heritage values identified	Section 6
Any practical measures that may be taken to protect and conserve those Aboriginal objects or declared Aboriginal places	Section 7
Any practical measures that may be taken to avoid or mitigate any actual or likely harm, alternatives to harm or, if this is not possible, to manage (minimise) harm.	Section 7

1.5. AUTHORSHIP

The present ACHAR has been prepared by Aaron Olsen, Urbis Consultant (Archaeology), and Andrew Crisp, Urbis Senior Consultant (Archaeology), with review and quality control undertaken by Balazs Hansel, Urbis Associate Director (Archaeology).

Aaron Olsen holds a Diploma of Arts (Archaeology) from the University of Sydney, a Bachelor of Science (Honours - First Class in Chemistry) and PhD (Chemistry) from the University of Newcastle and a Masters (Industrial Property) from the University of Technology Sydney. Andrew Crisp holds a Bachelor of Arts (Honours - First Class in Archaeology) from the University of Sydney. Balazs Hansel holds a Masters (History) and Masters (Archaeology and Museum Studies) from the University of Szeged (Hungary) and is currently completing a PhD (Archaeology) at the University of Sydney.

2. STATUTORY CONTEXT

2.1. HERITAGE CONTROLS

The protection and management of Aboriginal cultural heritage items, places and archaeological sites within New South Wales is governed by the relevant Commonwealth, State or local government legislation. These are discussed below in relation to the present subject area.

2.1.1. The National Parks and Wildlife Act 1974

Management of Aboriginal objects and places in NSW falls under the statutory control of the *National Parks and Wildlife Act 1974* (NPW Act). Application of the NPW Act is in accordance with the *National Parks and Wildlife Regulation 2019* (NPW Reg).

Section 5 of the NPW Act defines Aboriginal objects and Aboriginal places as follows:

> *Aboriginal object means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.*
>
> *Aboriginal place means any place declared to be an Aboriginal place under section 84 of the NPW Act.*

The NPW Act provides statutory protection for Aboriginal objects, defining two tiers of offence against which individuals or corporations who harm Aboriginal objects or Aboriginal places can be prosecuted. The highest tier offences are reserved for knowledgeable harm of Aboriginal objects or knowledgeable desecration of Aboriginal places. Second tier offences are strict liability offences - that is, offences regardless of whether or not the offender knows they are harming an Aboriginal object or desecrating an Aboriginal place - against which defences may be established under the *National Parks and Wildlife Regulation 2009* (NSW) (the NPW Regulation).

Section 86 of the NPW Act identifies rules and penalties surrounding harming or desecrating Aboriginal objects and Aboriginal places. These are identified as follows:

> *(1) A person must not harm or desecrate an object that the person knows is an Aboriginal object*
>
> *Maximum penalty:*
>
> *(a) in the case of an individual—2,500 penalty units or imprisonment for 1 year, or both, or (in circumstances of aggravation) 5,000 penalty units or imprisonment for 2 years, or both, or*
>
> *(b) in the case of a corporation—10,000 penalty units.*
>
> *(2) A person must not harm an Aboriginal object.*
>
> *Maximum penalty:*
>
> *(a) in the case of an individual—500 penalty units or (in circumstances of aggravation) 1,000 penalty units, or*
>
> *(b) in the case of a corporation—2,000 penalty units.*
>
> *(4) A person must not harm or desecrate an Aboriginal place.*
>
> *Maximum penalty:*
>
> *(a) in the case of an individual—5,000 penalty units or imprisonment for 2 years, or both, or*
>
> *(b) in the case of a corporation—10,000 penalty units.*
>
> *(5) The offences under subsections (2) and (4) are offences of strict liability and the defence of honest and reasonable mistake of fact applies.*

(6) Subsections (1) and (2) do not apply with respect to an Aboriginal object that is dealt with in accordance with section 85A.

(7) A single prosecution for an offence under subsection (1) or (2) may relate to a single Aboriginal object or a group of Aboriginal objects.

(8) If, in proceedings for an offence under subsection (1), the court is satisfied that, at the time the accused harmed the Aboriginal object concerned, the accused did not know that the object was an Aboriginal object, the court may find an offence proved under subsection (2).

Section 87 (1), (2) and (4) of the NPW Act establishes defences against prosecution under s.86. The defences are as follows:

- The harm was authorised by an Aboriginal Heritage Impact Permit (AHIP) (s.87(1)).
- Due diligence was exercised to establish Aboriginal objects will not be harmed (s.87(2)).

Due diligence may be achieved by compliance with requirements set out in the NPW Regulation or a code of practice adopted or prescribed by the NPW Regulation (s.87(3)).

The present ADD follows the Due Diligence Code and aims to establish whether any Aboriginal objects would be harmed by the proposed redevelopment of the subject area, consistent with s.87(2) of the NPW Act.

2.1.2. Environment Protection and Biodiversity Conservation Act 1999

In 2004, a new Commonwealth heritage management system was introduced under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act protects any items listed in the National Heritage List (NHL) and the Commonwealth Heritage List (CHL).

The National Heritage List (NHL) is a list of natural, historic and Indigenous places of outstanding significance to the nation. It was established to protect places that have outstanding value to the nation.

The Commonwealth Heritage List (CHL) was established to protect items and places owned or managed by Commonwealth agencies. The Australian Government Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) is responsible for the implementation of national policy, programs and legislation to protect and conserve Australia's environment and heritage and to promote Australian arts and culture. Approval from the Minister is required for controlled actions which will have a significant impact on items and places included on the NHL or CHL.

2.1.3. Ryde Local Environmental Plan 2014

The *Environmental Planning and Assessment Act 1979* (EP&A Act) requires each LGA to produce a Local Environment Plan (LEP). The LEP identifies items and areas of local heritage significance and outlines development consent requirements.

The subject area falls within the City of Ryde LGA and is subject to the Ryde Local Environmental Plan 2014. Under Section 5.10(2) of the Sydney LEP, development consent is required for:

(a) demolishing or moving any of the following or altering the exterior of any of the following (including, in the case of a building, making changes to its detail, fabric, finish or appearance)—

(i) a heritage item,

(ii) an Aboriginal object,

(iii) a building, work, relic or tree within a heritage conservation area,

(b) altering a heritage item that is a building by making structural changes to its interior or by making changes to anything inside the item that is specified in Schedule 5 in relation to the item,

(c) disturbing or excavating an archaeological site while knowing, or having reasonable cause to suspect, that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed,

(d) disturbing or excavating an Aboriginal place of heritage significance,

(e) erecting a building on land—

(i) on which a heritage item is located or that is within a heritage conservation area, or

(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance,

(f) subdividing land—

(i) on which a heritage item is located or that is within a heritage conservation area, or

(ii) on which an Aboriginal object is located or that is within an Aboriginal place of heritage significance.

The ADD was undertaken to determine whether or not Aboriginal archaeological resources are present within the subject area.

2.1.4. Ryde Development Control Plan 2014

The EP&A Act requires each LGA to produce a Development Control Plan (DCP). Not all LGAs provide information regarding Aboriginal cultural heritage and specific development controls to protect Aboriginal cultural heritage. The subject area is encompassed by the Ryde Development Control Plan 2014, which does not identify any controls relating to Aboriginal cultural heritage.

2.2. HERITAGE LISTS & REGISTERS

A review of relevant heritage lists and registers was undertaken to determine whether any Aboriginal cultural heritage items are located within the curtilage of, or in proximity to, the subject area.

2.2.1. Australian Heritage Database

The Australian Heritage Database is a database of heritage items included in the World Heritage List, the National Heritage List (NHL), the Commonwealth Heritage list (CHL) and places in the Register of the National Estate. The list also includes places under consideration, or that may have been considered, for any one of these lists.

A search of the Australian Heritage Database was undertaken on 15 March 2021. The search did not identify any heritage items within, or near to, the curtilage of the subject area.

2.2.2. NSW State Heritage Inventory

The State Heritage Inventory (SHI) is a database of heritage items in NSW which includes declared Aboriginal Places, items listed on the SHR, listed Interim Heritage Orders (IHOs) and items listed of local heritage significance on a local council's LEP.

A search of the SHI was undertaken on 1 July 2021. The search identified no heritage or archaeological items within the curtilage of the subject area (Figure 5). The nearest registered item is Item 10 of Ryde LEP (Local Significance), "Macquarie University (ruins)", which is located at 192 Balaclava Road, Macquarie Park, approximately 750m north-west of the present subject area.

2.3. SUMMARY

The statutory context of the subject area is summarised as follows:

- The present ACHA aims to establish whether any Aboriginal objects would be harmed by the proposed development of the subject area, thus addressing s.87(2) of the NPW Act and Section 5.10(2) of the Ryde LEP.
- No historical heritage items have been identified within the curtilage of the subject area.
- The nearest heritage item is located approximately 750m north-west of the present subject area.
- The potential impacts of any development on built heritage items is not the purview of the present report and can be addressed by preparation of a Heritage Impact Statement.



Figure 5 – Historical Heritage Items in the vicinity of the subject area

3. ABORIGINAL CULTURAL HERITAGE

3.1. ARCHAEOLOGICAL CONTEXT

A summary of background research for Aboriginal cultural heritage resources within and around the subject area is provided below, including search results from the Aboriginal Heritage Information Management System (AHIMS) and consideration of previous archaeological investigations pertinent to the subject area.

3.1.1. Past Aboriginal Land Use

Due to the absence of written records, it is difficult to infer what Aboriginal life was like prior to the arrival of European settlers. Much of our understanding of Aboriginal life pre-colonisation is informed by the histories documented in the late 18th and early 19th century by European observers. These histories provide an inherently biased interpretation of Aboriginal life both from the perspective of the observer but also through the act of observation. The social functions, activities and rituals recorded by Europeans may have been impacted by the Observer Effect, also known as the Hawthorne Effect. The Observer/Hawthorne Effect essentially states that individuals will modify their behaviour in response to their awareness of being observed. With this in mind, by comparing/contrasting these early observations with archaeological evidence is possible to establish a general understanding of the customs, social structure, languages, beliefs and general of the Aboriginal inhabitants of the Sydney Basin (Attenbrow 2010).

The archaeological record provides evidence of the long occupation of Aboriginal people in Australia and the Sydney region. The oldest generally accepted date for a site in the Sydney basis is 17,800 years before present (BP), recorded in a rock shelter at Shaw's Creek (Nanson et al 1987), near Castlereagh (approximately 47km north-west of the subject area). Older occupation sites along the now submerged coastline would have been flooded around 10,000 BP, with subsequent occupation concentrating along the current coastlines and Cumberland Plain (Attenbrow 2010).

Given the early contact with Aboriginal tribes in the Sydney region, more is known about these groups than those that inhabited regional areas. The Aboriginal population in the greater Sydney region is estimated to have been between around 4000 and 8000 people at the time of European contact (Attenbrow 2010). The area around Macquarie Park and the present subject area was occupied by the Wallumettagal (or Wallumedegal) clan (Smith 2005). The lands occupied by the Wallumettagal are believed to have extended from the Lane Cove River west along the north shore of the Parramatta River (Smith 2005).

The archaeological record is limited to materials and objects that were able to withstand degradation and decay. As a result, the most common type of Aboriginal objects remaining in the archaeological record are stone artefacts. Flaked artefacts are typically the most common type encountered of stone artefact, in part due to their long and ubiquitous use, but also due to their short use life and the large amount of waste produced in their manufacture. However, ground edged tools are also known to have been utilised by Aboriginal people in the Sydney region (Tench 1791). Stone technology and raw material utilisation changed over time. Until about 8,500 BP, stone tool technology remained fairly static with unifacial flaking being dominant and a preference for silicified tuff, quartz and some unheated silcrete evident. After about 4,000 BP, bipolar flaking and backed artefacts appear more frequently and ground stone axes are first observed (Attenbrow 2010:102; JMCHM 2006). From about 1,500 BP, there is evidence of a decline in stone tool manufacture, possibly due to an increase in the use of organic materials, changes in the way tools were made or changes in tool preferences (Attenbrow 2010). After European contact, Aboriginal people of the Sydney region continued to manufacture tools, sometimes with new materials such as bottle glass or ceramics (e.g. Ngara Consulting 2003).

Other materials, such as shell and bone, also survive in the archaeological record under certain conditions. The 'Wallumattagal' is likely derived from the word 'wallumai', the local name for the snapper fish (*Pagrus auratus*), which were abundant in Sydney's waterways (Smith 2005). There is significant evidence of reliance on river resources in the form of shell middens in the lands occupied by the Wallumettagal clan (see Section 3.1.3 below).

Based on the above background, it is possible that similar evidence of Aboriginal occupation is present within original and/or intact topsoils within the present subject area.

3.1.2. Previous Archaeological Investigations

Previous archaeological investigations may provide invaluable information on the spatial distribution, nature and extent of archaeological resources in a given area. Summaries of the most pertinent reports to the subject area are provided below.

3.1.2.1. Archaeological Reports from Subject Area

The following archaeological report relating directly to the subject area has been identified.

EcoLogical, 2017. Ivanhoe Estate, Macquarie Park NSW. Aboriginal and Historical Heritage Assessment

Eco Logical Australia was engaged by Citta Property Group to conduct an Aboriginal heritage due diligence assessment for the proposed Ivanhoe Estate Redevelopment within the portion of the subject area west of Shrimptons Creek (Lot 100 in DP1262209). A site inspection as part of the assessment confirmed that the study area is highly developed. The site inspection did not identify any Aboriginal objects or places within the subject area. Ground disturbance observed during the site inspection included cut and fill landscape modification across the site. It was further observed that none of the trees in the subject area appear old enough to be culturally modified, with most vegetation post-dating construction of the buildings. Based on the level of ground disturbance, it was determined that the subject area has low to nil archaeological potential. The report recommended that no further archaeological assessment within the study area was required.

3.1.2.2. Archaeological Reports from Local Area

Numerous archaeological reports have been produced relating to the broader area around the present subject area and the Sydney region in general. The most relevant to the specific conditions of the present subject area are summarised below.

Artefact Heritage, 2014. North Ryde Station Precinct, M2 site, State Significant Development Archaeological Assessment, Excavation and Monitoring Methodology

The report presents the results of historical and Aboriginal archaeological assessment for the M2 Site at North Ryde, part of the North Ryde Station Precinct, located approximately 1.5km south-east of the present subject area. The study area was assessed as having nil to low archaeological potential and low Aboriginal archaeological significance. It was determined that the majority of the study area had been subject to high levels of ground disturbance and therefore has no Aboriginal archaeological potential. The northern section of the study area was determined to have been subjected to low-moderate ground disturbance but was assessed as having a low archaeological potential due to its skeletal soils. The report illustrates that while high levels of ground disturbance significantly reduce archaeological potential, low to moderate ground disturbance may also reduce archaeological potential in areas with shallow soil profiles.

Mary Dallas Consulting Archaeologists, 2012. Due Diligence Aboriginal Heritage Assessment for Macquarie University, North Ryde.

The report presents the results of a Preliminary Due Diligence Aboriginal Heritage Assessment for the entire Macquarie University site, located approximately 300m north of the subject area on the opposite side of Herring Road. The report identifies three areas within the study area that have been subject to historical cut and fill activities: the University Village, the western open green and new car park and the Macquarie Lake and eastern open green. Despite each area including an archaeologically sensitive landscape feature (i.e. a tributary of the Lane Cove River), each was assessed as being devoid of archaeological potential where large-scale ground disturbance associated with the cut and fill activities had occurred. The report demonstrates that historical cut and fill activities in the immediate vicinity of the subject area destroy or significantly reduce archaeological potential, even near landscape and near archaeologically sensitive landscape features.

HLA-Envirosciences Pty Limited, 2003. Archaeological Subsurface Testing Program: Eden Gardens, Macquarie Park, NSW.

The report presents the results of a sub-surface testing program at Eden Gardens, approximately 1.6km east of the present subject area. The study area is located in a similar landscape to the present subject area, near to the Lane Cove River. The test excavations yielded only a single flaked artefact, which was found in a soil layer above historical materials. It was determined that natural soil profile had been significantly disturbed by historical activities. The report demonstrates that historical activities may significantly reduce archaeological potential within the landscape with which the present subject area is associated.

The archaeological reports summarised above demonstrate that archaeological potential within the context of the area surrounding the subject area may be significantly reduced by historical ground disturbance and shallow soils. However, further consideration of the degree of ground disturbance and soil depth specific to the present subject area is required in assessing archaeological potential.

3.1.3. Aboriginal Heritage Information Management System (AHIMS)

The Aboriginal Heritage Information Management System (AHIMS) database comprises previously registered Aboriginal archaeological objects and cultural heritage places in NSW and it is managed by the Department of Premier and Cabinet (DPC) under Section 90Q of the NPW Act. 'Aboriginal objects' is the official term used in AHIMS for Aboriginal archaeological sites. The terms 'Aboriginal sites', 'AHIMS sites' and 'sites' are used herein to describe the nature and spatial distribution of archaeological resources in relation to the subject area.

It should be noted that the AHIMS register does not represent a comprehensive list of all Aboriginal objects or sites in a specified area as it lists recorded sites only identified during previous archaeological survey effort. The wider surroundings of the subject area and the Concord area in general have been the subject of various levels and intensity of archaeological investigations during the last few decades. Most of the registered sites have been identified through targeted, pre-development surveys for infrastructure and maintenance works, with the restrictions on extent and scope of those developments.

A search of the AHIMS database was carried out on 5 March 2021 (AHIMS Client Service ID: 574117) for an area of approximately 7km by 7km around the subject area.

The AHIMS search identified no Aboriginal object or places within or immediately adjacent to the subject area.

A total of 81 Aboriginal objects were identified in the extensive AHIMS search area. Two registered sites were identified in the AHIMS register as 'not a site', reducing the total number of sites to 79. A summary of the identified Aboriginal sites is provided in Table 3 and the basic and extensive AHIMS search results are included in Appendix A. The distribution of sites identified in the extensive search area and in proximity to the subject area are shown in Figure 7 and Figure 8, respectively.

Table 3 – AHIMS search results (Client Service ID: 574117)

Site Type	Context	Number	Percentage
Art	Open	14	18%
Shelter with Midden	Closed	13	16%
Shelter with Artefact Scatter	Closed	11	14%
Shelter with PAD	Closed	9	11%
Grinding Grooves	Open	8	10%
Shelter with Art	Closed	6	8%
Artefact Scatter	Open	3	4%
Midden	Open	3	4%
Shelter with Art and Midden	Closed	3	4%
Midden with PAD	Open	2	3%
Shelter with Artefact Scatter and Midden	Closed	2	3%
Grinding Grooves with Water Hole	Open	1	1%
Isolated Find	Open	1	1%
Isolated Find with PAD	Open	1	1%

Shelter	Closed	1	1%
Shelter with Isolated Find	Closed	1	1%
Total		**79**	**100%**

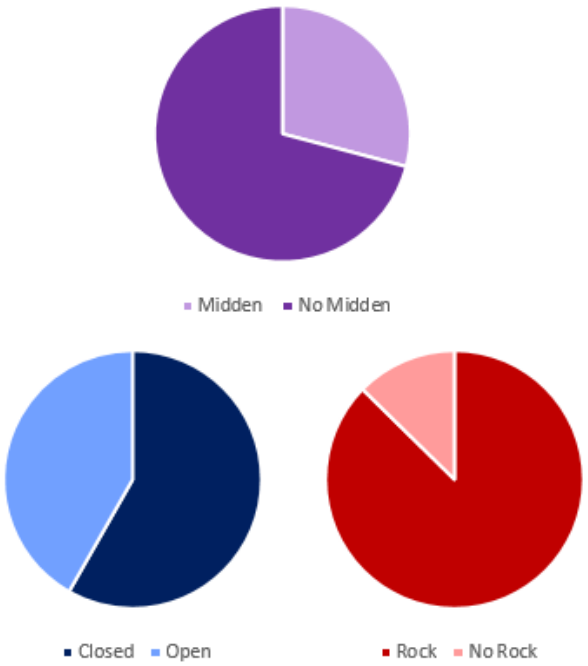

Figure 6 – Analysis of AHIMS search results (Client Service ID: 574117)

The distribution of sites in a landscape may be representative of the interaction between Aboriginal people and their environment. The nearest registered sites to the subject area are AHIMS ID# 45-6-2584 (shelter with artefact scatter), AHIMS ID# 45-6-2585 (shelter with artefact scatter) and AHIMS ID# 45-6-2653 (isolated find with PAD). Each is located approximately 1.4km from the present subject area (Figure 7 and Figure 8) and is associated with either Shrimptons Creek (AHIMS ID# 45-6-2584 and AHIMS ID# 45-6-2585) or Lane Cove River (AHIMS ID# 45-6-2653). More broadly, the Aboriginal sites within the extensive search area are also generally clustered around waterways, particularly the Lane Cover River (Figure 7). The observed clustering of sites around waterways may reflect a reliance of local Aboriginal people on riverine and estuarine resources, such as fish and shellfish. Indeed, the presence of middens in 29% (n=23) of all registered sites within the extensive search area (Figure 6) attests to a subsistence strategy based on utilisation of such resources.

The most common site types identified in the search are rock art sites, which comprise 18% (n=14) of search results. Rock art sites in the search area include either rock engravings or pigment art on rock. Sites involving rock outcrops (shelters, art and grinding groove) represent 87% (n=69) of all registered sites within the extensive search area (Figure 6). The second, third and fourth most common sites are shelters (i.e. 'closed context' sites) with a midden, artefact scatter or potential archaeological deposit (PAD), respectively. Closed sites represent 58% (n=46) of all registered sites within the search area (Figure 6). The high proportion of sites that include shelters or other rock outcrops is consistent with the utilisation of the area around waterways where the geology is more likely to be exposed.

The results of the AHIMS search reflect an environment in which sites are mostly occurring in the vicinity of rock outcrops associated with local waterways. These results reinforce the generic predictive model for the Cumberland Plain, which predicts that Aboriginal objects occur in higher frequency and density within 200m of water or within 20m of a cave, rock shelter, or a cave mouth (see Section 3.2 below).



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1 KM

Project No: P0032333

Project Manager: Andrew Crisp

AHIMS Sites in Extensive Search area

Ivanhoe Estate

Frasers Property Aus

Subject Area	Artefact Scatter	Midden	Rock Engraving	Shelter with Art and Midden
Contours	Grinding Grooves	Not a site	Shell Midden	Shelter with Artefact
Permanent	Grinding Grooves and Water Hole	PAD	Shelter	Shelter with Midden
Ephemeral	Isolated Find	Pigment Art	Shelter with Art	Shelter with PAD
Hydrology				

Figure 7 – Registered Aboriginal sites in extensive search area

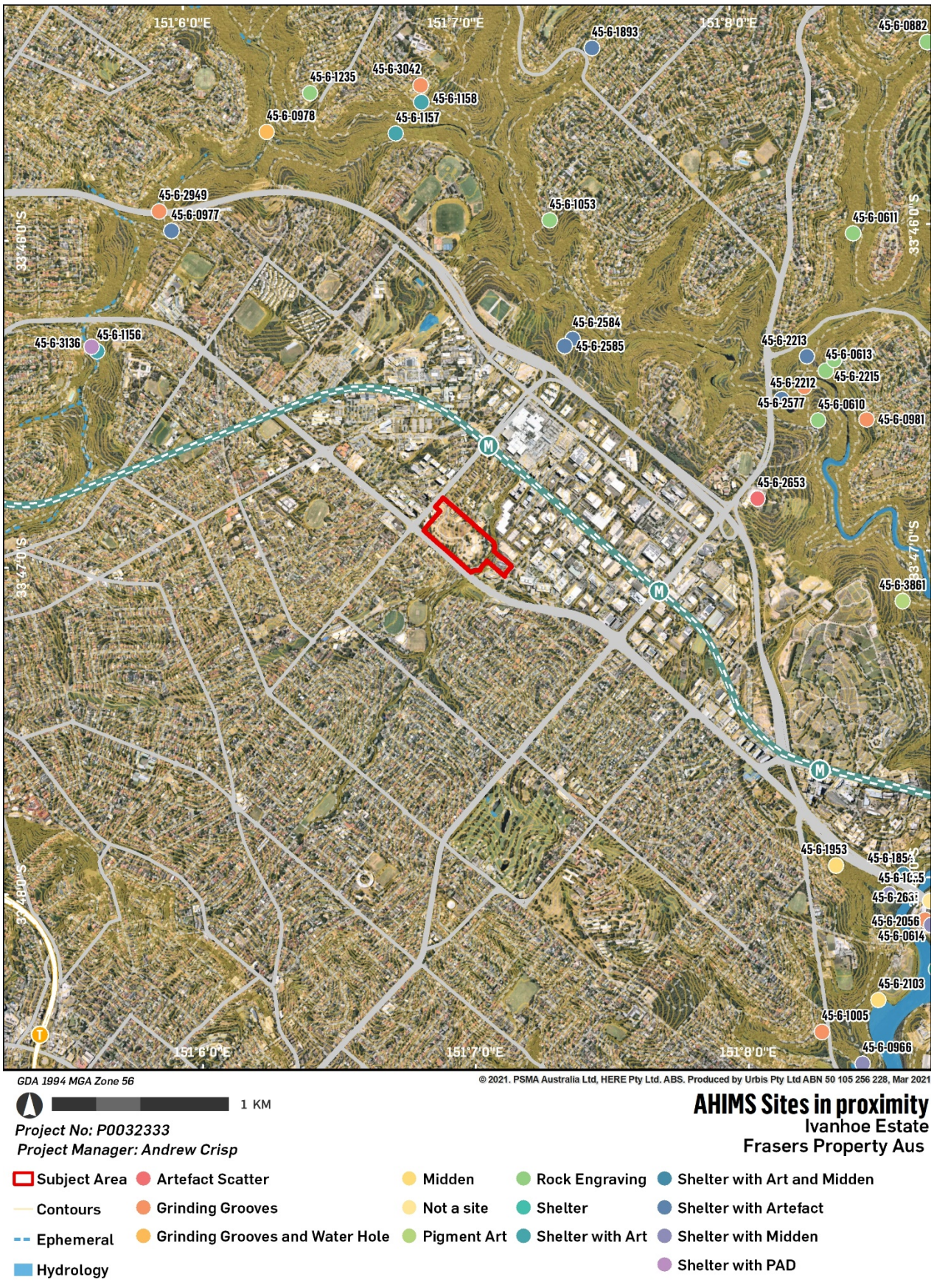


Figure 8 – Registered Aboriginal sites within proximity to the subject area

3.1.4. Conclusions Drawn from Archaeological Assessment

The following conclusions are drawn from the above archaeological assessment of the subject area:

- No Aboriginal objects or places are registered within the curtilage of the subject area.
- Within the regional context of the subject area, registered Aboriginal sites tend to be located near waterways.
- Archaeological reports from other sites near the present subject area indicate that archaeological potential may be significantly reduced by historical ground disturbing activity, despite proximity to waterways.
- A due diligence assessment (Eco Logical, 2017) relating directly to the subject area indicates that the portion of the subject area west of Shrimptons Creek is highly disturbed and has low to nil archaeological potential.
- The archaeological assessment indicates that the subject area may retain little archaeological potential due to ground disturbing activities, although the possibility of localised areas of potential warrants further consideration.

3.2. ENVIRONMENTAL CONTEXT

The environmental context of a subject area is relevant to its potential to include Aboriginal objects and places. Aboriginal objects and places may be associated with certain landscape features that played a part in the everyday lives and traditional cultural activities of Aboriginal people. Landscape features that are considered indicative of archaeological potential include rock shelters, sand dunes, waterways, waterholes and wetlands. Conversely, disturbance to the landscape after Aboriginal use may reduce the potential for Aboriginal objects and places. An analysis of the landscape within and near to the subject area is provided below.

3.2.1. Topography

Certain landform elements are associated with greater archaeological potential for Aboriginal objects and places. Areas that are located on a ridge top, ridge line or headland, located within 200m below or above a cliff face or within 20m of or in a cave, rock shelter or cave mouth are considered sensitive areas for Aboriginal objects and places.

The subject area does not include a ridge, headland or cliff, nor does the subject area does include any visible rock outcrops or overhangs. The subject area therefore does not include any topographic features that are indicative of archaeological potential.

3.2.2. Hydrology

Proximity to a body of water is a factor in determining archaeological potential according to the predictive model for the Cumberland Plain. Areas within 200m of freshwater or the high-tide mark of shorelines area considered sensitive areas for Aboriginal objects and places.

The eastern boundary of DP 1262209 Lot 100 and western boundary of DP 1263727 Lot 101 are defined by a lower order stream, Shrimptons Creek (Figure 9). Approximately half of the subject area lies within 200m of Shrimptons Creek, which may have been a viable source of fresh water and food for the local Aboriginal people. The hydrology of the subject area is therefore conducive to prolonged habitation and indicative of archaeological potential.

3.2.3. Geology and Soils

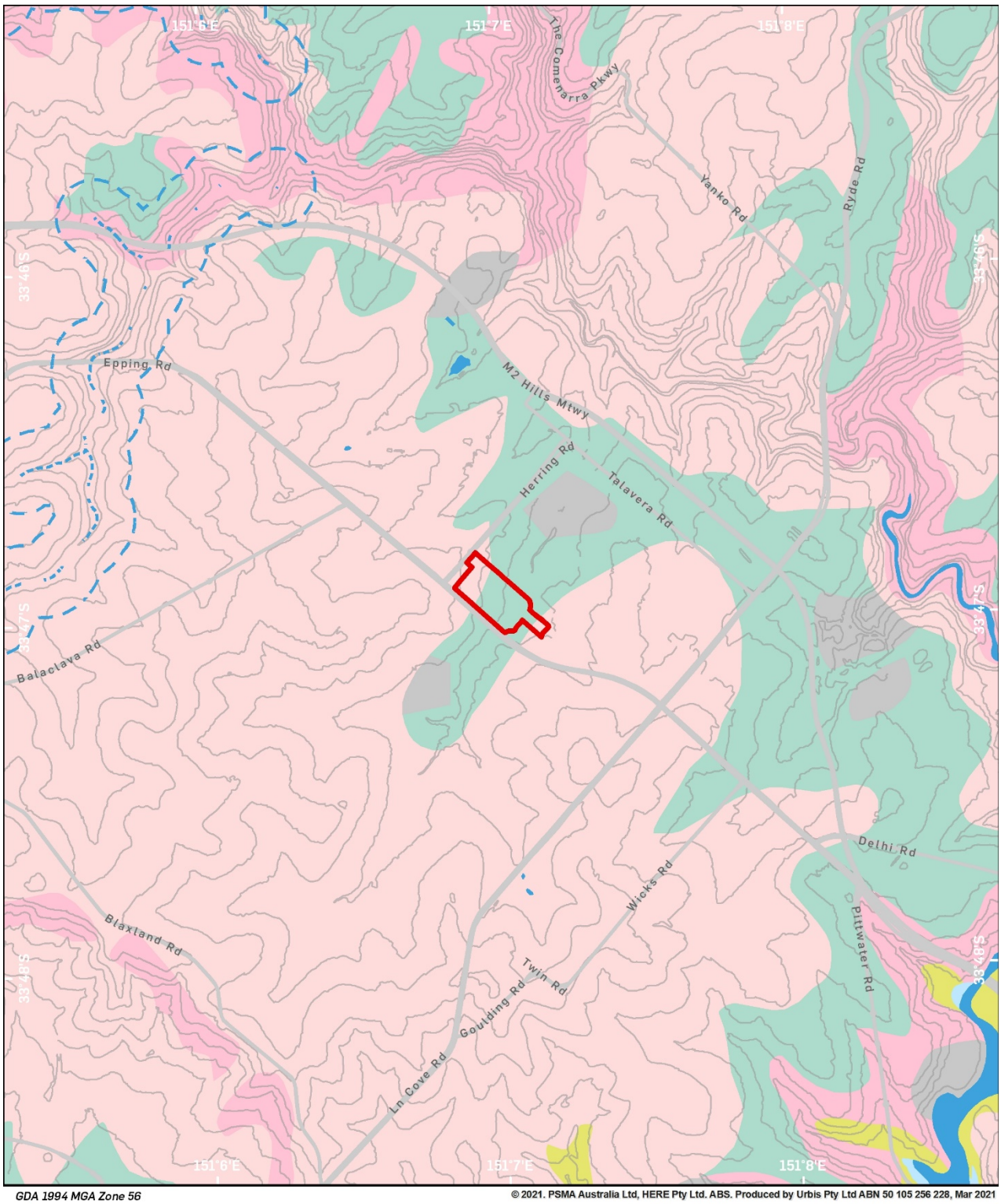
Certain soil landscapes and geological features are associated with greater archaeological potential for Aboriginal objects and places. For example, sand dune systems are associated with the potential presence of burials and sandstone outcrops are associated with the potential presence of grinding grooves and rock art. The depth of natural soils is also relevant to the potential for archaeological materials to be present, especially in areas where disturbance is high. In general, as disturbance level increases, the integrity of any potential archaeological resource decreases. However, disturbance might not remove the archaeological potential even if it decreases integrity of the resources substantially.

3.2.3.1. NSW Soil and Land Information System

The NSW Soil and Land Information System (SALIS) provides information on expected soil landscapes within NSW.

The majority of the subject is identified in SALIS as being located within the Lucas Heights (lh) soil landscape (Figure 9). The Lucas Heights soil landscape is described as residing on gently undulating crests and ridges on plateau surfaces of the Mittagong formation (alternating bands of shale and fine-grained sandstones). Soils are described as moderately deep (50–150 cm) hard-setting Yellow Podzolic Soils and Yellow Soloths (Dy2.41), with Yellow Earths (Gn2.24) on outer edges. Dominant soil materials include loose yellowish-brown sandy loam, bleached stony hard-setting sandy clay loam, earthy yellowish-brown sandy clay loam and pedal yellowish-brown clay.

On the western and eastern boundaries of the subject area, SALIS identifies the Glenorie (gn) soil landscape (Figure 9). The Glenorie soil landscape is described as residing upon undulating to rolling low hills on Wianamatta Group shales. Soils are described as shallow to moderately deep (<100 cm) Red Podzolic Soils (Dr2.11) on crests, with moderately deep (70–150 cm) Red and Brown Podzolic Soils (Dr2.11, Dr2.21, Db1.11, Db1.21) on upper slopes and deep (>200 cm) Yellow Podzolic Soils (Dy5.11) and Gleyed Podzolic Soils (Dg4.11) along drainage lines. Dominant soil materials include friable dark brown loam, hard-setting brown clay loam whole-coloured reddish brown strongly pedal clay, mottled grey plastic clay and brownish-grey plastic silty clay.



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1 KM

SOIL LANDSCAPES AND HYDROLOGY

Ivanhoe Estate
Frasers Property Aus

Project No: P0032333
Project Manager: Andrew Crisp

- Subject Area
- Hydrology
- Ephemeral
- Hydrology 200m Buffer
- Alluvial (ALlc)
- Colluvial (COha)
- Colluvial (COwp)
- Disturbed Terrain (DTxx)
- Erosional (ERgn)
- Erosional (ERgy)
- Residual (RElh)
- Water

Figure 9 – Soil landscapes and hydrology

3.2.3.2. Geotechnical Analysis

Douglas Partners (2017a and 2017b) has undertaken separate geotechnical assessments of the eastern portion and western portion of the subject area at the request of Citta Property Group Pty Limited on behalf of the Proponent.

Douglas Partners, 2017a. Geotechnical Desktop Assessment Proposed Residential Development 2-4 Lyon Park Road, Macquarie Park.

The report presents the results of a desktop geotechnical assessment undertaken by Douglas Partners Pty Ltd for the eastern portion of the present subject area (Lot 101 in DP1263727). The assessment sought to determine the subsurface soil and groundwater conditions and included a review of previous borehole testing of the study area.

Douglas Partners undertook a program of borehole testing in the portion of the subject area east of Shrimptons Creek (Lot 101 in DP1263727) in August 2000, prior to construction of the existing building. Soil samples were obtained from five boreholes, the locations of which are shown in Figure 10. The boreholes were drilled to total depths of between 2m (Borehole 1) and 7.75m (Borehole 5) below the existing ground surface. The borehole logs are annexed hereto as Appendix D.

Poorly compacted filling was present in the boreholes to depths of up to 1.8 m. However, earthworks involved in the construction of the existing building and pavements are likely to have altered this upper profile, potentially removing some or all of the unsuitable filling and/or the placement of new, possibly engineered filling. The natural soils underlying the filling generally comprised soft, firm and firm to stiff silty, sandy clay, sometimes with ironstone gravel. Sandstone was identified underlying the natural soils at Bores 2 to 5, at levels falling from RL 45 at Bore 5 to RL 42.9 at Bore 2. The sandstone ranged from extremely low strength, improving to high strength, with strength generally improving with depth.

These findings are consistent with the SALIS prediction that the subject area is located within the Lucas Heights and Glenorie Landscapes.

Douglas Partners, 2017b. Report on Geotechnical Desktop Assessment Proposed Residential Development Ivanhoe, Macquarie Park.

The report presents the results of a desktop geotechnical assessment undertaken by Douglas Partners Pty Ltd for the western portion of the present subject area (Lot 100 in DP1262209). The assessment sought to determine the subsurface soil and groundwater conditions and included a review of existing information relating to the subject area and a brief visit to the subject area to assess site conditions and make observations. The observations from the walkover are summarised in Figure 11.

The report notes that construction of the existing residential buildings has included cut and fill activities, which have cut into the bedrock. Exposed rock was visible in several locations at the rear of residences west of Ivanhoe Place, at the locations shown in Figure 11. It is apparent from the observations reported by Douglas Partners (2017b) that the intact natural soil will not be present across much of the western portion of the subject area due to historical cut and fill activities. Intact natural soil may remain along the southern and western boundaries of the subject area, which have not been subjected to cut and fill activities, and in the vicinity of Shrimptons Creek.

The report further notes that natural soils in the area are relatively shallow, despite the SALIS prediction of moderately deep soils. This assessment is consistent with observations of skeletal soils in the Lucas Heights soil landscape 1.5km south-east of the subject area (Artefact Heritage, 2014). Although the SALIS prediction that the subject area is located in the Lucas Heights and Glenorie Landscapes may be accurate, it appears likely that the soil depth is shallower than expected.

The shallow soils that are likely to be naturally occurring within the subject area would exacerbate the deleterious impact of ground disturbance on archaeological potential.

A single sandstone outcrop was also observed at the southern corner of the site, near Shrimptons Creek (Figure 11). Numerous sandstone boulders were also observed in association with Shrimptons Creek (Figure 11), which were likely to have been used for stabilisation of the slope against erosion and as headwalls. There is no evidence that the subject area includes any rocky outcrops or other sources of stone useful for the production of tools.

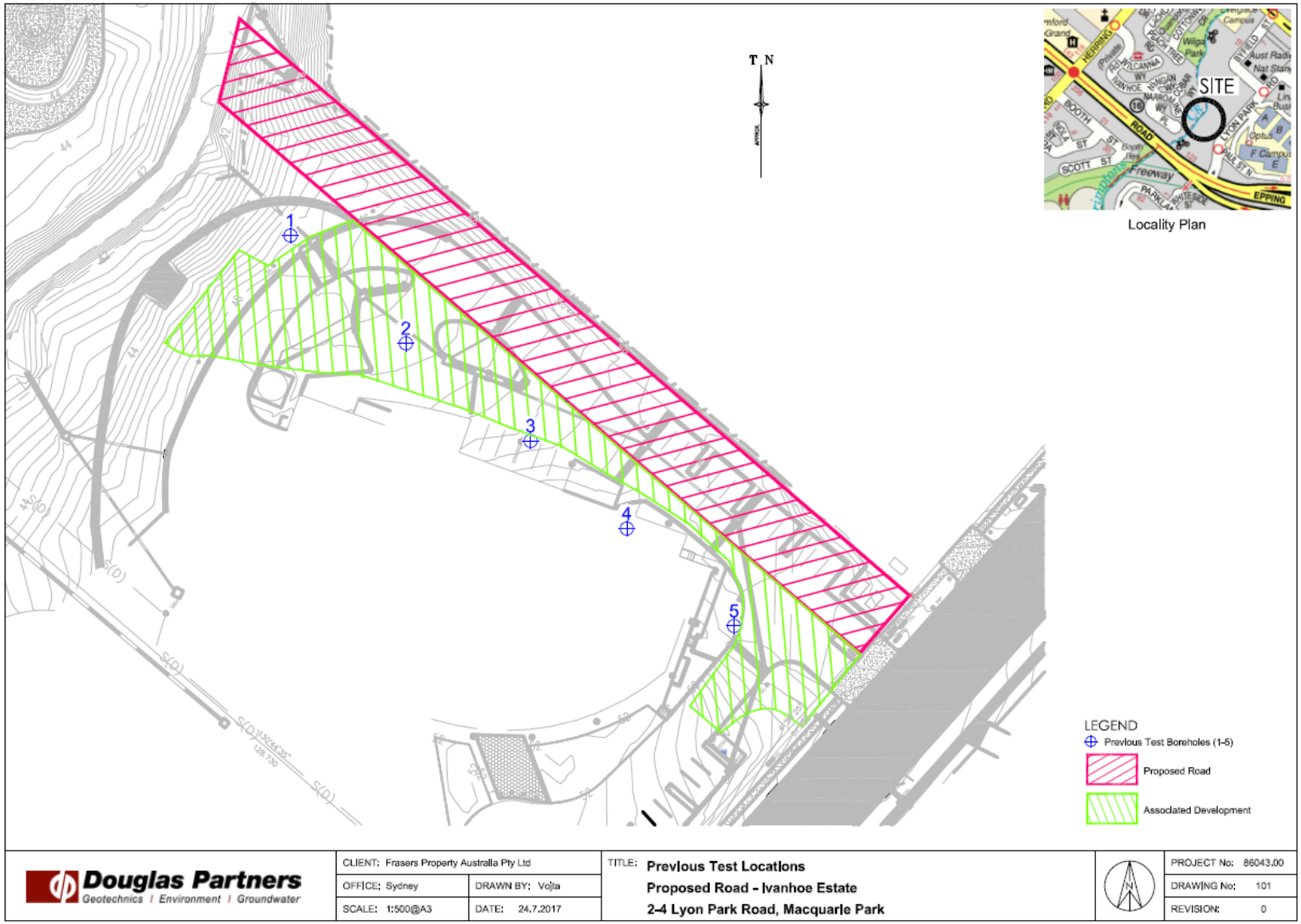

Figure 10 – Borehole locations
Source: Douglas Partners

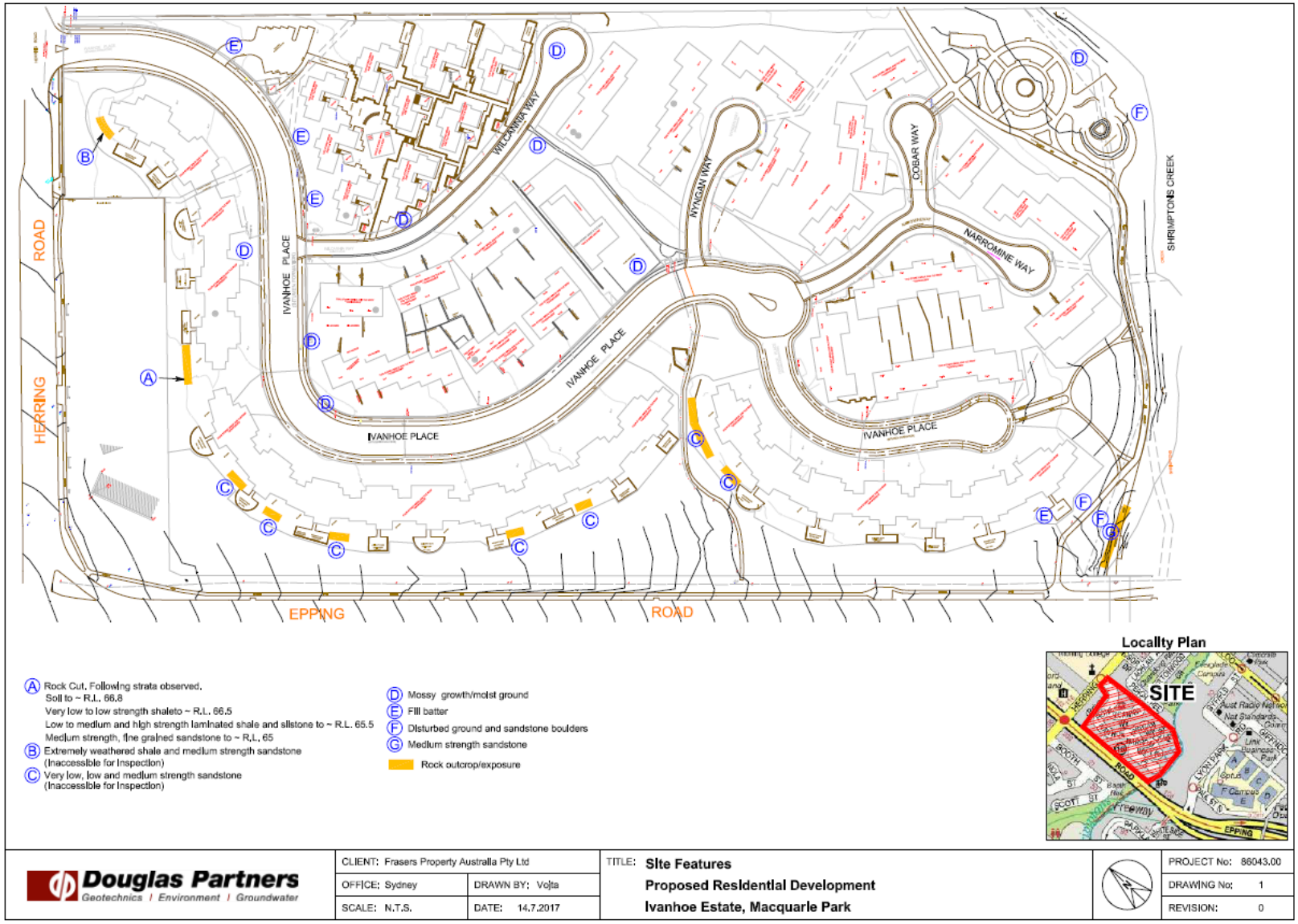

Figure 11 – Subject area features
Source: Douglas Partners

3.2.4. Vegetation

The presence of certain types of vegetation within in an area may be indicative of archaeological potential for certain site types, such as modified trees, or more generally of the habitability of an area for Aboriginal people.

Although the subject area includes numerous mature trees, it appears unlikely that the subject area currently includes any remnant vegetation due to historical land clearance (see Section 3.2.4 below). This is confirmed by a field survey conducted as part of the due diligence assessment for the western portion of the subject area (EcoLogical, 2017).

The vegetation associated with the Lucas Heights soil landscape would have originally comprised low, eucalypt open-forest and low eucalypt woodland with a sclerophyll shrub understorey. Dominant tree species would have included turpentine *Syncarpia glomulifera*, smooth-barked apple *Angophora costata*, red bloodwood *Eucalyptus gummifera*, thinleaved stringybark *E. eugenioides* and scribbly gum *E. haemastoma*. The Glenorie soil landscape would have been associated with tall open forest (wet sclerophyll forest). Dominant tree species would have included Sydney blue gum *E. saligna* and blackbutt *E. pilularis*. Other species would have included turpentine *Syncarpia glomulifera*, grey ironbark *E. paniculata*, white stringybark *E. globoidea* and rough-barked apple *Angophora floribunda*. Understorey species would have included Pittosporum *Pittosporum undulatum* and coffee bush *Breynia oblongifolia* are common understorey species.

The variety of floral and faunal species in the subject area could have been utilised by Aboriginal people for medicinal, ceremonial and subsistence purposes.

3.2.5. Historical Ground Disturbance

Historical ground disturbance, either through human activity (e.g. soil ploughing, construction of buildings and clearing of vegetation) or natural processes (e.g. erosion), can reduce the archaeological potential of a site. Ground disturbance may reduce the spatial and vertical integrity of archaeological resources and expose sub-surface deposits.

Development of the Ryde area began as early as 1792, when ex-marines were granted land on the northern banks of the Paramatta River (Dictionary of Sydney, 'Marsfield'). By 1802, land grants in the area were numerous and used grazing horses, cattle, sheep and goats (Campbell, 1927). In 1803, William Kent, Junior was granted 570 acres of land, which included the present subject area (Figure 12). Kent's grant was offered for sale in 1835 as "Tudor's Farm" (Ironside's Advertiser and Sydney Price Current, 1835). By 1912, Ken's designated as "Tudor" in the parish map of Hunters Hill (Figure 12).

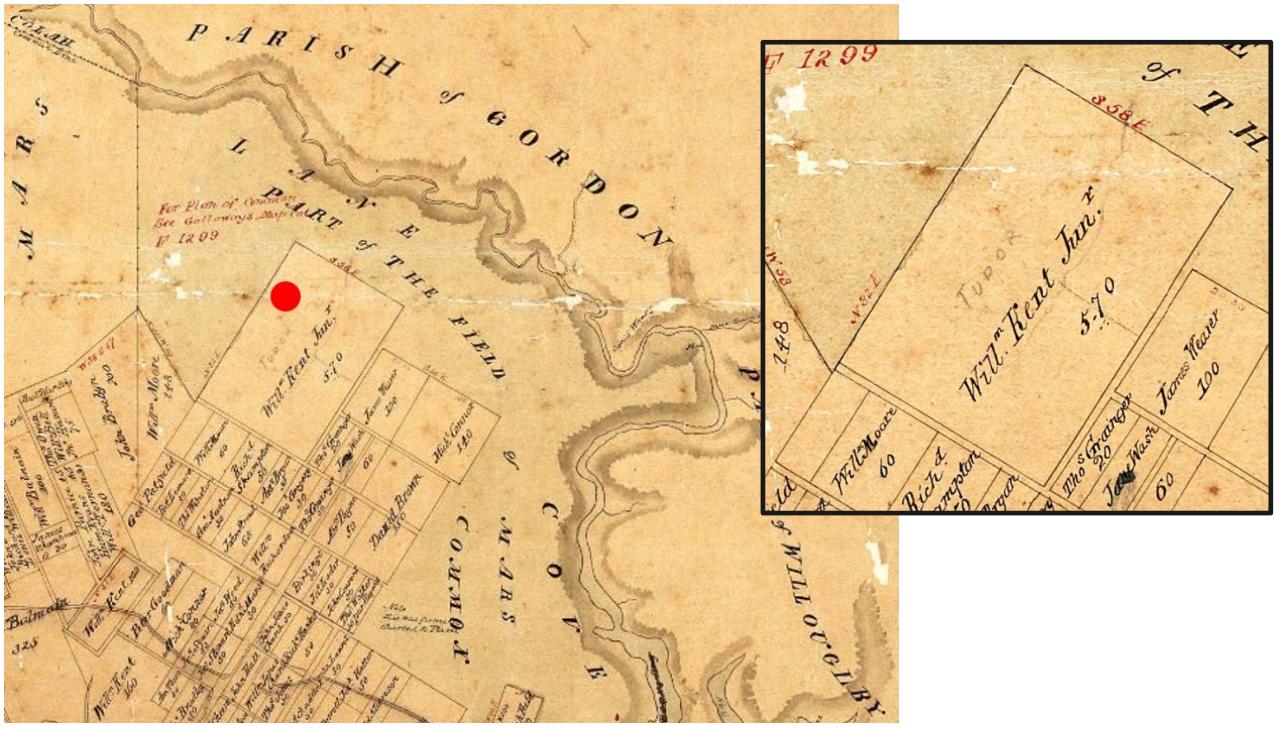

Figure 12 – Parish map of Hunters Hill, c. 1860s; red dot indicates approximate location of subject area in "Tudor" farm
Source: NSWLRS

It is apparent that the subject area was utilised for agricultural purposes or remained undeveloped prior to the mid-twentieth century.

Aerial photographs from 1943, 1986, 2009 and 2021 (see Figure 13) were analysed to develop an understanding of the level of historical ground disturbance within the subject area from the mid-20th century onwards. The analysis of the aerial photographs is provided in Table 4 below.

Table 4 – Analysis of historical aerial photographs

Year	Observation
1943	Approximately two-thirds of the subject area has been cleared of vegetation by this stage. A strip of remnant trees remains in the southern portion of the subject area and some more along Shrimptons Creek. The northern portion of the subject area is primarily utilised for farming on the western side of Shrimptons Creek. Several residential buildings are visible in the north-western corner of the subject area, associated with the farmed portion of the area.
1986	The subject area has been cleared of most remnant vegetation, except for a small number of trees along Shrimptons Creek. Regrowth of new trees is evident along Epping Road. The majority of the subject area has been cleared in preparation for construction of residential buildings, with some construction having commenced. The earlier residential buildings in the north-western corner have been demolished. The roads of Ivanhoe Estate (Ivanhoe Place, Wilcannia Way, Nyngan Way, Narromine Way and Cobar Way are all visible. The portion of the subject area east of Shrimptons Creek is little changed.
2009	The remnant vegetation along Shrimptons Creek remains, while new vegetation growth is evident across the subject area. Building construction has occurred across the subject area, with low to medium rise residential buildings now occupying much of the western portion of the subject area. A large, multi-story building has been constructed on the portion of the subject area east of Shrimptons Creek.
2021	All previous buildings in the western portion of the subject area have now been demolished, except for a single residential building along the northern boundary. The previous road surfaces have also been removed. A new building with associated parking facilities has been constructed in the north-western portion of the subject area, along the norther boundary. The multi-story building east of Shrimptons Creek remains.

It is apparent from the historic aerial imagery that prior to the mid-twentieth century, the subject area was subjected to low to moderate ground disturbance associated with land clearance, farming and construction of small buildings. From the 1980s onwards, the majority of the subject area was subject to a high level of ground disturbance associated with cut and fill earthworks and construction of larger buildings. Localised portions of the subject area along Epping Road and Shrimptons Creek have been subjected to low to moderate ground disturbance.

The majority of subject area is therefore highly disturbed, consistent with the findings of the geotechnical assessments discussed in Section 3.2.3.2 above, significantly reduce archaeological potential. The shallow natural soil profile in areas of low to moderate ground disturbance would also reduce archaeological potential in those areas.



GDA 1994 MGA Zone 56

0 50 M

Project No: P0032333
Project Manager: Andrew Crisp

Subject Area

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HISTORICAL AERIAL PHOTOGRAPHS
Ivanhoe Estate
Frasers Property Aus

Figure 13 – Historical aerial photographs

3.2.6. Conclusions Drawn from Environmental Context Analysis

The following conclusions are drawn from the above assessment of the environmental context of the subject area:

- The subject area does not include any topographic features that are indicative of archaeological potential.
- The proximity of the subject area to a natural water course is indicative of an archaeologically sensitive landscape.
- Vegetation in the subject area would have been conducive to Aboriginal occupation.
- The majority of subject area has been subjected to a high degree of ground disturbance, which is likely to significantly reduce archaeological potential.
- The shallow natural soil profile in areas of low to moderate ground disturbance would reduce archaeological potential in those areas.
- The review of the environmental context indicates that, despite the presence of archaeologically sensitive landscapes, archaeological potential is reduced across much of the subject area due to historical ground disturbance.

3.3. FIELD SURVEY

A field survey of the subject area was undertaken on Friday 25th June 2021 by Urbis Senior Archaeologist Andrew Crisp and Kamilaroi-Yankuntjatjara Working Group (KYWG) site officer Ralph Hampton in attendance. Representatives are listed in Table 5 below.

Invitation was extended to Metropolitan Local Aboriginal Land Council numerous times in the weeks prior to the survey, however, they were unable to attend.

Table 5 – RAP survey attendees

Group	Representative
Urbis	Andrew Crisp
Kamilaroi-Yankuntjatjara Working Group	Ralph Hampton

The study area was walked on foot with opportunistic inspection of areas of surface exposure. Zero landforms identified as having a potential for containing a subsurface archaeological deposit were identified. The archaeological survey was undertaken in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010a).

In accordance with the Code of Practice the study area was surveyed according to survey units, landforms, and landscapes. All survey units are shown in Figure 14 and Figure 15.

The field survey was undertaken in generally clear, sunny conditions with some cloud present in the morning. The field survey was undertaken via pedestrian transects with individuals distanced at approximately 5-10m where possible, and archaeologists with GPS trackers on either end of the group.

The coverage of the field survey as shown by GPS data is represented in Figure 14 below.

Generally, visibility was low across the subject area due to grass and vegetation coverage, with visibility limited to areas of exposure resulting from disturbance including paths and tracks, dam embankments and edges, and localised erosion scours at the base of mature trees (caused by cattle movement/impacts).

During the course of the survey disturbance was noted (Figure 16). No previously unidentified sites were recorded as a result of the survey.

Figure 14 – Archaeological Survey Tracks

Figure 15 – Archaeological Survey Units

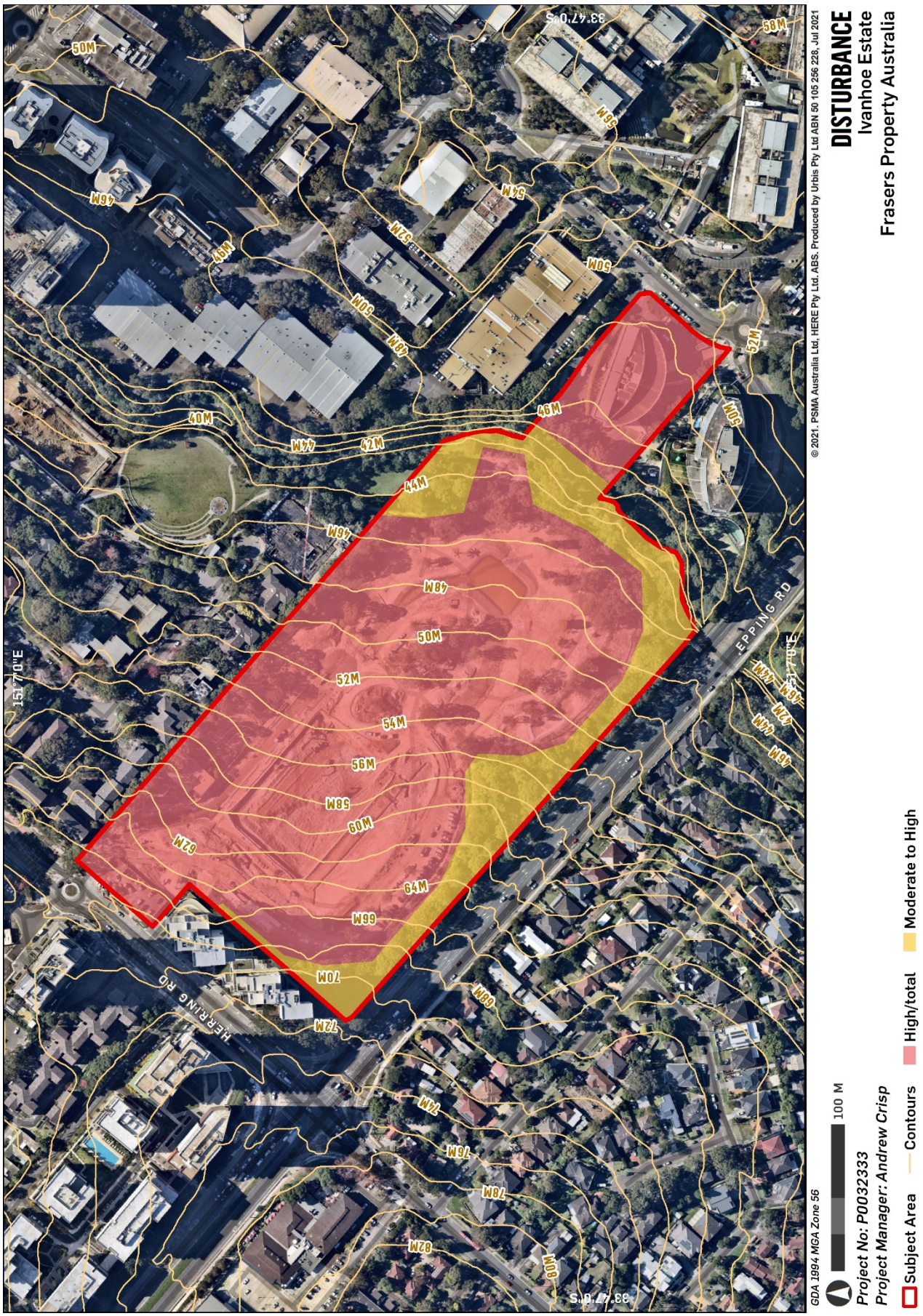

Figure 16 – Disturbance within the Subject Area

3.3.1. Survey Unit 1

Survey Unit 1 (SU1) incorporates the majority of Lot 1 DP 1262209 from Herring Road to the west, property boundary to the north, public pathway and creek alignment in the east and truncated sandstone bedrock to the south.

The entirety of SU1 has been impacted by in the form by bulk earthworks, demolition, construction and piling (Figure 17 to Figure 26) under Consent granted by the Minister for Planning and Public Spaces on 30 April 2020 for the Ivanhoe Estate - Concept Masterplan (SSD-8707) and for the first stage of physical works (SSD-8903) referred to as Stage 1.

The entirety of SU1 is considered to contain nil subsurface archaeological potential. No Aboriginal sites were identified in SU1.



Figure 17 – View from northwest corner of SU1, from Herring Road intersection. Aspect southeast



Figure 18 – Piling underway in northwest corner of SU1. Aspect north



Figure 19 – View southeast across axis of site showing multistorey pit in the centre of SU1 and extensive impact in the immediate surrounds



Figure 20 – Indicative level of impact from bulk earthworks in SU1. Aspect northeast



Figure 21 – Site Officer and client Engineer inspecting truncated and levelled ground in southeastern portion of SU1



Figure 22 – Temporary drainage channel excavated in eastern portion of SU1. Aspect east



Figure 23 – View southeast across axis of site showing multistorey pit in the centre of SU1



Figure 24 – Temporary drainage channel excavated in eastern portion of SU1. Aspect northeast



Figure 25 – Last remaining housing commission dwelling (mid-demolition) from Ivanhoe Estate



Figure 26 – Remnant residential roadway from Ivanhoe Estate in eastern portion of SU1

3.3.2. Survey Unit 2

Survey Unit 2 (SU2) incorporates the eastern most portion of Lot 1 DP 1262209 from Epping Road to the south, creek line to the east, property boundary to the north and boundary of current construction zone to the west.

SU2 contains a highly modified flat and creek line with impacts from subsurface utility alignments (stormwater and sewerage), pedestrian walkways, small concrete skatepark. The creek alignment itself has been significantly impacted within SU2 through attempts to semi-formalise the drainage line through concreting and artificial modifications.

SU2 was heavily grassed with some dense regrowth vegetation/undergrowth. Visibility in SU2 was low, at approximately 2-5%.

The entirety of SU2 is considered to contain nil to low subsurface archaeological potential. No Aboriginal sites were identified in SU2.



Figure 27 – Subsurface utility. Aspect east



Figure 28 – Subsurface utility. Aspect north



Figure 29 – Stormwater outlet from the prior Ivanhoe Estate. Aspect north



Figure 30 – Impacted and modified creek alignment. Aspect east



Figure 31 – Extant skatepark on northern portion of SU2. Aspect northeast



Figure 32 – Skatepark to the north, pedestrian pathway in centre and boundary hoarding between SU1 and SU2 to the south. Aspect east

3.3.3. Survey Unit 3

Survey Unit 3 (SU3) incorporates the southernmost portion of Lot 1 DP 1262209 between the truncated construction zone of SU1 to the north and the Epping Road easement to the south.

SU3 entirely consisted of moderately impacted hillslope landform with skeletal topsoil and small to medium size regrowth vegetation. This portion of the subject area was previously crisscrossed with formal pedestrian pathways, steps, stairways and benches to allow access to the prior Ivanhoe Estate from the Epping Road easement.

SU3 was largely inaccessible due to dense undergrowth. Visibility in SU3 was low, at approximately 5%.

The entirety of SU3 is considered to contain nil to low subsurface archaeological potential. No Aboriginal sites were identified in SU3.



Figure 33 – View south from SU1 at the edge of SU3. Truncation of landform from previous development as well as clear section showing skeletal topsoil onto eroding sandstone bedrock



Figure 34 – View south east from SU1 at the edge of SU3. Truncation of landform from previous development as well as clear section showing skeletal topsoil onto eroding sandstone bedrock



Figure 35 – Survey team accessing SU3



Figure 36 – Indicative shot of dense understorey and low visibility in SU3

3.3.4. Survey Unit 4

Survey Unit 4 (SU4) includes Lot 101 DP 1263727.

Access was restricted during the time of the survey and inspection of the opposite side of the creek line was attempted via SU2.

In consultation with Ralph Hampton (KYWG) during the survey visual inspection of this portion of the subject area (SU4) was determined to be redundant due to the clear and extensive modern impacts from the construction of the multistorey office building with carpark and formal vehicle access road (2-4 Lyonpark Road).

The entirety of SU4 is considered to contain nil subsurface archaeological potential. No Aboriginal sites were identified in SU4.

3.4. ARCHAEOLOGICAL POTENTIAL

3.4.1. Predictive Model

The *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* requires an appropriate predictive model be used to estimate the nature and distribution of evidence of Aboriginal land use in a subject area when undertaking an ACHA. A predictive model should consider variables that may influence the location, distribution and density of sites, features or artefacts within a subject area. Variables typically relate to the environment and topography, such as soils, landscape features, slope, landform and cultural resources.

The general process archaeologists employ to determine the likelihood of any particular site type (artefact scatter, shelter, midden etc) occurring within a given subject area requires the synthesis of information for general distribution of archaeological sites within the wider area including:

- Detailed analysis of previous archaeological investigations within the same region.
- Presence or absence of landscape features that present potential for archaeological resources (human occupation, use) such as raised terraces adjacent to permeant water.
- Analysis of the geology and soil landscape within the subject area which allows for a determination to be made of the type of raw material that would have been available for artefact production (silcrete, tuff, quartz etc) and the potential for the accumulation of archaeological resource within the subject area.
- Investigation of and determination of the level of disturbance/historical land use within the subject area which may impact on or remove entirely any potential archaeological material.

An indicative process of determining the likelihood of a given site occurring within a subject area is provided in Table 6 below.

Table 6 – Indicative process for determining the potential presence of a site

Likelihood	Indicative subject area context	Indicative action
High	Low level of ground disturbance in combination with at least one archaeologically sensitive landscape feature or Aboriginal object (either registered or newly identified) within the subject area.	Detailed archaeological investigation including but not limited to survey, test excavation and potentially (depending on density and/or significance of archaeological deposit) salvage excavation.
Moderate	Moderate level of ground disturbance in combination with at least one archaeologically sensitive landscape feature or Aboriginal object (either registered or newly identified) within the subject area.	Detailed archaeological investigation including but not limited to survey, test excavation and potentially (depending on density and/or significance of archaeological deposit) salvage excavation.
Low	High level of ground disturbance in combination with at least one archaeologically sensitive landscape feature or Aboriginal object (either registered or newly identified) within the subject area.	Employ chance finds procedure and works can continue without further archaeological investigation.
Nil	Complete ground disturbance (i.e. complete removal of natural soil landscape); or no archaeologically sensitive landscape features and no archaeological sites within subject area.	Employ chance finds procedure and works can continue without further archaeological investigation.

3.4.2. Typical Site Types

A range of Aboriginal site types are known to occur within New South Wales. Site types that are typically encountered in the Cumberland Plain are described below.

Art sites: can occur in the form of rock engravings or pigment on sandstone outcrops or within shelters. An engraving is some form of image which has been pecked or carved into a rock surface. Engravings typically vary in size and nature, with small abstract geometric forms as well as anthropomorphic figures and animals also depicted. In the Sydney region engravings tend to be located on the tops of Hawkesbury Sandstone ridges where vistas occur. Pigment art is the result of the application of material to a stone to leave a distinct impression. Pigment types include ochre, charcoal and pipeclay. Pigment art within the Sydney region is usually located in areas associated with habitation and sustenance.

Artefact Scatters/Camp Sites: represent past Aboriginal subsistence and stone knapping activities and include archaeological remains such as stone artefacts and hearths. This site type usually appears as surface scatters of stone artefacts in areas where vegetation is limited, and ground surface visibility increases. Such scatters of artefacts are also often exposed by erosion, agricultural events such as ploughing, and the creation of informal, unsealed vehicle access tracks and walking paths. These types of sites are often located on dry, relatively flat land along or adjacent to rivers and creeks. Camp sites containing surface or subsurface deposit from repeated or continued occupation are more likely to occur on elevated ground near the most permanent, reliable water sources. Flat, open areas associated with creeks and their resource-rich surrounds would have offered ideal camping areas to the Aboriginal inhabitants of the local area.

Bora / Ceremonial Sites: are locations that have spiritual or ceremonial values to Aboriginal people. Aboriginal ceremonial sites may comprise natural landforms and, in some cases, will also have archaeological material. Bora grounds are a ceremonial site type, usually consisting of a cleared area around one or more raised earth circles, and often comprised of two circles of different sizes, connected by a pathway, and accompanied by ground drawings or mouldings of people, animals or deities, and geometrically carved designs on the surrounding trees.

Burials: of the dead often took place relatively close to camp site locations. This is due to the fact that most people tended to die in or close to camp (unless killed in warfare or hunting accidents), and it is difficult to move a body long distance. Soft, sandy soils on, or close to, rivers and creeks allowed for easier movement of earth for burial; and burials may also occur within rock shelters or middens. Aboriginal burial sites may be marked by stone cairns, carved trees or a natural landmark. Burial sites may also be identified through historic records or oral histories.

Contact Sites: are most likely to occur in locations of Aboriginal and settler interaction, such as on the edge of pastoral properties or towns. Artefacts located at such sites may involve the use of introduced materials such as glass or ceramics by Aboriginal people or be sites of Aboriginal occupation in the historical period.

Grinding Grooves: are the physical evidence of tool making or food processing activities undertaken by Aboriginal people. The manual rubbing of stones against other stones creates grooves in the rock; these are usually found on flat areas of abrasive rock such as sandstone. They may be associated with creek beds, or water sources such as rock pools in creek beds and on platforms, as water enables wet-grinding to occur.

Isolated Finds: represent artefactual material in singular, one off occurrences. Isolated finds are generally indicative of stone tool production, although can also include contact sites. Isolated finds may represent a single item discard event or be the result of limited stone knapping activity. The presence of such isolated artefacts may indicate the presence of a more extensive, in situ buried archaeological deposit, or a larger deposit obscured by low ground visibility. Isolated artefacts are likely to be located on landforms associated with past Aboriginal activities, such as ridgelines that would have provided ease of movement through the area, and level areas with access to water, particularly creeks and rivers.

Middens: are indicative of Aboriginal habitation, subsistence and resource extraction. Midden sites are expressed through the occurrence of shell deposits of edible shell species often associated with dark, ashy soil and charcoal. Middens often occur in shelters, or in eroded or collapsed sand dunes. Middens occur along the coast or in proximity to waterways, where edible resources were extracted. Midden may represent a single meal or an accumulation over a long period of time involving many different activities. They are also often associated with other artefact types.

Modified Trees: are evidence of the utilisation of trees by Aboriginal people for various purposes, including the construction of shelters (huts), canoes, paddles, shields, baskets and bowls, fishing lines, cloaks, torches and bedding, as well as being beaten into fibre for string bags or ornaments. The removal of bark exposes the

heart wood of the tree, resulting in a scar. Trees may also have been scarred in order to gain access to food resources (e.g. cutting toeholds so as to climb the tree and catch possums or birds), or to mark locations such as tribal territories. Such scars, when they occur, are typically described as scarred trees. These sites most often occur in areas with mature, remnant native vegetation. The locations of scarred trees often reflect an absence of historical clearance of vegetation rather than the actual pattern of scarred trees. Carved trees are different from scarred trees, and the carved designs may indicate totemic affiliation; they may also have been carved for ceremonial purposes or as grave markers.

Potential Archaeological Deposits (PADs): are areas where there is no surface expression of stone artefacts, but due to a landscape feature there is a strong likelihood that the area will contain buried deposits of stone artefacts. Landscape features which may feature in PADs include proximity to waterways, particularly terraces and flats near third order streams and above; ridge lines, ridge tops and sand dune systems.

Shelters: are places of Aboriginal habitation. They take the form of rock overhangs which provided shelter and safety to Aboriginal people. Suitable overhangs must be large and wide enough to have accommodated people with low flooding risk. Due to the nature of these sites, with generic rock over hangs common particularly in areas with an abundance of sandstone, their use by Aboriginal people is generally confirmed through the correlation of other site types including middens, art, PAD and/or artefactual deposits.

3.4.3. Assessment of Archaeological Potential

The likelihood of the site types described in 3.4.2 above occurring within the present subject area is assessed in Table 7 below.

Table 7 – Predictive Model

Site type	Assessment	Potential
Art	The subject area does not include sandstone resources conducive to art production (see Section 3.2.3).	**Nil**
Artefact Scatters / Campsites	Part of the subject area is within 200m of Shrimptons Creek (see Section 3.2.2). A high level of ground disturbance across most of the subject area significantly reduces archaeological potential (see Section 3.2.5). Shallow soils in areas of low to moderate ground disturbance also reduces archaeological potential (see Section 3.2.5).	**Nil – Low**
Bora / Ceremonial	A high level of ground disturbance across most of the subject area significantly reduces archaeological potential (see Section 3.2.5). Shallow soils in areas of low to moderate ground disturbance also reduces archaeological potential (see Section 3.2.5).	**Nil**
Burial	The subject area does not include soft sandy soil (see Section 3.2.3). A high level of ground disturbance significantly reduces archaeological potential across most of the subject area (see Section 3.2.5). Shallow soils in areas of low to moderate ground disturbance also reduces archaeological potential (see Section 3.2.5).	**Nil – Low**

Site type	Assessment	Potential
Contact site	The subject area is at the margins of early European settlement where contact was likely (see Section 3.2.5). A high level of ground disturbance across most of the subject area significantly reduces archaeological potential (see Section 3.2.4). Shallow soils in areas of low to moderate ground disturbance also reduces archaeological potential (see Section 3.2.5).	**Nil**
Grinding Grooves	The subject area does not include sandstone resources conducive to grinding groove production (see Section 3.2.3).	**Nil**
Isolated Finds	Part of the subject area is within 200m of Shrimptons Creek (see Section 3.2.2). A high level of ground disturbance across most of the subject area significantly reduces archaeological potential (see Section 3.2.5). Shallow soils in areas of low to moderate ground disturbance also reduces archaeological potential (see Section 3.2.5).	**Nil – Low**
Midden	Part of the subject area is within 200m of Shrimptons Creek (see Section 3.2.2). A high level of ground disturbance across most of the subject area significantly reduces archaeological potential (see Section 3.2.4). Shallow soils in areas of low to moderate ground disturbance also reduces archaeological potential (see Section 3.2.5).	**Nil**
Modified Trees	The subject area does not appear to include any trees of sufficient age to have been culturally modified (see Section 3.2.4).	**Nil**
PAD	Part of the subject area is within 200m of Shrimptons Creek (see Section 3.2.2). A high level of ground disturbance across most of the subject area significantly reduces archaeological potential (see Section 3.2.5). Shallow soils in areas of low to moderate ground disturbance also reduces archaeological potential (see Section 3.2.5).	**Nil – Low**
Shelters	The subject area does not include any visible overhanging stone outcrops (see Section 3.2.1).	**Nil**

3.5. SUMMARY

The archaeological, landscape and historical ground disturbance assessments of the subject area are summarised as follows:

- No Aboriginal objects or places are registered within the curtilage of the subject area.
- Within the regional context of the subject area, registered Aboriginal sites tend to be located near waterways.
- Archaeological reports from other sites near the present subject area indicate that archaeological potential may be significantly reduced by historical ground disturbing activity, despite proximity to waterways.

- A due diligence assessment (EcoLogical, 2017) relating directly to the subject area indicates that the portion of the subject area west of Shrimptons Creek is highly disturbed and has low to nil archaeological potential.
- The subject area does not include any topographic features that are indicative of archaeological potential.
- The majority of subject area has been subjected to a high degree of ground disturbance, which is likely to significantly reduce archaeological potential.
- The shallow natural soil profile in areas of moderate ground disturbance (SU3) would reduce archaeological potential in those areas.
- The entirety of SU1 is considered to contain nil subsurface archaeological potential. No Aboriginal sites were identified in SU1.
- The entirety of SU2 is considered to contain nil to low subsurface archaeological potential. No Aboriginal sites were identified in SU2.
- The entirety of SU3 is considered to contain nil to low subsurface archaeological potential. No Aboriginal sites were identified in SU3.
- The entirety of SU4 is considered to contain nil subsurface archaeological potential. No Aboriginal sites were identified in SU4.
- Based on the above considerations, the archaeological potential of the subject area is determined to be nil to low.

4. ABORIGINAL COMMUNITY CONSULTATION

In administering its statutory functions under Part 6 of the *NSW National Parks and Wildlife Act 1974*, the Department of Premier and Cabinet (DPC) requires that Proponent consult with Aboriginal people about the Aboriginal cultural heritage values (cultural significance) of Aboriginal objects and/or places within any given development area in accordance with Clause 80c of the NSW National Parks and Wildlife Regulation, 2009.

The DPC maintains that the objective of consultation with Aboriginal communities about the cultural heritage values of Aboriginal objects and places is to ensure that Aboriginal people have the opportunity to improve ACHA outcomes by (DECCW 2010a):

- Providing relevant information about the cultural significance and values of Aboriginal objects and/or places.
- Influencing the design of the method to assess cultural and scientific significance of Aboriginal objects and/or places.
- Actively contributing to the development of cultural heritage management options and recommendations for any Aboriginal objects and/or places within the proposed subject area.
- Commenting on draft assessment reports before they are submitted by the Proponent to the DPC.

Consultation in line with the Consultation Requirements (DECCW 2010) is a formal requirement where a Proponent is aware that their development activity has the potential to harm Aboriginal objects or places. The DPC also recommends that these requirements be used when the certainty of harm is not yet established but a proponent has, through some formal development mechanism, been required to undertake a cultural heritage assessment to establish the potential harm their proposal may have on Aboriginal objects and places.

The Consultation Requirements outline a four-stage consultation process that includes the following:

- Stage 1 – Notification of project proposal and registration of interest.
- Stage 2 – Presentation of information about the proposed project.
- Stage 3 – Gathering information about the cultural significance.
- Stage 4 – Review of draft cultural heritage assessment report.

The document also outlines the roles and responsibilities of the DPC, Registered Aboriginal Parties (RAPs) including Local and State Aboriginal Land Councils, and proponents throughout the consultation process.

To meet the requirements of consultation it is expected that proponents will:

- Bring the RAPs, or their nominated representatives, together and be responsible for ensuring appropriate administration and management of the consultation process.
- Consider the cultural perspectives, views, knowledge and advice of the RAPs involved in the consultation process in assessing cultural significance and developing any heritage management outcomes for Aboriginal objects(s) and/or places(s).
- Provide evidence to the DPC of consultation by including information relevant to the cultural perspectives, views, knowledge and advice provided by the RAPs.
- Accurately record and clearly articulate all consultation findings in the final cultural heritage assessment report.
- Provide copies of the cultural heritage assessment report to the RAPs who have been consulted.

The consultation process undertaken to seek active involvement from relevant Aboriginal representatives for the project followed the current NSW statutory guideline, namely, the Consultation Requirements. Section 1.3 of the Consultation Requirements describes the guiding principles of the document. The principles have been derived directly from the principles section of the *Australian Heritage Commission's Ask First: A guide to respecting Indigenous heritage places and values* (Australian Heritage Commission 2002).

The following outlines the process and results of the consultation conducted during this assessment to ascertain and reflect the Aboriginal cultural heritage values of the subject area.

4.1. STAGE 1: NOTIFICATION OF PROJECT PROPOSAL AND REGISTRATION OF INTEREST

The aim of Stage 1 is to identify, notify and register Aboriginal people who hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the subject area.

4.1.1. Government Organisation Contact

A search of the National Native Title Tribunal (NNTT) register was undertaken on 5 March 2021. The search identified no registered Native Title or Native Title claims within the subject area. The NNTT was also contacted by email on 5 March 2021 to request a formal search of the NNTT Register. A reply was received on 9 March 2021 indicating that there are no Native Title Determination Applications, Determinations of Native Title, or Indigenous Land Use Agreements over the subject area.

To identify Aboriginal people who may be interested in registering as Aboriginal parties for the project, the organisations stipulated in Section 4.1.2 of the Consultation Guidelines were contacted (refer to Table 8). The template for the emails sent to each organisation is included in Appendix C. A total of 45 Aboriginal groups and individuals with an interest in the subject area were identified following this stage. These groups were contacted, with further information presented at Section 4.1.2 below.

Table 8 – Contacted organisations

Organisation	Date Notification Sent	Date Response Received
Office of the Registrar, Aboriginal Land Rights Act 1983	12 March 2021	n/a
Heritage NSW, Department of Premier and Cabinet	12 March 2021	19 March 2021
NTS Corp	12 March 2021	n/a
Metropolitan Local Aboriginal Land Council	12 March 2021	n/a
Local Land Services, Greater Sydney	12 March 2021	n/a
City of Ryde Council	12 March 2021	n/a

4.1.2. Notification of Project

In accordance with Section 4.1.3 of the Consultation Guidelines, letters were sent to the 45 Aboriginal groups and individuals via email or post (depending on the method identified by each group) to notify them of the proposed project. A total of 41 were sent via email on 22 March 2021, with four sent by express post on 1 April 2021. The letters included a brief introduction to the project and the project location and set a deadline for response of 21 April 2021, providing more than the 14 days to register an interest required by the Consultation Requirements. A copy of the letter template is included in Appendix C.

In addition, an advertisement was placed in one local newspaper, The Koori Mail, also in accordance with Section 4.1.3 of the Consultation Guidelines. The advertisement was published in the 7 April 2021 edition, and registration was open until 21 April 2021, providing 14 days to register an interest in accordance with the Consultation Requirements. A copy of the advertisement is included in Appendix C.

4.1.3. Registration of Interest

A total of nine groups were registered for the project as a result of this phase (Table 9). Six groups registered by the deadline of 21 April 2021 and a further two (A1 Indigenous Heritage and Butucarbin Aboriginal Corporation) registered after the deadline. Acknowledgement emails or telephone calls were made by Urbis to all respondents to confirm registration had been received. The Metropolitan Local Aboriginal Land Council was registered for the project despite no response being received.

In accordance with Section 4.1.6 of the Consultation Guidelines, the list of Registered Aboriginal Parties (RAPs) was provided to the DPC and the Metropolitan Local Aboriginal Land Council on 7 May 2021 (see Appendix C).

Table 9 – Stage 1 Consultation – Registration of Interest

Organisation/Individual	Contact Person
Metropolitan Local Aboriginal Land Council	Nathan Moran
A1 Indigenous Services	Carolyn Hickey
Butucarbin Aboriginal Corporation	Lowanna Gibson
Darug Custodian Aboriginal Corporation	Justine Coplin
Didge Ngunawal Clan	Lilly Carroll & Paul Boyd
Gulaga	Wendy Smith
Kamilaroi Yankuntjatjara Working Group	Phil Khan
Ngambaa Cultural Connections	Kaarina Slater
Tocomwall	Danny Franks

4.2. STAGE 2: PRESENTATION OF INFORMATION ABOUT THE PROJECT

The aim of Stage 2 is to provide registered Aboriginal parties with information about the scope of the proposed project, and the proposed cultural heritage assessment process. A Stage 2/3 information pack was sent to registered Aboriginal parties via email on 7 May 2021. The information pack was prepared as a combination of Stage 2 and 3 of the Consultation Guidelines, and included the following information:

- Project overview, location and purpose.
- Proposed works.
- Project history.
- Brief archaeological and environmental background.
- Protocol of gathering information on cultural heritage significance.
- Request for comment on methodology and recommendations for site investigation, and request for any cultural information the respondent wished to share.

A response to the Stage 2/3 information pack was requested by 4 June 2021, being 28 days from the date of the communication.

Each of the above communications are included in Appendix C of this report.

4.3. STAGE 3: GATHERING INFORMATION ABOUT THE PROPOSED PROJECT

Stage 3 is concerned with gathering feedback on a project, proposed methodologies, and obtaining any cultural information that registered Aboriginal parties wish to share. This may include ethno-historical information, or identification of significant sites or places in the local area.

4.3.1. Site inspection and meeting

An inspection of the subject area and meeting with RAP was held on Friday 25th June 2021. The site inspection and meeting was conducted by Andrew Crisp (Urbis Senior Consultant, Archaeology). The RAP present at the site inspection and meeting are listed in Table 10. Invitation was extended to Metropolitan Local Aboriginal Land Council numerous times in the weeks prior to the survey, however, they were unable to attend.

Table 10 – RAPs in attendance at site inspection and meeting

Group	Representative
KYWG	Ralph Hampton

The purpose of the site inspection and meeting was to conduct a thorough briefing with the RAP about the proposed development and to discuss the proposed works, to conduct a walkover of the subject area, to discuss the information provided in the Stage 2/3 document provided on 7th May 2021 and to discuss potential archaeological mitigation strategies. Refer to Section 3.3 for survey results.

RAPs were provided the opportunity to provide verbal feedback on site and also to submit written information via email.

4.3.2. RAP Responses

Two responses were received to the Stage 2 and 3 information pack. These responses are included in Appendix C and addressed in Table 11 below.

Table 11 – RAP responses to the Stage 2/3 Information Pack

RAP	Response	Urbis Response
Gulaga	*"Thank you for providing this information.* *Gulaga supports the methodology and makes no comment at this stage"*	Acknowledged and included in consultation log.
Kamilaroi Yankuntjatjara Working Group	*"Thank you for your ACHA for Ivanhoe Estate stage 2/3. The study area is highly significant to the Aboriginal people. The study area is important to us Aboriginal people and as a last chance we should excavate the study area.* *We as Aboriginal people hold a deep connection to the land & we follow a lore that is known to us. The Aboriginal people have looked after this land for tens of thousands of years and continue to do so.* *In saying that we would like to agree to your recommendations and we support your ACHA.* *I would also like to take the time to mention Aboriginal Cultural interpretation for the development or within the building. Some examples are native gardens, artefact display, artwork, and signage, please do not hesitate to contact us about interpretation plan.* *We should also always be mindful of burials as we do not know where they are located."*	Acknowledged and included in consultation log. Fraser have engaged with The Fulcrum Agency to address the Designing with Country aspect of the project. RAP details for the ACHAR have been provided for ongoing input. Given the nil-low archaeological potential across the subject area the Unexpected Finds Protocols will be followed during all proposed works.

4.4. STAGE 4: REVIEW OF DRAFT ACHAR

The aim of Stage 4 is to prepare and finalise an ACHAR with input from registered Aboriginal Parties.

A draft of the present ACHAR was sent to RAPs via email on the 9th July 2021 with comment on the Draft ACHAR requested prior to close of business 6th August 2021. It is noted that the time allowed for comment should reflect the size and complexity of the project.

A single response was received to the Stage 4 Draft ACHAR. This response is included in Appendix C and addressed in Table 12 below.

Table 12 – RAP responses to the Stage 4 Draft ACHAR

RAP	Response	Urbis Response
Kamilaroi Yankuntjatjara Working Group (KYWG)	*Thank you for your ACHAR for proposed site Ivanhoe Estate. KYWG aim to conserve and protect cultural heritage.* *We look to the sky for guidance and follow the stories that it holds. We live off the land and we respect our mother earth as she provides for us, we follow the water ways to drink from. Not so long ago we hunted and lived off the land, we camped close by to water and carried out daily activities. We lived a peaceful life with lora and kinship and order, one with mother earth and our environment. We are connected to all types of life; we follow the sessions and move accordingly. We were colonized and assimilated to the white man's way, yet our culture survived and lived the Aboriginal way of life still to this day.* *The study area is highly significant due to it being in close proximity to water ways, for this reason we would like to push for monitoring of the any works, done by an Aboriginal person as we don't believe that the construction works can identify Aboriginal objects.* *One induction is not enough train and they may not have the time to be aware of Aboriginal finds.* *We also should be mindful of our burials as they hold deep meaning to us and we have been striped of the location of them.*	Acknowledged and included in consultation log. Given the nil-low archaeological potential across the subject area archaeological monitoring is not warranted and the Unexpected Finds Protocols will be followed during all proposed works.

4.5. SUMMARY

The outcomes of the consultation process with RAPs are summarised as follows:

- There was limited RAP feedback received during the ACHA process
- Kamilaroi Yankuntjatjara Working Group (KYWG) consider the subject area culturally significant due to landscape features such as proximity to water and connection to Country.
- KYWG recommend that Aboriginal cultural interpretation for the development be implemented such as native gardens, artwork and signage.
- KYWG have pushed for monitoring during the proposed works, however, due to the nil-low archaeological potential across the subject area archaeological monitoring is not warranted and the Unexpected Finds Protocols will be followed during all proposed works

5. CULTURAL HERITAGE VALUES AND STATEMENT OF SIGNIFICANCE

The following is an assessment and discussion of the cultural significance of the subject area, made in consultation with the RAPs. The assessment follows principles and procedures outlined in the Burra Charter the Assessment Guidelines.

5.1. ASSESSMENT FRAMEWORK FOR HERITAGE SIGNIFICANCE

The Burra Charter defines cultural significance as being derived from the following values: social or cultural value, historic value, scientific value and aesthetic value. Aesthetic, historic, scientific and social values are commonly interrelated. All assessments of heritage values occur within a social and historic context. Therefore, all potential heritage values will have a social component.

Assessment of each value should be graded in terms that allow the significance to be described and compared (e.g. high, moderate, or low). In applying these criteria, consideration should be given to:

- Research potential: *does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?*
- Representativeness: *how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?*
- Rarity: *is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?*
- Education potential: *does the subject area contain teaching sites or sites that might have teaching potential?*

Heritage significance is assessed by considering each cultural or archaeological site against the significance criteria set out in the Assessment Guidelines. The Assessment Guidelines require that the assessment and justification in a statement of significance includes a discussion of whether any value meets the following criteria:

- Does the subject area have a strong or special association with a particular community or cultural group for social, cultural or spiritual reasons? – social value.
- Is the subject area important to the cultural or natural history of the local area and/or region and/or state? – historic value.
- Does the subject area have potential to yield information that will contribute to an understanding of the cultural or natural history of the local area and/or region and/or state? – scientific (archaeological) value.
- Is the subject area important in demonstrating aesthetic characteristics in the local area and/or region and/or state? – aesthetic value.

5.2. ASSESSMENT OF HERITAGE VALUES

The following assessment of the social or cultural, historic, scientific and aesthetic values of the subject area has been prepared in accordance with the Assessment Guidelines.

In acknowledgment that the Aboriginal community themselves are in the best position to identify heritage values, the assessment is informed by consultation with the Aboriginal community. Consultation with Aboriginal people should provide insight into past events. The RAPs were invited to provide comment and input into this ACHAR and to the assessment of cultural heritage values for the subject area, as documented in this report. Any culturally sensitive values identified have not been explicitly included in the report or made publicly available. Any such values would be documented and lodged with the knowledge holder providing the information.

5.2.1. Social or cultural value

Social or cultural value encompasses the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them. Places of social or cultural value have

associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods, or events. Communities can experience a sense of loss should a place of social or cultural value be damaged or destroyed. Social or cultural values can therefore only be identified through consultation with Aboriginal people.

Kamilaroi Yankuntjatjara Working Group (KYWG) consider the subject area culturally significant due to landscape features such as proximity to water and connection to Country. The cultural value of the subject area is considered moderate.

5.2.2. Historic value

Historic value encompasses the history of aesthetics, science and society. A place may have historic value because it is associated with a historic figure, event, phase or activity in an Aboriginal community. The significance of a place will be greater where evidence of the association or event survives in situ, or where the settings are substantially intact, than where it has been changed or evidence does not survive. However, some events or associations may be so important that the place retains significance regardless of subsequent treatment. Places may also have 'shared' historic values with other (non-Aboriginal) communities.

Places of post-contact Aboriginal history have generally been poorly recognised in investigations of Aboriginal heritage. Consequently, the Aboriginal involvement and contribution to important regional historical themes is often missing from accepted historical narratives. For this reason, it is often necessary to collect oral histories along with archival or documentary research to gain a sufficient understanding of historic values.

The subject area is not considered to represent any element of historic value. The historic value of the subject area is considered nil to low.

5.2.3. Scientific (archaeological) value

Scientific value relates to the importance of a landscape, area, place or object because of its rarity, representativeness and the extent to which it may contribute to further understanding and information (ICOMOS, 1988). Information about scientific value will be gathered through any archaeological investigation undertaken. Archaeological investigations must be carried out according to the Code of Practice.

Zero Aboriginal Sites or areas of archaeological potential have been identified within the subject area. The scientific value of the subject area is considered nil to low.

5.2.4. Aesthetic value

Aesthetic value of a place relates to the sensory, scenic, architectural and creative aspects of a place. It may include visual aspects, such as form, scale, colour, texture and material of the fabric, and the smells and sounds associated with the place and its use (ICOMOS, 1988).

It is evident that the subject area is highly disturbed due to land clearance, agriculture, construction of buildings and, in particular, cut and fill earthworks. The present visual appearance and other sensory aspects of the subject area are unlikely to resemble those of the landscape of the local area as it existed prior to European contact. It is therefore considered that the subject area has low aesthetic value insofar as it relates to Aboriginal cultural heritage.

5.3. ASSESSMENT OF CULTURAL HERITAGE SIGNIFICANCE AND VALUES

An assessment of cultural heritage significance and values incorporates a range of values which may vary for different individual groups and may relate to both the natural and cultural characteristics of places or sites. Cultural significance and Aboriginal cultural views can only be determined by the Aboriginal community using their own knowledge of the area and any sites present, and their own value system. All Aboriginal heritage evidence tends to have some contemporary significance to Aboriginal people, because it represents an important tangible link to their past and to the landscape.

Consultation with members of the local Aboriginal community (project RAPs) was undertaken to identify the level of spiritual/cultural significance of the subject area and its components. In acknowledgment that the Aboriginal community themselves are in the best position to identify levels of cultural significance, the project RAPs were invited to provide comment and input into this ACHAR and to the assessment of cultural heritage significance and values presented therein.

Kamilaroi Yankuntjatjara Working Group (KYWG) consider the subject area culturally significant due to landscape features such as proximity to water and connection to Country. The cultural value of the subject area is considered moderate.

No further specific cultural heritage significance associated with the subject was identified by the RAPs for this project.

5.4. ASSESSMENT OF SCIENTIFIC (ARCHAEOLOGICAL) SIGNIFICANCE

In accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*, and in consultation with representatives of the local Aboriginal community, the following assessment of the scientific (archaeological) significance of identified sites within the subject area has been prepared.

This assessment has determined that there are no Aboriginal objects or places within or proximity to the subject area. Furthermore, as a result of the high level of disturbance there is nil to low potential for subsurface archaeological material to remain within the subject area.

The subject area is considered to contain low scientific (archaeological) significance.

The subject area is considered to contain moderate cultural significance.

6. IMPACT ASSESSMENT

The following is an assessment of the impact of the proposed development on the significance of the Aboriginal heritage values within the subject area.

6.1. POTENTIAL HARM

The potential harm to cultural heritage arising from the proposal may relate to the demolition, excavation and construction phases. Harm can be direct or indirect, defined by the Assessment Guidelines as:

- Direct harm – may occur as the result of any activity which disturbs the ground including, but not limited to, site preparation activities, installation of services and infrastructure, roadworks, excavation, flood mitigation measures.
- Indirect harm – may affect sites or features located immediately beyond or within the area of the proposed activity. Examples include, but are not limited to, increased impact on art in a shelter from increased visitation, destruction from increased erosion and changes in access to wild food resources.

This assessment has established that the current subject area has nil to low potential to contain Aboriginal archaeological objects or sites due to the extent to which it has been disturbed and the absence of particular landforms such as suitable rock overhangs (i.e. rock shelters) or platforms (that may indicate the presence of rock art, engravings, or grinding grooves).

No Aboriginal archaeological objects or places are recorded in the subject area.

6.2. LIKELY IMPACTED VALUES

The ACHA has identified that zero Aboriginal heritage sites will be harmed by the proposed development. No archaeological mitigation measures are required.

6.3. CONSIDERATION OF INTER-GENERATIONAL EQUITY

The principle of inter-generational equity (IGE) holds that the present generation should make every effort to ensure the health, diversity and productivity of the environment – which includes cultural heritage – is available for the benefit of future generations.

Cumulative impact of any development on Aboriginal sites assesses the extent of the proposed impact on the site and how this will affect both the proportion of this type of Aboriginal site in the area and the impact this destruction will have on Aboriginal cultural heritage values generally in the area. For example, if an artefact scatter is destroyed in the course of a proposed development, how many artefact scatters are likely to remain in that area and how will the destruction of that site affect the overall archaeological evidence remaining in that area? If a site type that was once common in an area becomes rare, the loss of that site (and site type) will affect our ability to understand past Aboriginal land uses, will result in an incomplete archaeological record and will negatively affect intergenerational equity.

This assessment has established that the subject area does not contain any previously identified Aboriginal sites and contains nil-low archaeological potential. As such it has been determined that there will be no discernible impact in regard to IGE.

7. AVOIDING AND MINIMISING HARM

The nature and complexity of mitigation measures to avoid and/or minimise harm to any Aboriginal objects and archaeological resources that might be identified will be provided in context of the nature, extent and significance of those resources.

The ACHA has identified that zero Aboriginal heritage sites will be harmed by the proposed development. No archaeological mitigation measures are required.

8. CONCLUSIONS

The ACHA that informed the current report concluded that:

- No Aboriginal objects or places are registered within the curtilage of the subject area.
- Within the regional context of the subject area, registered Aboriginal sites tend to be located near waterways.
- Archaeological reports from other sites near the present subject area indicate that archaeological potential may be significantly reduced by historical ground disturbing activity, despite proximity to waterways.
- A due diligence assessment (EcoLogical, 2017) relating directly to the subject area indicates that the portion of the subject area west of Shrimptons Creek is highly disturbed and has low to nil archaeological potential.
- The subject area does not include any topographic features that are indicative of archaeological potential.
- The majority of subject area has been subjected to a high degree of ground disturbance, which is likely to significantly reduce archaeological potential.
- The shallow natural soil profile in areas of moderate ground disturbance (SU3) would reduce archaeological potential in those areas.
- The entirety of SU1 is considered to contain nil subsurface archaeological potential. No Aboriginal sites were identified in SU1.
- The entirety of SU2 is considered to contain nil to low subsurface archaeological potential. No Aboriginal sites were identified in SU2.
- The entirety of SU3 is considered to contain nil to low subsurface archaeological potential. No Aboriginal sites were identified in SU3.
- The entirety of SU4 is considered to contain nil subsurface archaeological potential. No Aboriginal sites were identified in SU4.
- Based on the above considerations, the archaeological potential of the subject area is determined to be nil to low.
- Kamilaroi Yankuntjatjara Working Group (KYWG) consider the subject area culturally significant due to landscape features such as proximity to water and connection to Country. The cultural value of the subject area is considered moderate.

9. RECOMMENDATIONS

Based on the conclusions of this assessment there is no further investigation warranted and the proposed activity can proceed under the following recommendations:

Recommendation 1 – Aboriginal Cultural Heritage Induction

It is recommended that induction materials be prepared for inclusion in site inductions for any contractors working at the subject area. The induction material should include an overview of the types of sites to be aware of (i.e. artefact scatters or concentrations of shells that could be middens), obligations under the NPW Act, and the requirements of an archaeological finds' procedure (refer below). This should be prepared for the project and included in any site management plans.

The induction material may be paper based, included in any hard copy site management documents; or electronic, such as "PowerPoint" for any face to face site inductions.

Recommendation 2 – Archaeological Chance Find Procedure

Although considered highly unlikely, should any archaeological deposits be uncovered during any site works, a procedure must be implemented. The following steps must be carried out:

1. All works stop in the vicinity of the find. The find must not be moved 'out of the way' without assessment.
2. Site supervisor, or another nominated site representative must contact either the project archaeologist (if relevant) or DPC to contact a suitably qualified archaeologist.
3. The nominated archaeologist examines the find, provides a preliminary assessment of significance, records the item and decides on appropriate management, in conjunction with the RAPs for the project. Such management may require further consultation with DPC, preparation of a research design and archaeological investigation/salvage methodology and preparation of AHIMS Site Card.
4. Depending on the significance of the find, reassessment of the archaeological potential of the subject area may be required, and further archaeological investigation undertaken.
5. Reporting may need to be prepared regarding the find and approved management strategies. Any such documentation should be appended to this ACHAR and revised accordingly.
6. Works in the vicinity of the find can only recommence upon relevant approvals from DPC.

Recommendation 3 – Human Remains Procedure

In the unlikely event that human remains are uncovered during any site works, the following must be undertaken:

1. All works within the vicinity of the find immediately stop.
2. Site supervisor or other nominated manager must notify the NSW Police and DPC.
3. The find must be assessed by the NSW Police, and may include the assistance of a qualified forensic anthropologist.
4. Management recommendations are to be formulated by the Police, DPIE and site representatives.
5. Works are not to recommence until the find has been appropriately managed.

Recommendation 4 – RAP consultation

A copy of the final ACHAR must be provided to all RAPs. Ongoing consultation with RAPs should occur as the project progresses, to ensure ongoing communication about the project and key milestones, and to ensure the consultation process does not lapse, particularly with regard to consultation should the CFP be enacted.

10. REFERENCES

Attenbrow, V. 2010. *Sydney's Aboriginal Past, 2nd Edition,* University of New South Wales Press, Sydney: Australia.

Campbell, JF, 1927. "Rural Settlement about Brush Farm"*, Royal Australian Historical Society, Journal and Proceedings*, vol. XIII, Part IV.

Corkill, T, 1991. *Survey for Aboriginal Archaeological Sites at CSIRO, North Ryde, NSW*.

Corkill, T, 1997. *Test Excavation of Rockshelter CSIRO PAD 1/Site 2, Riverside Corporate Park, North Ryde, NSW*.

Department of Environment, Climate Change and Water NSW (DECCW), 2010a. *Aboriginal cultural heritage consultation requirements for proponents 2010: Part 6 National Parks and Wildlife Act 1974*.

DECCW, 2010b. *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales: Part 6 National Parks and Wildlife Act 1974*.

Dictionary of Sydney, 'Marsfield'

Douglas Partners, 2017a. *Geotechnical Desktop Assessment Proposed Residential Development 2-4 Lyon Park Road, Macquarie Park.*

Douglas Partners, 2017b. *Report on Geotechnical Desktop Assessment Proposed Residential Development Ivanhoe, Macquarie Park.*

EcoLogical, 2017. *Ivanhoe Estate, Macquarie Park NSW. Aboriginal and Historical Heritage Assessment.*

HLA-Envirosciences Pty Limited, 2003. *Archaeological Subsurface Testing Program: Eden Gardens, Macquarie Park, NSW*.

ICOMOS, 2013. *The Australia ICOMOS Charter for Places of Cultural Significance, The Burra Charter, 2013.*

Ironside's Advertiser and Sydney Price Current, 1835 … vol. 1, no. 6 ///

Mary Dallas Consulting Archaeologists, 2012. *Due Diligence Aboriginal Heritage Assessment for Macquarie University, North Ryde*.

Nanson, G.C., Young, R.W., & Stockton, E.D. 1987. "Chronology and palaeoenvironment of the Cranebrook Terrace (near Sydney) containing artefacts more than 40,000 years old". *Archaeology in Oceania, 22 (2): 72-78.*

Ngara Consulting Pty Ltd, 2003. *Archaeological Assessment of Aboriginal Heritage: Reservoir Entry Lands (AHIMS#102059), Prospect*. Unpublished report to Conybeare and Morrison.

Office of Environment and Heritage, 2011. *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW*.

Smith, KV 2005, *Wallumedegal An Aboriginal History of Ryde*, Community Services Unit, City of Ryde.

Tench, W. 1789. *A Narrative of the Expedition to Botany Bay,* p. 53. Cited in Flannery, 2012. *Watkin Tench: 1788,* The Text Publishing Company, Melbourne: Australia.

DISCLAIMER

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In preparing this report, Urbis was required to make judgements which may be affected by unforeseen future events, the likelihood and effects of which are not capable of precise assessment.

All surveys, forecasts, projections and recommendations contained in or associated with this report are made in good faith and on the basis of information supplied to Urbis at the date of this report, and upon which Urbis relied. Achievement of the projections and budgets set out in this report will depend, among other things, on the actions of others over which Urbis has no control.

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This report has been prepared with due care and diligence by Urbis and the statements and opinions given by Urbis in this report are given in good faith and in the reasonable belief that they are correct and not misleading, subject to the limitations above.

APPENDIX A BASIC AND EXTENSIVE AHIMS SEARCH RESULTS

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : P32333_IvanhoeEstate_3.5k

Client Service ID : 574117

Urbis Pty Ltd - Angel Place L8 123 Pitt Street

Level 8 123 Angel Street
Sydney New South Wales 2000

Attention: Meggan Walker

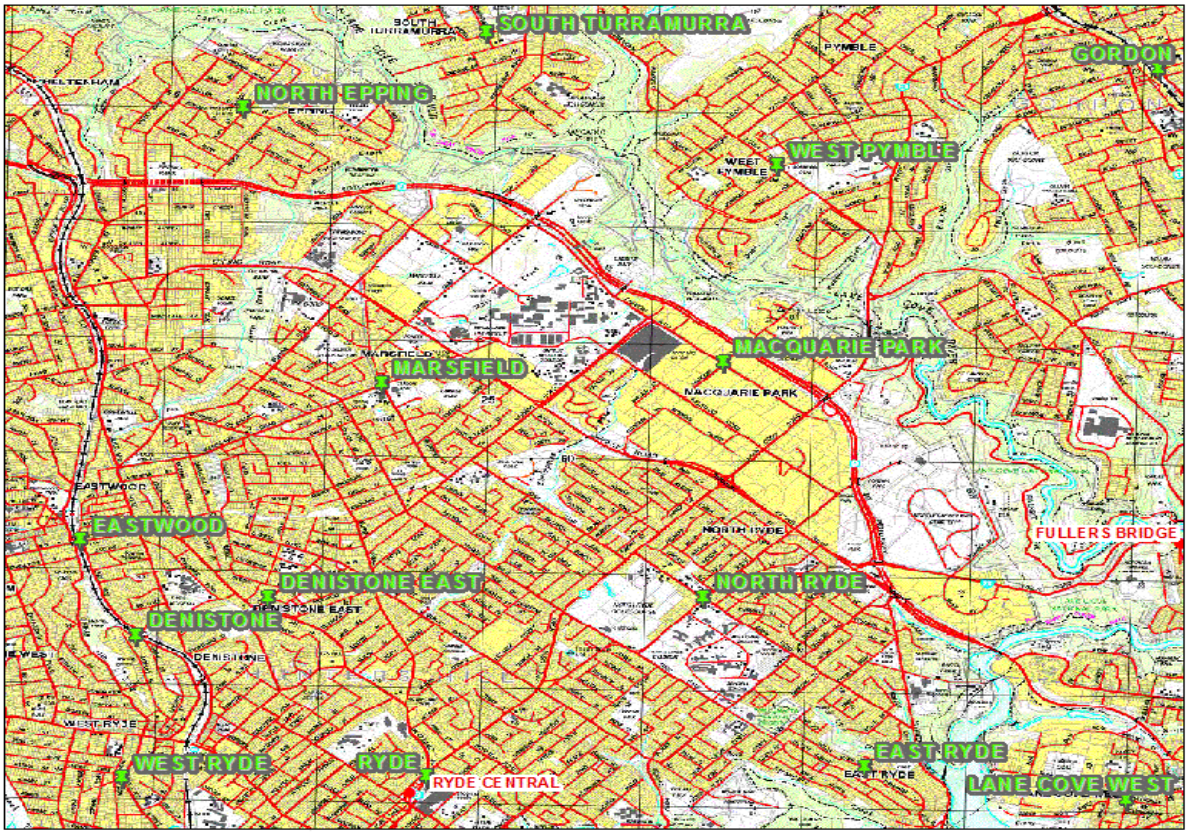
Email: mwalker@urbis.com.au

Date: 05 March 2021

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters, conducted by Meggan Walker on 05 March 2021.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

81	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

3 Marist Place, Parramatta NSW 2150
Locked Bag 5020 Parramatta NSW 2220
Tel: (02) 9585 6380 Fax: (02) 9873 8599

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : P32333_IvanhoeEstate_3.5k

Client Service ID : 574117

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-2584	Shrimptons Creek 1;Macquarie Park (Lane Cove NP); RYDE 005	GDA	56	326234	6261520	Closed site	Valid	Artefact : -	Shelter with Deposit	98744,102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2585	Shrimpton's Creek 2;Macquarie Park (Lane Cove NP); RYDE 006	GDA	56	326189	6261480	Closed site	Valid	Artefact : -	Shelter with Deposit	98744,102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2598	CSIRO 3 (CSIRO North Ryde) RYDE 010	GDA	56	328354	6258740	Open site	Valid	Artefact : -	Open Camp Site	4157,102489
	Contact	**Recorders**	Aboriginal Heritage Office,Ms.Tessa Corkill					**Permits**		
45-6-2599	CSIRO 2 (CSIRO North Ryde) RYDE 011	GDA	56	328319	6258660	Closed site	Valid	Artefact : -	Shelter with Deposit	4157,102489
	Contact	**Recorders**	Aboriginal Heritage Office,Ms.Tessa Corkill					**Permits**		
45-6-2236	Blue Gum Cave;	AGD	56	328320	6259190	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2237	Blackman Park 4;	AGD	56	328110	6256950	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2238	Blackman Park 5;	AGD	56	328050	6256990	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2275	Blackman Park 1;	AGD	56	328310	6256780	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2276	Blackman Park 2;	AGD	56	328560	6256780	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2281	Mars Rd Cave;Lane Cove West;	AGD	56	328130	6257150	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2284	Athletics Fields;Lane Cove West;	AGD	56	328490	6258170	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2310	Hand Hold Cave;	GDA	56	328738	6258512	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2311	Rope Swing Cave;	GDA	56	328735	6258502	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : P32333_IvanhoeEstate_3.5k

Client Service ID : 574117

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-2216	Lane_Cove_#1	GDA	56	328497	6258962	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers,DPIE,Ms.Elise McCarthy					**Permits**		
45-6-2653	Eden Gardens PAD RYDE 007	GDA	56	327279	6260615	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		102489
	Contact	**Recorders**	Aboriginal Heritage Office,Ms.Norma Richardson					**Permits**	1613,1685	
45-6-2681	PAD B	AGD	56	328150	6258150	Open site	Not a Site	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mrs.Robynne Mills					**Permits**	1871	
45-6-2272	Mowbray Park 5;	GDA	56	329010	6258450	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-0989	Gladesville;Ryde 018	GDA	56	327224	6257020	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-5-2584	LC NPM 1	AGD	56	328710	6259000	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Bobbie Oakley					**Permits**		
45-5-2585	LCNPM 2	AGD	56	328350	6259020	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Bobbie Oakley					**Permits**		
45-6-1558	Delhi Road;North Ryde; RYDE 009	GDA	56	329034	6258982	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	102489
	Contact	**Recorders**	Warren Bluff,Aboriginal Heritage Office					**Permits**		
45-6-2056	Footbridge Cave;	GDA	56	328261	6258205	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2058	Sugarloaf 2	AGD	56	327890	6256670	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**	624	
45-6-0610	Lane Cove River De Burgh's Bridge	AGD	56	327518	6260868	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Unknown Author					**Permits**		
45-6-0611	Lane Cove River West Pymble	AGD	56	327715	6261925	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Charles.D Power					**Permits**		
45-6-0613	Lane Cove River Terrace Road Bradfield	AGD	56	327560	6261150	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-0614	North Ryde;Delhi Rd;	AGD	56	328121	6258045	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-1893	KP.1.;	AGD	56	326239	6262975	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Margrit Koettig					**Permits**		
45-5-1005	IFCH1	AGD	56	322415	6262289	Open site	Not a Site	Artefact : -	Isolated Find	
	Contact	**Recorders**	Mr.Geordie Oakes,AECOM Australia Pty Ltd - Sydney,Ms.Tessa Corkill					**Permits**		
45-6-2209	Carters creek.	AGD	56	328290	6259190	Closed site	Valid	Artefact : -	Shelter with Deposit	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers,R Pallin					**Permits**		
45-6-2211	Lane Cove 3	AGD	56	328780	6258670	Open site	Valid	Shell : -, Artefact : -	Midden	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-2212	Blue Hole	AGD	56	327310	6260990	Closed site	Valid	Artefact : -	Shelter with Deposit	1899,98744
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-2215	Terrace Road #2	AGD	56	327610	6261210	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-2103	Magdala park; RYDE 014	GDA	56	327964	6257780	Open site	Valid	Shell : -, Artefact : -	Midden,Open Camp Site	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-1235	Epping;Lane Cove River;	AGD	56	324644	6262720	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-2575	Strangers Creek; RYDE 020	GDA	56	327239	6257010	Closed site	Valid	Artefact : -	Shelter with Deposit	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2576	Field of Mars; RYDE 021	GDA	56	327314	6256880	Open site	Valid	Shell : -, Artefact : -	Midden	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2577	River Bend;	AGD	56	327440	6261060	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	98744
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-1156	Epping;Terrys Creek Cave; RYDE 002	GDA	56	323544	6261450	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-6-1157	Brown;Cut Inside Cave; RYDE 003	GDA	56	325234	6262680	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-1158	Brown Two Ceiling Domes Cave RYDE 004	AGD	56	325274	6262670	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-6-2268	Big River Cave;	AGD	56	328890	6258410	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-1348	Mowbray Park;Lane Cove West;Mowbray Park 1.;Chatswood West;	GDA	56	329030	6258405	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	1497
	Contact	**Recorders**	Val Attenbrow,Michael Guider					**Permits**		
45-6-1354	Sewer Pipe Cave;Stringybark Creek;	GDA	56	328974	6257760	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Ms.Tessa Corkill					**Permits**		
45-6-1252	LC#4 Chatswood	AGD	56	328435	6258730	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899
	Contact	**Recorders**	P Clark,Ms.Bronwyn Conyers					**Permits**		
45-6-1940	Stringy Bark Creek Cave 1;	AGD	56	329010	6257390	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-0931	Boronia Park, Ryde 019	GDA	56	327234	6257010	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	102489
	Contact	**Recorders**	Charles.D Power,Aboriginal Heritage Office					**Permits**		
45-6-1653	Ironbarks	AGD	56	328440	6258840	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	J Wyeth					**Permits**		
45-6-0882	Lane Cove River;Gordon;	AGD	56	328134	6263010	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Charles.D Power					**Permits**		
45-6-1953	Pages Creek Cave;	GDA	56	327724	6258540	Open site	Valid	Shell : -, Artefact : -	Midden	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-1053	Lane Cove River;	AGD	56	326000	6262000	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	98744
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-1054	Lane Cove;Man Goanna Cave;	AGD	56	325690	6263590	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	ASRSYS					**Permits**	580	
45-6-0966	Kitty's Creek;Lane Cove SRA; RYDE 016	GDA	56	327874	6257420	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809,102489
	Contact	**Recorders**	Val Attenbrow,Alice Gorman,Aboriginal Heritage Office					**Permits**		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-1844	Mowbray Park 2, Chatswood west.;Chatswood West;	GDA	56	329050	6258380	Closed site	Valid	Artefact : -, Shell : -	Shelter with Deposit,Shelter with Midden	1497
	Contact	**Recorders**	Val Attenbrow,Michael Guider					**Permits**		
45-6-1845	Mowbray Park 3, Chatswood west.;	AGD	56	328670	6258230	Closed site	Valid	Artefact : -	Shelter with Deposit	1497
	Contact	**Recorders**	Val Attenbrow					**Permits**		
45-6-1854	L C/2 Lanecove 2 Epping Road Bridge RYDE 012	GDA	56	328104	6258490	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	2383,102489
	Contact	**Recorders**	Val Attenbrow,Alice Gorman,K Cutmore,Ms.Laila Haglund,Aboriginal Heritage Offic					**Permits**		
45-6-1855	L C/1 Lanecove 1	AGD	56	327920	6258190	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Ms.Laila Haglund					**Permits**		
45-6-0977	Epping;Lane Cove River; Little bloodwood stump cave RYDE 001	GDA	56	323964	6262130	Closed site	Valid	Artefact : -	Shelter with Deposit	2047,102489
	Contact	**Recorders**	Val Attenbrow,Aboriginal Heritage Office,Mr.Rick Bullers					**Permits**		
45-6-0978	Lane Cove River: KUR-050	GDA	56	324504	6262690	Open site	Valid	Grinding Groove : -, Water Hole : -	Axe Grinding Groove,Water Hole/Well	
	Contact	**Recorders**	Mr.Phil Hunt,Mr.R Taplin					**Permits**		
45-6-0981	Lane Cove River	AGD	56	327792	6260874	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	1899,98744
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-1005	Martins Creek;Lane Cove SRA; RYDE 015	GDA	56	327644	6257600	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	102489
	Contact	**Recorders**	Michael Guider,J.A Hatfield,Aboriginal Heritage Office					**Permits**		
45-6-2717	Will-144 Mowbray Park	AGD	56	328660	6258290	Closed site	Valid	Habitation Structure : -		
	Contact	**Recorders**	David Watts					**Permits**		
45-6-2718	Will-145 - Mowbray Park	AGD	56	328580	6258330	Open site	Valid	Shell : -		
	Contact	**Recorders**	David Watts					**Permits**		
45-6-2213	DeBurghs Bridge	AGD	56	327454	6261230	Closed site	Valid	Artefact : -	Shelter with Deposit	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-2214	Commandment Rock(LC#2)	AGD	56	328290	6259580	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899
	Contact	**Recorders**	P Clark,Ms.Bronwyn Conyers,D Brown					**Permits**		

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Extensive search - Site list report

Your Ref/PO Number : P32333_IvanhoeEstate_3.5k

Client Service ID : 574117

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-3010	Stringybark Creek PAD Shelter 7 - LCC085	GDA	56	329119	6257645	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3013	Stringybark Creek PAD Shelter 8 - LCC 086	GDA	56	328624	6257885	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3021	Field of Mars RYDE 026	GDA	56	327404	6257120	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3015	Stringybark Creek PAD Shelter 9 LCC 087	GDA	56	328714	6257860	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3067	Crescent 1	GDA	56	322187	6263082	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Kelleher Nightingale Consulting Pty Ltd					**Permits**		
45-6-3042	Eden Ave Groove 1 KUR 052	GDA	56	325374	6262955	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3861	Riverside Drive Charcoal Art	GDA	56	328101	6260036	Open site	Valid	Art (Pigment or Engraved) : -		
	Contact	**Recorders**	DPIE,Ms.Elise McCarthy					**Permits**		
45-6-2765	LCC 077 Pumphouse Shelter	AGD	56	328185	6257765	Open site	Valid	Habitation Structure : 1		
	Contact S Scanlon	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-2949	M2A1	GDA	56	323895	6262241	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	Mr.Rick Bullers					**Permits**		
45-6-3114	Epping to Thornleigh Third Track Unexpected Find 1	GDA	56	322194	6263106	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Josh Symons					**Permits**		
45-6-3136	Terrys Creek Shelter PAD1	GDA	56	323515	6261475	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-3117	Crescent 2 (C2)	GDA	56	322259	6262900	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Matthew Kelleher					**Permits**		
45-6-3319	Mowbray Park PAD4 WILL214	GDA	56	328850	6258435	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		

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Client Service ID : 574117

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mr.Phil Hunt,Aboriginal Heritage Office					**Permits**		
45-6-3321	Mowbray Park PAD3 WILL213	GDA	56	328735	6258510	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt,Aboriginal Heritage Office					**Permits**		
45-6-3795	Avian Cres PAD 1 WILL181	GDA	56	328675	6258385	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-3796	Avian Cres PAD 2 WILL182	GDA	56	328645	6258375	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		

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APPENDIX B REGISTERED ABORIGINAL PARTY CONSULTATION LOG

Date	Time	Type	Contacted	Contacted Individual	Contacted by	Contacted by Individual	Subject	Message	Follow-up needed?	Person actioned	Comment	Included in App. C
Stage 1 Agency notice												
5/03/2021	2:25pm	email	NNTT	n/a	Urbis	Meggan Walker (MW)	Stage 1.1 NNTT Search	Request for information	N	AO	n/a	Y
9/03/2021	1:20pm	email	Urbis	MW	NNTT	n/a	Stage 1.1 RESPONSE	No overlap, no relevant entries	N	AO	n/a	Y
12/03/2021	3:20pm	email	Metropolitan LALC	n/a	Urbis	Aaron Olsen (AO)	Stage 1.2 Agency Notice	Request for information	N	AO	n/a	
12/03/2021	3:20pm	email	DPC	n/a	Urbis	AO	Stage 1.2 Agency Notice	Request for information	N	AO	n/a	
12/03/2021	3:20pm	email	GSLLS	n/a	Urbis	AO	Stage 1.2 Agency Notice	Request for information	N	AO	n/a	
12/03/2021	3:20pm	email	ORALRA	n/a	Urbis	AO	Stage 1.2 Agency Notice	Request for information	N	AO	n/a	Y
12/03/2021	3:20pm	email	City of Ryde Council	n/a	Urbis	AO	Stage 1.2 Agency Notice	Request for information	N	AO	n/a	
12/03/2021	3:20pm	email	NTSCorp	n/a	Urbis	AO	Stage 1.2 Agency Notice	Request for information	N	AO	n/a	
19/03/2021	10:00am	email	Urbis	Andrew Crisp (AC)	DPC	Paul Houston	Stage 1.2 RESPONSE	RAP List provided	N	AO	n/a	Y
Stage 1 RAP notice/advertisement												
22/03/2021	10:28am	email	DPC Contact List	n/a	Urbis	AO	Stage 1.3 Invitation	Invitation to Register	N	AO	n/a	Y
22/03/2021	10:33am	email	Urbis	AO	Tocomwall	Danny Franks	Stage 1.3 RESPONSE	Registering Interest	N	AO	n/a	Y
22/03/2021	11:04am	email	Urbis	AO	Kamilaroi Yankuntjatjara Working Group (KYWG)	Phil Khan	Stage 1.3 RESPONSE	Registering Interest	N	AO	n/a	Y
22/03/2021	4:08pm	email	Urbis	AO	Gulaga	Wendy Smith	Stage 1.3 RESPONSE	Registering Interest	N	AO	n/a	Y
23/03/2021	12:02pm	email	Urbis	AO	Darug Custodian Aboriginal Corpo	Justine Coplin	Stage 1.3 RESPONSE	Registering Interest	N	AO	n/a	Y
24/03/2021	3:28pm	email	Urbis	AO	Ngambaa Cultural Connections	Kaarina Slater	Stage 1.3 RESPONSE	Registering Interest	N	AO	n/a	Y
8/04/2021	5:48pm	email	Urbis	AC	Didge Ngunawal Clan (DNC)	Lilly Carroll / Paul Boyd	Stage 1.3 RESPONSE	Registering Interest	N	AO	n/a	Y
22/04/2021	1:37am	email	Urbis	AO	Butucarbin Heritage	Lowanna Gibson	Stage 1.3 RESPONSE	Registering Interest	N	AO	n/a	Y
26/04/2021	9:41am	email	Urbis	AO	A1 Indigenous Services (A1)	Carolyn Hickey	Stage 1.3 RESPONSE	Registering Interest	N	AO	n/a	Y
7/05/2021	11:15am	email	DPC	n/a	Urbis	AO	Stage 1.6 Notice	Provision of RAP List	N	AO	n/a	Y
7/05/2021	11:17am	email	MLALC	Nathan Moran	Urbis	AO	Stage 1.6 Notice	Provision of RAP List	N	AO	n/a	Y
Stage 2 and 3												
7/05/2021	11:36am	email	All RAPs	n/a	Urbis	AO	Stage 2/3 Letter	Provision of project information. Deadline for response: 4 June 2021	N	AO	n/a	Y
7/05/2021	2:51pm	email	Urbis	AO	Gulaga	Wendy Smith	Stage 2/3 RESPONSE	Thank you for providing this information. Gulaga supports the methodology and makes no comment at this stage.	N	AO	n/a	Y
19/05/2021	9:52am	email	Urbis	AO	KYWG	Kadibulla Khan	Stage 2/3 RESPONSE	Thank you for your ACHA for Ivanhoe Estate stage 2/3. The study area is highly significant to the Aboriginal people. The study area is important to us Aboriginal people and as a last chance we should excavate the study area. We as Aboriginal people hold a deep connection to the land & we follow a lore that is known to us. the Aboriginal people have looked after this land for tens of thousands of years and continue to do so. In saying that we would like to agree to your recommendations and we support your ACHA. I would also like to take the time to mention Aboriginal Cultural interpretation for the development or within the building. Some examples are native gardens, artefact display, artwork, and signage, please do not hesitate to contact us about interpretation plan. We should also always be mindful of burials as we do not know where they are located.	N	AO	n/a	Y
Stage 4												
9/07/2021	9:43am	email	All RAPs	n/a	Urbis	AO	Stage 4 Draft ACHAR	Provision of draft ACHAR for review. Deadline for response 6 August 2021	N	AO	n/a	Y
16/07/2021	11:16am	email	Urbis	AAO	KYWG	Kadibulla Khan	Stage 4 RESPONSE	The study area is highly significant due to it being in close proximity to water ways, for this reason we would like to push for monitoring of the any works, done by an Aboriginal person as we don't believe that the construction works can identify Aboriginal objects. One induction is not enough train and they may not have the time to be aware of Aboriginal finds. We also should be mindful of our burials as they hold deep meaning to us and we have been striped of the location of them.	N	AO	n/a	Y

APPENDIX C REGISTERED ABORIGINAL PARTY CONSULTATION DOCUMENTATION

Meggan Walker

From: Meggan Walker
Sent: Friday, 5 March 2021 2:25 PM
To: 'GeospatialSearch@nntt.gov.au'
Cc: Andrew Crisp
Subject: Ivanhoe Estate - NNTT Search - P0032333
Attachments: Search Form_Request for Search of Tribunal Registers 2021_filled in.pdf; Search Form_Request for Search of Tribunal Registers 2021_filled in.docx

Hi all,

Please see attached form for the Native Title Tribunal for Ivanhoe Estate, Lot 100 DP1262209 and Lot 101 DP1263727.

Kind regards,

MEGGAN WALKER
CONSULTANT

D +61 2 8233 7626
T +61 2 8233 9900
E mwalker@urbis.com.au

SHAPING CITIES AND COMMUNITIES

URBIS

ANGEL PLACE, LEVEL 8, 123 PITT STREET
SYDNEY, NSW 2000, AUSTRALIA

Urbis recognises the traditional owners of the land on which we work.
Learn more about our **Reconciliation Action Plan.**

This email and any files transmitted are for the intended recipient's use only. It contains information which may be confidential and/or protected by copyright. Any personal information in this email must be handled in accordance with the *Privacy Act 1988 (Cth)*. If you have received this email by mistake, please notify the sender and permanently delete the email. Any confidentiality or copyright is not waived or lost because this email has been sent to you by mistake.

National Native Title Tribunal

Request for Search of Tribunal Registers

Search for overlapping interests i.e.: Is there a native title claim, determination or land use agreement over this land?
Please note: the NNTT cannot search over freehold land.
For further information on freehold land: Click Here (NNTT website)

1. Your details

NAME:	Meggan Walker
POSITION:	Consultant
COMPANY/ORGANISATION:	Urbis
POSTAL ADDRESS:	Level 8, 123 Pitt Street, Sydney, NSW, 2000
TELEPHONE:	0 82337626
EMAIL:	mwalker@urbis.com.au
YOUR REFERENCE:	P0032333
DATE OF REQUEST:	5/03/2021

2. Reason for your request

Are you a party to a native title proceeding? ☐Yes ☒No

Please provide Federal Court/Tribunal file number/or application name:

OR

Do you need to identify existing- native title interests to comply with the *Native Title Act 1993* (Cth) or other State/Territory legislation? ☒Yes ☐No

Please provide brief details of these obligations here: Archaeological assessment

3. Identify the area to be searched

If there is insufficient room below, please send more information on a Word or Excel document.

Mining tenure

State/Territory:

Tenement ref/s:

OR

Crown land / non-freehold tenure

Tenure type: ☒Lease ☐Reserve or other Crown land

State/Territory: New South Wales

Lot and plan details: Lot 100 DP1262209 and Lot 101 DP1263727

Pastoral Lease number or name:

Other details: (Town/County/Parish/Section/Hundred/Portion): **Macquarie Park/ Cumberland/Hunters Hill**

Email completed form to: GeospatialSearch@nntt.gov.au

Meggan Walker

From: Geospatial Search Requests <GeospatialSearch@NNTT.gov.au>
Sent: Tuesday, 9 March 2021 1:20 PM
To: Meggan Walker
Cc: Andrew Crisp
Subject: RE: SR21/363 - Ivanhoe Estate - NNTT Search - P0032333

Follow Up Flag: Follow up
Flag Status: Flagged

UNCLASSIFIED

Native title search – *NSW Parcels – Lot 100 on DP1262209 and Lot 101 on DP1263727*
Your ref: *P0032333* - **Our ref:** *SR21/363*

Dear Meggan Walker**,**

Thank you for your search request received on 05 March 2021 in relation to the above area. Based on the records held by the National Native Title Tribunal as at 08 March 2021 it would appear that there are no Native Title Determination Applications, Determinations of Native Title, or Indigenous Land Use Agreements over the identified area.

Search Results
The results provided are based on the information you supplied and are derived from a search of the following Tribunal databases:

- Schedule of Native Title Determination Applications
- Register of Native Title Claims
- Native Title Determinations
- Indigenous Land Use Agreements (Registered and notified)

At the time this search was carried out, there were **no relevant entries** in the above databases.

Cadastral data as at: 01/02/2021

Parcel ID	Feature Area SqKm	Tenure	NNTT file number	Name	Category
100//DP1262209	0.0826	NSW GOVERNMENT	No overlap		
101//DP1263727	0.0088	FREEHOLD	No overlap		

For more information about the Tribunal's registers or to search the registers yourself and obtain copies of relevant register extracts, please visit our website.

Information on native title claims and freehold land can also be found on the Tribunal's website here: Native title claims and freehold land .

Please note: There may be a delay between a native title determination application being lodged in the Federal Court and its transfer to the Tribunal. As a result, some native title determination applications recently filed with the Federal Court may not appear on the Tribunal's databases.

The search results are based on analysis against external boundaries of applications only. Native title applications commonly contain exclusions clauses which remove areas from within the external boundary. To determine whether the areas described are in fact subject to claim, you need to refer to the "Area covered by claim" section of the relevant Register Extract or Schedule Extract and any maps attached.

Search results and the existence of native title
Please note that the enclosed information from the Register of Native Title Claims and/or the Schedule of Applications is **not** confirmation of the existence of native title in this area. This cannot be confirmed until the Federal Court makes a determination that native title does or does not exist in relation to the area. Such determinations are registered on the National Native Title Register.

The Tribunal accepts no liability for reliance placed on enclosed information
The enclosed information has been provided in good faith. Use of this information is at your sole risk. The National Native Title Tribunal makes no representation, either express or implied, as to the accuracy or suitability of the information enclosed for any particular purpose and accepts no liability for use of the information or reliance placed on it.

If you have any further queries, please do not hesitate to contact us via GeospatialSearch@NNTT.gov.au

Regards,

Geospatial Searches
National Native Title Tribunal | Perth
Email: GeospatialSearch@nntt.gov.au | **www.nntt.gov.au**

From: Meggan Walker <mwalker@urbis.com.au>
Sent: Friday, 5 March 2021 11:25 AM
To: Geospatial Search Requests <GeospatialSearch@NNTT.gov.au>
Cc: Andrew Crisp <acrisp@urbis.com.au>
Subject: SR21/363 - Ivanhoe Estate - NNTT Search - P0032333

Caution: This is an external email. DO NOT click links or open attachments unless you recognise the sender and know the content is safe.

Hi all,

Please see attached form for the Native Title Tribunal for Ivanhoe Estate, Lot 100 DP1262209 and Lot 101 DP1263727.

Kind regards,

MEGGAN WALKER
CONSULTANT

D +61 2 8233 7626
T +61 2 8233 9900
E mwalker@urbis.com.au

SHAPING CITIES AND COMMUNITIES

URBIS

URBIS

ANGEL PLACE
LEVEL 8, 123 PITT STREET
SYDNEY NSW 2000

URBIS.COM.AU
Urbis Pty Ltd
ABN 50 105 256 228

12 March 2021

To whom it may concern,

P0032333 - IVANHOE ESTATE - ABORIGINAL CULTURAL HERITAGE ASSESSMENT - ABORIGINAL COMMUNITY CONSULTATION - AGENCY NOTICE STAGE 1.2

Urbis has been commissioned by Frasers Property Australia (FPA) (the proponent) to conduct an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed redevelopment of the Ivanhoe Estate (hereafter referred to as the subject area) (see attached figures). The ACHA Report (ACHAR) will form part of the Environmental Impact Statement (EIS) which will accompany the State Significant Development Applications for the development of the subject area. The ACHAR will assess the impacts of the development on the Aboriginal archaeological and cultural heritage values of the site, as required under Condition C2 of the Concept Approval consent.

The ACHA is to be carried out in accordance with relevant guidelines under the *National Parks and Wildlife Act 1974* (NPW Act), including the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). The assessment would detail any potential Aboriginal cultural heritage resources within the subject area and provide recommendations regarding management of those resources.

Ivanhoe Estate (Figure1 and Figure 2) is located within the suburb of Macquarie Park at the northeast of the intersection of Herring Road and Epping Road, within the Ryde Local Government Area (LGA). It is located on the southern fringe of Macquarie Park, and is within approximately 500 metres of both Macquarie Shopping Centre and Macquarie University. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings.

The site is approximately 8.2 hectares (ha) and irregular in shape. The site previously accommodated 259 social housing dwellings comprising a mix of townhouse and apartment buildings set around a cul-de-sac street layout, with all dwellings now demolished (Figure 2).

The site is in the process of being redeveloped as part of the NSW Government's 'Communities Plus' program which seeks to deliver new communities with good access to transport, employment, improved facilities, and open space through leveraging the expertise and capacity of the private and non-government sectors. Development delivered under Communities Plus is mixed-tenure – that is, a mix of both social and market housing. This mix serves two purposes: to offset the cost of delivering new social housing, and to provide well-integrated communities. Mission Australia Housing will manage the site's social housing portfolio and is a national Tier 1 Community Housing Provider (CHP).

Consent was granted by the Minister for Planning and Public Spaces on 30 April 2020 for the Ivanhoe Estate - Concept Masterplan (SSD-8707) and for the first stage of physical works (SSD-8903) referred to as Stage 1. FPA and NSW Land and Housing Corporation (LAHC) are now seeking to pursue the

next stage of planning approvals for the detailed design, construction, and operation of Stage 2 of the Ivanhoe Estate Concept Masterplan. Stage 2 comprises the Village Green and Community Centre (C2), and residential buildings C3 and C4 (Figure 3, Figure 4 and Figure 5).

Following the consolidation of previous allotments as part of the SSD-8903, the Ivanhoe Estate site is now legally described as Lot 100 in DP1262209 except for a portion of Shrimptons Creek and neighbouring land at 2-4 Lyon Park Road, known as Lot 1 DP 859537. 2-4 Lyonpark Road is owned by LIF Pty Ltd as trustee for Local Government Super, while the Ivanhoe Estate lot is owned and managed by LAHC.

The proponent can be contacted via:

Scott Clohessy
Senior Development Manager
Frasers Property Australia
Suite 11 Lumiere Commercial
Level 12, 1010 Bathurst Street
Sydney NSW 2000
E: Scott.Clohessy@frasersproperty.com.au

In accordance with the *Aboriginal cultural heritage consultation requirements for proponents (DEECW 2010)* (the Consultation Requirements) and Clause 80C of the NSW National Parks and Wildlife Regulation 2009, the Proponent will conduct a community consultation process with registered Aboriginal people. The community consultation will include:

- Identifying and describing the Aboriginal cultural heritage values that exist across the subject area in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW OEH* (2010), and documenting these in an Aboriginal Cultural Heritage Assessment Report (ACHAR) which may include the need for surface survey and test excavation.
- Undertaking consultation with Aboriginal people and document in accordance with *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW).
- The preparation of the ACHA Report (ACHAR) to support the SSDA, demonstrating attempts to avoid any impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts; and
- Recording of any Aboriginal objects in line with the requirements of the Department of Premier and Cabinet's Aboriginal Heritage Information Management System (AHIMS) that may be identified within the subject area.

In accordance with Section 4.1.2 of the Consultation Requirements, Urbis proposes to compile a list of Aboriginal people and organisations who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/or places that may exist within the subject area.

Should you be aware of any Aboriginal persons and/or organisations that may hold an interest in the project, please provide their details at your earliest convenience and preferably by **24th March 2021** in writing to:

Andrew Crisp
Senior Archaeologist
Urbis
Level 8 123 Pitt Street,
Sydney, NSW, 2000
E: acrisp@urbis.com.au

Urbis, on behalf of the proponent, will write to each Aboriginal person or group whose details are provided to notify them of the proposed project and invite them to register an interest in the community consultation process.

Please be advised that, as per the Consultation Requirements, the proponent is required to forward the names of Aboriginal persons and groups who register an interest (Registered Aboriginal Parties) to the Metropolitan Local Aboriginal Land Council and Heritage NSW/Department of Premier and Cabinet unless the person or group specifies that they do not want their details released.

Please do not hesitate to contact us should you have any queries in relation to the provided information.

Kind regards,



Andrew Crisp
Senior Consultant
+61 2 8233 7642
acrisp@urbis.com.au

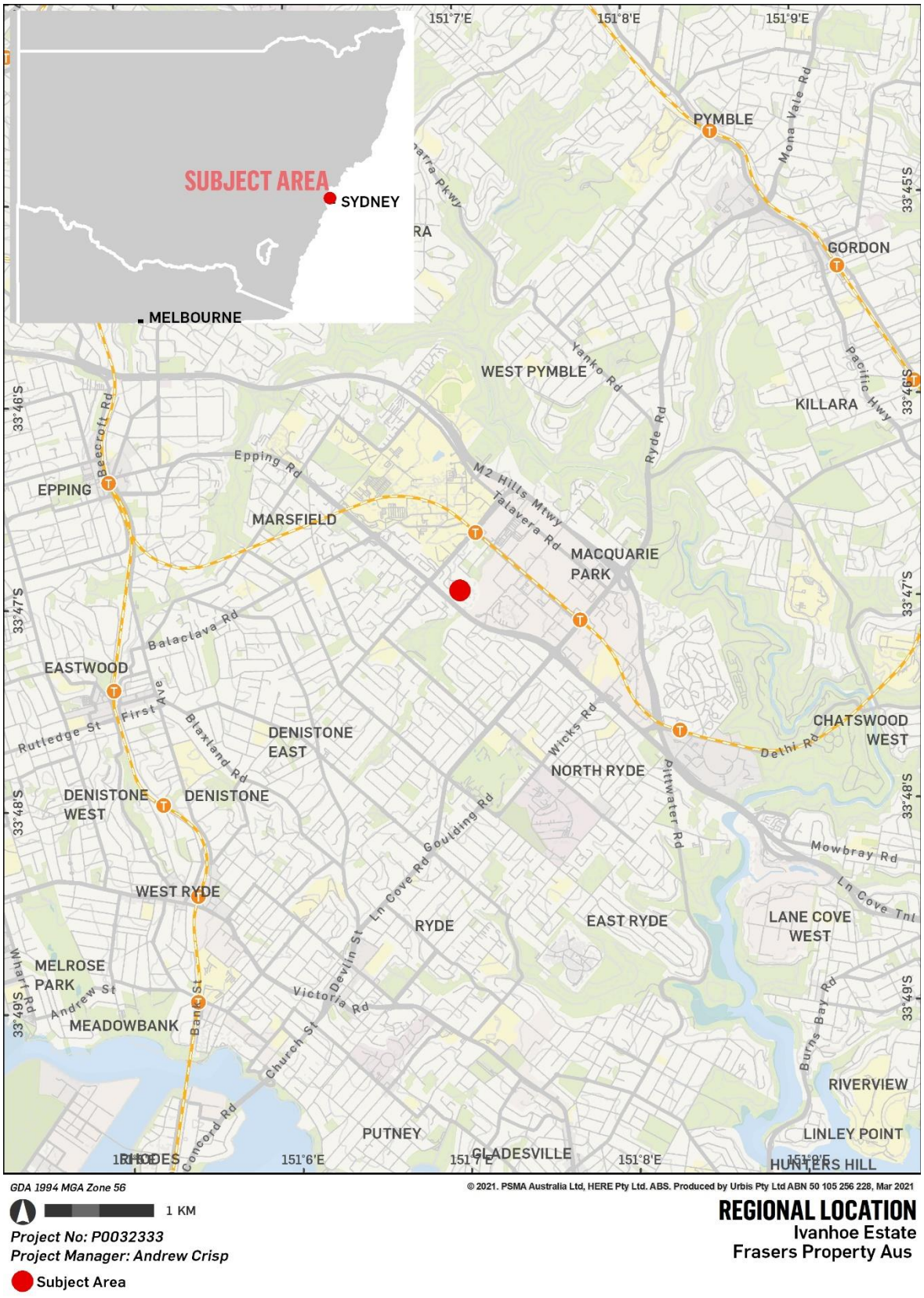

Figure 1 – Regional location



Figure 2 – Location of the subject area



Figure 3 - Ivanhoe Estate Concept Masterplan

Source: Ethos Urban

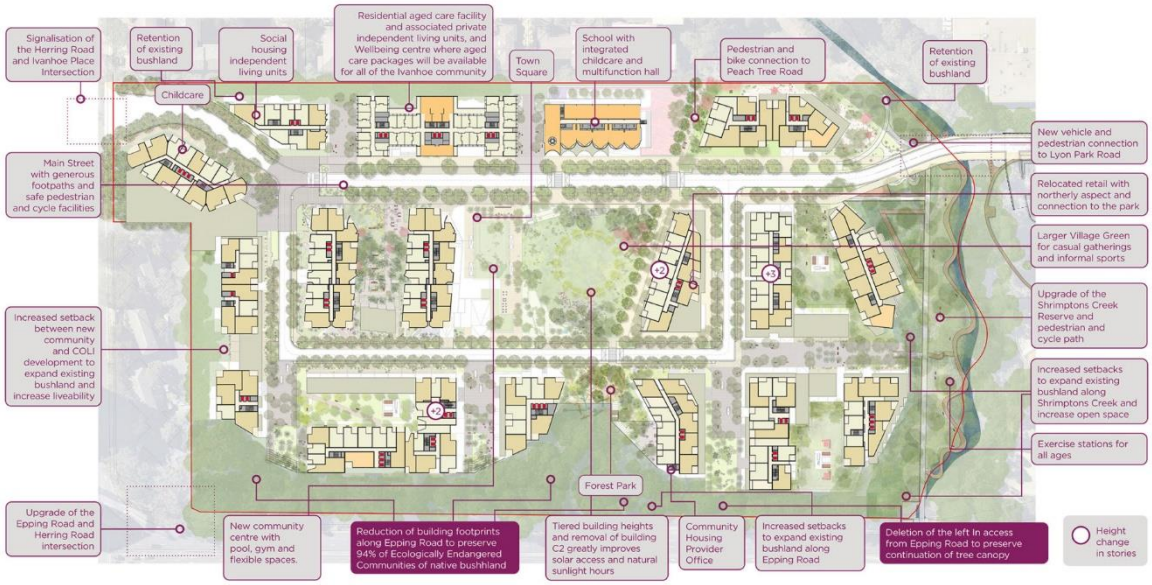

Figure 4 – Ivanhoe Estate Concept Masterplan - details

Source: Ethos Urban

From:	Paul Houston
To:	Andrew Crisp
Cc:	Aaron Olsen
Subject:	Rap letter for the proposed "Redevelopment of the Ivanhoe Estate Macquarie Park, NSW Ryde LGA.
Date:	Friday, 19 March 2021 10:00:59 AM
Attachments:	DOC21-199535-1Redevelopment of the Ivanhoe Estate, Macquarie Park, NSW.pdf
Importance:	High

Andrew

Please see attached RAP letter for the proposed "Redevelopment of the Ivanhoe Estate Macquarie Park, NSW Ryde LGA.

If you have any questions please contact me.

Thanxs
Paul

Paul Houston, Aboriginal Heritage Planning Officer
Heritage NSW, Community Engagement, Department of Premier and Cabinet
142 Brisbane St, Dubbo NSW 2830
T: 02 68835361, M: 0427832205| Paul.Houston@environment.nsw.gov.au

Please lodge all Applications to Heritagemailbox@environment.nsw.gov.au

I acknowledge and respect the traditional custodians and ancestors of the lands I work across.
Heritage NSW and coronavirus (COVID-19)
Heritage NSW has taken steps to protect the safety, health and wellbeing of our staff, communities and customers. Whilst our offices remain open, we have put in place flexible working arrangements for our teams across NSW and continue to adapt our working arrangements as necessary. Face-to-face meetings and field work/site visits with our customers are subject to rules on gatherings and social distancing measures. We thank you for your patience and understanding at this time.

This email is intended for the addressee(s) named and may contain confidential and/or privileged information.
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Any views expressed in this email are those of the individual sender except where the sender expressly and with authority states them to be the views of the NSW Office of Environment and Heritage.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

Premier & Cabinet

Reference: DOC21/199535-1

Andrew Crisp
Urbis
Level 8 123 Pitt Street
SYDNEY NSW 2000
acrisp@urbis.com.au

RE: Request for information on Aboriginal stakeholders for an Aboriginal cultural heritage assessment for proposed "Redevelopment of the Ivanhoe Estate, Macquarie Park, NSW"

Dear Andrew,

Thank you for your letter of 12 March 2021 about Aboriginal cultural heritage consultation for the proposed "Redevelopment of the Ivanhoe Estate, Macquarie Park, NSW", within the Ryde local government area. I appreciate the opportunity to provide input.

Please find enclosed a list of known Aboriginal parties for the Ryde local government area (Attachment 1) that we consider likely to have an interest in the proposal. Note this is not an exhaustive list of all interested Aboriginal parties. Receipt of this list does not remove the requirement for a proponent/consultant to advertise the proposal in the local print media and contact other bodies and community groups seeking interested Aboriginal parties, in accordance with the '*Aboriginal cultural heritage consultation requirements for proponents 2010'* (the CRs).

We would also like to take this opportunity to remind the proponent and consultant to:

- Ensure that consultation is fair, equitable and transparent. If the Aboriginal parties express concern or are opposed to parts of or the entire project, we expect that evidence will be provided to demonstrate the efforts made to find common ground between the opponents and the proponent.

If you have any questions about this advice, please do not hesitate to contact me via paul.houston@environment.nsw.gov.au or 02 68835361.

Yours sincerely



Paul Houston
Aboriginal Heritage Planning Officer
Aboriginal Cultural Heritage Regulation - Northern
Heritage NSW
Department of Premier and Cabinet
19 March 2021

ATTACHMENT A

Table 1: List of Aboriginal stakeholder groups within the Ryde LGA. - that may have an interest in the project; provided as per the "OEH Aboriginal cultural heritage requirement for proponents 2010".

Ryde Local Government Area

Organisation/ Individual	Contact Name	Email Address/ Fax / Phone	Postal Address	Additional information
Metropolitan Local Aboriginal Land Council	Nathan Moran	(02) 83949666 officeadmin@metrolalc.org.au	PO Box 1103 Strawberry Hills NSW 2016	
Darug Aboriginal Cultural Heritage Assessments	Gordon Morton	02 9410 3665 or 0422 865 831	Unit 9, 6 Chapman Avenue, Chatswood, NSW 2067	
Darug Land Observations	Jamie Workman and Anna Workman	0418 494 951 0413 687 279 daruglandobservations@gmail.com	PO Box 173, Ulladulla, NSW 2539	
A1 Indigenous Services	Carolyn Hickey	0411 650 057 cazadirect@live.com	10 Marie Pitt Place Glenmore Park 2745 NSW.	
Eric Keidge	Eric Keidge	04311 66423	11 Olsson Close Hornsby Heights NSW 2077	
Kamilaroi Yankuntjatjara Working Group	Phil Khan	0434 545 982 philipkhan.acn@live.com.au	78 Forbes Street, Emu Plains, NSW 2750	
Tocomwall	Scott Franks	0404 171 544	PO Box 76, Caringbah NSW 1495	
Amanda Hickey Cultural Services	Amanda Hickey	0434 480 588 amandahickey@live.com.au	57 Gough st emu plains 2750	
Dhinawan Culture & Heritage Pty Ltd	Stephen Fields	0411232285 dhinawan.ch@gmail.com		
Gunyuu	Kylie Ann Bell	gunyuuchts@gmail.com		
Walbunja	Hika Te Kowhai	0402 730 612 walbunja@gmail.com		
Badu	Karia Lea Bond	0476 381 207	11 Jeffery Place, Moruya, NSW 2537	
Goobah Developments	Basil Smith	0405 995 725 goobahchts@gmail.com	66 Grantham Road, Batehaven NSW, 2536	
Wullung	Lee-Roy James Boota	0403 703 942	54 Blackwood Street, Gerringong, NSW, 2534	
Yerramurra	Robert Parson	yerramurra@gmail.com		
Nundagurri	Newton Carriage	nundagurri@gmail.com		
Murrumbul	Mark Henry	murrumbul@gmail.com		

Jerringong	Joanne Anne Stewart	0422 800 184 jerringong@gmail.com		
Pemulwuy CHTS	Pemulwuy Johnson	0425 066 100 pemulwuyd@gmail.com	14 Top Place, Mt Annan	
Bilinga	Simalene Carriage	bilingachts@gmail.com		
Munyunga	Kaya Dawn Bell	munyungachts@gmail.com		
Wingikara	Hayley Bell	wingikarachts@gmail.com		
Minnamunnung	Aaron Broad	0402 526 888	1 Waratah Avenue, Albion Park Rail NSW 2527	
Walgalu	Ronald Stewart	walgaluchts@gmail.com		
Thauaira	Shane Carriage	thauairachts@gmail.com		
Dharug	Andrew Bond	dharugchts@gmail.com		
Gulaga	Wendy Smith	gulagachts@gmail.com		
Callendulla	Corey Smith	cullendullachts@gmail.com		
Murramarang	Roxanne Smith	murramarangchts@gmail.com		
DJMD Consultancy	Darren Duncan	darrenjohnduncan@gmail.com		
Butucarbin Aboriginal Corporation	Jennifer Beale	(02)9832 7167 butuheritage@gmail.com	PO Box E18, Emerton, NSW 2770	
Didge Ngunawal Clan	Lillie Carroll Paul Boyd	0426 823 944 didgengunawalclan@yahoo.com.au	33 Carlyle Crescent Cambridge Gardens NSW 2747	
Ginninderra Aboriginal Corporation	Steven Johnson and Krystle Carroll	0406991221 Ginninderra.corp@gmail.com	PO BOX 3143 Grose Vale NSW 2754	
Wailwan Aboriginal Group	Philip Boney	0436 483 210 waarlan12@outlook.com		
Barking Owl Aboriginal Corporation	Mrs Jody Kulakowski (Director)	0426 242 015 barkingowlcorp@gmail.com	2-65/69 Wehlow St. Mt Druitt	
Thoorga Nura	John Carriage (Chief Executive Officer)	0401 641 299 thoorganura@gmail.com	50B Hilltop Crescent, Surf Beach, 2536, NSW	
Darug Boorooberongal Elders Aboriginal Corporation	Paul Hand (chairperson)	0456786738 paulhand1967@gmail.com	PO.Box 14 Doonside NSW 2767	
B.H. Heritage Consultants	Ralph Hampton Nola Hampton	0435 785 138 0401 662 531	184 Captain Cook Drive Willmot 2770 NSW 95 Mount Ettalong Road Umina	

		hamptonralph46@gmail.com kinghampton@77gmail.com	Beach 2257 NSW	
Ngambaa Cultural Connections	Kaarina Slater	0422 729 117 ngambaaculturalconnections@hotmail.com	6 Natchez Cresent, Greenfield Park NSW 2176	
Goodradigbee Cultural & Heritage Aboriginal Corporation,	Caine Carroll	0410974236 goodradigbee1@outlook.com	1 Morilla Road, East Kurrajong NSW 2758	
Mura Indigenous Corporation,	Phillip Carroll	0448824188 mura.indigenous@bigpond.com	11 Nargal Street Flinders NSW 2529	
Aragung Aboriginal Cultural Heritage Site Assessments	Jamie Eastwood	0427793334 0298323732 James.eastwood@y7mail.com	33 Bulolo Drive Whalan NSW 2770	
Waawaar Awaa Aboriginal Corporation	Rodney Gunther	0410580962 Waawaar.awaa@gmail.com	15 Bungonia Street Prestons NSW 2170	
Wori Wooilywa	Daniel Chalker	woriwooilywa@gmail.com 0409006216	261 Mockingbird Rd Pheasants Nest NSW 2574	
Darug Custodian Aboriginal Corporation	Justine Coplin	0414 962 766 justinecoplin@optusnet.com.au	PO Box 81, Windsor NSW 2756	

URBIS

ANGEL PLACE
LEVEL 8, 123 PITT STREET
SYDNEY NSW 2000

URBIS.COM.AU
Urbis Pty Ltd
ABN 50 105 256 228

22 March 2021

To whom it may concern,

IVANHOE ESTATE - ABORIGINAL CULTURAL HERITAGE ASSESSMENT – ABORIGINAL COMMUNITY CONSULTATION STAGE 1.3 – INVITATION TO REGISTER

Please be advised that your contact details have been provided by the Department of Premier and Cabinet (DPC) in accordance with Section 4.1.2 of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW, 2010) ('the Consultation Requirements') as a potential Aboriginal stakeholder who may have interest in registering to the abovementioned project.

Urbis has been commissioned by Frasers Property Australia (FPA) ('the Proponent') to conduct an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed redevelopment of the Ivanhoe Estate ('the subject area') (see Figure 1 and Figure 2).

The ACHA Report (ACHAR) will form part of the Environmental Impact Statement (EIS) which will accompany the State Significant Development Applications for the development of the subject area. The ACHAR will assess the impacts of the development on the Aboriginal archaeological and cultural heritage values of the site, as required under Condition C2 of the Concept Approval consent.

The ACHA is to be carried out in accordance with relevant guidelines under the *National Parks and Wildlife Act 1974* (NPW Act), including the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). The assessment would detail any potential Aboriginal cultural heritage resources within the subject area and provide recommendations regarding management of those resources.

Ivanhoe Estate is located within the suburb of Macquarie Park at the northeast of the intersection of Herring Road and Epping Road, within the Ryde Local Government Area (LGA) (see Figure 1 and Figure 2). It is located on the southern fringe of Macquarie Park, and is within approximately 500 metres of both Macquarie Shopping Centre and Macquarie University. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings. The site is approximately 8.2 hectares (ha) and irregular in shape. It previously accommodated 259 social housing dwellings comprising a mix of townhouse and apartment buildings set around a cul-de-sac street layout, with all dwellings now demolished (Figure 2).

The site is in the process of being redeveloped as part of the NSW Government's 'Communities Plus' program which seeks to deliver new communities with good access to transport, employment, improved facilities, and open space through leveraging the expertise and capacity of the private and non-government sectors. Development delivered under Communities Plus is mixed-tenure – that is, a mix of both social and market housing. This mix serves two purposes: to offset the cost of delivering new social housing, and to provide well-integrated communities. Mission Australia Housing will manage the site's social housing portfolio and is a national Tier 1 Community Housing Provider (CHP).

Consent was granted by the Minister for Planning and Public Spaces on 30 April 2020 for the Ivanhoe Estate - Concept Masterplan (SSD-8707) and for the first stage of physical works (SSD-8903) referred to as Stage 1. FPA and NSW Land and Housing Corporation (LAHC) are now seeking to pursue the next stage of planning approvals for the detailed design, construction, and operation of Stage 2 of the Ivanhoe Estate Concept Masterplan. Stage 2 comprises the Village Green and Community Centre (C2), and residential buildings C3 and C4.

Following the consolidation of previous allotments as part of the SSD-8903, the Ivanhoe Estate site is now legally described as Lot 100 in DP1262209 except for a portion of Shrimptons Creek and neighbouring land at 2-4 Lyon Park Road, known as Lot 1 DP 859537. 2-4 Lyonpark Road is owned by LIF Pty Ltd as trustee for Local Government Super, while the Ivanhoe Estate lot is owned and managed by LAHC.

The proponent can be contacted via:

Scott Clohessy
Senior Development Manager
Frasers Property Australia
Suite 11 Lumiere Commercial
Level 12, 1010 Bathurst Street
Sydney NSW 2000
E: Scott.Clohessy@frasersproperty.com.au

In accordance with the *Aboriginal cultural heritage consultation requirements for proponents (DEECW 2010)* (the Consultation Requirements) and Clause 80C of the NSW National Parks and Wildlife Regulation 2009, the Proponent will conduct a community consultation process with registered Aboriginal people. The community consultation will include:

- Identifying and describing the Aboriginal cultural heritage values that exist across the subject area in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW OEH* (2010), and documenting these in an Aboriginal Cultural Heritage Assessment Report (ACHAR) which may include the need for surface survey and test excavation.
- Undertaking consultation with Aboriginal people and document in accordance with *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW).
- The preparation of the ACHAR to support the AHIP application and demonstrating attempts to avoid any impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts.
- Recording of any Aboriginal objects in line with the requirements of the OEH's Aboriginal Heritage Information Management System (AHIMS) that may be identified within the subject area.

Should you wish to register your interest in this project, please respond in writing by clearly stating your interest and nominating a contact person by **21 April 2021**. Please send responses to the following:

Andrew Crisp
Senior Archaeologist
Urbis
Level 8 123 Pitt Street,
Sydney, NSW, 2000
E: acrisp@urbis.com.au

Please be advised that, as per the Consultation Requirements, the Proponent is required to forward the names of Aboriginal persons and groups who register an interest (Registered Aboriginal Parties) to the Metropolitan Local Aboriginal Land Council and Aboriginal Cultural Heritage Regulation Branch of the DPC unless the person or group specifies that they do not want their details released.

Please be further advised that in accordance with Section 3.4 of the Consultation Requirements, inclusion in the consultation process does not automatically result in paid site assessment. The decision on who is engaged for delivering particular services is made by the Proponent and will be based on a range of considerations including skills, relevant experience, and providing necessary certificates of currency.

If you have any queries in relation to the provided information, please do not hesitate to contact us.

Yours sincerely,



Andrew Crisp
Senior Consultant
+61 2 8233 7642
acrisp@urbis.com.au

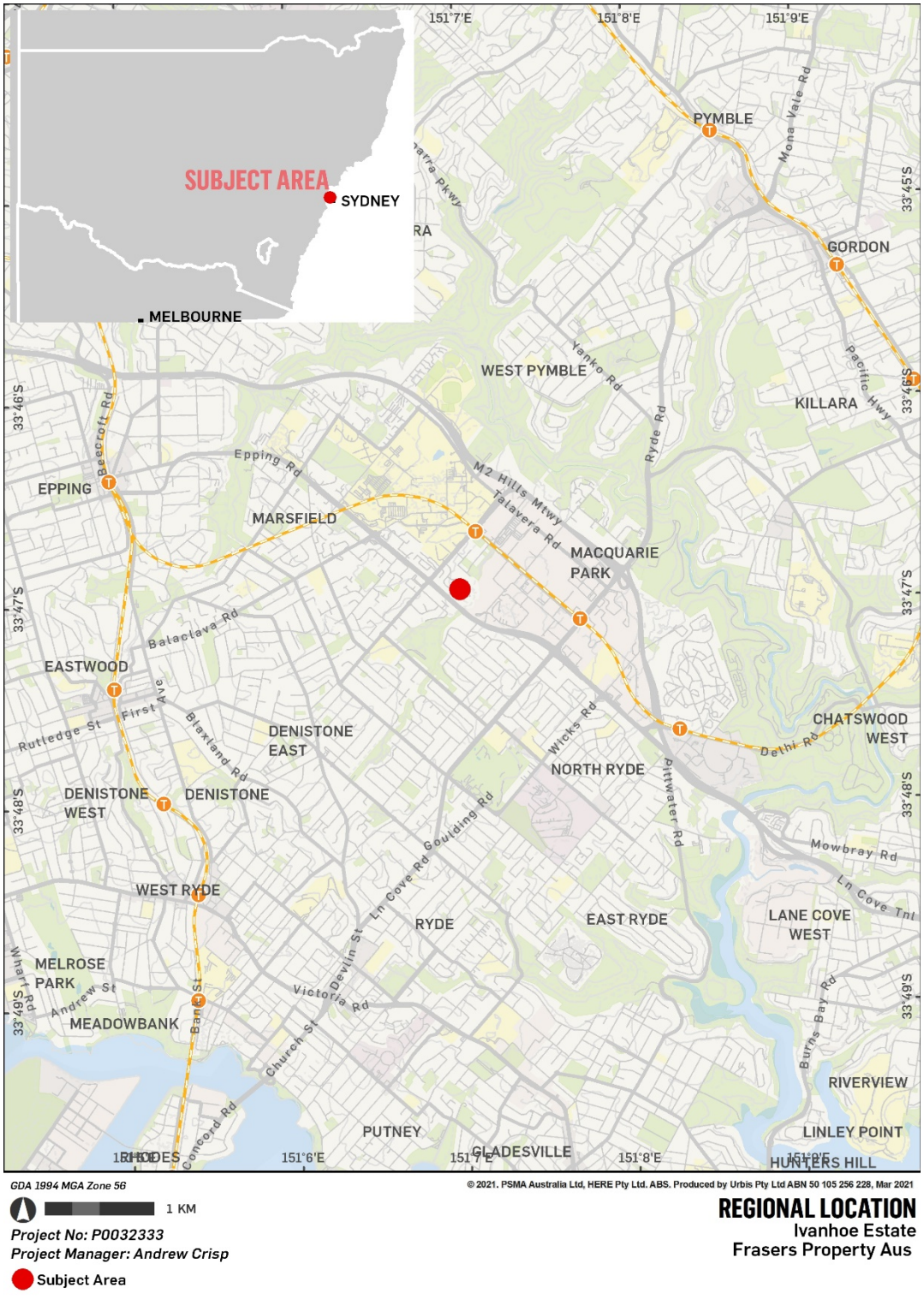

Figure 1 – Regional Location of the subject area



Figure 2 – Location of the subject area

Ivanhoe Estate/Macquarie Park NSW
Aboriginal Cultural Heritage Assessment – Community Consultation Stage 1

Urbis has been commissioned by Frasers Property Australia (FPA) ('the Proponent') to conduct an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed redevelopment of the Ivanhoe Estate, Macquarie Park ('the subject area').

The ACHA Report (ACHAR) will form part of the Environmental Impact Statement (EIS) which will accompany a State Significant Development Applications for the development of the subject area. The ACHAR will assess the impacts of the development on the Aboriginal archaeological and cultural heritage values of the site, as required under Condition C2 of the Concept Approval consent

The proponent can be contacted via:

Scott Clohessy
Senior Development Manager
Frasers Property Australia
Suite 11 Lumiere Commercial
Level 12, 1010 Bathurst Street
Sydney NSW 2000
E: Scott.Clohessy@fraserspropery.com.au

In accordance with Section 4.1.3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010)* and Clause 80C of the *NSW National Parks and Wildlife Regulation 2009*, the Proponent is seeking the registration of Aboriginal persons or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) that may be present in the subject area.

Please register your interest in writing to the contact details provided below by 5.00pm 21 April 2021.

Andrew Crisp
Senior Consultant
Urbis Pty Ltd
Level 8 123 Pitt Street
Sydney NSW 2000
E: acrisp@urbis.com.au

Please be advised that the Proponent is required to forward the names of Aboriginal persons and groups who register an interest to the Department of Premier & Cabinet and the Metropolitan Local Aboriginal Land Council; unless the person or group specifies that they do not want their details released.

From:	Danny Franks
To:	Aaron Olsen
Cc:	Andrew Crisp
Subject:	Re: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register
Date:	Monday, 22 March 2021 10:32:44 AM
Attachments:	image002.png image003.png image004.png image005.png image006.png

---

Good Morning Andrew,

I hope you and the team are keeping safe and dry.

Please register tocomwall on this project.

Have a nice day

Regards,

Danny franks

Heritage manager
M: 0415226275

Get Outlook for iOS

From: Aaron Olsen <aolsen@urbis.com.au>
Sent: Monday, March 22, 2021 10:28:29 AM
Cc: Andrew Crisp <acrisp@urbis.com.au>
Subject: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register

Good morning

Please be advised that your contact details have been provided by the Department of Premier and Cabinet (DPC) in accordance with Section 4.1.2 of the Aboriginal cultural heritage consultation requirements for proponents (DECCW, 2010) ('the Consultation Requirements') as a potential Aboriginal stakeholder who may have interest in registering to the abovementioned project.

Urbis has been commissioned by Frasers Property Australia (FPA) ('the Proponent') to conduct an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed redevelopment of the Ivanhoe Estate ('the subject area') (see attached Figure 1 and Figure 2).

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The ACHA is to be carried out in accordance with relevant guidelines under the *National Parks and Wildlife Act 1974* (NPW Act), including the Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW (OEH 2011). The assessment would detail any potential Aboriginal cultural heritage resources within the subject area and provide recommendations regarding management of those resources.

Ivanhoe Estate is located within the suburb of Macquarie Park at the northeast of the intersection of

From: philip khan
To: Aaron Olsen
Subject: RE: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register
Date: Monday, 22 March 2021 11:03:50 AM
Attachments: image002.png
image003.png
image004.png
image005.png
image006.png
0C9119E969D348FA999F6AD55D272970.png
Public Liability Kamilaroi 2021 to 2022.pdf
ICARE workers comp. insurance Kamilaroi Yankuntjatjara Working Group 2021.pdf

---

Hi Aaron,

Thank you for informing us that **Urbis** will be involved in an Aboriginal Cultural Heritage Assessment at **Ivanhoe Estate** &, that you are inviting Aboriginal organisations to register, if they wish too be involved in the community consultation process.

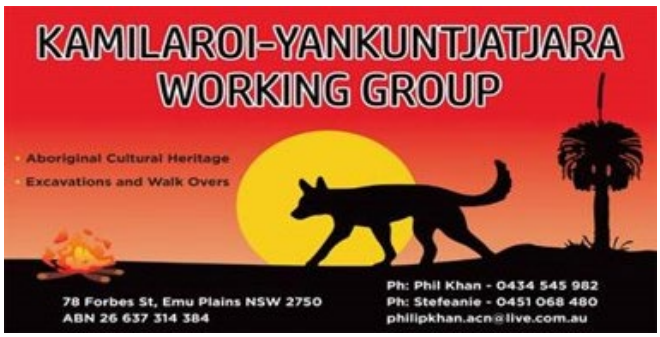
As a senior Aboriginal person for the past 50yrs, I actively participate in the protection of the Aboriginal Cultural Heritage throughout the Sydney Basin, & particularly throughout Western Sydney, on behalf of Kamilaroi Yankuntjatjara Working Group I wish to provide to you my organisation's registration of interest.

I wish to be involved & participate in all levels of consultation/project involvement. I wish to attend all meetings, participate in available field work & receive a copy of the report.

I have attached a copy of Kamilaroi Yankuntjatjara Working group's Public Liability Insurance & Workers Compensation certificate.
Our RAPS have up to 15yrs Cultural Heritage experience in – field work which involves manual excavation (digging), sieving , identifying artefacts, setting up transits, setting up equipment, packing equipment, site surveys & attending meetings.

Should you wish me to provide further information, please do not hesitate to contact me on 0434545982 or Stefeanie on 0451068480.

Kind Regards
Phil Khan



Sent from Mail for Windows 10

From: Aaron Olsen <aolsen@urbis.com.au>
Sent: Monday, March 22, 2021 10:28:29 AM
Cc: Andrew Crisp <acrisp@urbis.com.au>
Subject: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register

Good morning

Please be advised that your contact details have been provided by the Department of Premier and Cabinet (DPC) in accordance with Section 4.1.2 of the Aboriginal cultural heritage consultation requirements for proponents (DECCW, 2010) ('the Consultation Requirements') as a potential Aboriginal stakeholder who may have interest in registering to

From:	Gulaga
To:	Aaron Olsen
Subject:	Re: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register
Date:	Monday, 22 March 2021 4:08:09 PM
Attachments:	image002.png image003.png image004.png image005.png image006.png

Hi Aaron,

Can you please register Gulaga's interest in this project as I hold cultural interests and cultural knowledge for this area.

Kind Regards
Wendy Smith
Cultural Heritage Officer
Gulaga
0401 808 988

This email may contain privileged information. Privilege is not waived if it has been sent to you in error, or if you are not the intended recipient. Please immediately notify me and delete the email if you have received this in error.

On Mon, Mar 22, 2021 at 10:29 AM Aaron Olsen <aolsen@urbis.com.au> wrote:

> Good morning
>
> Please be advised that your contact details have been provided by the Department of Premier and Cabinet (DPC) in accordance with Section 4.1.2 of the Aboriginal cultural heritage consultation requirements for proponents (DECCW, 2010) ('the Consultation Requirements') as a potential Aboriginal stakeholder who may have interest in registering to the abovementioned project.
>
> Urbis has been commissioned by Frasers Property Australia (FPA) ('the Proponent') to conduct an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed redevelopment of the Ivanhoe Estate ('the subject area') (see attached Figure 1 and Figure 2).
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DARUG CUSTODIAN
ABORIGINAL CORPORATION

DARUG CUSTODIAN
ABORIGINAL
CORPORATION

PO BOX 81 WINDSOR 2756
PHONE: 0245775181 FAX: 0245775098
MOBILE: 0414962766 Justine Coplin
EMAIL: justinecoplin@optusnet.com.au

Attention Urbis **Date:** 23/03/21

Subject: Ivanhoe Estate

Dear: Andrew

Our group is a non- profit organisation that has been active for over forty years in Western Sydney, we are a Darug community group with over three hundred members. The main aim in our constitution is the care of Darug sites, places, wildlife and to promote our culture and provide education on the Darug history.

This is an area that our group has a vast knowledge of, we have worked and lived in for many years, this area is significant to the Darug people due to the connection of sites and the continued occupation. Our group has been involved in all previous assessments and works in this area as a traditional owner Darug group for the past 40 plus years.

Therefore, we would like to register our interest for full consultation and involvement in the above project area.

Please contact us with all further enquiries on the above contacts.

Regards



Justine Coplin

We acknowledge and pay respect to the Darug people,the traditional Aboriginal custodians of this land.

From:	Kaarina Slater
To:	Aaron Olsen
Subject:	Re: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register
Date:	Wednesday, 24 March 2021 3:27:59 PM
Attachments:	image002.png image003.png image004.png image005.png image006.png

---

Hi Aaron

Ngambaa Cultural Connections would like to register our expression of interest for the project.

Regards,

Kaarina Slater
Director
Ngambaa Cultural Connections
0422 729 117

From: Aaron Olsen <aolsen@urbis.com.au>
Sent: Monday, 22 March 2021 7:28 AM
Cc: Andrew Crisp <acrisp@urbis.com.au>
Subject: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register

Good morning

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Ivanhoe Estate is located within the suburb of Macquarie Park at the northeast of the intersection of Herring Road and Epping Road, within the Ryde Local Government Area (LGA) (see Figure 1 and Figure 2). It is located on the southern fringe of Macquarie Park, and is within approximately 500 metres of both Macquarie Shopping Centre and Macquarie University. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings. The site is approximately 8.2 hectares (ha) and irregular in shape. It previously

From: lilly carroll <didgengunawalclan@yahoo.com.au>
Sent: Thursday, 8 April 2021 5:48 PM
To: Andrew Crisp <acrisp@urbis.com.au>
Subject: EOI

Hi Andrew

DNC would like to register an interest into Ivanhoe estate /Macquarie Park subject subject area

Kind regards
Paul Boyd & Lilly Carroll
Directors DNC
0426823944

Sent from Yahoo Mail for iPhone

From: Butucarbin Heritage
To: Aaron Olsen
Subject: Re: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register
Date: Thursday, 22 April 2021 1:37:21 AM
Attachments: image002.png
image003.png
image004.png
image005.png
image006.png

Hi Aaron,
On behalf of Butucarbin, I would like to register interest in relation to the Ivanhoe Estate project.

kind regards,

On Mon, Mar 22, 2021 at 10:29 AM Aaron Olsen <aolsen@urbis.com.au> wrote:

> Good morning
>
> Please be advised that your contact details have been provided by the Department of Premier and Cabinet (DPC) in accordance with Section 4.1.2 of the Aboriginal cultural heritage consultation requirements for proponents (DECCW, 2010) ('the Consultation Requirements') as a potential Aboriginal stakeholder who may have interest in registering to the abovementioned project.
>
> Urbis has been commissioned by Frasers Property Australia (FPA) ('the Proponent') to conduct an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed redevelopment of the Ivanhoe Estate ('the subject area') (see attached Figure 1 and Figure 2).
>
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>
> Ivanhoe Estate is located within the suburb of Macquarie Park at the northeast of the intersection of Herring Road and Epping Road, within the Ryde Local Government Area (LGA) (see Figure 1 and Figure 2). It is located on the southern fringe of Macquarie Park, and is within approximately 500 metres of both Macquarie Shopping Centre and Macquarie University. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings. The site is approximately 8.2 hectares (ha) and irregular in shape. It previously accommodated 259 social housing dwellings comprising a mix of townhouse and apartment buildings set around a cul-de-sac street layout, with all dwellings now demolished (Figure 2).

AARON OLSEN
CONSULTANT

D +61 2 8233 9957
T +61 2 8233 9900
E aolsen@urbis.com.au

SHAPING
CITIES AND
COMMUNITIES

URBIS

ANGEL PLACE, LEVEL 8, 123 PITT STREET
SYDNEY, NSW 2000, AUSTRALIA

Our highest priority is the health and wellbeing of our people, clients and community. **Click here to read Urbis' response to COVID-19.**

This email and any files transmitted are for the intended recipient's use only. It contains information which may be confidential and/or protected by copyright. Any personal information in this email must be handled in accordance with the *Privacy Act 1988 (Cth)*. If you have received this email by mistake, please notify the sender and permanently delete the email. Any confidentiality or copyright is not waived or lost because this email has been sent to you by mistake.

--
Lowanna Gibson
Project Manager for Butucarbin Cultural Heritage Assessments
B.A Archaeology/Anthropology USYD
Juris Doctor UTS

From:	Carolyn .H
To:	Aaron Olsen
Subject:	Re: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register
Date:	Monday, 26 April 2021 9:41:50 AM
Attachments:	image002.png image003.png image004.png image005.png image006.png A1.PL2022.pdf A1.WC2022.pdf

---

INDIGENOUS SERVICES PTY LTD

Contact: Carolyn Hickey
M: 0411650057
E: Cazadirect@live.com
A: 10 Marie Pitt Place, Glenmore Park, NSW 2745
ACN: 639 868 876
ABN: 31 639 868 876

Hi,
Thank you for your email, I would like to register in being involved in all levels of consultation for this project, such as, Meetings, Reports, Sharing Cultural Information, and available Field Work.

I've had many years' experience in helping preserve Aboriginal cultural heritage on projects, I hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and values that exist in the project area.

I have attached A1 Indigenous Services Insurances.

Please feel free to contact me on details supplied
Kind Regards,
Carolyn Hickey

From: Aaron Olsen <aolsen@urbis.com.au>
Sent: Monday, 22 March 2021 10:28 AM
Cc: Andrew Crisp <acrisp@urbis.com.au>
Subject: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 1.3 - Invitation to Register

Good morning

Please be advised that your contact details have been provided by the Department of Premier and Cabinet (DPC) in accordance with Section 4.1.2 of the Aboriginal cultural heritage consultation requirements for proponents (DECCW, 2010) ('the Consultation Requirements') as a potential Aboriginal stakeholder who may have interest in registering to the abovementioned project.

URBIS

ANGEL PLACE
LEVEL 8, 123 PITT STREET
SYDNEY NSW 2000

URBIS.COM.AU
Urbis Pty Ltd
ABN 50 105 256 228

7 May 2021

Department of Premier and Cabinet
Heritage NSW
Aboriginal Branch
heritagemailbox@environment.nsw.gov.au

To whom it may concern

STAGE 1.6 –ABORIGINAL CULTURAL HERITAGE ASSESSMENT – IVANHOE ESTATE – LIST OF REGISTERED ABORIGINAL PARTIES AND NOTIFICATION LETTER

In accordance with Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010) please find below the compiled list of Registered Aboriginal Parties (RAPs) and notification letter under Section 4.1.3 for the abovementioned project.

Table 1 – List of Registered Aboriginal Parties

Name	**Contact**
Metropolitan Local Aboriginal Land Council	Nathan Moran
A1 Indigenous Services	Carolyn Hickey
Butucarbin Aboriginal Corporation	Lowanna Gibson
Darug Custodian Aboriginal Corporation	Justine Coplin
Didge Ngunawal Clan	Paul Boyd & Lilly Carroll
Gulaga	Wendy Smith
Kamilaroi Yankuntjatjara Working Group	Phil Khan
Ngambaa Cultural Connections	Kaarina Slater
Tocomwall	Danny Franks

Please do not hesitate to contact us should you have any queries in relation to the provided information.

Yours sincerely,



Andrew Crisp
Senior Consultant
+61 2 8233 7642
acrisp@urbis.com.au

APPENDIX A NOTIFICATION LETTER

URBIS

ANGEL PLACE
LEVEL 8, 123 PITT STREET
SYDNEY NSW 2000

URBIS.COM.AU
Urbis Pty Ltd
ABN 50 105 256 228

22 March 2021

To whom it may concern,

IVANHOE ESTATE - ABORIGINAL CULTURAL HERITAGE ASSESSMENT – ABORIGINAL COMMUNITY CONSULTATION STAGE 1.3 – INVITATION TO REGISTER

Please be advised that your contact details have been provided by the Department of Premier and Cabinet (DPC) in accordance with Section 4.1.2 of the *Aboriginal cultural heritage consultation requirements for proponents* (DECCW, 2010) ('the Consultation Requirements') as a potential Aboriginal stakeholder who may have interest in registering to the abovementioned project.

Urbis has been commissioned by Frasers Property Australia (FPA) ('the Proponent') to conduct an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed redevelopment of the Ivanhoe Estate ('the subject area') (see Figure 1 and Figure 2).

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The ACHA is to be carried out in accordance with relevant guidelines under the *National Parks and Wildlife Act 1974* (NPW Act), including the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). The assessment would detail any potential Aboriginal cultural heritage resources within the subject area and provide recommendations regarding management of those resources.

Ivanhoe Estate is located within the suburb of Macquarie Park at the northeast of the intersection of Herring Road and Epping Road, within the Ryde Local Government Area (LGA) (see Figure 1 and Figure 2). It is located on the southern fringe of Macquarie Park, and is within approximately 500 metres of both Macquarie Shopping Centre and Macquarie University. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings. The site is approximately 8.2 hectares (ha) and irregular in shape. It previously accommodated 259 social housing dwellings comprising a mix of townhouse and apartment buildings set around a cul-de-sac street layout, with all dwellings now demolished (Figure 2).

The site is in the process of being redeveloped as part of the NSW Government's 'Communities Plus' program which seeks to deliver new communities with good access to transport, employment, improved facilities, and open space through leveraging the expertise and capacity of the private and non-government sectors. Development delivered under Communities Plus is mixed-tenure – that is, a mix of both social and market housing. This mix serves two purposes: to offset the cost of delivering new social housing, and to provide well-integrated communities. Mission Australia Housing will manage the site's social housing portfolio and is a national Tier 1 Community Housing Provider (CHP).

Consent was granted by the Minister for Planning and Public Spaces on 30 April 2020 for the Ivanhoe Estate - Concept Masterplan (SSD-8707) and for the first stage of physical works (SSD-8903) referred to as Stage 1. FPA and NSW Land and Housing Corporation (LAHC) are now seeking to pursue the next stage of planning approvals for the detailed design, construction, and operation of Stage 2 of the Ivanhoe Estate Concept Masterplan. Stage 2 comprises the Village Green and Community Centre (C2), and residential buildings C3 and C4.

Following the consolidation of previous allotments as part of the SSD-8903, the Ivanhoe Estate site is now legally described as Lot 100 in DP1262209 except for a portion of Shrimptons Creek and neighbouring land at 2-4 Lyon Park Road, known as Lot 1 DP 859537. 2-4 Lyonpark Road is owned by LIF Pty Ltd as trustee for Local Government Super, while the Ivanhoe Estate lot is owned and managed by LAHC.

The proponent can be contacted via:

Scott Clohessy
Senior Development Manager
Frasers Property Australia
Suite 11 Lumiere Commercial
Level 12, 1010 Bathurst Street
Sydney NSW 2000
E: Scott.Clohessy@frasersproperty.com.au

In accordance with the *Aboriginal cultural heritage consultation requirements for proponents (DEECW 2010)* (the Consultation Requirements) and Clause 80C of the NSW National Parks and Wildlife Regulation 2009, the Proponent will conduct a community consultation process with registered Aboriginal people. The community consultation will include:

- Identifying and describing the Aboriginal cultural heritage values that exist across the subject area in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW OEH* (2010), and documenting these in an Aboriginal Cultural Heritage Assessment Report (ACHAR) which may include the need for surface survey and test excavation.
- Undertaking consultation with Aboriginal people and document in accordance with *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW).
- The preparation of the ACHAR to support the AHIP application and demonstrating attempts to avoid any impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts.
- Recording of any Aboriginal objects in line with the requirements of the OEH's Aboriginal Heritage Information Management System (AHIMS) that may be identified within the subject area.

Should you wish to register your interest in this project, please respond in writing by clearly stating your interest and nominating a contact person by **21 April 2021**. Please send responses to the following:

Andrew Crisp
Senior Archaeologist
Urbis
Level 8 123 Pitt Street,
Sydney, NSW, 2000
E: acrisp@urbis.com.au

Please be advised that, as per the Consultation Requirements, the Proponent is required to forward the names of Aboriginal persons and groups who register an interest (Registered Aboriginal Parties) to the Metropolitan Local Aboriginal Land Council and Aboriginal Cultural Heritage Regulation Branch of the DPC unless the person or group specifies that they do not want their details released.

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If you have any queries in relation to the provided information, please do not hesitate to contact us.

Yours sincerely,



Andrew Crisp
Senior Consultant
+61 2 8233 7642
acrisp@urbis.com.au

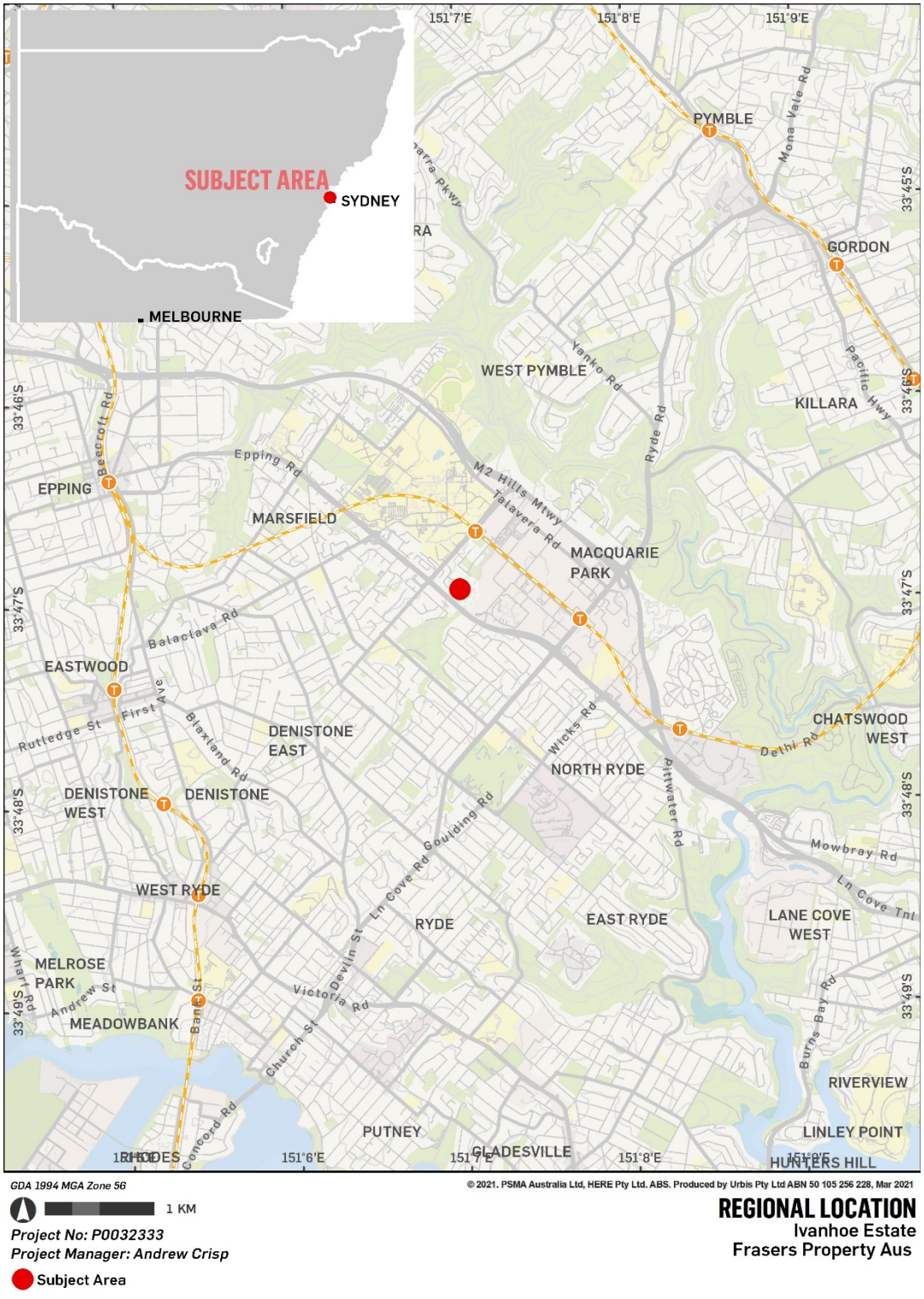

Figure 1 – Regional Location of the subject area



Figure 2 – Location of the subject area

URBIS

ANGEL PLACE
LEVEL 8, 123 PITT STREET
SYDNEY NSW 2000

URBIS.COM.AU
Urbis Pty Ltd
ABN 50 105 256 228

7 May 2021

Nathan Moran
Metropolitan Local Aboriginal Land Council
officeadmin@metrolalc.org.au

Dear Nathan,

STAGE 1.6 –ABORIGINAL CULTURAL HERITAGE ASSESSMENT – IVANHOE ESTATE – LIST OF REGISTERED ABORIGINAL PARTIES AND NOTIFICATION LETTER

In accordance with Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010) please find below the compiled list of Registered Aboriginal Parties (RAPs) and notification letter under Section 4.1.3 for the abovementioned project.

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Name	**Contact**
Metropolitan Local Aboriginal Land Council	Nathan Moran
A1 Indigenous Services	Carolyn Hickey
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Darug Custodian Aboriginal Corporation	Justine Coplin
Didge Ngunawal Clan	Paul Boyd & Lilly Carroll
Gulaga	Wendy Smith
Kamilaroi Yankuntjatjara Working Group	Phil Khan
Ngambaa Cultural Connections	Kaarina Slater
Tocomwall	Danny Franks

Please do not hesitate to contact us should you have any queries in relation to the provided information.

Yours sincerely,



Andrew Crisp
Senior Consultant
+61 2 8233 7642
acrisp@urbis.com.au

APPENDIX A NOTIFICATION LETTER

URBIS

ANGEL PLACE
LEVEL 8, 123 PITT STREET
SYDNEY NSW 2000

URBIS.COM.AU
Urbis Pty Ltd
ABN 50 105 256 228

22 March 2021

To whom it may concern,

IVANHOE ESTATE - ABORIGINAL CULTURAL HERITAGE ASSESSMENT – ABORIGINAL COMMUNITY CONSULTATION STAGE 1.3 – INVITATION TO REGISTER

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The ACHA is to be carried out in accordance with relevant guidelines under the *National Parks and Wildlife Act 1974* (NPW Act), including the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011). The assessment would detail any potential Aboriginal cultural heritage resources within the subject area and provide recommendations regarding management of those resources.

Ivanhoe Estate is located within the suburb of Macquarie Park at the northeast of the intersection of Herring Road and Epping Road, within the Ryde Local Government Area (LGA) (see Figure 1 and Figure 2). It is located on the southern fringe of Macquarie Park, and is within approximately 500 metres of both Macquarie Shopping Centre and Macquarie University. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings. The site is approximately 8.2 hectares (ha) and irregular in shape. It previously accommodated 259 social housing dwellings comprising a mix of townhouse and apartment buildings set around a cul-de-sac street layout, with all dwellings now demolished (Figure 2).

The site is in the process of being redeveloped as part of the NSW Government's 'Communities Plus' program which seeks to deliver new communities with good access to transport, employment, improved facilities, and open space through leveraging the expertise and capacity of the private and non-government sectors. Development delivered under Communities Plus is mixed-tenure – that is, a mix of both social and market housing. This mix serves two purposes: to offset the cost of delivering new social housing, and to provide well-integrated communities. Mission Australia Housing will manage the site's social housing portfolio and is a national Tier 1 Community Housing Provider (CHP).

Consent was granted by the Minister for Planning and Public Spaces on 30 April 2020 for the Ivanhoe Estate - Concept Masterplan (SSD-8707) and for the first stage of physical works (SSD-8903) referred to as Stage 1. FPA and NSW Land and Housing Corporation (LAHC) are now seeking to pursue the next stage of planning approvals for the detailed design, construction, and operation of Stage 2 of the Ivanhoe Estate Concept Masterplan. Stage 2 comprises the Village Green and Community Centre (C2), and residential buildings C3 and C4.

Following the consolidation of previous allotments as part of the SSD-8903, the Ivanhoe Estate site is now legally described as Lot 100 in DP1262209 except for a portion of Shrimptons Creek and neighbouring land at 2-4 Lyon Park Road, known as Lot 1 DP 859537. 2-4 Lyonpark Road is owned by LIF Pty Ltd as trustee for Local Government Super, while the Ivanhoe Estate lot is owned and managed by LAHC.

The proponent can be contacted via:

Scott Clohessy
Senior Development Manager
Frasers Property Australia
Suite 11 Lumiere Commercial
Level 12, 1010 Bathurst Street
Sydney NSW 2000
E: Scott.Clohessy@frasersproperty.com.au

In accordance with the *Aboriginal cultural heritage consultation requirements for proponents (DEECW 2010)* (the Consultation Requirements) and Clause 80C of the NSW National Parks and Wildlife Regulation 2009, the Proponent will conduct a community consultation process with registered Aboriginal people. The community consultation will include:

- Identifying and describing the Aboriginal cultural heritage values that exist across the subject area in accordance with the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH, 2011) and *Code of Practice for Archaeological Investigations of Aboriginal Objects in NSW OEH* (2010), and documenting these in an Aboriginal Cultural Heritage Assessment Report (ACHAR) which may include the need for surface survey and test excavation.
- Undertaking consultation with Aboriginal people and document in accordance with *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW).
- The preparation of the ACHAR to support the AHIP application and demonstrating attempts to avoid any impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts.
- Recording of any Aboriginal objects in line with the requirements of the OEH's Aboriginal Heritage Information Management System (AHIMS) that may be identified within the subject area.

Should you wish to register your interest in this project, please respond in writing by clearly stating your interest and nominating a contact person by **21 April 2021**. Please send responses to the following:

Andrew Crisp
Senior Archaeologist
Urbis
Level 8 123 Pitt Street,
Sydney, NSW, 2000
E: acrisp@urbis.com.au

Please be advised that, as per the Consultation Requirements, the Proponent is required to forward the names of Aboriginal persons and groups who register an interest (Registered Aboriginal Parties) to the Metropolitan Local Aboriginal Land Council and Aboriginal Cultural Heritage Regulation Branch of the DPC unless the person or group specifies that they do not want their details released.

Please be further advised that in accordance with Section 3.4 of the Consultation Requirements, inclusion in the consultation process does not automatically result in paid site assessment. The decision on who is engaged for delivering particular services is made by the Proponent and will be based on a range of considerations including skills, relevant experience, and providing necessary certificates of currency.

If you have any queries in relation to the provided information, please do not hesitate to contact us.

Yours sincerely,



Andrew Crisp
Senior Consultant
+61 2 8233 7642
acrisp@urbis.com.au

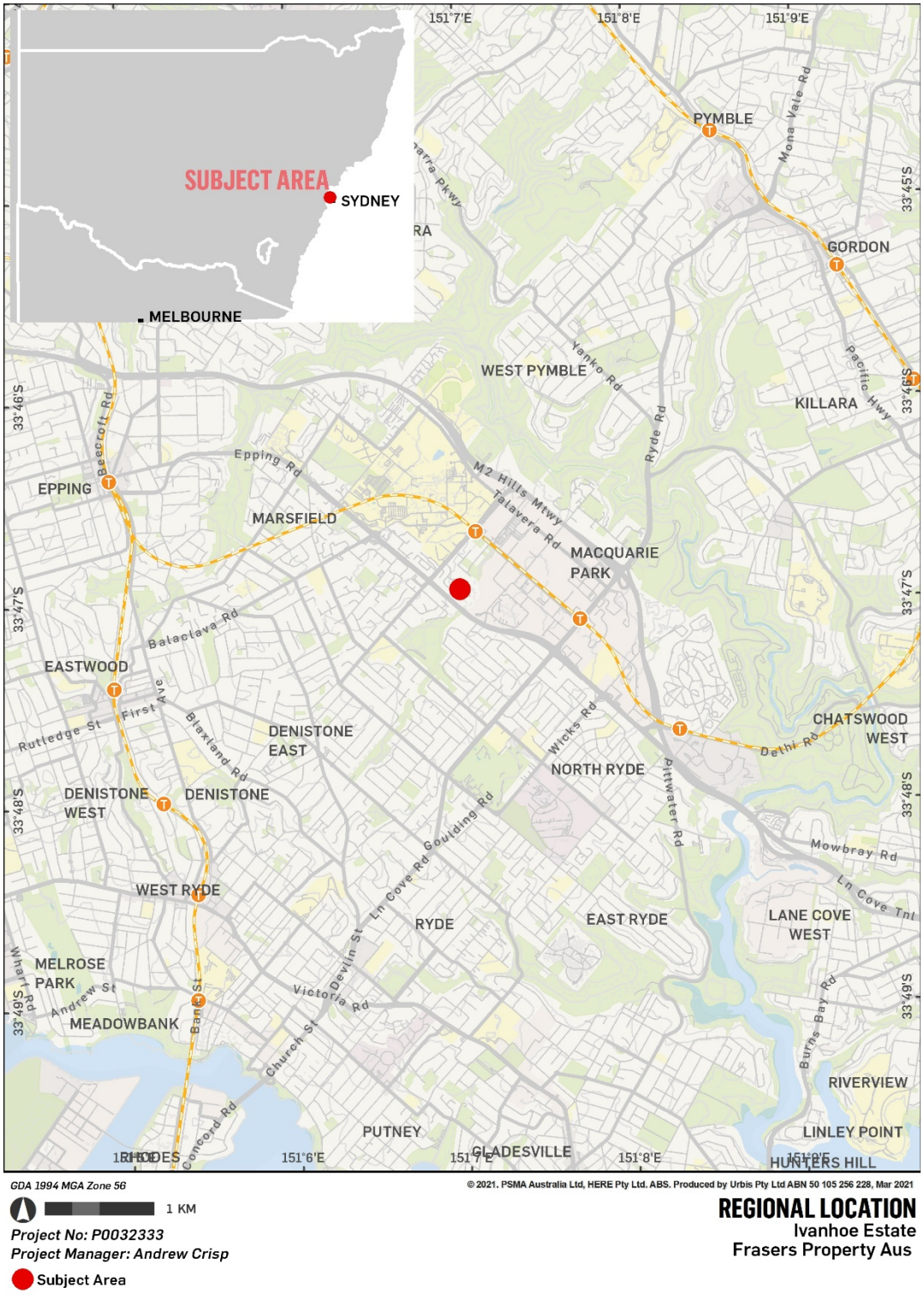

Figure 1 – Regional Location of the subject area



Figure 2 – Location of the subject area

From:	Aaron Olsen
To:	officeadmin@metrolalc.org.au; metrolalc@metrolalc.org.au
Cc:	Andrew Crisp
Subject:	Aboriginal Cultural Heritage Assessment – Ivanhoe Estate – Stage 1.6 – List of Registered Aboriginal Parties and Notification Letter (Our Ref: P0032333)
Date:	Friday, 7 May 2021 11:17:00 AM
Attachments:	image002.png image004.png image006.png image008.png image010.png MLALC_Stage1.6_Ivanhoe_F01.pdf

Good morning

In accordance with Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010), please find attached a list of Registered Aboriginal Parties (RAPs) and notification letter under Section 4.1.3 for the redevelopment of Ivanhoe Estate at Ivanhoe Place (Lot 100 in DP1262209) and 2-4 Lyon Park Road (Lot 101 in DP 1263727).

If you have any questions, please let us know.

Kind regards

AARON OLSEN
CONSULTANT

D +61 2 8233 9957
T +61 2 8233 9900
E aolsen@urbis.com.au

SHAPING CITIES AND COMMUNITIES

URBIS

ANGEL PLACE, LEVEL 8, 123 PITT STREET
SYDNEY, NSW 2000, AUSTRALIA

Our highest priority is the health and wellbeing of our people, clients and community. **Click here to read Urbis' response to COVID-19.**

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From:	Aaron Olsen
To:	OEH HD Heritage Mailbox
Cc:	Andrew Crisp
Subject:	Aboriginal Cultural Heritage Assessment – Ivanhoe Estate – Stage 1.6 – List of Registered Aboriginal Parties and Notification Letter (Our Ref: P0032333)
Date:	Friday, 7 May 2021 11:15:00 AM
Attachments:	DPC_Stage1.6_Ivanhoe_F01.pdf image002.png image004.png image006.png image008.png image010.png

Good morning

In accordance with Section 4.1.6 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW, 2010), please find attached a list of Registered Aboriginal Parties (RAPs) and notification letter under Section 4.1.3 for the redevelopment of Ivanhoe Estate at Ivanhoe Place (Lot 100 in DP1262209) and 2-4 Lyon Park Road (Lot 101 in DP 1263727).

If you have any questions, please let us know.

Kind regards

AARON OLSEN
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D +61 2 8233 9957
T +61 2 8233 9900
E aolsen@urbis.com.au

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URBIS

ANGEL PLACE
LEVEL 8, 123 PITT STREET
SYDNEY NSW 2000

URBIS.COM.AU
Urbis Pty Ltd
ABN 50 105 256 228

7 May 2021

To whom it may concern,

ABORIGINAL CULTURAL HERITAGE ASSESSMENT – IVANHOE ESTATE – ABORIGINAL COMMUNITY CONSULTATION STAGE 2 PRESENTATION OF INFORMATION & STAGE 3 GATHERING INFORMATION ABOUT CULTURAL SIGNIFICANCE

Thank you for registering your interest in the above project.

As previously advised, Urbis has been commissioned by Frasers Property Australia (FPA) (the proponent) to conduct an Aboriginal Cultural Heritage Assessment (ACHA) for the proposed redevelopment of the Ivanhoe Estate, Macquarie Park, NSW, 2113 ('the subject area'), which comprises Ivanhoe Place (Lot 100 in DP1262209) and 2-4 Lyon Park Road (Lot 101 in DP 1263727).

The purpose of the community consultation is to assist the Proponent in the preparation of an ACHA Report (ACHAR), which will accompany an Environmental Impact Statement (EIS) in support of State Significant Development Applications for the subject area.

The present communication seeks to provide all registered Aboriginal parties (RAPs) with information about the scope of the proposed project and the proposed ACHA process, in accordance with Section 4.2.1 of the *Aboriginal cultural heritage consultation requirements for proponents 2010* (Department of Environment, Climate Change and Water NSW) ('the Consultation Requirements'). It is further aimed at facilitating a process for RAPs to: (a) contribute to culturally appropriate information gathering and research methodology; (b) provide information that will enable the cultural significance of Aboriginal objects and/or places within or near the proposed project to be determined; and (c) have input into the development of any cultural heritage management options, in accordance with Section 4.2.2 of the Consultation Requirements.

1. PROJECT INFORMATION

The details of the proposed project that are relevant to the nature, scope, methodology and impacts are outlined below, in accordance with Section 4.2.2(a) of the Consultation Requirements.

The subject area is located within the City of Ryde Local Government Area (LGA), approximately 12.5km north-west of the Sydney CBD (Figure 1 and Figure 2). It is located on the southern fringe of Macquarie Park, and is within approximately 500 metres of both Macquarie Shopping Centre and Macquarie University. The surrounding area is characterised by a mix of commercial and education uses, as well as student accommodation and residential dwellings. The subject area is approximately 8.2ha and is irregular in shape. It has frontages on Epping Road to the south, Lyon Park Road to the east and Herring Road to the west. It is further bounded to the west and north by mixed use and lots

and parkland and to the east by commercial lots. The subject area previously accommodated 259 social housing dwellings comprising a mix of townhouse and apartment buildings set around a cul-de-sac street layout, with all dwellings now demolished.

The subject area is being redeveloped as part of the NSW Government's 'Communities Plus' program, which seeks to deliver new communities with good access to transport, employment, improved facilities, and open space through leveraging the expertise and capacity of the private and non-government sectors. Development delivered under Communities Plus is mixed tenure, combining both social and market housing. Consent was granted by the Minister for Planning and Public Spaces on 30 April 2020 for the Ivanhoe Estate - Concept Masterplan (SSD-8707) and for the first stage of physical works (SSD-8903) referred to as Stage 1.

The present ACHAR relates to subsequent State Significant Development Applications (SSDA) for the Ivanhoe Estate redevelopment (including but not limited to Stage 2). These SSDAs will be pursuant to the approved Ivanhoe Estate Concept Masterplan (SSD-8707) and subsequent to the approved Stage 1 works (SSD-8903).

Stage 2 of the proposed redevelopment comprises the Village Green and Community Centre (C2), and residential buildings C3 and C4 (Figure 3 and Figure 4). The Stage 2 application will include the following works, noting site preparation works, roads, servicing and public domain works across the site have already been approved under SSD-8903:

- The detailed design, construction, and operation of:

  C2 composing the community centre, pool, gym and Village Green central open space area.

  C3 comprising a 17-storey mixed use building with approximately 170 market housing residential apartments and ground floor retail uses.

  C4 comprising a 24-storey building with 286 market apartments and a 17-storey building comprising 216 social housing apartments.
- Excavation of basements for Buildings C3 and C4, and detailed earthworks to achieve the required levels for the community centre and Village Green.
- Utilities and services infrastructure to tie-into the detailed requirements of the proposed buildings.
- New driveways and public domain areas to tie-into the approved internal road network and road reserves.
- Stratum subdivision to correspond with the proposed buildings.

The capital investment value of Stage 2 is over $30 million and is carried out on behalf of the NSW Land and Housing Corporation, as such is classified as State Significant Development (SSD) in accordance with Clause 10, Schedule 2 of State Environmental Planning Policy (State and Regional Development) 2011 (SEPP SRD).

1.1. ARCHAEOLOGICAL CONTEXT

The Aboriginal Heritage Information Management System (AHIMS) database comprises previously registered Aboriginal archaeological objects and cultural heritage places in NSW and it is managed by the Department of Premier and Cabinet (DPC) under Section 90Q of the NPW Act.

A search of the AHIMS database was carried out on 5 March 2021 (AHIMS Client Service ID: 574117) for an area of approximately 7km by 7km around the subject area. The basic and extensive AHIMS

search results are provided in Appendix A. The AHIMS search identified no Aboriginal object or places within or immediately adjacent to the subject area. A total of 81 Aboriginal objects were identified in the extensive AHIMS search area. Two registered sites were identified in the AHIMS register as 'not a site', reducing the total number of sites to 79. A summary of the identified Aboriginal sites is provided in Table 1 and their spatial distribution is shown in Figure 5.

As part of the ACHA process, the relevance of Aboriginal objects in the extensive search area to the archaeological potential of the subject area will be considered.

Table 1 – AHIMS search results (Client Service ID: 574117)

Site Type	Context	Number	Percentage
Art	Open	14	18%
Shelter with Midden	Closed	13	16%
Shelter with Artefact Scatter	Closed	11	14%
Shelter with PAD	Closed	9	11%
Grinding Grooves	Open	8	10%
Shelter with Art	Closed	6	8%
Artefact Scatter	Open	3	4%
Midden	Open	3	4%
Shelter with Art and Midden	Closed	3	4%
Midden with PAD	Open	2	3%
Shelter with Artefact Scatter and Midden	Closed	2	3%
Grinding Grooves with Water Hole	Open	1	1%
Isolated Find	Open	1	1%
Isolated Find with PAD	Open	1	1%
Shelter	Closed	1	1%
Shelter with Isolated Find	Closed	1	1%
Total		**79**	**100%**

1.2. ENVIRONMENTAL CONTEXT

The subject area is located within the Cumberland Plain, which consists of mostly low rolling hills and wide valleys, lying on Triassic shales and sandstones. The NSW Soil and Land Information System (SALIS) identifies the majority of the subject area as being located within the Lucas Heights (lh) soil landscape, with the western corner of the subject area identified as being located within the Glenorie (gn) soil landscape (Figure 6).

The eastern boundary of DP 1262209 Lot 100 and western boundary of DP 1263727 Lot 101 are defined by a lower order stream, Shrimptons Creek (Figure 6). Approximately half of the subject area lies within 200m of Shrimptons Creek.

Although the subject area includes numerous mature trees, it appears unlikely that the subject area currently includes any remnant vegetation due to historical land clearance. Original vegetation may have included low eucalypt open-forest and woodland with a sclerophyll shrub understorey and tall open forest (wet sclerophyll forest).

It is apparent that the topography of the subject area has been modified by historical activities.

As part of the ACHA process, the relevance of the environmental context of the subject area to the archaeological potential of the subject area will be considered.

2. METHODOLOGY

The proposed impact assessment process for the ACHA, including the input points into the investigation and assessment activities for RAPs, is outlined below, in accordance with Section 4.2.2(b) of the Consultation Requirements.

The ACHA will be conducted in accordance with accordance with Part 6 of the *National Parks and Wildlife Act 1974* ('NPW Act'), Part 5 of the *National Parks and Wildlife Regulation 2019* ('NPW Reg') and will adhere to the following guidelines:

- The Consultation Requirements.
- *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (Department of Environment, Climate Change and Water NSW, 2010).
- *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (Office of Environment and Heritage, Department of Premier and Cabinet, 2011).
- *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS, 2013).

The ACHA will follow the general methodology described in Table 2 below.

Table 2 – Aboriginal cultural heritage assessment methodology

Process Method	Description
Desktop assessment	Collection and evaluation of background information, including archaeological and historical resources and environmental conditions, to develop a predictive model for archaeological potential.
Consultation with RAPs	Providing information on the project to RAPs and gathering information about the proposed methodology and the Aboriginal cultural heritage values and significance of the subject area.
Site inspection with RAPs	On-site meeting including site inspection of the subject area with the RAPs to allow further opportunity for cultural information to be provided and for the RAPs to familiarise themselves with the subject area and discuss the archaeological approach.
Preparation of draft ACHA report	Synthesis of all information collected during the ACHA process to prepare a draft assessment report and provision of the draft report to the Proponent and the RAPs for comments. The report will include an assessment of significance of any Aboriginal objects or Aboriginal cultural heritage values that may exist within the subject area, an impact assessment and provide management and mitigation measures.
Finalisation of ACHA report	Incorporation of all comments from the Proponent and RAPs into ACHA report and finalisation.

Urbis welcomes input and information from the RAPs at any stage throughout the entire process of the ACHA. Consistent with the Consultation Requirements, the formal input points for the consultation are the following:

- During Stage 2 and 3 – Following review of the current communication, which presents information about the proposed project and ACHA methodology.
- During Stage 2 and 3 – During or following the site visit and meeting.
- During Stage 4 – Following review of the draft ACHA.

The critical timelines for the above stages are provided in Section 3 below.

3. CRITICAL TIMELINES

The critical timelines and milestones for the completion of the ACHA and delivery of reports are presented in Table 3 below, in accordance with Section 4.2.2(c) of the Consultation Requirements. Please note that the presented timeframes are estimates only and are intended as a guided to allow forward planning of personnel and resources.

Table 3 – Critical timelines

Consultation Stage	Timing
Stage 2 and 3: Provision of comments on the provided project information and proposed methodology (this document) by RAPs.	Close of business 4 June 2021 (i.e. within 28 days of the release date of this document).
Stage 2 and 3: Site inspection and meeting.	Date to be confirmed.
Stage 4: Provision of the draft ACHA report (including the proposed management and mitigation measures) to the RAPs.	Anticipated to be provided by 11 June 2021 (date to be confirmed).
Stage 4: Provision of comments on draft ACHA report by RAPs.	Within 28 days of delivery of the draft ACHA report to RAPs (anticipated date of 9 July 2021).
Stage 4: Finalisation of the ACHA report including the consideration of all comments and feedback.	Within one week of the closing of the comment period for the draft ACHA report (anticipated date of 16 July 2021.

4. ROLES, FUNCTIONS AND RESPONSIBILITIES

The roles, functions and responsibilities of the proponent and RAPs are defined below, in accordance with Section 4.2.2(d) of the Consultation Requirements.

The roles, functions and responsibilities of the Proponent, Urbis (acting on behalf of the Proponent), RAPs and any other parties involved in the consultation process are those defined in Section 5 of the Consultation Requirements.

Please note that, in accordance with Section 3.4 of the Consultation Requirements, consultation does not include the employment of Aboriginal people to assist in field assessment and/or site monitoring. Furthermore, there is no obligation on the Proponent to employ Aboriginal people registered for consultation. Aboriginal people may provide services to the Proponent through a contractual arrangement separate to the consultation process. Consultation will continue irrespective of potential or actual employment opportunities for Aboriginal people.

5. GATHERING CULTURAL INFORMATION

Urbis is providing the opportunity for RAPs to identify, raise and discuss their cultural concerns, perspectives and assessment requirements (if any), in accordance with Section 4.2.2(e) of the Consultation Requirements.

Urbis is actively seeking information on the cultural heritage and cultural significance of the subject area. Such information includes the existence of any Aboriginal objects of cultural value to Aboriginal people in or near the subject area and the existence of any places of cultural value to Aboriginal people in or near the subject area (whether declared under s.84 of the NPW Act or not), including places of social, spiritual and cultural value, historic places with cultural significance and potential places/areas of historic, social, spiritual and/or cultural significance.

Please also consider the following when providing information:

- Do you have information on any Aboriginal objects within or near the subject area?
- Do you or somebody you know have information of cultural values, stories in relation to the subject area and if that information can be shared?

If you or your organisation has sensitive or restricted public access information for determining or managing the heritage values of the subject area, it is proposed that the proponent will manage this information (if provided by the Aboriginal community) in accordance with a sensitive cultural information management protocol. It is anticipated that the protocol will include making note of and managing the material in accordance with the following key limitations as advised by Aboriginal people at the time of the information being provided:

- Any restrictions on access of the material.
- Any restrictions on communication of the material (confidentiality).
- Any restrictions on the location/storage of the material.
- Any cultural recommendations on handling the material.
- Any names and contact details of persons authorised within the relevant Aboriginal group to make decisions concerning the Aboriginal material and degree of authorisation.
- Any details of any consent given in accordance with customary law.
- Any access and use by the RAPs of the cultural information in the material.

Please consider the above list when providing your recommendations regarding any culturally sensitive information.

6. QUESTONNAIRE

To streamline information gathering during Stage 2 and 3, and to inform the proponent for any field inspection component, Urbis requests the following information from you:

1. **Cultural connection:** Please describe the nature of your cultural connection to the country on which the subject area is situated. Please include any relevant cultural knowledge or knowledge of Aboriginal objects or places within the subject area. Have you ever lived in or near the subject area? If you are a Traditional Owner, please state this clearly.

2. **Representing your community members:** Please state who you or your organisation represents. Do you or your organisation represent other members of the Aboriginal community? If so, please describe how information is provided to the other members, and how their information and knowledge may be provided back to the proponent and Urbis.

3. **Previous experience:** Please list your relevant (for example, in the area of the proposed project) previous experience in providing cultural heritage advice and survey participation.

4. **Schedule of Rates:** Please provide your Certificate of Currency including Product and Public Liability Insurance and Worker's Compensation. Please also include a schedule of rates (hourly/half day/day) for fieldwork participation, and include any expenses you may expect to incur, and these will be sought to be reimbursed. Please note that it is for the discretion for the proponent to decide if they invite RAPs for site works and the consultation process does not guarantee paid employment.

The above questions are provided as a questionnaire in Appendix B, for your convenience. Please complete the questionnaire and return it to:

Aaron Olsen
Consultant
Urbis
Level 8, 123 Pitt Street
Sydney NSW 2000
E: aolsen@urbis.com.au

Please provide the requested information and any other comments by close of business **4 June 2021**. Comments received after this date might be excluded from the draft ACHA report.

If you have any questions, please do not hesitate to contact us.

Yours sincerely,



Andrew Crisp
Senior Consultant
+61 2 8233 7642
acrisp@urbis.com.au

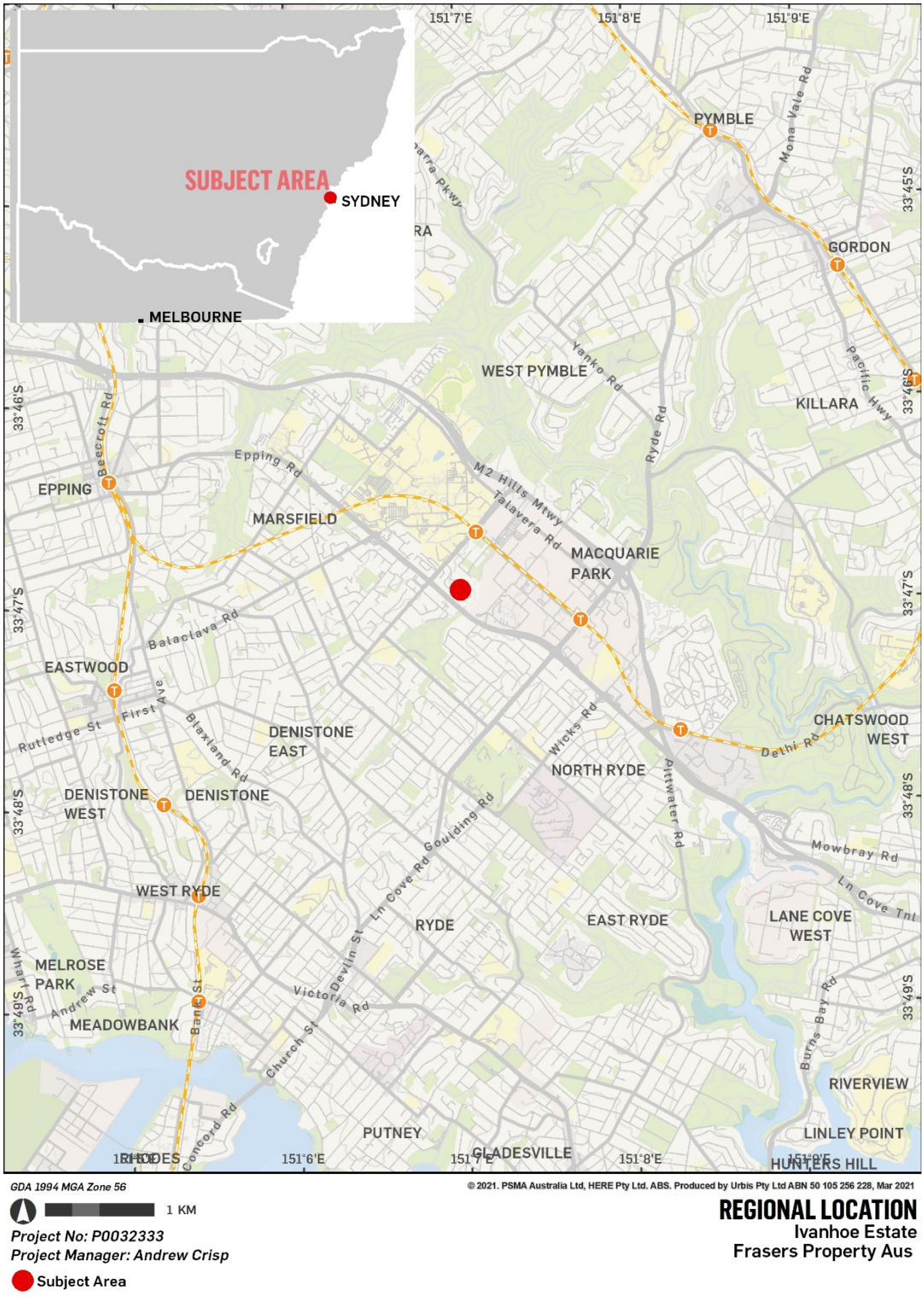


Figure 1 – Regional location



Figure 2 – Location of the subject area



Figure 3 – Ivanhoe Estate Masterplan
Source: Ethos Urban

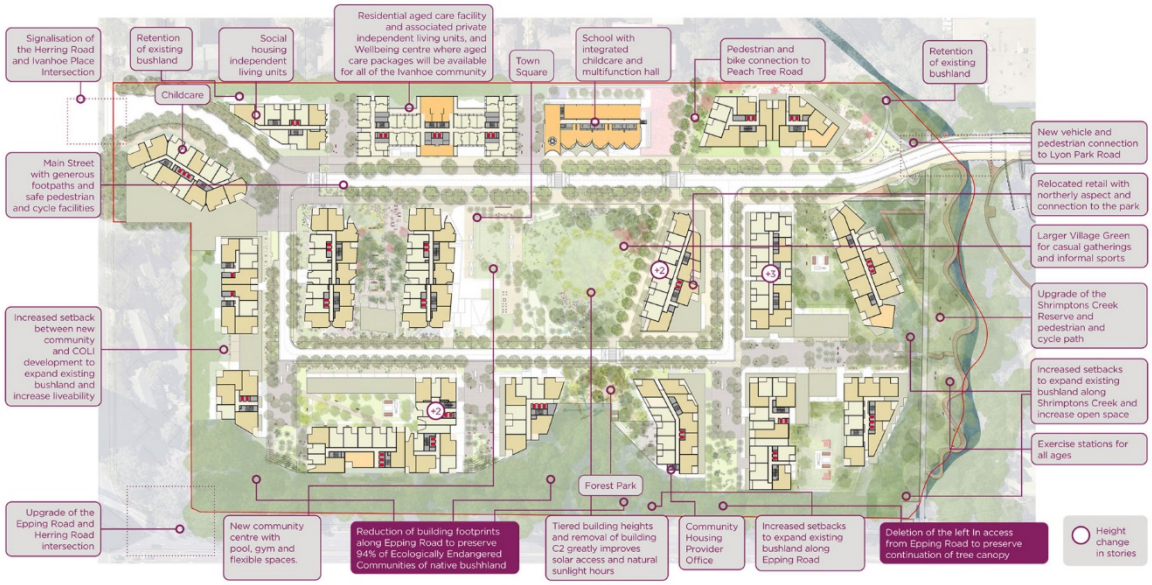


Figure 4 – Ivanhoe Estate Masterplan
Source: Ethos Urban



Figure 5 – Registered Aboriginal sites in extensive search area

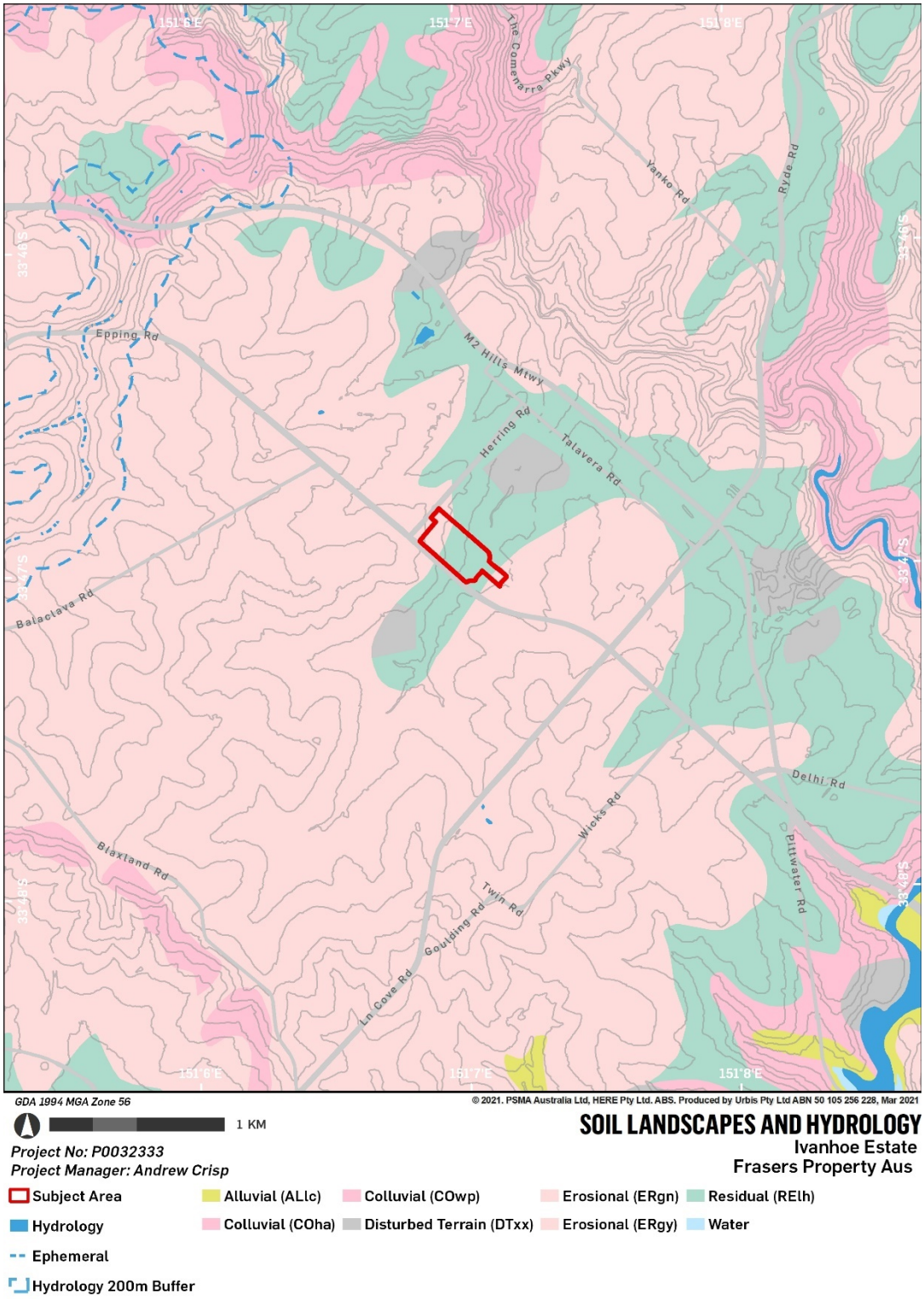


Figure 6 – Soils landscapes and hydrology

APPENDIX A AHIMS BASIC AND EXTENSIVE RESULTS

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : P32333_IvanhoeEstate_3.5k

Client Service ID : 574117

Urbis Pty Ltd - Angel Place L8 123 Pitt Street

Level 8 123 Angel Street
Sydney New South Wales 2000

Attention: Meggan Walker

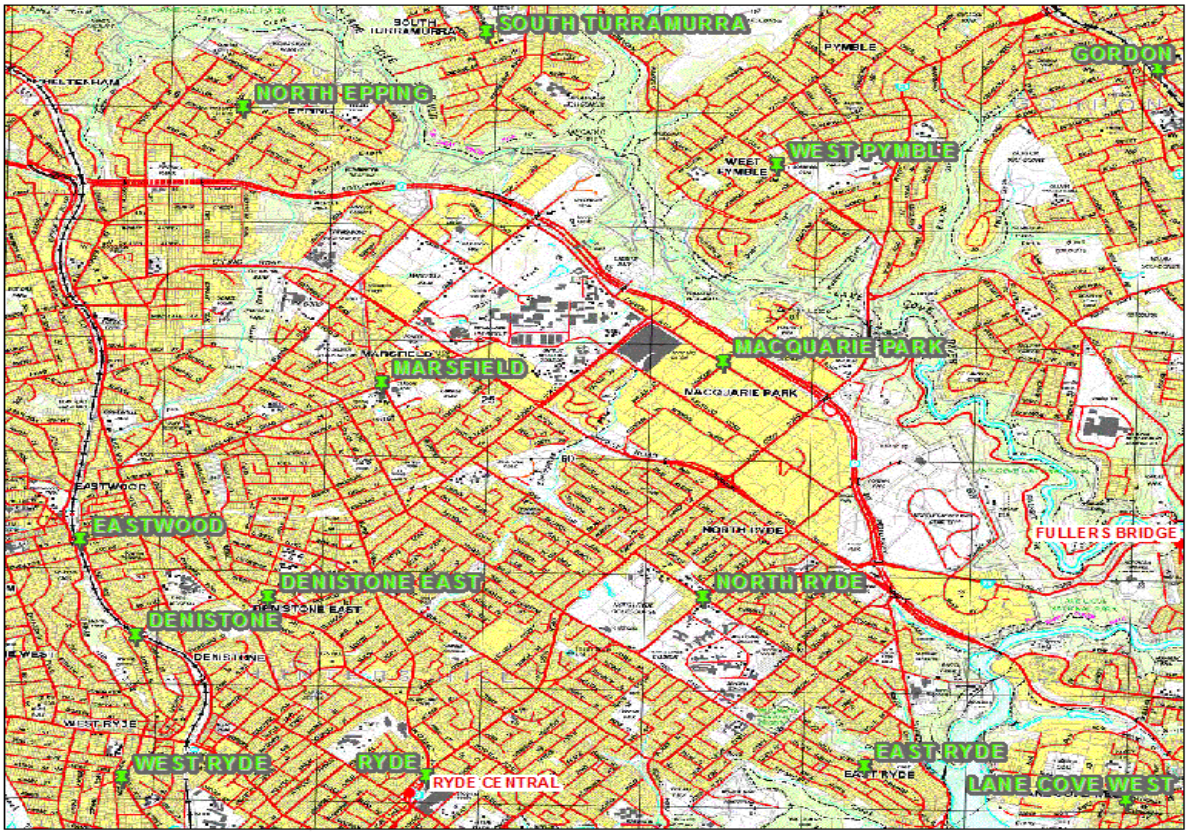
Email: mwalker@urbis.com.au

Date: 05 March 2021

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters, conducted by Meggan Walker on 05 March 2021.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

81	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

3 Marist Place, Parramatta NSW 2150
Locked Bag 5020 Parramatta NSW 2220
Tel: (02) 9585 6380 Fax: (02) 9873 8599

ABN 30 841 387 271
Email: ahims@environment.nsw.gov.au
Web: www.environment.nsw.gov.au

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : P32333_IvanhoeEstate_3.5k

Client Service ID : 574117

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-2584	Shrimptons Creek 1;Macquarie Park (Lane Cove NP); RYDE 005	GDA	56	326234	6261520	Closed site	Valid	Artefact : -	Shelter with Deposit	98744,102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2585	Shrimpton's Creek 2;Macquarie Park (Lane Cove NP); RYDE 006	GDA	56	326189	6261480	Closed site	Valid	Artefact : -	Shelter with Deposit	98744,102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2598	CSIRO 3 (CSIRO North Ryde) RYDE 010	GDA	56	328354	6258740	Open site	Valid	Artefact : -	Open Camp Site	4157,102489
	Contact	**Recorders**	Aboriginal Heritage Office,Ms.Tessa Corkill					**Permits**		
45-6-2599	CSIRO 2 (CSIRO North Ryde) RYDE 011	GDA	56	328319	6258660	Closed site	Valid	Artefact : -	Shelter with Deposit	4157,102489
	Contact	**Recorders**	Aboriginal Heritage Office,Ms.Tessa Corkill					**Permits**		
45-6-2236	Blue Gum Cave;	AGD	56	328320	6259190	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2237	Blackman Park 4;	AGD	56	328110	6256950	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2238	Blackman Park 5;	AGD	56	328050	6256990	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2275	Blackman Park 1;	AGD	56	328310	6256780	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2276	Blackman Park 2;	AGD	56	328560	6256780	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2281	Mars Rd Cave;Lane Cove West;	AGD	56	328130	6257150	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2284	Athletics Fields;Lane Cove West;	AGD	56	328490	6258170	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2310	Hand Hold Cave;	GDA	56	328738	6258512	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2311	Rope Swing Cave;	GDA	56	328735	6258502	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : P32333_IvanhoeEstate_3.5k

Client Service ID : 574117

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-2216	Lane_Cove_#1	GDA	56	328497	6258962	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers,DPIE,Ms.Elise McCarthy					**Permits**		
45-6-2653	Eden Gardens PAD RYDE 007	GDA	56	327279	6260615	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : -		102489
	Contact	**Recorders**	Aboriginal Heritage Office,Ms.Norma Richardson					**Permits**	1613,1685	
45-6-2681	PAD B	AGD	56	328150	6258150	Open site	Not a Site	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mrs.Robynne Mills					**Permits**	1871	
45-6-2272	Mowbray Park 5;	GDA	56	329010	6258450	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-0989	Gladesville;Ryde 018	GDA	56	327224	6257020	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-5-2584	LC NPM 1	AGD	56	328710	6259000	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Bobbie Oakley					**Permits**		
45-5-2585	LCNPM 2	AGD	56	328350	6259020	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Bobbie Oakley					**Permits**		
45-6-1558	Delhi Road;North Ryde; RYDE 009	GDA	56	329034	6258982	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	102489
	Contact	**Recorders**	Warren Bluff,Aboriginal Heritage Office					**Permits**		
45-6-2056	Footbridge Cave;	GDA	56	328261	6258205	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2058	Sugarloaf 2	AGD	56	327890	6256670	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	Contact	**Recorders**	Michael Guider					**Permits**	624	
45-6-0610	Lane Cove River De Burgh's Bridge	AGD	56	327518	6260868	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Unknown Author					**Permits**		
45-6-0611	Lane Cove River West Pymble	AGD	56	327715	6261925	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Charles.D Power					**Permits**		
45-6-0613	Lane Cove River Terrace Road Bradfield	AGD	56	327560	6261150	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-0614	North Ryde;Delhi Rd;	AGD	56	328121	6258045	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-1893	KP.1.;	AGD	56	326239	6262975	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Margrit Koettig					**Permits**		
45-5-1005	IFCH1	AGD	56	322415	6262289	Open site	Not a Site	Artefact : -	Isolated Find	
	Contact	**Recorders**	Mr.Geordie Oakes,AECOM Australia Pty Ltd - Sydney,Ms.Tessa Corkill					**Permits**		
45-6-2209	Carters creek.	AGD	56	328290	6259190	Closed site	Valid	Artefact : -	Shelter with Deposit	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers,R Pallin					**Permits**		
45-6-2211	Lane Cove 3	AGD	56	328780	6258670	Open site	Valid	Shell : -, Artefact : -	Midden	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-2212	Blue Hole	AGD	56	327310	6260990	Closed site	Valid	Artefact : -	Shelter with Deposit	1899,98744
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-2215	Terrace Road #2	AGD	56	327610	6261210	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899,98744
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-2103	Magdala park; RYDE 014	GDA	56	327964	6257780	Open site	Valid	Shell : -, Artefact : -	Midden,Open Camp Site	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-1235	Epping;Lane Cove River;	AGD	56	324644	6262720	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		
45-6-2575	Strangers Creek; RYDE 020	GDA	56	327239	6257010	Closed site	Valid	Artefact : -	Shelter with Deposit	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2576	Field of Mars; RYDE 021	GDA	56	327314	6256880	Open site	Valid	Shell : -, Artefact : -	Midden	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-2577	River Bend;	AGD	56	327440	6261060	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	98744
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-1156	Epping;Terrys Creek Cave; RYDE 002	GDA	56	323544	6261450	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-6-1157	Brown;Cut Inside Cave; RYDE 003	GDA	56	325234	6262680	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-1158	Brown Two Ceiling Domes Cave RYDE 004	AGD	56	325274	6262670	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	102489
	Contact	**Recorders**	Mr.R Taplin,Aboriginal Heritage Office					**Permits**		
45-6-2268	Big River Cave;	AGD	56	328890	6258410	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-1348	Mowbray Park;Lane Cove West;Mowbray Park 1.;Chatswood West;	GDA	56	329030	6258405	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	1497
	Contact	**Recorders**	Val Attenbrow,Michael Guider					**Permits**		
45-6-1354	Sewer Pipe Cave;Stringybark Creek;	GDA	56	328974	6257760	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	Ms.Tessa Corkill					**Permits**		
45-6-1252	LC#4 Chatswood	AGD	56	328435	6258730	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899
	Contact	**Recorders**	P Clark,Ms.Bronwyn Conyers					**Permits**		
45-6-1940	Stringy Bark Creek Cave 1;	AGD	56	329010	6257390	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-0931	Boronia Park, Ryde 019	GDA	56	327234	6257010	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	102489
	Contact	**Recorders**	Charles.D Power,Aboriginal Heritage Office					**Permits**		
45-6-1653	Ironbarks	AGD	56	328440	6258840	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	J Wyeth					**Permits**		
45-6-0882	Lane Cove River;Gordon;	AGD	56	328134	6263010	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	Charles.D Power					**Permits**		
45-6-1953	Pages Creek Cave;	GDA	56	327724	6258540	Open site	Valid	Shell : -, Artefact : -	Midden	102489
	Contact	**Recorders**	Michael Guider,Aboriginal Heritage Office					**Permits**		
45-6-1053	Lane Cove River;	AGD	56	326000	6262000	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	98744
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-1054	Lane Cove;Man Goanna Cave;	AGD	56	325690	6263590	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	Contact	**Recorders**	ASRSYS					**Permits**	580	
45-6-0966	Kitty's Creek;Lane Cove SRA; RYDE 016	GDA	56	327874	6257420	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809,102489
	Contact	**Recorders**	Val Attenbrow,Alice Gorman,Aboriginal Heritage Office					**Permits**		

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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-1844	Mowbray Park 2, Chatswood west.;Chatswood West;	GDA	56	329050	6258380	Closed site	Valid	Artefact : -, Shell : -	Shelter with Deposit,Shelter with Midden	1497
	Contact	**Recorders**	Val Attenbrow,Michael Guider					**Permits**		
45-6-1845	Mowbray Park 3, Chatswood west.;	AGD	56	328670	6258230	Closed site	Valid	Artefact : -	Shelter with Deposit	1497
	Contact	**Recorders**	Val Attenbrow					**Permits**		
45-6-1854	L C/2 Lanecove 2 Epping Road Bridge RYDE 012	GDA	56	328104	6258490	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	2383,102489
	Contact	**Recorders**	Val Attenbrow,Alice Gorman,K Cutmore,Ms.Laila Haglund,Aboriginal Heritage Offic					**Permits**		
45-6-1855	L C/1 Lanecove 1	AGD	56	327920	6258190	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	Contact	**Recorders**	Ms.Laila Haglund					**Permits**		
45-6-0977	Epping;Lane Cove River; Little bloodwood stump cave RYDE 001	GDA	56	323964	6262130	Closed site	Valid	Artefact : -	Shelter with Deposit	2047,102489
	Contact	**Recorders**	Val Attenbrow,Aboriginal Heritage Office,Mr.Rick Bullers					**Permits**		
45-6-0978	Lane Cove River: KUR-050	GDA	56	324504	6262690	Open site	Valid	Grinding Groove : -, Water Hole : -	Axe Grinding Groove,Water Hole/Well	
	Contact	**Recorders**	Mr.Phil Hunt,Mr.R Taplin					**Permits**		
45-6-0981	Lane Cove River	AGD	56	327792	6260874	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	1899,98744
	Contact	**Recorders**	Mr.R Taplin					**Permits**		
45-6-1005	Martins Creek;Lane Cove SRA; RYDE 015	GDA	56	327644	6257600	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	102489
	Contact	**Recorders**	Michael Guider,J.A Hatfield,Aboriginal Heritage Office					**Permits**		
45-6-2717	Will-144 Mowbray Park	AGD	56	328660	6258290	Closed site	Valid	Habitation Structure : -		
	Contact	**Recorders**	David Watts					**Permits**		
45-6-2718	Will-145 - Mowbray Park	AGD	56	328580	6258330	Open site	Valid	Shell : -		
	Contact	**Recorders**	David Watts					**Permits**		
45-6-2213	DeBurghs Bridge	AGD	56	327454	6261230	Closed site	Valid	Artefact : -	Shelter with Deposit	1899
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
45-6-2214	Commandment Rock(LC#2)	AGD	56	328290	6259580	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1899
	Contact	**Recorders**	P Clark,Ms.Bronwyn Conyers,D Brown					**Permits**		

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : P32333_IvanhoeEstate_3.5k

Client Service ID : 574117

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-6-3010	Stringybark Creek PAD Shelter 7 - LCC085	GDA	56	329119	6257645	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3013	Stringybark Creek PAD Shelter 8 - LCC 086	GDA	56	328624	6257885	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3021	Field of Mars RYDE 026	GDA	56	327404	6257120	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3015	Stringybark Creek PAD Shelter 9 LCC 087	GDA	56	328714	6257860	Closed site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3067	Crescent 1	GDA	56	322187	6263082	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Kelleher Nightingale Consulting Pty Ltd					**Permits**		
45-6-3042	Eden Ave Groove 1 KUR 052	GDA	56	325374	6262955	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	Aboriginal Heritage Office					**Permits**		
45-6-3861	Riverside Drive Charcoal Art	GDA	56	328101	6260036	Open site	Valid	Art (Pigment or Engraved) : -		
	Contact	**Recorders**	DPIE,Ms.Elise McCarthy					**Permits**		
45-6-2765	LCC 077 Pumphouse Shelter	AGD	56	328185	6257765	Open site	Valid	Habitation Structure : 1		
	Contact S Scanlon	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-2949	M2A1	GDA	56	323895	6262241	Open site	Valid	Grinding Groove : 1		
	Contact	**Recorders**	Mr.Rick Bullers					**Permits**		
45-6-3114	Epping to Thornleigh Third Track Unexpected Find 1	GDA	56	322194	6263106	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Mr.Josh Symons					**Permits**		
45-6-3136	Terrys Creek Shelter PAD1	GDA	56	323515	6261475	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-3117	Crescent 2 (C2)	GDA	56	322259	6262900	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Matthew Kelleher					**Permits**		
45-6-3319	Mowbray Park PAD4 WILL214	GDA	56	328850	6258435	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		

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Extensive search - Site list report

Your Ref/PO Number : P32333_IvanhoeEstate_3.5k

Client Service ID : 574117

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Mr.Phil Hunt,Aboriginal Heritage Office					**Permits**		
45-6-3321	Mowbray Park PAD3 WILL213	GDA	56	328735	6258510	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt,Aboriginal Heritage Office					**Permits**		
45-6-3795	Avian Cres PAD 1 WILL181	GDA	56	328675	6258385	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		
45-6-3796	Avian Cres PAD 2 WILL182	GDA	56	328645	6258375	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**		

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APPENDIX B ACHA QUESTIONNAIRE

1. Cultural connection:

Please describe the nature of your cultural connection to the country on which the subject area is situated. Please include any relevant cultural knowledge or knowledge of Aboriginal objects or places within the subject area. Have you ever lived in or near the subject area? If you are a Traditional Owner, please state this clearly.

2. Representing your community members:

Please state who you or your organisation represents. Do you or your organisation represent other members of the Aboriginal community? If so, please describe how information is provided to the other members, and how their information and knowledge may be provided back to the Proponent and Urbis.

3. Previous experience:

Please list your relevant (for example, in the area of the proposed project) previous experience in providing cultural heritage advice and survey participation.

4. Schedule of Rates:

Please provide your Certificate of Currency including Product and Public Liability Insurance and Worker's Compensation. Please also schedule of rates (hourly/half day/day) for fieldwork participation, and include any expenses you may expect to incur, and these will be sought to be reimbursed. Please note that it is for the discretion for the Proponent to decide if they invite RAPs for site works and the consultation process does not guarantee paid employment.

From:	Aaron Olsen
Cc:	Andrew Crisp
Bcc:	officeadmin@metrolalc.org.au; cazadirect@live.com; butuheritage@gmail.com; justinecoplin@optusnet.com.au; didgengunawalclan@yahoo.com.au; gulagachts@gmail.com; philipkhan.acn@live.com.au; ngambaaculturalconnections@hotmail.com; danny@tocomwall.com.au
Subject:	Aboriginal Cultural Heritage Assessment – Ivanhoe Estate – Stage 2/3 – Presentation of Information and Gathering Information about Cultural Significance (Our Ref: P0032333)
Date:	Friday, 7 May 2021 11:36:00 AM
Attachments:	P0032333_Ivanhoe_Stage2.3_F01.pdf image002.png image004.png image006.png image008.png image010.png

Good morning

Thank you for registering your interest in the above project at Ivanhoe Estate at Ivanhoe Place (Lot 100 in DP1262209) and 2-4 Lyon Park Road (Lot 101 in DP 1263727). Please find attached a letter as part of Stages 2 and 3 of the ACHA process, which provides information on the project and methodology proposed to be employed.

You will note that we have included a request for specific information in the form of a Questionnaire (Appendix B). We would appreciate your response to that questionnaire as soon as possible. If you have already provided us with your Schedule of Rates, please disregard that question.

If you wish to provide any comments in relation to the attached document, please do so in writing, preferably by email, by **4 June 2021**, to:

Aaron Olsen
Consultant
Urbis Pty Ltd
Level 8, 123 Pitt Street
Sydney NSW 2000
P: 02 8233 9957
E: aolsen@urbis.com.au

Please let us know if you have any questions.

Kind regards

AARON OLSEN
CONSULTANT

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SHAPING CITIES AND COMMUNITIES

URBIS

ANGEL PLACE, LEVEL 8, 123 PITT STREET
SYDNEY, NSW 2000, AUSTRALIA

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From:	Gulaga
To:	Aaron Olsen
Subject:	Re: Aboriginal Cultural Heritage Assessment – Ivanhoe Estate – Stage 2/3 – Presentation of Information and Gathering Information about Cultural Significance (Our Ref: P0032333)
Date:	Friday, 7 May 2021 2:51:01 PM
Attachments:	image002.png image004.png image006.png image008.png image010.png

---

Hi Aaron,

Thank you for providing this information.
Gulaga supports the methodology and makes no comment at this stage.

Kind Regards
Wendy Smith
Cultural Heritage Officer
Gulaga
0401 808 988

This email may contain privileged information. Privilege is not waived if it has been sent to you in error, or if you are not the intended recipient. Please immediately notify me and delete the email if you have received this in error.

On Fri, May 7, 2021 at 11:37 AM Aaron Olsen <aolsen@urbis.com.au> wrote:

> Good morning
>
> Thank you for registering your interest in the above project at Ivanhoe Estate at Ivanhoe Place (Lot 100 in DP1262209) and 2-4 Lyon Park Road (Lot 101 in DP 1263727). Please find attached a letter as part of Stages 2 and 3 of the ACHA process, which provides information on the project and methodology proposed to be employed.
>
> You will note that we have included a request for specific information in the form of a Questionnaire (Appendix B). We would appreciate your response to that questionnaire as soon as possible. If you have already provided us with your Schedule of Rates, please disregard that question.
>
> If you wish to provide any comments in relation to the attached document, please do so in writing, preferably by email, by **4 June 2021**, to:
>
> Aaron Olsen
>
> Consultant
>
> Urbis Pty Ltd
>
> Level 8, 123 Pitt Street

Sydney NSW 2000

P: 02 8233 9957

E: aolsen@urbis.com.au

Please let us know if you have any questions.

Kind regards

AARON OLSEN
CONSULTANT

D +61 2 8233 9957
T +61 2 8233 9900
E aolsen@urbis.com.au

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ANGEL PLACE, LEVEL 8, 123 PITT STREET
SYDNEY, NSW 2000, AUSTRALIA

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From:	philip khan
To:	Aaron Olsen
Subject:	Re: Aboriginal Cultural Heritage Assessment – Ivanhoe Estate – Stage 2/3 – Presentation of Information and Gathering Information about Cultural Significance (Our Ref: P0032333)
Date:	Wednesday, 19 May 2021 9:52:10 AM
Attachments:	image002.png image004.png image006.png image008.png image010.png Outlook-yabwdumo.png 89C887D1BAAE453486399F09E76FE0D2.png

Dear Aaron,

Thank you for your ACHA for Ivanhoe Estate stage 2/3. The study area is highly significant to the Aboriginal people. The study area is important to us Aboriginal people and as a last chance we should excavate the study area. We as Aboriginal people hold a deep connection to the land & we follow a lore that is known to us. the Aboriginal people have looked after this land for tens of thousands of years and continue to do so.

In saying that we would like to agree to your recommendations and we support your ACHA. I would also like to take the time to mention Aboriginal Cultural interpretation for the development or within the building. Some examples are native gardens, artefact display, artwork, and signage, please do not hesitate to contact us about interpretation plan. We should also always be mindful of burials as we do not know where they are located.

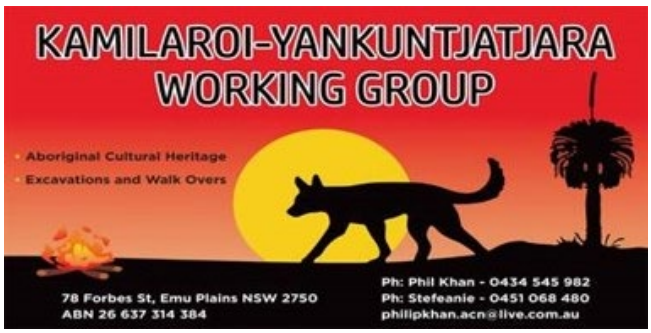
As a senior Aboriginal person for the past 50yrs, I actively participate in the protection of the Aboriginal Cultural Heritage throughout the Sydney Basin, & particularly throughout Western Sydney, on behalf of Kamilaroi Yankuntjatjara Working Group I wish to provide to you my organisation's registration of interest.

I wish to be involved & participate in all levels of consultation/project involvement. I wish to attend all meetings, participate in available field work & receive a copy of the report.

Our Rates - $100 per hour, $400 half day & $800 full day (Exc. GST)
Our RAPS have up to 15yrs Cultural Heritage experience in – field work which involves manual excavation (digging), sieving , identifying artefacts, setting up transits, setting up equipment, packing equipment, site surveys & attending meetings.
Should you wish me to provide further information, please do not hesitate to contact me on 0434545982 or Stefeanie on 0451068480.

Kind Regards

Kadibulla Khan



From: Aaron Olsen <aolsen@urbis.com.au>
Sent: Friday, 7 May 2021 11:36 AM
Cc: Andrew Crisp <acrisp@urbis.com.au>
Subject: Aboriginal Cultural Heritage Assessment – Ivanhoe Estate – Stage 2/3 – Presentation of Information and Gathering Information about Cultural Significance (Our Ref: P0032333)

Good morning

Thank you for registering your interest in the above project at Ivanhoe Estate at Ivanhoe Place (Lot 100 in DP1262209) and 2-4 Lyon Park Road (Lot 101 in DP 1263727). Please find attached a letter as part of Stages 2 and 3 of the ACHA

process, which provides information on the project and methodology proposed to be employed.

You will note that we have included a request for specific information in the form of a Questionnaire (Appendix B). We would appreciate your response to that questionnaire as soon as possible. If you have already provided us with your Schedule of Rates, please disregard that question.

If you wish to provide any comments in relation to the attached document, please do so in writing, preferably by email, by **4 June 2021**, to:

Aaron Olsen
Consultant
Urbis Pty Ltd
Level 8, 123 Pitt Street
Sydney NSW 2000
P: 02 8233 9957
E: aolsen@urbis.com.au

Please let us know if you have any questions.

Kind regards

AARON OLSEN
CONSULTANT

D +61 2 8233 9957
T +61 2 8233 9900
E aolsen@urbis.com.au

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From:	Aaron Olsen
Cc:	Andrew Crisp
Bcc:	"officeadmin@metrolalc.org.au"; "cazadirect@live.com"; "butuheritage@gmail.com"; "justinecoplin@optusnet.com.au"; "didgengunawalclan@yahoo.com.au"; "gulagachts@gmail.com"; "philipkhan.acn@live.com.au"; "ngambaaculturalconnections@hotmail.com"; "danny@tocomwall.com.au"
Subject:	Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 4 Draft ACHAR (Our Ref: P0032333)
Date:	Friday, 9 July 2021 9:42:00 AM
Attachments:	P0032333_Ivanhoe_ACHAR_D01.pdf image002.png image004.png image006.png image008.png image010.png

Good morning

Thank you again for registering your interest in the above project. As part of Stage 4 of the Aboriginal Cultural Heritage Assessment (ACHA), we now provide a draft Aboriginal Cultural Heritage Assessment Report (ACHAR) for your consideration and comment.

You will note that parts of the draft ACHAR include yellow highlighted text. These sections will be amended after completion of Stage 4 of the ACHA process.

Please provide any comments in relation to the draft ACHAR by **6 August 2021** to:

Andrew Crisp
Senior Consultant
Urbis Pty Ltd
Level 8, 123 Pitt Street
Sydney NSW 2000
E: acrisp@urbis.com.au
P: 02 8233 7642

If you have any questions, please let us know.

Kind regards

AARON OLSEN
CONSULTANT

D +61 2 8233 9957
T +61 2 8233 9900
E aolsen@urbis.com.au

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From: philip khan
To: Aaron Olsen
Subject: Re: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 4 Draft ACHAR (Our Ref: P0032333)
Date: Friday, 16 July 2021 11:16:13 AM
Attachments: Outlook-qff0mmzr.png
3BC36A99134847B48F2862038B1EEDA0.png
0FD4518505994416A782C31EEDA2B1F7.png
ABC97D97C0D145F0875D79F386B3DD0C.png
0C3818FC8ACD4D73814C3C38E9F699B1.png
FBE3B01603DA46EC86A0241CB00D92F8.png
B05B1BD945FA470B9B0BECA347E8D47E.png

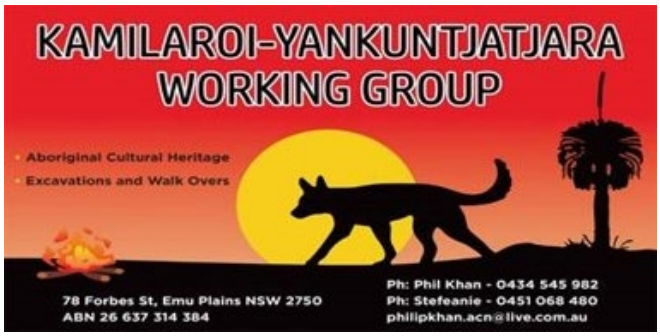
Dear Aaron,

Thank you for your ACHAR for proposed site Ivanhoe Estate. KYWG aim to conserve and protect cultural heritage. We look to the sky for guidance and follow the stories that it holds. We live off the land and we respect our mother earth as she provides for us, we follow the water ways to drink from. Not so Long ago we hunted and lived off the land, we camped close by to water and carried out daily activities. We lived a peace full life with lora and kinship and order, one with mother earth and our environment. We are connected to all types of life; we follow the sessions and move accordingly. We were colonized and assimilated to the white man's way, yet our culture savvied and lived the Aboriginal way of life still to this day.

The study area is highly significant due to it being in close proximity to water ways, for this reason we would like to push for monitoring of the any works, done by an Aboriginal person as we don't believe that the construction works can identify Aboriginal objects. One induction is not enough train and they may not have the time to be aware of Aboriginal finds. We also should be mindful of our burials as they hold deep meaning to us and we have been striped of the location of them.

Kind Regards

Kadibulla Khan



From: Aaron Olsen <aolsen@urbis.com.au>
Sent: Friday, 9 July 2021 9:42 AM
Cc: Andrew Crisp <acrisp@urbis.com.au>
Subject: Ivanhoe Estate - Aboriginal Cultural Heritage Assessment - Stage 4 Draft ACHAR (Our Ref: P0032333)

Good morning

Thank you again for registering your interest in the above project. As part of Stage 4 of the Aboriginal Cultural Heritage Assessment (ACHA), we now provide a draft Aboriginal Cultural Heritage Assessment Report (ACHAR) for your consideration and comment.

You will note that parts of the draft ACHAR include yellow highlighted text. These sections will be amended after completion of Stage 4 of the ACHA process.

Please provide any comments in relation to the draft ACHAR by **6 August 2021** to:

Andrew Crisp
Senior Consultant
Urbis Pty Ltd
Level 8, 123 Pitt Street
Sydney NSW 2000
E: acrisp@urbis.com.au
P: 02 8233 7642

If you have any questions, please let us know.

Kind regards

AARON OLSEN
CONSULTANT

D +61 2 8233 9957
T +61 2 8233 9900
E aolsen@urbis.com.au

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APPENDIX D GEOTECHNICAL BOREHOLE LOGS

TEST BORE REPORT

CLIENT: LIPMAN PTY LTD
PROJECT: PROPOSED MULTI STOREY BUILDING
LOCATION: 2-4 LYON PARK ROAD, NORTH RYDE

DATE: 1 AUGUST 00
PROJECT No.: 29190
SURFACE LEVEL: 45.12

BORE No. 1
SHEET 1 **OF** 1

Depth m	Description of Strata	Sampling & In Situ Testing: Type	Depth (m)	Results	Headspace PID (ppm)
0	FILLING - poorly compacted, light brown to brown clay filling with a trace of silt and gravel	A	0.5	1,1,2 N=3	2
		S	0.95		
1.4	CLAY - firm, brown mottled red brown clay with a trace of ironstone gravel				
1.8	IRONSTONE				
2.0	TEST BORE DISCONTINUED AT 2.0 METRES - auger refusal				

RIG: B40 **DRILLER:** DRIVER **LOGGED:** CARLE **CASING:**

TYPE OF BORING: 100mm DIAMETER SPIRAL FLIGHT AUGER

GROUND WATER OBSERVATIONS: NO FREE GROUNDWATER OBSERVED

REMARKS: TBM GRATE IN LYON PARK ROAD RL 48.22

SAMPLING & IN SITU TESTING LEGEND

A auger sample	PL point load strength I_S (50)MPa
B bulk sample	S standard penetration test
C core drilling	Ux x mm dia. tube
pp Pocket Penetration (kPa)	V shear vane (kPa)

CHECKED:
Initials:
Date: 10/8

Douglas Partners
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TEST BORE REPORT

BORE No: 2
DATE: 2/8/00
SHEET 1 **OF** 1

CLIENT: LIPMAN PTY LTD
PROJECT: PROPOSED MULTISTOREY BUILDING
LOCATION: 2-4 LYON PARK ROAD, NORTH RYDE

PROJECT No: 29190
SURFACE LEVEL: 45.91
DIP OF HOLE: 90°
AZIMUTH:

Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Discontinuities (B – Bedding, J – Joint, S – Shear, D – Drill Break)	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Sampling & In Situ Testing: Sample Type	Core Rec. %	RQD %	Test Results & Comments
0	FILLING – poorly compacted, dark brown silty sandy clay									
0.75							S			1,2,4 N=6
1	FILLING – poorly compacted, dark grey and yellow brown sandy clay and gravel filling									
1.1	FILLING – crushed sandstone and gravel filling									
1.7	SANDY CLAY – firm to stiff, light grey and yellow brown sandy clay									
2							S			3,4,4 N=8
3										
3.0	SANDSTONE – extremely low to very low strength, light grey brown sandstone									
3.5	TEST BORE DISCONTINUED AT 3.5 METRES						A			
4										
5										
6										
7										
8										
9										
10										

RIG: B40 **DRILLER:** DRIVER **LOGGED:** PARMAR **CASING:** UNCASED

TYPE OF BORING: SPIRAL FLIGHT AUGER TO 3.5m

WATER OBSERVATIONS: NO FREE GROUNDWATER OBSERVED

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A auger sample	PL point load strength I_S (50)MPa
B bulk sample	S standard penetration test
C core drilling	Ux x mm dia. tube
pp pocket penetrometer (kPa)	V Shear Vane (kPa)

CHECKED:
Initials:
Date: 10/8

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TEST BORE REPORT

BORE No: 3
DATE: 2/8/00
SHEET 1 OF 1
AZIMUTH:

CLIENT: LIPMAN PTY LTD
PROJECT: PROPOSED MULTISTOREY BUILDING
LOCATION: 2-4 LYON PARK ROAD, NORTH RYDE
PROJECT No: 29190
SURFACE LEVEL: 46.76
DIP OF HOLE: 90°

Depth (m)	Description of Strata	Graphic Log	Rock Strength	Discontinuities	Fracture Spacing (m)	Sampling & In Situ Testing: Sample Type	Core Rec. %	RQD %	Test Results & Comments
0	FILLING - brown clay filling								
0.3	FILLING - poorly compacted, yellow brown grey sandy clay filling with ironstone gravel					S			1,1,3 N=4
0.9	SANDY SILTY CLAY - soft to firm, light grey sandy silty clay								
1.2	SANDY CLAY - firm to stiff, brown sandy clay			Note: unless otherwise stated rock is fractured along slightly rough to smooth planar bedding planes					
1.8	SANDY CLAY - stiff, light yellow grey mottled red brown sandy clay					S			3,3,6 N=9
2.3	SANDSTONE - extremely low strength, extremely weathered sandstone								
2.5									
2.6	SANDSTONE - low strength sandstone			Core loss 200mm					PL (A)=0.8MPa
2.8	SANDSTONE - medium and high strength, moderately weathered, slightly fractured to unbroken, light yellow brown to grey brown and purple, medium to coarse grained sandstone			3.59m:J 5° ironstained rough 3.87m:B 5° with clayey veneer 4.29m:B 10° with 3-4mm sandy clay 4.32m:B 5° with 3-4mm sandy clay 4.37m:B 10° 4.42m:B 5° with 6-7mm sandy clay 4.82m:B 10° 5.13m:B 10° ironstained		C	93	89	PL (A)=1.2MPa PL (A)=1.6MPa
5.6	TEST BORE DISCONTINUED AT 5.6 METRES								

Rock Strength: Ex Low, Very Low, Low, Medium, High, Very High, Ex High
Degree of Weathering: EW, HW, MW, SW, FS, FR
Discontinuities: B - Bedding, J - Joint, S - Shear, D - Drill Break
Fracture Spacing (m): 0.01, 0.05, 0.10, 0.50, 1.00

RIG: B40 **DRILLER:** DRIVER **LOGGED:** PARMAR **CASING:** GL TO 2.6m

TYPE OF BORING: SPIRAL FLIGHT AUGER TO 2.6m,NMLC CORING TO 5.6m

WATER OBSERVATIONS: NO FREE GROUNDWATER OBSERVED WHILST AUGERING

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A auger sample	PL point load strength I_S (50)MPa
B bulk sample	S standard penetration test
C core drilling	Ux x mm dia. tube
pp pocket penetrometer (kPa)	V Shear Vane (kPa)

CHECKED:
Initials:
Date: 10/8

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TEST BORE REPORT

CLIENT: LIPMAN PTY LTD
PROJECT: PROPOSED MULTI STOREY BUILDING
LOCATION: 2-4 LYON PARK ROAD, NORTH RYDE

DATE: 1 AUGUST 00
PROJECT No.: 29190
SURFACE LEVEL: 47.3

BORE No. 4
SHEET 1 **OF** 1

Depth m	Description of Strata	Sampling & In Situ Testing: Type	Depth (m)	Results	Headspace PID (ppm)
0	FILLING - poorly compacted, brown, slightly sandy clay filling	AX	0.5	1,2,4 N=6	2
		S	0.95		
1	- 0.95m - traces of wood				
1.3	CLAY - red brown clay with a trace of silt and sand				
1.7	SILTY SANDY CLAY - grey silty sandy clay	A	1.8		2
2	CLAY - firm, red brown clay		2.0	2,3,5 N=8	
2.0		S	2.45		
2.8	SANDSTONE - extremely low strength, light grey sandstone with some clay				
3					
3.5	TEST BORE DISCONTINUED AT 3.5 METRES - auger refusal				
4					
5					

RIG: B40 **DRILLER:** DRIVER **LOGGED:** CARLE **CASING:**

TYPE OF BORING: 100mm DIAMETER SPIRAL FLIGHT AUGER

GROUND WATER OBSERVATIONS: NO FREE GROUNDWATER OBSERVED

REMARKS: *DENOTES DUPLICATE SAMPLE Z1 TAKEN

SAMPLING & IN SITU TESTING LEGEND

A auger sample	PL point load strength I_S (50)MPa
B bulk sample	S standard penetration test
C core drilling	Ux x mm dia. tube
pp Pocket Penetration (kPa)	V shear vane (kPa)

CHECKED:
Initials:
Date: 19/8

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TEST BORE REPORT

BORE No: 5
DATE: 3/8/00
SHEET 1 OF 1
AZIMUTH:

CLIENT: LIPMAN PTY LTD
PROJECT: PROPOSED MULTISTOREY BUILDING
LOCATION: 2-4 LYON PARK ROAD, NORTH RYDE
PROJECT No: 29190
SURFACE LEVEL: 48.05
DIP OF HOLE: 90°

Depth (m)	Description of Strata	Degree of Weathering (EW, HW, MW, SW, FS, FR)	Graphic Log	Rock Strength (Ex Low, Very Low, Low, Medium, High, Very High, Ex High)	Discontinuities (B – Bedding, J – Joint, S – Shear, D – Drill Break)	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Sampling & In Situ Testing: Sample Type	Core Rec. %	RQD %	Test Results & Comments
0	FILLING – poorly to moderately compacted, light brown sandy clay and gravel filling						SPT			2,3,5 N=8
1.8	SILTY SANDY CLAY – soft, light yellow brown mottled red silty sandy clay with a trace of ironstone grvel						S			2,1,2 N=3
3.1	SANDSTONE – extremely low to very low strength, highly weathered, light grey sandstone				Note: unless otherwise stated rock is fractured along smooth planar bedding planes dipping at 10° -20°		S			7,20,17 N=37
4.58	SANDSTONE – medium then high strength, slightly weathered, fractured to slightly fractured, light grey, medium to coarse grained sugary sandstone with extremely low and very low strength bands				4.77m:B 10° with 2-3mm silty clay 4.95m:B 10° with clayey coating 5.04m:J 25° Core loss 200mm		C	84	37	PL (A)=1.4MPa PL (A)=0.5MPa
5.07										
5.27										
5.37	SANDSTONE – medium then high strength, moderately and slightly weathered, slightly fractured to fractured, light yellow brown and grey, medium to coarse grained sandstone				6.46m:B 10° with carbonaceous coating 7.49m:B 10° with clayey coating		C	100	90	PL (A)=1.9MPa PL (A)=1.2MPa
7.75	TEST BORE DISCONTINUED AT 7.75 METRES									

RIG: B40 **DRILLER:** DRIVER **LOGGED:** PARMAR **CASING:** GL TO 4.45m

TYPE OF BORING: SPIRAL FLIGHT AUGER TO 4.45m,NMLC CORING TO 7.75m

WATER OBSERVATIONS: NO FREE GROUNDWATER OBSERVED WHILST AUGERING

REMARKS:

SAMPLING & IN SITU TESTING LEGEND

A auger sample	PL point load strength I_S (50)MPa
B bulk sample	S standard penetration test
C core drilling	Ux x mm dia. tube
pp pocket penetrometer (kPa)	V Shear Vane (kPa)

CHECKED:
Initials:
Date: 14/8

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Sampling

Sampling is carried out during drilling or test pitting to allow engineering examination (and laboratory testing where required) of the soil or rock.

Disturbed samples taken during drilling provide information on colour, type, inclusions and, depending upon the degree of disturbance, some information on strength and structure.

Undisturbed samples are taken by pushing a thin-walled sample tube into the soil and withdrawing it to obtain a sample of the soil in a relatively undisturbed state. Such samples yield information on structure and strength, and are necessary for laboratory determination of shear strength and compressibility. Undisturbed sampling is generally effective only in cohesive soils.

Test Pits

Test pits are usually excavated with a backhoe or an excavator, allowing close examination of the in-situ soil if it is safe to enter into the pit. The depth of excavation is limited to about 3 m for a backhoe and up to 6 m for a large excavator. A potential disadvantage of this investigation method is the larger area of disturbance to the site.

Large Diameter Augers

Boreholes can be drilled using a rotating plate or short spiral auger, generally 300 mm or larger in diameter commonly mounted on a standard piling rig. The cuttings are returned to the surface at intervals (generally not more than 0.5 m) and are disturbed but usually unchanged in moisture content. Identification of soil strata is generally much more reliable than with continuous spiral flight augers, and is usually supplemented by occasional undisturbed tube samples.

Continuous Spiral Flight Augers

The borehole is advanced using 90-115 mm diameter continuous spiral flight augers which are withdrawn at intervals to allow sampling or in-situ testing. This is a relatively economical means of drilling in clays and sands above the water table. Samples are returned to the surface, or may be collected after withdrawal of the auger flights, but they are disturbed and may be mixed with soils from the sides of the hole. Information from the drilling (as distinct from specific sampling by SPTs or undisturbed samples) is of relatively low reliability, due to the remoulding, possible mixing or softening of samples by groundwater.

Non-core Rotary Drilling

The borehole is advanced using a rotary bit, with water or drilling mud being pumped down the drill rods and returned up the annulus, carrying the drill cuttings. Only major changes in stratification can be determined from the cuttings, together with some information from the rate of penetration. Where drilling mud is used this can mask the cuttings and reliable identification is only possible from separate sampling such as SPTs.

Continuous Core Drilling

A continuous core sample can be obtained using a diamond tipped core barrel, usually with a 50 mm internal diameter. Provided full core recovery is achieved (which is not always possible in weak rocks and granular soils), this technique provides a very reliable method of investigation.

Standard Penetration Tests

Standard penetration tests (SPT) are used as a means of estimating the density or strength of soils and also of obtaining a relatively undisturbed sample. The test procedure is described in Australian Standard 1289, Methods of Testing Soils for Engineering Purposes - Test 6.3.1.

The test is carried out in a borehole by driving a 50 mm diameter split sample tube under the impact of a 63 kg hammer with a free fall of 760 mm. It is normal for the tube to be driven in three successive 150 mm increments and the 'N' value is taken as the number of blows for the last 300 mm. In dense sands, very hard clays or weak rock, the full 450 mm penetration may not be practicable and the test is discontinued.

The test results are reported in the following form.

- In the case where full penetration is obtained with successive blow counts for each 150 mm of, say, 4, 6 and 7 as:

  4,6,7
  N=13

- In the case where the test is discontinued before the full penetration depth, say after 15 blows for the first 150 mm and 30 blows for the next 40 mm as:

  15, 30/40 mm

The results of the SPT tests can be related empirically to the engineering properties of the soils.

Dynamic Cone Penetrometer Tests / Perth Sand Penetrometer Tests

Dynamic penetrometer tests (DCP or PSP) are carried out by driving a steel rod into the ground using a standard weight of hammer falling a specified distance. As the rod penetrates the soil the number of blows required to penetrate each successive 150 mm depth are recorded. Normally there is a depth limitation of 1.2 m, but this may be extended in certain conditions by the use of extension rods. Two types of penetrometer are commonly used.

- Perth sand penetrometer - a 16 mm diameter flat ended rod is driven using a 9 kg hammer dropping 600 mm (AS 1289, Test 6.3.3). This test was developed for testing the density of sands and is mainly used in granular soils and filling.
- Cone penetrometer - a 16 mm diameter rod with a 20 mm diameter cone end is driven using a 9 kg hammer dropping 510 mm (AS 1289, Test 6.3.2). This test was developed initially for pavement subgrade investigations, and correlations of the test results with California Bearing Ratio have been published by various road authorities.

Soil Descriptions

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Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are based on Australian Standard AS 1726-1993, Geotechnical Site Investigations Code. In general, the descriptions include strength or density, colour, structure, soil or rock type and inclusions.

Soil Types

Soil types are described according to the predominant particle size, qualified by the grading of other particles present:

Type	Particle size (mm)
Boulder	>200
Cobble	63 - 200
Gravel	2.36 - 63
Sand	0.075 - 2.36
Silt	0.002 - 0.075
Clay	<0.002

The sand and gravel sizes can be further subdivided as follows:

Type	Particle size (mm)
Coarse gravel	20 - 63
Medium gravel	6 - 20
Fine gravel	2.36 - 6
Coarse sand	0.6 - 2.36
Medium sand	0.2 - 0.6
Fine sand	0.075 - 0.2

The proportions of secondary constituents of soils are described as:

Term	Proportion	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	20 - 35%	Sandy Clay
Slightly	12 - 20%	Slightly Sandy Clay
With some	5 - 12%	Clay with some sand
With a trace of	0 - 5%	Clay with a trace of sand

Definitions of grading terms used are:

- Well graded - a good representation of all particle sizes
- Poorly graded - an excess or deficiency of particular sizes within the specified range
- Uniformly graded - an excess of a particular particle size
- Gap graded - a deficiency of a particular particle size with the range

Cohesive Soils

Cohesive soils, such as clays, are classified on the basis of undrained shear strength. The strength may be measured by laboratory testing, or estimated by field tests or engineering examination. The strength terms are defined as follows:

Description	Abbreviation	Undrained shear strength (kPa)
Very soft	vs	<12
Soft	s	12 - 25
Firm	f	25 - 50
Stiff	st	50 - 100
Very stiff	vst	100 - 200
Hard	h	>200

Cohesionless Soils

Cohesionless soils, such as clean sands, are classified on the basis of relative density, generally from the results of standard penetration tests (SPT), cone penetration tests (CPT) or dynamic penetrometers (PSP). The relative density terms are given below:

Relative Density	Abbreviation	SPT N value	CPT qc value (MPa)
Very loose	vl	<4	<2
Loose	l	4 - 10	2 -5
Medium dense	md	10 - 30	5 - 15
Dense	d	30 - 50	15 - 25
Very dense	vd	>50	>25

Soil Descriptions

Soil Origin

It is often difficult to accurately determine the origin of a soil. Soils can generally be classified as:

- Residual soil - derived from in-situ weathering of the underlying rock;
- Transported soils - formed somewhere else and transported by nature to the site; or
- Filling - moved by man.

Transported soils may be further subdivided into:

- Alluvium - river deposits
- Lacustrine - lake deposits
- Aeolian - wind deposits
- Littoral - beach deposits
- Estuarine - tidal river deposits
- Talus - scree or coarse colluvium
- Slopewash or Colluvium - transported downslope by gravity assisted by water. Often includes angular rock fragments and boulders.

Rock Strength

Rock strength is defined by the Point Load Strength Index ($Is_{(50)}$) and refers to the strength of the rock substance and not the strength of the overall rock mass, which may be considerably weaker due to defects. The test procedure is described by Australian Standard 4133.4.1 - 2007. The terms used to describe rock strength are as follows:

Term	Abbreviation	Point Load Index $Is_{(50)}$ MPa	Approximate Unconfined Compressive Strength MPa*
Extremely low	EL	<0.03	<0.6
Very low	VL	0.03 - 0.1	0.6 - 2
Low	L	0.1 - 0.3	2 - 6
Medium	M	0.3 - 1.0	6 - 20
High	H	1 - 3	20 - 60
Very high	VH	3 - 10	60 - 200
Extremely high	EH	>10	>200

* Assumes a ratio of 20:1 for UCS to $Is_{(50)}$. It should be noted that the UCS to $Is_{(50)}$ ratio varies significantly for different rock types and specific ratios should be determined for each site.

Degree of Weathering

The degree of weathering of rock is classified as follows:

Term	Abbreviation	Description
Extremely weathered	EW	Rock substance has soil properties, i.e. it can be remoulded and classified as a soil but the texture of the original rock is still evident.
Highly weathered	HW	Limonite staining or bleaching affects whole of rock substance and other signs of decomposition are evident. Porosity and strength may be altered as a result of iron leaching or deposition. Colour and strength of original fresh rock is not recognisable
Moderately weathered	MW	Staining and discolouration of rock substance has taken place
Slightly weathered	SW	Rock substance is slightly discoloured but shows little or no change of strength from fresh rock
Fresh stained	Fs	Rock substance unaffected by weathering but staining visible along defects
Fresh	Fr	No signs of decomposition or staining

Degree of Fracturing

The following classification applies to the spacing of natural fractures in diamond drill cores. It includes bedding plane partings, joints and other defects, but excludes drilling breaks.

Term	Description
Fragmented	Fragments of <20 mm
Highly Fractured	Core lengths of 20-40 mm with some fragments
Fractured	Core lengths of 40-200 mm with some shorter and longer sections
Slightly Fractured	Core lengths of 200-1000 mm with some shorter and longer sections
Unbroken	Core lengths mostly > 1000 mm

Rock Descriptions

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq 100 \text{ mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or better. The RQD applies only to natural fractures. If the core is broken by drilling or handling (i.e. drilling breaks) then the broken pieces are fitted back together and are not included in the calculation of RQD.

Stratification Spacing

For sedimentary rocks the following terms may be used to describe the spacing of bedding partings:

Term	Separation of Stratification Planes
Thinly laminated	< 6 mm
Laminated	6 mm to 20 mm
Very thinly bedded	20 mm to 60 mm
Thinly bedded	60 mm to 0.2 m
Medium bedded	0.2 m to 0.6 m
Thickly bedded	0.6 m to 2 m
Very thickly bedded	> 2 m

Symbols & Abbreviations

Douglas Partners

Introduction

These notes summarise abbreviations commonly used on borehole logs and test pit reports.

Drilling or Excavation Methods

C	Core drilling
R	Rotary drilling
SFA	Spiral flight augers
NMLC	Diamond core - 52 mm dia
NQ	Diamond core - 47 mm dia
HQ	Diamond core - 63 mm dia
PQ	Diamond core - 81 mm dia

Water

▷	Water seep
▽	Water level

Sampling and Testing

A	Auger sample
B	Bulk sample
D	Disturbed sample
E	Environmental sample
U_{50}	Undisturbed tube sample (50mm)
W	Water sample
pp	Pocket penetrometer (kPa)
PID	Photo ionisation detector
PL	Point load strength Is(50) MPa
S	Standard Penetration Test
V	Shear vane (kPa)

Description of Defects in Rock

The abbreviated descriptions of the defects should be in the following order: Depth, Type, Orientation, Coating, Shape, Roughness and Other. Drilling and handling breaks are not usually included on the logs.

Defect Type

B	Bedding plane
Cs	Clay seam
Cv	Cleavage
Cz	Crushed zone
Ds	Decomposed seam
F	Fault
J	Joint
Lam	Lamination
Pt	Parting
Sz	Sheared Zone
V	Vein

Orientation

The inclination of defects is always measured from the perpendicular to the core axis.

h	horizontal
v	vertical
sh	sub-horizontal
sv	sub-vertical

Coating or Infilling Term

cln	clean
co	coating
he	healed
inf	infilled
stn	stained
ti	tight
vn	veneer

Coating Descriptor

ca	calcite
cbs	carbonaceous
cly	clay
fe	iron oxide
mn	manganese
slt	silty

Shape

cu	curved
ir	irregular
pl	planar
st	stepped
un	undulating

Roughness

po	polished
ro	rough
sl	slickensided
sm	smooth
vr	very rough

Other

fg	fragmented
bnd	band
qtz	quartz

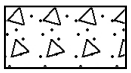
Symbols & Abbreviations

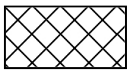
Graphic Symbols for Soil and Rock

General

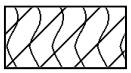

Asphalt

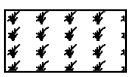

Road base


Concrete


Filling

Soils


Topsoil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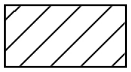
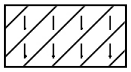
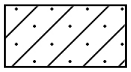
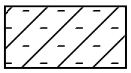
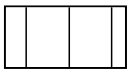

Clay

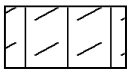

Silty clay

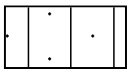

Sandy clay

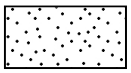

Gravelly clay

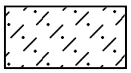

Shaly clay

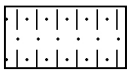

Silt


Clayey silt


Sandy silt

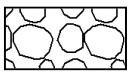

Sand

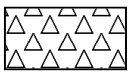

Clayey sand


Silty sand


Gravel

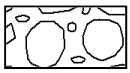

Sandy gravel


Cobbles, boulders

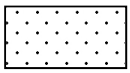

Talus

Sedimentary Rocks


Boulder conglomerate


Conglomerate


Conglomeratic sandstone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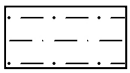
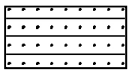
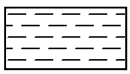
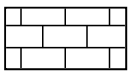

Siltstone

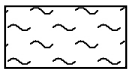

Laminite

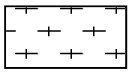

Mudstone, claystone, shale


Coal


Limestone

Metamorphic Rocks


Slate, phyllite, schist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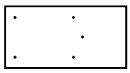
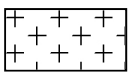

Quartzite

Igneous Rocks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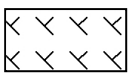
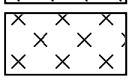
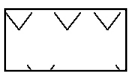

Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

URBIS

Construction Environmental Management Plan
Project Ivanhoe C2 Building – Community Centre and Village Green

Application Number: SSD 15822622- DA Condition B35
Site: Ivanhoe Estate, Macquarie Park

Project: Midtown C2
Project Number: 6410

Grindley Construction Pty Ltd
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Document Control

Version	Date Approved	Brief Description	Approved By
1	9/07/24	Project Commencement	PW

This Plan is uncontrolled when printed

Review

This Plan including emergency procedures will be reviewed at a minimum every six (6) months, where there is a significant change to the project requiring immediate documenting and in the event of a significant incident.

Distribution

This Plan is available via the Project's Construction Management Software (CMS). When a new version of the Plan is published, required personnel will be notified. Upon request and subsequent approval, a copy will be available via the Project Team.

Condition B35 – CEMP Table of Contents

Condition No	Condition Requirement	Location Addressed in Plan
B35	Prior to the commencement of any works, the Applicant shall prepare and implement a Construction Environmental Management Plan (CEMP) for the development and be submitted to the Certifier. The CEMP must be prepared in consultation with, and address the relevant requirements of, Council.	All Contents of Plan
B35 (a)	describe the relevant stages and phases of construction including work program outlining relevant timeframes for each stage/phase;	Section 1.2
B35 (b)	describe all activities to be undertaken on the site during site establishment and construction of the development;	Section 1.2
B35 (c)	include a Dust Management Plan	Section 6.1.1 Appendix 4 Appendix 9
B35 (d)	clearly outline the stages/phases of construction that require ongoing environmental management monitoring and reporting	Section 8.1
B35 (e)	detail statutory and other obligations that the Applicant is required to fulfil during site establishment and construction, including approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies	Section 3
B35 (f)	describe the roles and responsibilities for all relevant employees involved in the site establishment and construction of the works	Section 4

B35 (g)	detail how the environmental performance of the site preparation and construction works will be monitored, and what actions will be taken to address identified potential environmental impacts, including but not limited to noise, traffic and air impacts	Section 6
B35 (h)	include measures to ensure adequate groundwater entitlement is sourced in order to account for groundwater flows into the construction excavations, unless any exemption applies	6.1.7
B35 (i)	management of groundwater during construction;	6.1.7
B35 (j)	document and incorporate all relevant sub environmental management plans (Sub-Plans), control plans, studies and monitoring programs required under this part of the consent; and	Appendix 2-9
B35 (k)	include arrangements for community consultation and complaints handling procedures during construction.	Appendix 8

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1. General

1.1. Introduction

This Construction Environmental Management Plan (CEMP) has been prepared by Grindley Construction Pty Ltd for the Midtown C2 Development This CEMP and its sub-plans will be developed in accordance with the SSD-15822622 Conditions of Consent,

Grindley Construction environmental management systems, the relevant project approval documentation. The purpose of this Construction Environmental Management Plan is to:
Identify the environmental issues (aspects and impacts) for this project;

- Maintain Compliance with the SSDA;
- Establish, communicate & implement environmental operational controls to reduce any adverse impacts on the environment from Grindley activities, products and services.
- implement and Monitor compliance by Grindley and its suppliers & subcontractors with the requirements of all relevant environmental legislation, conditions of any applicable licence, approval and permit, regulatory requirements and this EMP.
- Action any outcomes from incidents or accidents, project audits or other identified non-conformances to continually improve the Grindley environmental management system.

Grindley Construction is committed to being an environmentally and socially responsible organisation while meeting the needs of our clients without hindering future generations. To achieve this goal we require all persons involved in any way with this project to comply with the requirements of this EMP. Any person found to be in breach of these requirements will be subject to appropriate action which may include expulsion from the Site.

We encourage all persons to be actively involved in limiting our impact on the environment, including reporting and resolving environmental related issues. If you identify any problems while on the Site, you must report them immediately to your supervisor or Site Management.

This EMP is to be read in conjunction with the Grindley Management System (GMS), documents referenced in this EMP unless indicated otherwise form part of the GMS.

1.2. Description of Project

Client: Frasers Property

Scope:
The project involves the Design and construction of a three-level community centre (Midtown Ivanhoe building C2) for Frasers Property at Macquarie Park, NSW. This project is a 5 Star Green Star Project within the precinct that is targeting a 6 Star Green Star communities rating. This project comprises construction of:

- A café (Shell Only)
- A Gym (Shell Only)
- A 25m swimming pool and change room facilities
- Village Green and Playground Equipment
- Hard and soft Landscaping to village Green and Community Centre

This CEMP will apply to all construction activities relating to the project, including:

- Site establishment and installation of fencing and gates
- Earthworks and piling
- Erection of scaffolding and hoarding
- Construction of the C2 Building
- Construction of the Village Green
- Installation of new services and internal finishes
- Completion of all external works

Indicative plant and equipment to be utilised:

- Excavators
- Piling machines
- Rollers
- Mobile cranes
- Trucks
- Concrete pumps
- Concrete trucks

The project will be delivered in a single stage and delivered over an 18-month period.

Environmental Policy

Grindley's Environmental Policy outlines the company's commitment to sustainability, while recognising our responsibility to do so, providing a clear strategy of direction and communicative leadership, continuous review of the effectiveness of, emphasising the need of appropriate resourcing and the vision and action required by management to achieve our objective and targets.

The Policy is included at Appendix 1 and displayed via the Site's noticeboard.

1.3. Activities Undertaken

The project involves the following activities:

Basement:

- Demolition of existing temporary C1 Building carpark exhaust
- Riser
- Tie in of building C2 to existing building
- C1 including services.
- New carpark exhaust
- Pool plant room
- COMMS, storage and MSB.

Lower Ground Floor:

- Cold shell gym for future fit out including
- services to achieve OC
- Construction of indoor pool
- Amenities
- Reception area
- Lift and stairs
- Landscaping.

Upper Ground Floor:

- Community rooms 1 to 3

- Kitchen and café
- Storage and back of house
- Stairs, ramps and lift
- Amenities
- Landscaping
- Through site Link.

Public Domain – Upper Ground Village Green:

- Landscaping
- Pathways and steps
- Play equipment
- Lighting.

Roof:

- Plant areas
- Roof plant and pool heat pump room
- Lift and stairs
- Aluminium pergola.

1.4. Environmental Management System

The Environmental Management System is integrated with the GMS, the GMS is based on the plan, do, check, act concept. It is intended to meet the requirements of ISO 14001 Environmental Management Systems and it is currently assessed as complying with those requirements.

The Environment Management System is assessed and subject to regular audits by Best Practice Certification (JAS-ANZ Accreditation #: M4381109AF), Certificate Number: 42003586687E.

2. Objectives and Targets

Each year Environmental objectives and targets are set to define the Environmental priorities, monitor the Environmental performance of the company and to facilitate continual improvement. These targets apply to the business as a whole and to each individual project.

The Project's performance is reported via the Project Report.

- Minimise Environmental incidents while striving for zero (0) incidents
- Achieve compliance with all environmental legislative, regulative and any other requirements to which we subscribe, incur zero (0) environmental related notices and fines
- Conduct one (1) per week Environmental Inspection by Site Management
- Reduce the amount of waste generated by the Project and therefore directed to landfill, where possible redirect any to recycling

3. Legal Requirements

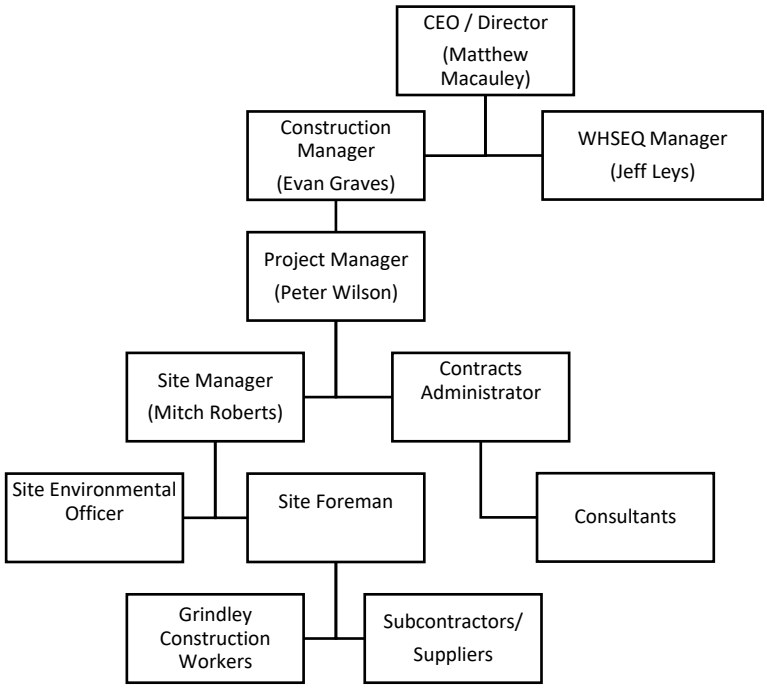
There will be Legislation, Codes of Practice and Standards that apply to each job and they will be identified through completion of the 146 - Project Hazard Assessment and review of the 814 Legal and Other Requirements Register and then ticked below as applicable to the project.

Name of Document	Type of Document	Applicable
Protection of the Environment Operations Act 1997	Legislation	☒
Waste Avoidance and Resource Recovery Act 2001	Legislation	☒
Environmental Planning and Assessment Act 1979	Legislation	☒
Environment Protection and Biodiversity Conservation Act 1999	Legislation	☒
Environmental Hazardous Chemicals Act 1985	Legislation	☒
Soil Conservation Act 1938	Legislation	☒
Contaminated Land Management Act 1997	Legislation	☒
SSD Development Consent 15822622	Planning	☒

SSD Development Consent is available via the CMS.

4. Roles and Responsibilities

4.1. Project Organisation Chart



4.2. Responsibilities

4.2.1. Peter Wilson - Project Manager

- Control of system compliance
- Supervision of head office process control
- Oversee site process control
- Internal monthly reporting
- Sub-contract administration and payment
- Review all incident/non-conformance records, accident & incident reports and audit reports
- Authorise subcontract tendering and subcontract procedures, and establish an administrative system to monitor the subcontracts and the payment of subcontractors in relation to their environmental responsibilities

4.2.2. Mitch Roberts - Site Manager

- Implement and ensure adherence to Project Plan and all associated sub-plans
- Implement all environmental plans and procedures as required
- Co-ordination of all on site activities including trade interface
- Organisation of all deliveries and managing materials handling
- Establish and maintain site environmental measures
- Review all Subcontractor Management Plans and waste management plans submitted and obtain approval from Project Manager before allowing work to commence on site
- Implementation of all inspection and testing requirements
- Liaison and co-ordination with testing and inspection authorities

- Preparation of check sheets and supervision of remedial works
- Liaise with Project Manager to co-ordinate the works and resources required

4.2.3. Site Environmental Officer

- Ensure compliance with environmental plans and regulations
- Isolate and report any environmental spills/events to site manager and Environmental Manager
- Conduct weekly site inspections
- Conduct inspections after intense or prolonged inclement weather
- Ensure all environmental protection equipment is in place
- Advise the Site Manager / Foreman on areas of concern
- Quarantine unsafe work areas, materials, plant and equipment
- Identify and report potential environmental impacts and risks
- Assume the role of company Representative for the Environment on site

4.2.4. Subcontractors

- Ensure compliance with environmental plans and regulations
- Ensure all required paperwork is presented on submission of progress claims

5. Project Planning

5.1. Systems and Procedures

The Project Manager is responsible for the implementation of the management system for the project in accordance with the Project Environmental Management Plan.

The Project Manager and their nominees shall review weekly the effectiveness of the system and will consider project safety and environmental issues.

Preparation of project programs and monitoring of progress shall be carried out from time to time as required. The Project Manager shall address any changes required by the client or by virtue of latent conditions, safety considerations or environmental considerations and update the program accordingly.

When a non-conformance or incident is detected, it shall be addressed according to the Grindley Construction Environmental Management Manual. When it is necessary to seek concession, the Project Manager shall act according to the requirements of this procedure. The corrective action and improvement to prevent the reoccurrence of non-conformance/incident is also covered in the Grindley Construction Environmental Management Manual.

5.2. Strategy

Construction of Midtown Ivanhoe Building C2 will be via a Design and Construct Contract and the other Project/Site Specific Management Plans.

The Project management team will be responsible for:

- Site establishment
- Temporary fencing of compound to ensure security
- Hoarding off to any existing facilities
- Environmental protection apparatus being correctly installed and or maintained ready for use in case of emergency
- Site inductions, environmental & safety meetings
- Production, review and approval of work method statements and Waste Management plans
- Monitoring adherence to Waste Management plans
- Monitoring inspection and testing methods and records
- Implementing Project Quality, Environmental and Safety plans
- Monthly reporting of progress

5.3. Project Designers and Consultants

Contact details for project designers and consultants are established and distributed by the superintendent on initiation of the project. Some of these are displayed on the wall of the site office, as well as filed in the appropriate folder.

Project Disciplines	**Consultant Company and Name**
Council	City of Ryde Council
Client	Frasers Property
Client Superintendent	Frasers Property
Project Architect	Chrofi
Head Contractor	Grindley Construction
Landscape Architect	Site Design and Studios
BCA Certifier	AED Consulting

5.4. Neighbour Notification

Managing Neighbour interfaces with the construction process is an important part of the process of environment interaction. The following processes will be undertaken by Grindley to inform neighbours of the work as well as provide a contact point:

- Site Sign will be erected giving contact details of the site manager to be contacted for any concerns/queries regarding the construction works
- Letters will be issued to all immediate neighbours also with Grindley contact details as well as an indicative start and duration of construction activities (If required).

5.5. Community Consultation and Complaints

The Community Communication Strategy developed by Frasers Property has been developed in response to conditions B12 and B13 of Development Consent SSD 15822622 and is included in Appendix 8.

6. Environmental Impact Issues

6.1.1. Air Quality and Dust Management

Air quality and dust management is the responsibility of the site manager. As per Impact Mitigation Plan 006 (IMP006 – Appendix 9) dust minimisation techniques are to be employed as needed during construction, including the use of water carts as necessary. Air quality is to be managed through the proper maintenance of all machinery on site as per plant maintenance declaration form (form 129) (refer to Grindley Construction Safety Management Plan). Any incidents where poor air quality becomes an issue is to be assessed on a case by case basis and managed according to all relevant legislation.

In addition to the mitigation measures outlined above an Air Quality and Odour Management Plan is included in Appendix 4 prepared by EDP Consultants.

The measures in the below table are required to be implemented and maintained to demonstrate compliance with the conditions listed to reduce the impact, if any, on surrounding neighbours and workers.

Table 1 – Management of Dust Impacts

Potential source	Potential impacts	Mitigation	Responsibility	Performance measures
Excavation/Demolition	Neighbourhood Complains, Worker Exposure	Water Suppression during dry conditions. Daily water suppression during earthworks activities. Site shade cloth installed to fence.	Principal Contractor, Subcontractor	Onsite Observation of Dust and visual monitoring.
Asbestos Dust (Unexpected Finds)	Neighbourhood Complains, Worker Exposure	Air Monitoring for air quality, Suppression with water.	Principal Contractor, Subcontractor	Onsite Observation, Implementation of AMP and compliance.
Dirt Stockpiles	Wind Driven Dust to Neighbourhood,	Covering of stockpiles with tarps/fabric and water suppression. Site shade cloth installed to fence.	Principal Contractor, Subcontractor	Visual Evidence, or replacement of fabric
Truck Loads	Neighbourhood Complains, Worker Exposure	Ensure Trucks entering and leaving site have loads covered.	Principal Contractor, Subcontractor	Surveillance of trucks entering and exiting site.

6.1.2. Contaminated Water and Soil

Contaminated water and soil is to be treated as per section 4.1 above 'Spills and or Discovery of Contaminated Material on Site'. Any contamination that is contained on site is to be assessed and dealt with as per all relevant legislation.

6.1.3. Flora and Fauna

Flora and Fauna on the site will be managed through the recommendations of the Flora and Fauna conditions detailed in the SSD approval and any subsequent conditions will be complied with as detailed.

6.1.4. Noise

Noise impacts from construction are an ongoing concern for all construction projects. Construction noise management will be in accordance with the Acoustic Assessment Report (Construction Noise and Vibration Management Plan for the purpose of Development Consent SSD 15822622 included in Appendix 3) and will be the responsibility of the Principal Contractor to enforce.

6.1.5. Traffic

Traffic management will be in accordance with the Construction Traffic Management Plan (Construction Pedestrian and Traffic Management Plan for purpose of Development Consent SSD 15822622 included in Appendix 2) and will be the responsibility of the Principal Contractor to enforce.

The effectiveness of the TMP control measures will be monitored regularly, in particular the Environmental Inspection conducted weekly will formally prompt the inspection of the effectiveness of the control measures in addition to the informal observations made by Site Management in their day to day operations.

6.1.6. Waste Management

Waste Management will be in accordance with the Waste Management Plan (Construction Waste Management Plan for purpose of Development Consent SSD 15822622 included in Appendix 5) and Impact Mitigation Plan 004 (IMP004) included in Appendix 9. A waste management plan will be developed in conjunction with the selected waste contractor for the project and will be audited at random intervals throughout the course of the project.

6.1.7. Groundwater

This CEMP is to include a groundwater management plan including measures to prevent groundwater contamination. The site history recorded the proposed basement floor levels are above the measured groundwater levels, within bedrock.

In addition, given that the (upslope) C1 site will have a similar basement level, it is expected that most groundwater seepage from elevated groundwater levels would be intercepted by that basement. Therefore, no permanent groundwater inflows are anticipated, although some ephemeral seepage may still occur through defects within the rock and allowance should be made for drainage of these inflows.

From a practical perspective, the anticipated ephemeral groundwater seepage into the basement excavation is likely to be readily managed using ‘sump-and-pump’ methods, in the temporary and long-term case.

In the unlikely event groundwater is encountered works will cease and the principal contractor will consult with relevant consultants to assess and implement applicable measures. This would be in addition to the ground water measures listed below.

Table 1: - Management of Groundwater Contamination

Potential source	Potential impacts	Mitigation	Responsibility	Performance measures
Industrial	Groundwater contamination	Dilute any chemical with water washed into the soil, use of spill kits.	Principal Contractor, Subcontractor	Monitoring Site Observations and

Sediment and Erosion Control
This section identifies sediment control systems to be implemented on the project. The sediment control systems are designed to minimise erosion on-site and retain sediment eroded by water and wind.

Sediment and erosion control will be as per the sediment and erosion control plan. These plans have been prepared in accordance with Landcom's guide on Managing Urban Stormwater (the "Blue Book")

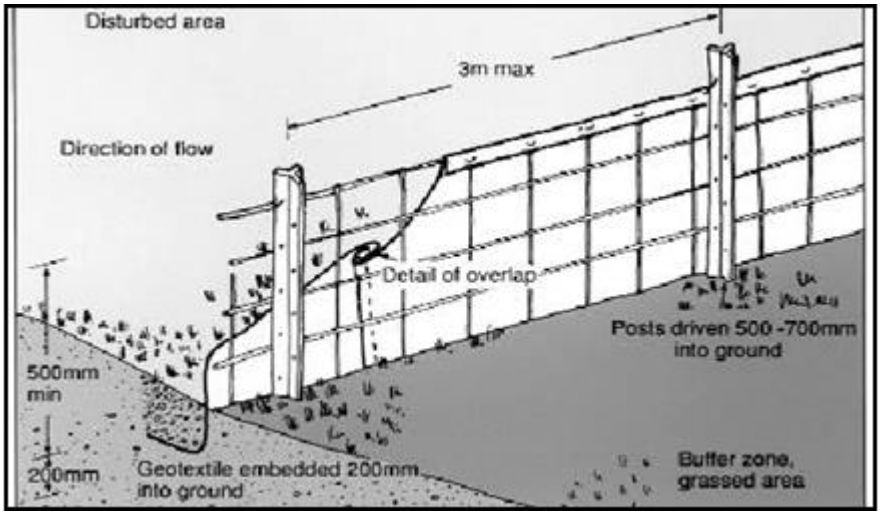
The erosion and sediment control devices described will be installed during site preparation works along with the site fences and sheds. These devices will be in place throughout all construction phases, especially excavation. Refer Appendix 6

6.2. Sediment and Erosion Control Devices

Unnecessary disturbance of the site shall not occur and all cuts are to be stabilised as soon as possible after the completion of site earthworks. Extra care will be taken to prevent sediment run off into all neighbouring lots and stormwater. Any collected silt will be disposed of in accordance with all other relevant codes and standards.

6.2.1. Silt Fences

Silt fences are to be installed to all site boundaries. Geotextile fabric will be fixed to the temporary construction fencing to the 'downhill' boundaries of the site. The fabric will be turned down under the existing ground line and secured at regular intervals not exceeding 3m in accordance with the following diagram.

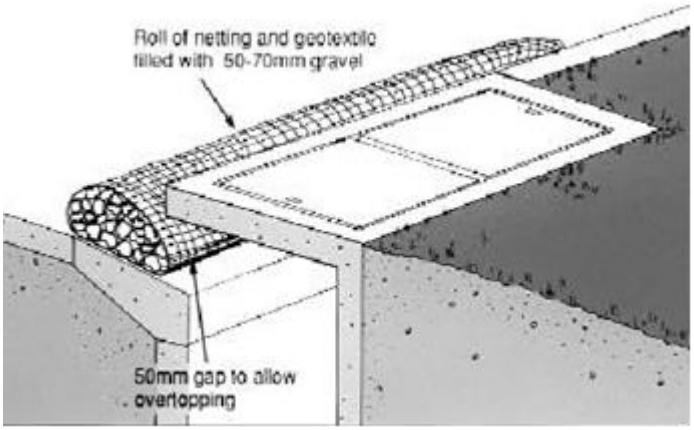


6.2.2. Vehicle Access

Vehicular access will be controlled to prevent sediment being tracked. This will be done by maintaining an all weather access/driveway composed of an approved course aggregate surface. Also if the need arises a shaker grid will be installed to the main access by Grindley Construction during the construction works. Any sediment that is tracked onto the surrounding roads will be cleaned off in a timely manner.

6.2.3. Stormwater Inlets

All stormwater inlets are to be covered with geotextile fabric in a roll or other format to ensure that no sediment enters into the stormwater system. This will be the responsibility of the Site Manager to enforce. The rolls will not only be placed directly at the inlets as shown below, they will also be placed at regular intervals in the gutters 'upstream' from the inlets creating multiple barriers.



6.2.4. Stockpiles

If appropriate topsoil is to be stockpiled on site then the following measures will be put in place. If stockpiling is required, stockpiles shall be stored at least 2 meters clear of drainage lines, natural watercourse and established trees.

Stockpiles will have temporary silt fences in place around the stockpiles to create an enclosure and if necessary they will be covered will shade cloth or tarpaulin to retain the materials on the stock pile. The location of stock piles will be determined on site.

6.2.5. Waste Enclosures

Dedicated building waste enclosures will be set up around the site to enclose building waste where required. No waste enclosures will be set up outside of the site boundary.

6.2.6. Dust Control

The shade cloth to the boundary fences will be maintained throughout all stage of construction to assist in dust control. Also if the need arises due to excessive dust being created, the site will be watered down by a water truck where possible, and/or sprinklers and hoses. Also all stockpiled soils will be covered during periods of high wind to reduce the dust created from on site storage.

6.2.7. Monitoring

In order to maintain the various erosion and sediment control devices, regular inspections, repairs and cleaning will be carried out on the silt fences to the boundaries, stockpiles, waste enclosures, and to the stockpile covers in accordance with the Construction Soil and Water Management Plan included in Appendix 6.

Inspections of the site erosion and sediment control devices will be carried out in accordance with CMS, Environmental Inspection, conducted weekly pending tasks being executed.

7. Performance Evaluation

Grindley evaluates its performance to assist with achieving our core value of commitment. It's evaluated against a number of objectives, notably those included in our Environmental Policy, the Objectives and Targets of this Plan along with those included elsewhere within GMS. With the outcome being used to improve our performance from both a failure to an opportunity to improve perspective.

7.1. Inspections and Monitoring

Regular compliance activities, such as inspections, observations and monitoring will be undertaken throughout construction of the Project.

The following inspections will typically be conducted at the documented frequencies pending tasks being executed:

Phase of Construction	Item	Responsibility	Frequency
Al Phase of Construction	Environmental Inspection	Site Management	Weekly, post intense/prolonged inclement weather, UFP triggered
Al Phase of Construction	Site Shutdown Mitigation Inspection	Site Management	Prior to specific extended periods of site closure
Al Phase of Construction	Project Managers WHSEQ Project Inspection	Project Team	Quarterly
Al Phase of Construction	WHSEQ Monthly Project Inspection	WHSEQ Manager	Monthly
Al Phase of Construction	WHSEQ Quarterly Project Inspection	WHSEQ Manager	Quarterly

Inspections are conducted using the Inspection tool and action items (non-compliance) and opportunities for improvement are managed using the Observations tool of the CMS. Action items (non-compliance) and opportunities for improvement are to be documented as Observation(s) identifying the non-compliance, detail what is required to ensure compliance and assign to the applicable person who is responsible for rectifying the failure or opportunity for improvement. Upon satisfactory action being taken to rectify the non-compliance, the Observation's status is to be changed to Closed.

The Project Team are responsible for the management of Observations to ensure they are actioned and closed. The Project Team are responsible for reporting any suspected System breakdown to the WHSEQ Manager.

8. Incident Management

All incidents no matter how minor must be reported to Site Management as soon as practical. The incident scene is not to be disturbed until directed otherwise by Site Management and or as required to make the scene safe to assist an injured person or prevent immediate further damage to the environment or property.

In the event of an incident, first priority is the health and safety of persons involved and secondly the protection of the environment and property.

In the event of an incident, the applicable Emergency Response Plan is to be implemented, typically the following is to immediately occur:

- Grindley become aware of incident
- Scene isolated
- Situation evaluated, if required evacuation procedure activated
- Scene made safe to prevent further injury and or damage
- First aid provided
- Further environment and property damage prevented and or minimised

As soon as practical all significant/critical incidents such as a fatality, serious injury, permanent or serious environmental and or property impact/damage or a near miss with the potential to have been any of those, the WHSEQ Manager is to be immediately notified.

Upon the incident being controlled and the scene made safe, Incident/Accident Reporting and Investigation Procedure 791 and 757 Environmental Emergency Response, is to be actioned.

8.1. Emergency Contacts

Site Emergency Contact Details (Form 117) details the key contacts that may be required in the event of an emergency. The details are included below and displayed via the Site's noticeboard.

Position	Name	Contact	Alt Contact
Site Manager	Mitch Roberts	0425 216 446	
Project Manager	Peter Wilson	0414 914 514	
First Aider	Mitch Roberts	0425 216 446	
Safety Officer	Mitch Roberts	0425 216 446	
Environmental Officer	Mitch Roberts	0425 216 446	
WHSEQ Manager Rehab Co-ordinator	Jeff Leys	(02) 9988 3811	

8.2. Emergency Response Plans

Potential Emergency	What to Do	Relevant Authorities and Persons
Injury caused by: • Fire • Explosion • Machinery accidents • Minor injuries	• For serious injuries call an ambulance. You should also have the contact details of the nearest doctor, Medical Centre and Hospital. • Immediately inform the site First Aid Officer. • Follow the procedures as detailed in the Site Safety plan. • For major injuries contact the Site Manager or Project Manager	• Emergency Services • Nearest Doctor • Medical Centre • Site Manager • Project Manager
Fire • Fire at the diesel tank • Fire at any of the machineries • Fire caused by vandalism	• Evacuate all personnel to a safe area immediately. • Call the Fire Brigade (Emergency Services). • If the fire is likely to damage neighboring property inform the adjacent residents. • Follow the procedures as detailed in the Site Safety plan. • For major fire emergencies, contact the Site Manager or Project Manager	• Emergency Services • Site Manager • Project Manager • Adjacent residents
Explosion (e.g. rupture in a gas line)	• Evacuate all personnel to a safe area immediately. • Call the Emergency Services immediately. • Contact the neighbouring residents. • If service related, call the relevant service provider (e.g. AGL) • Follow the procedures as detailed in the Site Safety Plan • Contact the Site Manager or Project Manager	• Emergency Services • AGL • Site Manager • Project Manager • Adjacent residents
Spills • Major spill when filling the diesel tank • Major spill from the diesel tank stored on-site • Spill or release of other hazardous chemicals of material	• For major spills, immediately call the Fire Brigade. • Identify the source of the spill. • Refer to the Material Safety Data Sheet (MSDS) and quickly evaluate the hazards of the material. • If the material is dangerous, evacuate the site immediately and notify the neighbours. • If it is safe, stop the source of the spill immediately. • Contain the spill and control its flow. • Block storm water drains downstream of the spill. • EPA and local council must be notified about any spills that are likely to threaten the environment. • If the spill is likely to impact on the catchments, contact Department of Natural Resources (DNR) immediately. • Clean up small spills promptly to prevent run-off into the storm water system. • Contact the Site Manager or Project Manager	• Emergency Services (fire brigade) • DEC • Council Officer • Site Manager • Project Manager • DNR
Heavy rainstorm and flood – beyond the capacity of the	• Contain/minimise the flow. • Contact Council immediately.	• Council • Site Manager

Potential Emergency	What to Do	Relevant Authorities and Persons
sediment and erosion controls on-site. Or, failure of the sedimentation control measures.	• Investigate reasons for failure and prepare an incident report including details of five-day rainfall figures. • Contact the Project Manager	• Project Manager
Discovery of items of conservation value (e.g. flora & fauna, heritage)	• Fence off the area as "no go" zone and contact the Site Manager or Project manager immediately for further action.	• Site Manager • Project Manager
Discovery of contaminated material on-site (e.g. underground fuel storage tanks)	• Fence off the area as "no go" zone and contact the Site Manager or Project manager immediately for further action.	• Site Manager • Project Manager
Rupture of Authority pipelines (water pipes, sewerage pipes)	• Contain/minimise the flow • Ensure all spilled materials are contained on site or if running off site are directed through sediment control measures • Block storm water drains downstream of the spill. • Contact relevant authority as soon as possible • EPA and local council must be notified about any spills that are likely to threaten the environment. • If the spill is likely to impact on the catchments, contact Department of Natural Resources (DNR) immediately.	• Relevant Authority • DEC • Council Officer • Site Manager • Project Manager • DNR
Waste contractor not submitting waste dockets and illegally disposing of waste in an unauthorized facility	• Immediate contact with contractor to establish reasons • Hold all payments to contractor • Request waste dockets for approved facility • Notify local council where waste is being deposited (section 148 POEO Act 1997)	• Site Manager • Project Manager • Environment Manager • Council Officer

Appendix 1: Environmental Policy

Grindley

Environmental Policy

Grindley Construction was established in 1988 and has built a reputation based on our core value of Commitment. Commitment to be an environmentally and socially responsible organisation while meeting the needs of our clients without hindering future generations.

To achieve this, we will:

- Demonstrate leadership at all levels of the organisation, committed to sustainability
- Maintain a management system that allows for the protection of the environment including the prevention of pollution
- Incorporate into the management system legislative, regulative, and any other requirements to which we subscribe that relate to environment to ensure minimum compliance
- Set measurable objectives at relevant functions and levels of the organisation
- Plan and implement procedures to achieve objectives
- Monitor performance
- Maintain and continually improve our management system
- Provide education and training to facilitate knowledge and experience
- Allocation of appropriate resources to achieve our objectives
- Continually strive to achieve greater environmental sustainability where our activities preserve natural resources for future generations

We acknowledge that the organisation operates in an environment where we have a responsibility to all and are committed to continual improvement of sustainability and prevention of pollution.

Our policy documents how we will achieve our commitment to being environmentally and socially responsible. It governs how we manage the environmental impacts of our activities and it will be communicated to all those applicable in our operations. The policy will be reviewed regularly to maintain relevance and appropriateness to our organisation's objectives.

Alan Carstens Owner	Matthew Macauley Chief Executive Officer	John Little Company Secretary

[illegible] Environmental Policy
Doc: 812 Version: 5

Appendix 2: Construction Traffic and Pedestrian Management Sub-Plan

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS



CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN

Approved Residential Development
Building C2, Ivanhoe Estate Macquarie Park

Reference: 24.277r01v02
Date: July 2024

Suite 2.08, 50 Holt St
Surry Hills, NSW 2010

t: (02) 8324 8700
w: www.traffix.com.au

DOCUMENT VERIFICATION

Job Number	24.277			
Project	Building C2 Ivanhoe Estate Macquarie Park			
Client	Grindley			
Revision	**Date**	**Prepared By**	**Checked By**	**Signed**
v02	11/07/2024	Stephan Hoang	Thomas Yang	

TRAFFIC CONTROL PLAN CERTIFICATES

Prepare a Work Zone Traffic Management Plan			
Name	Thomas Yang	**Card No.**	TCT0028714

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1. INTRODUCTION

TRAFFIX has been commissioned by Grindley to prepare a Construction Traffic and Pedestrian Management Plan (CTPMP) report for the approved construction of Building C2 of the Ivanhoe Estate, located at the western corner of Epping Road and Herring Road. The development forms part of Stage 2 of the approved State Significant Development (SSD-15822622), which was granted by the Minister for Planning and Public Spaces on 28 November 2022.

This report documents the construction traffic and pedestrian management arrangements and methodology relating to the approved works and should be read in conjunction with any other construction documentation prepared by the applicant.

The report is structured as follows:

- Section 2: Outlines the CTPMP requirements.
- Section 3: Documents the existing traffic conditions.
- Section 4: Describes the overall construction program.
- Section 5: Describes the proposed traffic management arrangements.
- Section 6: Concludes the report.

2. CTPMP REQUIREMENTS

2.1 Traffic Guidance Schemes

The Traffic Guidance Schemes (TGSs) that are included in this report, should be implemented taking due account of on-site conditions as will occur over the construction period. Accordingly, construction crew are expected to respond in a pro-active manner to ensure that this plan is implemented to maximum effect and with no obvious safety issues being overlooked. In particular, the following matters are considered noteworthy:

- All signs are to be placed where clear visibility is available;
- Installations should be checked intermittently during the course of the day/s; and
- SafeWork NSW certified Traffic Controllers shall be on-site during work hours to supervise vehicle, cyclist, and pedestrian movements.

To improve sign visibility, signs should be positioned utilising existing power poles and signage stems where possible, covered where not applicable, and not positioned between parked cars where possible (to avoid hazard to cyclists and improve visibility for vehicles).

It is noted that TRAFFIX is responsible for the preparation of this CTPMP only and not for its implementation, which is the responsibility of the builder.

2.2 Development Consent CTPMP Requirements

In addition to the above, it is noted that the Notice of Determination (NoD) for SSD-15822622 outlines a requirement for the preparation of a Construction Traffic Management Plan. Specifically, Condition B36 states the following:

B36. *Prior to the commencement of any works, a* ***Construction Pedestrian and Traffic Management Plan*** *(CPTMP) prepared by a suitably qualified person shall be endorsed by TfNSW (Sydney Coordination Office) and submitted to the Certifying Authority. The CPTMP must be prepared in consultation with Council, TfNSW (Sydney Coordination Office), and TfNSW (RMS).*

The CPTMP shall address (but not be limited to):

(a) location of the proposed work zone;

(b) haulage routes;

(c) construction vehicle access and traffic control arrangements;

(d) proposed construction hours;

(e) estimated number of construction vehicle movements (including cumulative impacts from Stage 1);

(f) any changes required to on-street parking;

(g) construction program;

(h) any potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction;

(i) cumulative construction impacts of projects considering any traffic and pedestrian management plans prepare for these projects to ensure that work activities are coordinated and managed to minimise impacts on the road network. Information relating to cumulative construction impacts to be sourced from TfNSW (Sydney Coordination Office);

(j) measures to ensure construction vehicles do not arrive at the site or surrounding areas outside approved hours;

(k) measures proposed to mitigate any associated general traffic, public transport, pedestrian access and cyclist impacts/conflicts;

(l) measures to encourage public transport use and other non-car travel options by construction workers.

Prior to the commencement of works, a copy of the CPTMP demonstrating compliance with the above must be submitted to TfNSW and the Planning Secretary.

2.3 Previous Consent

The subject works form a component of a multi-stage masterplan development of Ivanhoe Estate approved under SSD-8707 and SSD-8903. Stage 1 of the approved masterplan have been completed.

2.4 Location and Site

The subject site is located at western corner of Epping Road and Herring Road. The site is approximately 605 metres south of the Macquarie University Metro Station, approximately 1.1 kilometres west of Macquarie Park Metro Station and approximately 12.7 kilometres northwest of the Sydney Central Business District.

The site is approximately 8.2 hectares and is currently an active construction site. It has a north-west frontage of approximately 210 metres to Herring Road and neighbouring residential developments, and a south-west frontage of approximately 400 metres to Epping Road. It has a north-east boundary to neighbouring residential developments and a south-east boundary to commercial developments.

A Location Plan is presented in **Figure 1** and a Site Plan presented in **Figure 2** which provide an appreciation of the generally character of roads and other key attributes in proximity to the site.

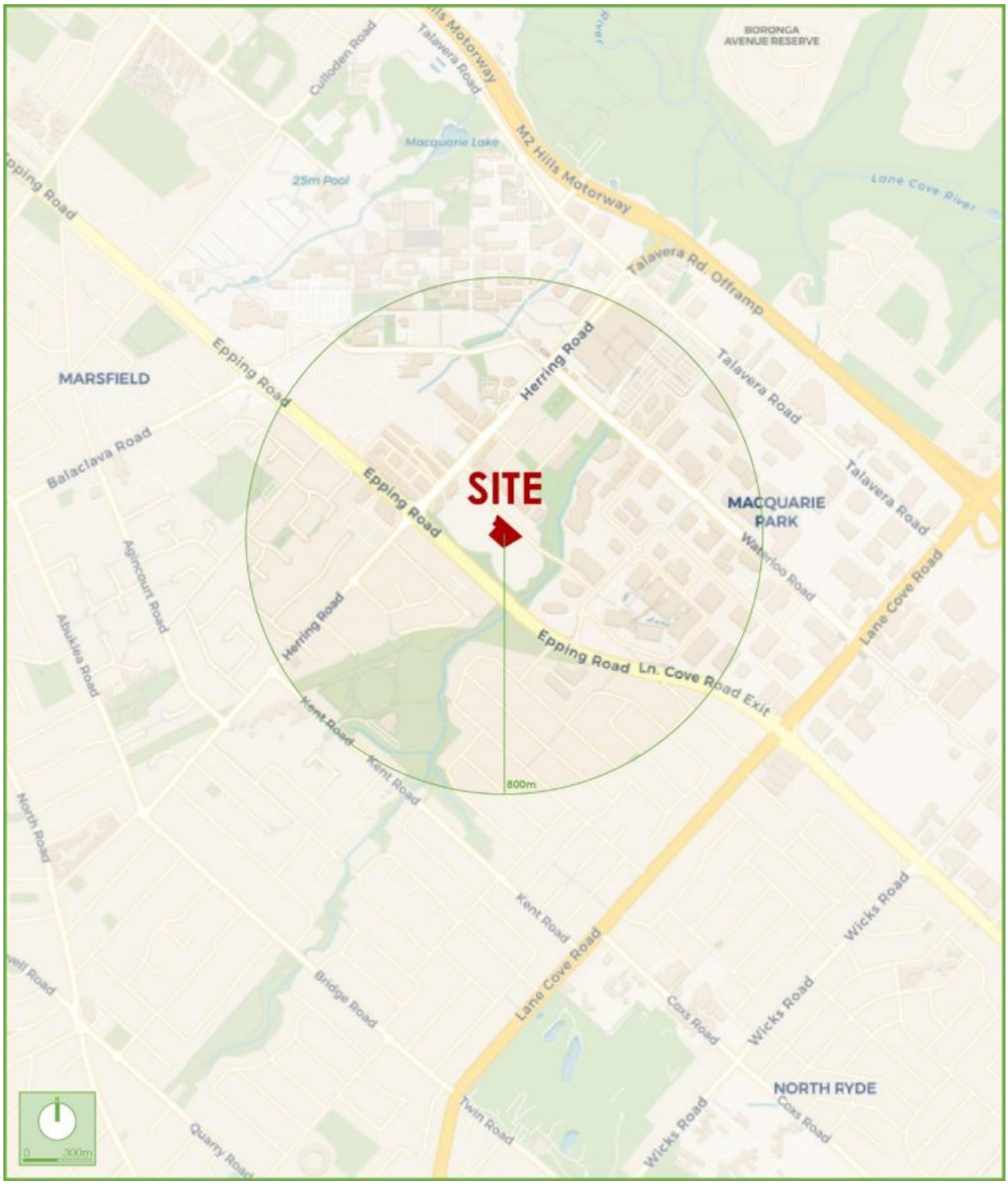


Figure 1: Location Plan



Figure 2: Site Plan

2.5 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- M2 Motorway: a TfNSW classified State Road (MR 6002) that traverses in an east-west direction between Lane Cove in the east and the Baulkham Hills in the west. Within the vicinity of the site, it is subject to 100km/h speed zoning and accommodates two (2) to three (3) lanes of traffic in each direction.
- Epping Road: a TfNSW classified State Road (MR 373) that generally traverses in an east-west direction between Longueville Road in the east and Beecroft Road in the west. Within the vicinity of the site, it is subject to 70km/h speed zoning and accommodates three (3) lanes of traffic in each direction. Kerbside parking is not permitted in either direction.
- Herring Road: an Unclassified Regional Road (UR 7486) that traverses in a north-south direction between Talevera Road and the M2 Motorway in the north and Bridge Road in the south. Within the vicinity of the site, it is subject to 50km/h speed zoning and accommodates two (2) lanes of traffic in each direction. Kerbside parking is not permitted in either direction.
- Lyonpark Road: a local road that traverses in a north-south direction between Griffnock Avenue in the north and Epping Road in the south. It is subject to a 50km/h speed zoning and accommodates a single lane of traffic in each direction with restricted on-street parking along both sides.

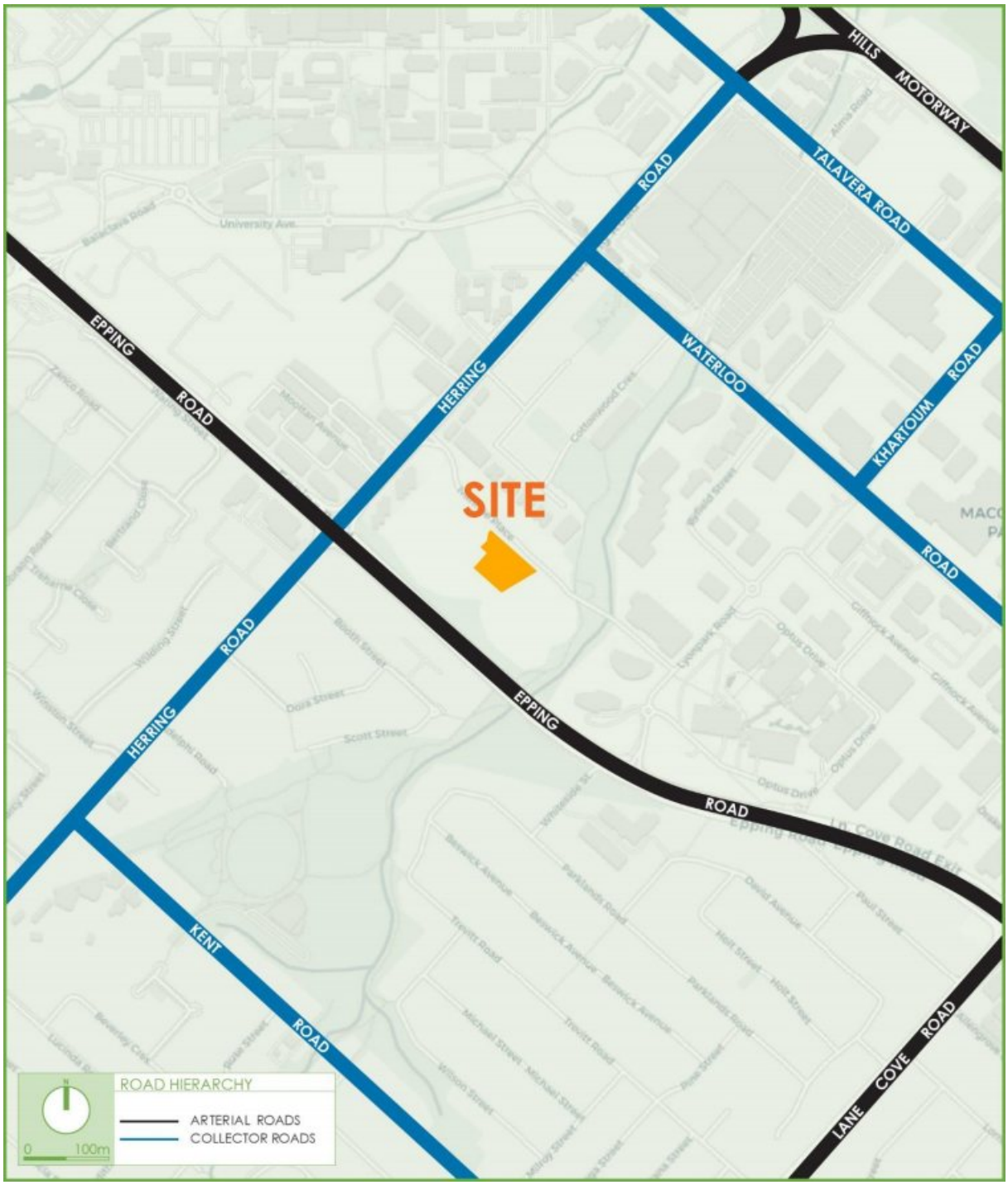


Figure 3: Road Hierarchy

2.6 Public Transport

The site is well located to take advantage of the numerous public transport services that serve the local area. The existing bus services that operate in the locality are shown in **Figure 4** and are summarised as follows:

- 288 – Epping to City Erskine Street
- 290 – Epping to City Erskine St (Night Service)
- 291 – Epping to McMahon Point
- 293 – Marsfield to City Wynyard
- 517 – Macquarie Centre to Ryde
- 518 – Macquarie University to Meadowbank Wharf
- 544 – Macquarie Centre to Auburn

Additionally, the site is located approximately 605 metres south of the Macquarie University Metro Station. This stations provide services along the Metro North West Line, which provide services to Tallawong, Epping, and Chatswood and to be extended into the CBD in 2024 (as per Sydney Metro's November 2023 update).



Figure 4: Public Transport

3. OVERVIEW OF CONSTRUCTION PROGRAM

3.1 Hours of Work and Noise

Construction is expected to occur over approximately 24 months, however further clarification will be provided by the builder. The standard hours of construction are to be in accordance with NoD SSD-15822622 summarised below:

C.1 Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

(a) between 7.00 am and 7.00 pm, Mondays to Fridays inclusive; and

(b) between 8.00 am and 4.00 pm, Saturdays.

C2. No work may be carried out on Sundays or public holidays.

C3. Activities may be undertaken outside of these hours if required:

(a) by the Police or a public authority for the delivery of vehicles, plant or materials; or

(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm.

C4. Notification of such activities must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

C5. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

(a) 9.00 am to 12.00 pm, Monday to Friday;

(b) 2.00 pm to 5.00 pm Monday to Friday; and

(c) 9.00 am to 12.00 pm, Saturday.

3.2 Construction Site Establishment Plan

The construction site establishment plan has been provided in **Appendix A**, indicating the location of the access points to the site, locations of onsite equipment such as cranes, hoists, scaffolding and hoarding to be installed around the perimeter of the site.

3.3 Builder Contact

The below contact information including afterhours contact must be prominently displayed on site and provided to nearby buildings:

- Name: Peter Wilson
- Position: Senior Project Manager
- Email: pwilson@grindley.com.au
- Telephone: (02) 9988 3811
- Mobile: 0414 914 514

Further to the above, Council is generally available to resolve issues relating to traffic, public transport, freight, servicing and pedestrian access during construction in real time if required.

3.4 Excavation Works

This stage will commence in September 2024 with an approximate duration of 14 weeks. The stage will involve a maximum workforce of 12 people on-site at any one time with an average of 10 people. The maximum sized truck to be utilised during this stage will be 20.0m Avs and truck and dog vehicles. It is proposed that excavation works will occur within the site at all times.

This stage will have an average of 30 truck arrivals per day (30 in, 30 out), with a peak of approximately five (5) truck arrivals during the peak hour. This is considered a minor volume and would mirror the vehicle movements of the Stage 1 construction works and hence, the impact on the performance of key intersections in the locality will be negligible.

3.5 Structure Works

This stage will commence over a 50-week period after bulk excavation works and will involve a maximum workforce of 65 people on-site at any one time with an average of 50 people. The maximum sized truck to be utilised during this stage will be 20.0m AVs. It is proposed that structure works will occur within the site at all times.

This stage will have an average of 15 truck arrivals per day (15 in, 15 out), equating to approximately 2 truck arrivals during the peak hour. This is considered a minor volume and would mirror the vehicle movements of the Stage 1 construction works and hence, the impact on the performance of key intersections in the locality will be negligible.

3.6 Fitout & Finishes Works

This stage will commence over a 34-week period after structure works and will involve a maximum workforce of 85 people on-site at any one time with an average of 70 people. The maximum sized truck to be utilised during this stage will be 8.8m MRVs. It is proposed that fitout & finishes works will occur within the site at all times.

This stage will have an average of 15 truck arrivals per day (15 in, 15 out), with a peak of approximately 5 truck arrivals during the peak hour. This is considered a minor volume and would mirror the vehicle movements of the Stage 1 construction works and hence, the impact on the performance of key intersections in the locality will be negligible.

3.7 Public Domain Works

It is noteworthy to mention that any public domain works along the frontage of the development will be subject to a separate submission to Council. This submission will be arranged by the construction contractor.

4. TRAFFIC AND PEDESTRIAN MANAGEMENT ARRANGEMENTS

4.1 Construction Vehicles

It is expected that the maximum sized vehicle to be utilised during the aforementioned construction stages be a 20.0 metre articulated vehicle (AV), which will access and egress the site via Herring Road.

Additionally, 6.4 metre small rigid vehicles (SRV), 8.8 metre medium rigid vehicles (MRV) and 12.5m heavy rigid vehicles (HRV) will be used throughout the construction process and will access and egress the site via Herring Road and Lyonpark Road.

4.2 Vehicular Access

It is proposed all construction vehicles will access and egress the site via the signalised intersection of Herring Road and the site access throughout the construction period as per current construction activities. Additionally, construction vehicles will be advised to use the future access along Lyonpark Road once the access is fully operation. All construction vehicles will access and egress the site in a forward direction.

Swept path analysis has also been undertaken for 20m AVs accessing / egressing the site via Herring Road and 12.5m HRVs accessing / egressing the site via Lyonpark Road during construction demonstrating satisfactory inbound and outbound movements. The swept path analysis is provided in **Appendix B**.

In addition to the above, the following items are noteworthy:

- All loading and unloading activities are to be contained wholly within the site;
- All adjacent property accesses will be maintained at all times;
- All vehicles are not to obstruct any pedestrian crossings or footpaths; and

4.3 Truck Routes

The proposed truck routes make use of Transport for NSW (TfNSW) classified State Roads, where possible. All drivers will be required to radio in prior to arriving onsite, to avoid queuing on surrounding roads. Drivers will not be permitted to park on surrounding roads outside of the site. The proposed truck routes are recommended to allow all vehicles to access the site in a forward direction, noting that truck movements will be restricted to outside the school's morning and afternoon peak periods. A copy of the routes would be provided to all drivers prior to attending the site, with the proposed routes outlined below.

Two (2) proposed inbound and outbound truck routes are presented in **Figure 5** and **Figure 6**, summarised as follows:

4.3.1 Herring Road Access

- Routes to Site (IN):
  1. Arrive on Epping Road, eastbound/westbound.
  2. Turn left/right onto Herring Road, northbound.
  3. Turn right into site, eastbound.
- Routes from Site (Westbound):
  1. Depart the site access, westbound.
  2. Turn right onto Herring Road, northbound.
  3. Continue straight onto the M2 Motorway, westbound.
- Routes from Site (Eastbound):
  1. Depart the site access, westbound.
  2. Turn right onto Herring Road, northbound.
  3. Turn left onto Talavera Road, westbound.
  4. Turn right onto Christie Road, northbound.
  5. Turn right onto the M2 Motorway, eastbound

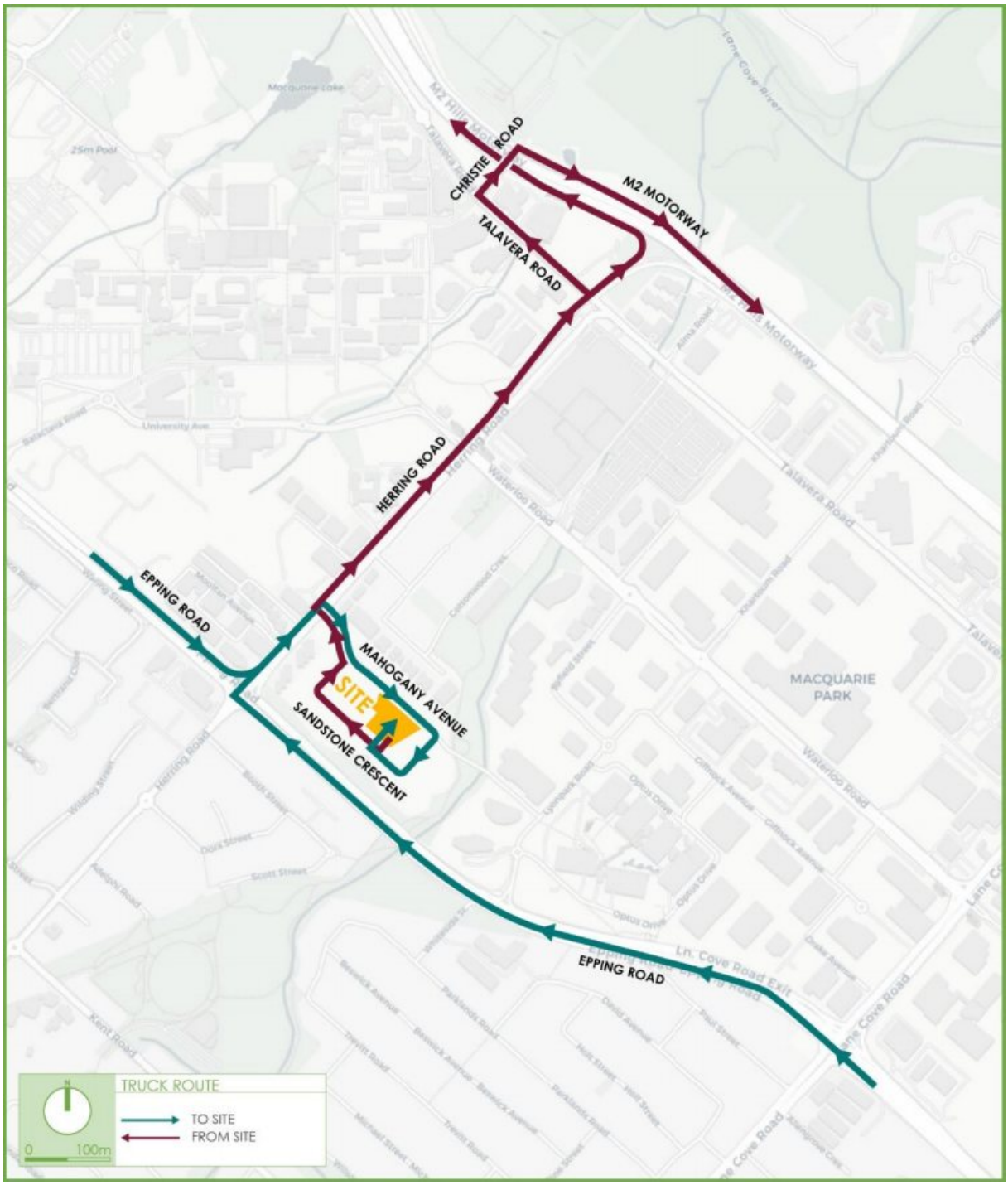


Figure 5. Inbound and Outbound Truck Routes via Herring Road

4.3.2 Lyonpark Road Access

- Routes to Site (IN):
  1. Arrive on Epping Road, eastbound.
  2. Turn left onto Lyonoark Road, northbound.
  3. Turn left into site, westbound.
- Routes from Site (Westbound):
  1. Depart the site access, eastbound.
  2. Turn right onto Lyonpark Road, southbound.
  3. Turn left onto Epping Road, eastbound.
- Routes from Site (Eastbound):
  1. Depart the site access, eastbound.
  2. Turn right onto Lyonpark Road, southbound.
  3. Turn left onto Epping Road, eastbound.
  4. Turn left onto Lane Cove Road, northbound.
  5. Turn left onto the M2 Motorway, westbound.



Figure 6. Inbound and Outbound Truck Routes via Lyonpark Road

4.4 Trucks Arrivals

All trucks will be linked via CB radio and/or hands-free mobile and will only be called to the site when required and when there is sufficient capacity to accommodate the proposed trucks. This management of loading / unloading or deliveries is envisaged to be the same throughout all stages of construction and will ensure no trucks would be required to queue or park on-street.

4.5 Traffic Controllers

SafeWork NSW accredited traffic controllers will be utilised at the site vehicle access points/works zone to assist construction vehicles and pedestrians during work hours. It is noted that traffic controllers are not to stop or slow traffic at any time on public roads to allow trucks to enter or exit the site. Additionally, pedestrians may be held only for very short periods to ensure their safety when trucks are leaving or entering the site, but they are not to be stopped in anticipation – i.e. pedestrians have right of way on the footpath at all times.

4.6 Permits

Permits including out of hours permits, road/lane closure permits, crane permits etc. will be submitted to Council in a separate application.

4.7 Concrete Pumping Activities

All concrete pumping activities will be conducted within the site from the internal loading zones in the site. It should be noted the above activities will be completed using line pumps and/or static lines.

4.8 Crane Requirements

A mobile crane will be utilised throughout the construction of Building C2. The crane will be located within the site and will facilitate loading / unloading of material, machinery plant, etc. from within the site storage area and adjacent loading zones.

It is also noted that the tower crane installation will not impact any of the nearby public trafficable roads (Epping Road and Herring Road).

4.9 Pedestrian Control

Pedestrian access surrounding the work site will be managed safely during all construction stages. In order to maintain pedestrian safety, A-Class hoarding will be installed along the Epping Road and Herring Road frontage to maintain pedestrian thoroughfare. The A-Class hoarding will be maintained from Stage 1 of the Ivanhoe Estate through the construction of Building C2. Additionally, temporary chain mesh fencing will be installed along the perimeter of the C2 building site within the Ivanhoe Estate.

In addition to the above, all material, plant and spoil bin storage is to be accommodated within the site at all times during all stages of construction. No building materials shall be placed, dumped or left on any Council road or footpath area at any time, with footpaths to remain in a safe condition for use by pedestrians at all times. Should the builder require any place of any plant/equipment on Council road or land, an application for relevant approvals will be required.

These pedestrian control arrangements are therefore considered acceptable and will ensure that pedestrian safety is maintained at all times.

4.10 Emergency Vehicle Access

Emergency vehicle access adjacent to the work site will be maintained at all times.

4.11 Access to Neighbouring Properties

All neighbouring properties are to have their vehicular and pedestrian accesses maintained at all times over the course of construction. If at any time, the accesses to the neighbouring properties are obstructed, temporary access arrangements will be provided to the satisfaction of the occupants and Council.

4.12 Worker Vehicles

As the site has ample cleared space for informal parking, workers will have plenty of opportunities to park on-site. However, workers will be encouraged during inductions to utilise the excellent range of public transport services available in the locality. Information relating to the available public transport options will be provided within induction material provided to contractors by the builder.

4.13 Monitoring

A monitoring and review process for the CTPMP will be set out by the Construction Project Manager to ensure that the CTPMP is implemented correctly, in compliance with all regulations and policies and also adapted to reflect any changes or variations during the actual construction process.

4.14 Community Consultation

The Construction Project Manager will be the main point of contact for all enquiries, complaints, feedback, and compliments regarding the issues arising from the traffic management arrangements put in place. This may involve distributing notification letters notifying nearby residents and the community of the proposed traffic management arrangements, their potential impact, the Construction Manager's phone and email contact. Specifically, the disruption to existing travel routes will need to be explicitly made known to community members, parents, students, staff so that their safety is not compromised. The details and direct contact number of the Site Construction/Project Manager shall be provided on all notification letters to the residents and to the community and on a prominent sign displayed on-site.

4.15 Traffic Guidance Schemes

The Traffic Guidance Schemes (TGSs) included in **Appendix C** demonstrates the proposed signage / traffic management measures to be adopted for all stages of construction. The TGSs included will ensure that vehicle and pedestrian movements are managed safely and efficiently:

- TGS No. 1 – Truck Entry via Herring Road
- TGS No. 2 – Truck Entry via Lyonpark Road

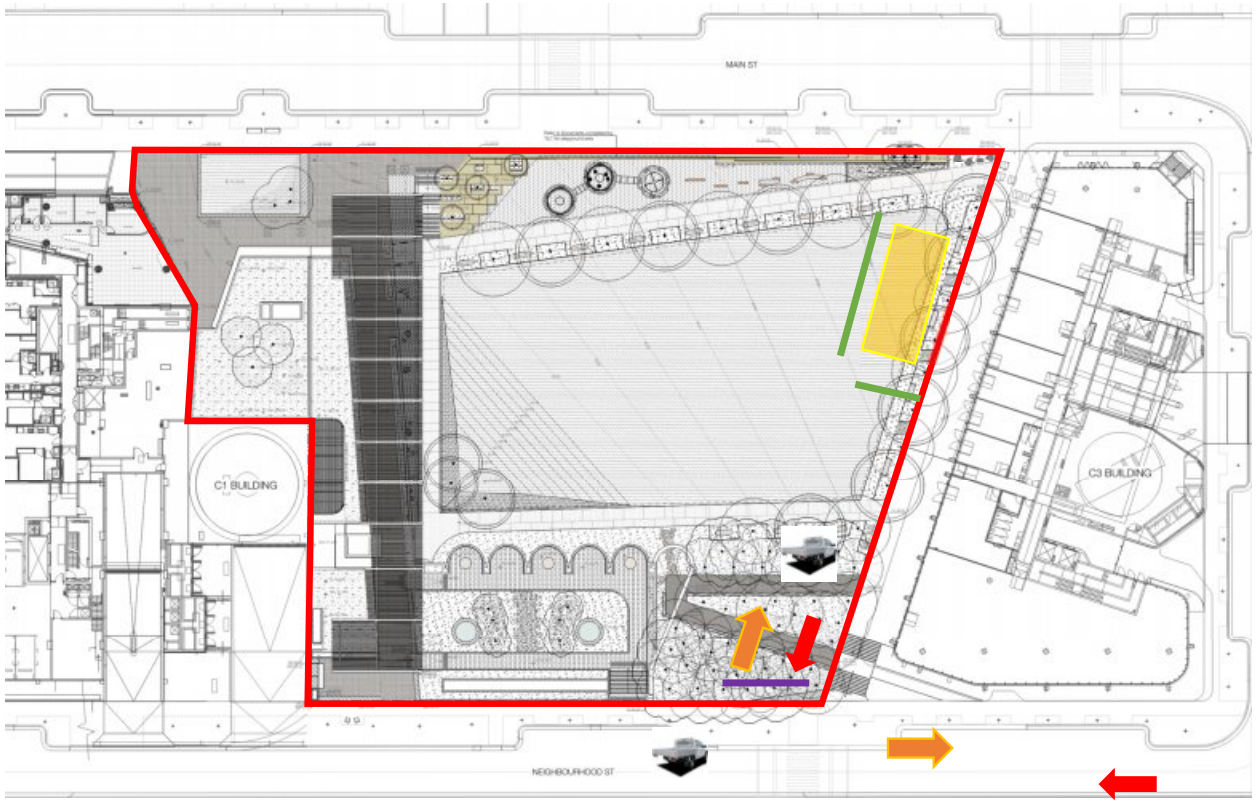
The proposed TGS will ensure that all traffic and pedestrians are managed safely during truck movements. This TGS has been designed in accordance with the requirements of the TfNSW Traffic Control at Work Sites Technical Manual, with copies of the TGSs to be kept on-site at all times.

5. CONCLUSION

This report should be read in conjunction with other documentation prepared by the builder relating to the internal construction activities. The plan outlined above is considered satisfactory and will minimise any disruptions to residents / tenants of neighbouring developments, and pedestrians in the area. This plan meets all requirements of the TfNSW *Traffic Control at Work Sites Manual* and is recommended for adoption.

APPENDIX A

Construction Site Establishment Plan



Site Establishment	Description
	Main site fencing, shade cloth. Erosion & sediment control
	Two sliding gates to allow heavy vehicle entry to site
	Site shedding & amenities
	Vehicle entry – entry & exit
	Protection concrete jersey kerbs













Grindley

Site establishment

APPENDIX B

Swept Path Analysis



Notes:

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Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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PO Box 1124
Strawberry Hills, NSW 2012

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Drawing Title

12.5m Heavy Rigid Vehicle
Lyonpark Road Entry

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.01	A



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Drawing Title

12.5m Heavy Rigid Vehicle
Lyonpark Road Exit

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
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Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

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w: www.traffix.com.au

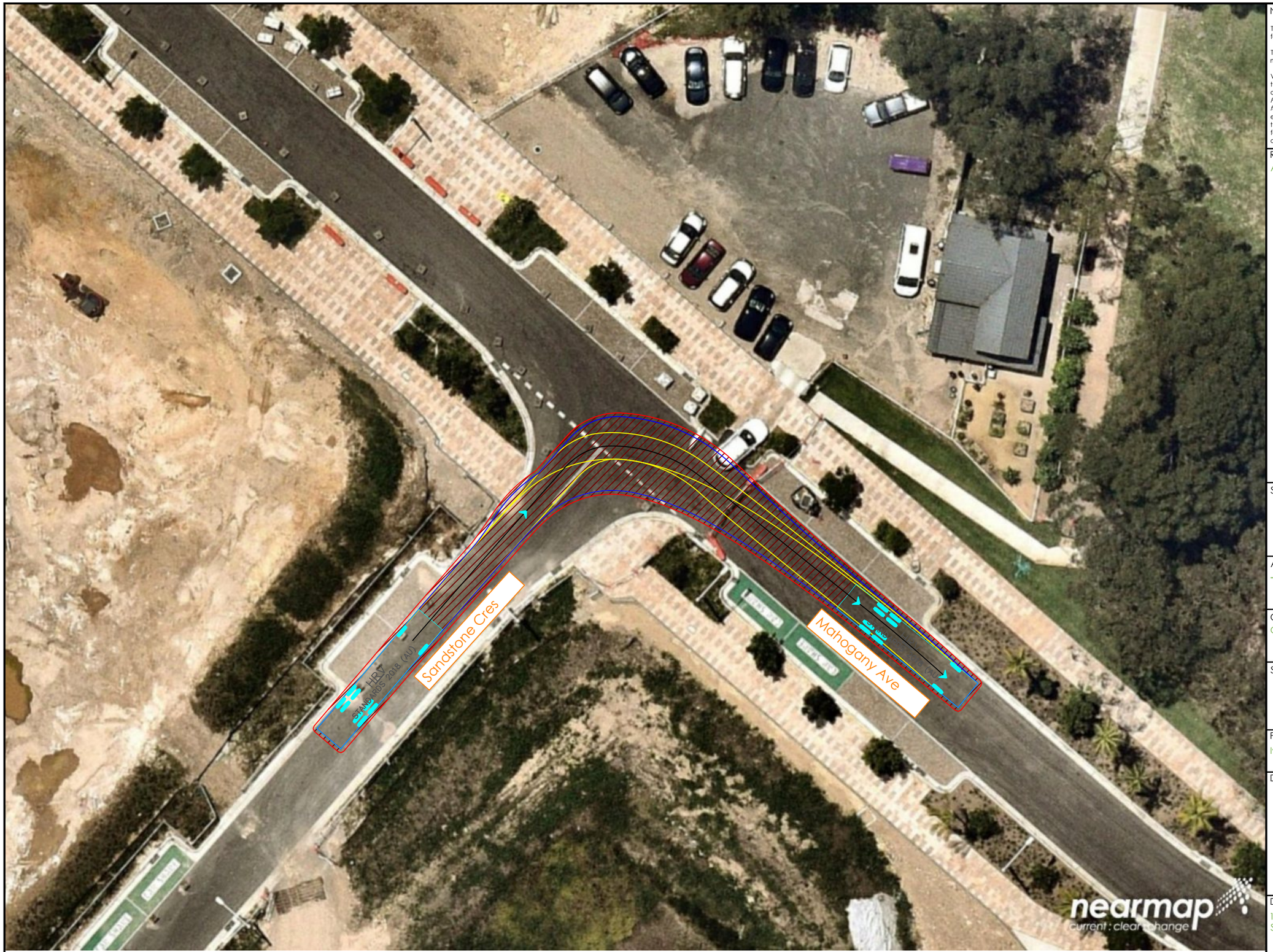
Drawing Title

12.5m Heavy Rigid Vehicle
Sandstone Crescent Entry

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.02	A



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- Clearance Envelope (300mm)

Architect

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Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

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Drawing Title

12.5m Heavy Rigid Vehicle
Sandstone Crescent Exit

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
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A	Swepth Path Analysis	SH	10-07-24
B	Swepth Path Analysis	SH	11-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

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TRAFFIC AND TRANSPORT PLANNERS

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PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title

20.0m Articulated Vehicle
Site Entry

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
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Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

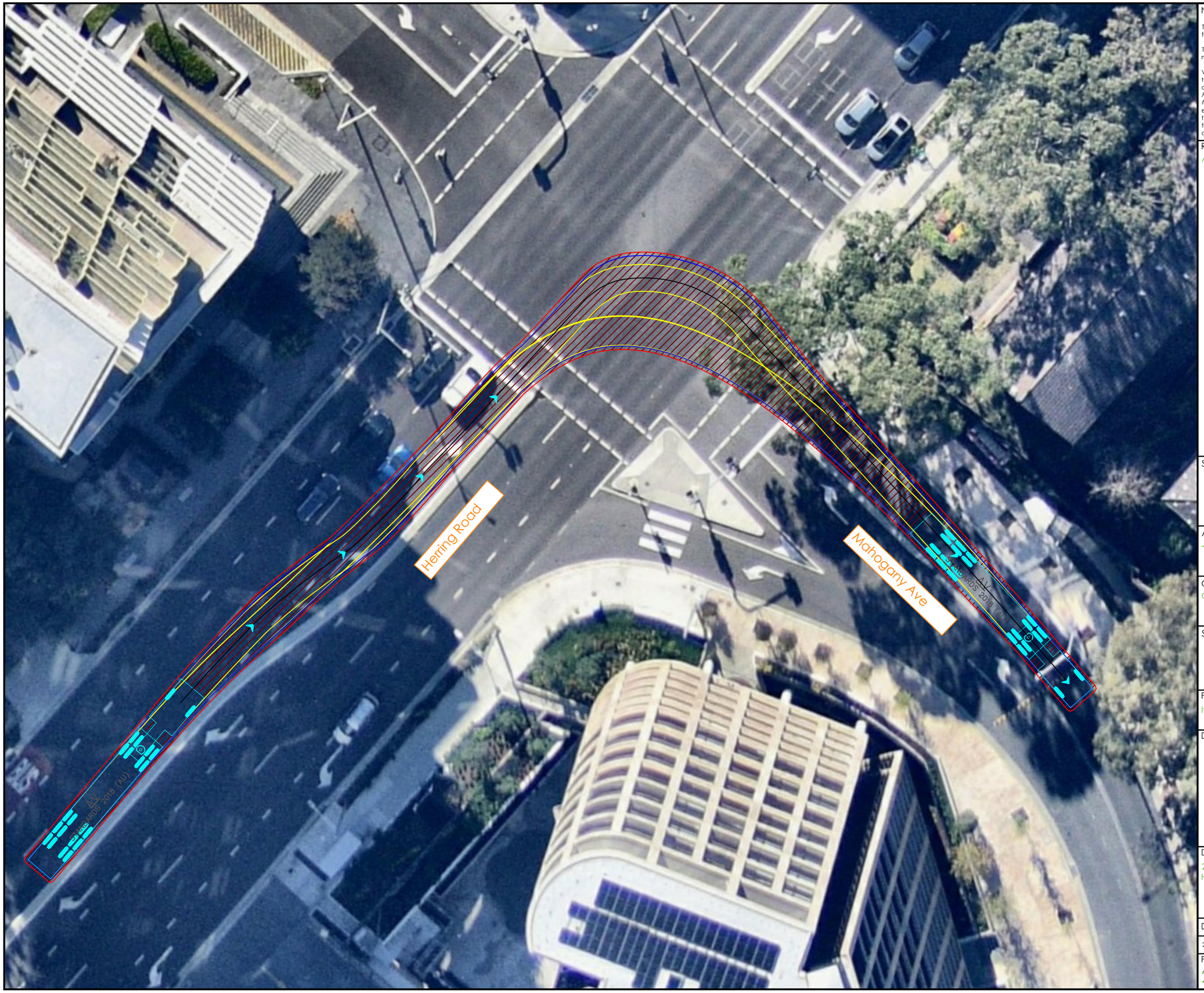
Drawing Title

20.0m Articulated Vehicle
Site Exit

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.03a	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

TRAFFIX
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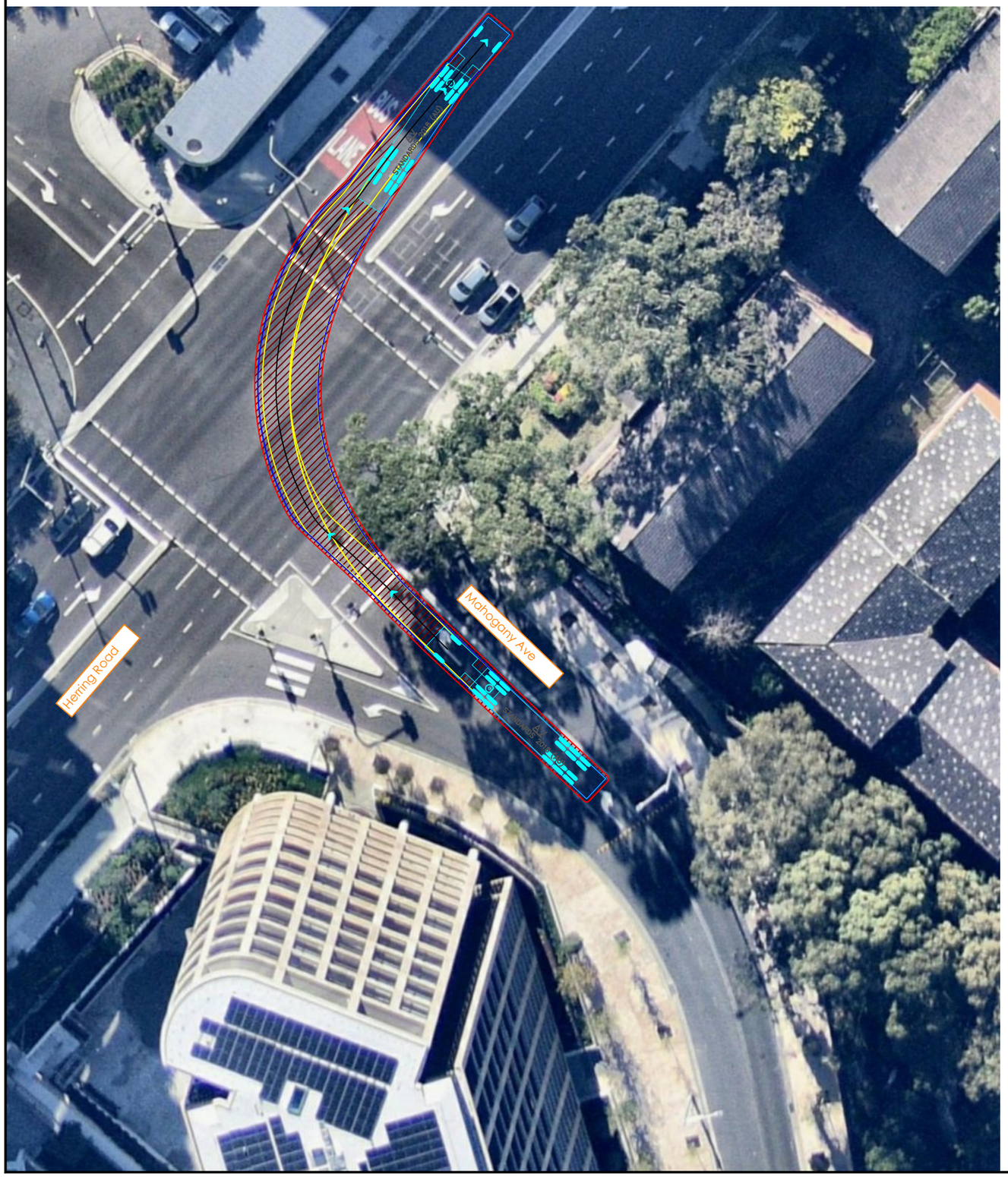
Drawing Title

20.0m Articulated Vehicle
Herring Road Entry

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.04	A



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Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

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w: www.traffix.com.au

Drawing Title

20.0m Articulated Vehicle
Herring Road Exit

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.04a	A

APPENDIX C

Traffic Guidance Schemes



VALUE OF DIMENSION "D"

Speed of Traffic (km/h)	Dimension "D" (m)
50	50

Note:
Herring Road - 50 km/h

Time Period:
Sep 24 - 26 2024

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
(02) 8324 8700
info@traffix.com.au

LEGEND Site Access

GENERAL NOTES
- Plan not to scale.
- All signage dimension D shall comply with the minimum requirements of TfNSW TCAWS Technical Manual.
- Qualified personnel to undertake a site inspection prior to implementation.
- It must be noted that TRAFFIX is not responsible for the implementation of this TGS, which is the responsibility of the on-site qualified traffic controller.

PROJECT
BLDG C2 IVANHOE ESTATE MACQUARIE PARK

PROJECT NUMBER
24.277

DATE
09.07.2024

CLIENT
PARKVIEW CONSTRUCTIONS PTY LTD

TGS
TGS 01:
TRUCK ACCESS VIA HERRING ROAD

PREPARED BY
STEPHAN HOANG

APPROVED BY
THOMAS YANG

SAFEWORK NSW CARD NUMBER
TCT1026821

SIGNATURE



TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
(02) 8324 8700
info@traffix.com.au

LEGEND Truck Access

GENERAL NOTES
- Plan not to scale.
- All signage dimension D shall comply with the minimum requirements of TfNSW TCAWS Technical Manual.
- Qualified personnel to undertake a site inspection prior to implementation.
- It must be noted that TRAFFIX is not responsible for the implementation of this TGS, which is the responsibility of the on-site qualified traffic controller.

PROJECT
BLDG C2 IVANHOE ESTATE MACQUARIE PARK

PROJECT NUMBER
24.277

DATE
09.07.2024

CLIENT
PARKVIEW CONSTRUCTIONS PTY LTD

TGS
TGS 02: TRUCK ACCESS VIA LYONPARK ROAD

PREPARED BY
STEPHAN HOANG

APPROVED BY
THOMAS YANG

SAFEWORK NSW CARD NUMBER
TCT1026821

SIGNATURE

Appendix 3: Construction Noise and Vibration Management Sub-Plan

Ivanhoe Green & Community Centre (C2 Building)

Construction Noise and Vibration Management Plan

Ivanhoe Precinct – Midtown Macquarie Park

Grindley

Report number: 240360-Ivanhoe BC2 Community-CNVMSP_BW_R0
Date: 1 July 2024
Version: For Information

Project Number: 240360

PULSE WHITE NOISE ACOUSTICS Suite 601, L6, 32 Walker St, North Sydney NSW 2060
P 1800 4 PULSE (1800 478 573) **E** info@pwna.com.au **pwna.com.au** ABN 95 642 886 306

DOCUMENT CONTROL

Project Name	Ivanhoe Green & Community Centre
Project Number	240360
Report Reference	240360-Ivanhoe BC2 Community-CNVMSP_BW_R0
Client:	Grindley

Revision	Description	Reference	Date	Prepared	Checked	Authorised
0	For Information	240360-Ivanhoe BC2 Community-CNVMSP_BW_R0	24 June 2024	Ben White	Matt Furlong	Ben White

PREPARED BY:

Pulse White Noise Acoustics Pty Ltd
ABN 95 642 886 306
Suite 601, Level 6, 32 Walker Street, North Sydney, 2060
1800 4 PULSE

This report has been prepared by Pulse White Noise Acoustics Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Grindley. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Grindley
No warranties or guarantees are expressed or should be inferred by any third parties.
This report may not be relied upon by other parties without written consent from Pulse White Noise Acoustics.

This report remains the property of Pulse White Noise Acoustics Pty Ltd until paid for in full by the client, Grindley.

Pulse White Noise Acoustics disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1 INTRODUCTION

Pulse White Noise Acoustics (PWNA) has been engaged to prepare a Construction Noise and Vibration Management Plan (CNVMP) for the construction activities to be undertaken as part of the Ivanhoe Precinct, Macquarie Park, Ivanhoe Village Green & Community Centre project including item B37 of the SSD-15822622.

Onsite unattended and attended noise levels have previously been determined for the project and included in the Acoustic Logic *Proposed Residential Development, Ivanhoe Stage 2, Macquarie Park – Development Application Environmental Noise Impact Assessment* with reference 20210325.1/1607/A/R7/GW and dated 16/7/2021 and referenced in the projects SSD consent. The details of the acoustic survey included in the Acoustic Logic report have been used in this assessment.

A glossary of acoustic terminology used throughout this report is included in Appendix A.

The author of this report is a director of Pulse White Noise Acoustics who is a member of the Australian Acoustic Society, details including Ben's CV and membership of the AAS are included in Appendix B.

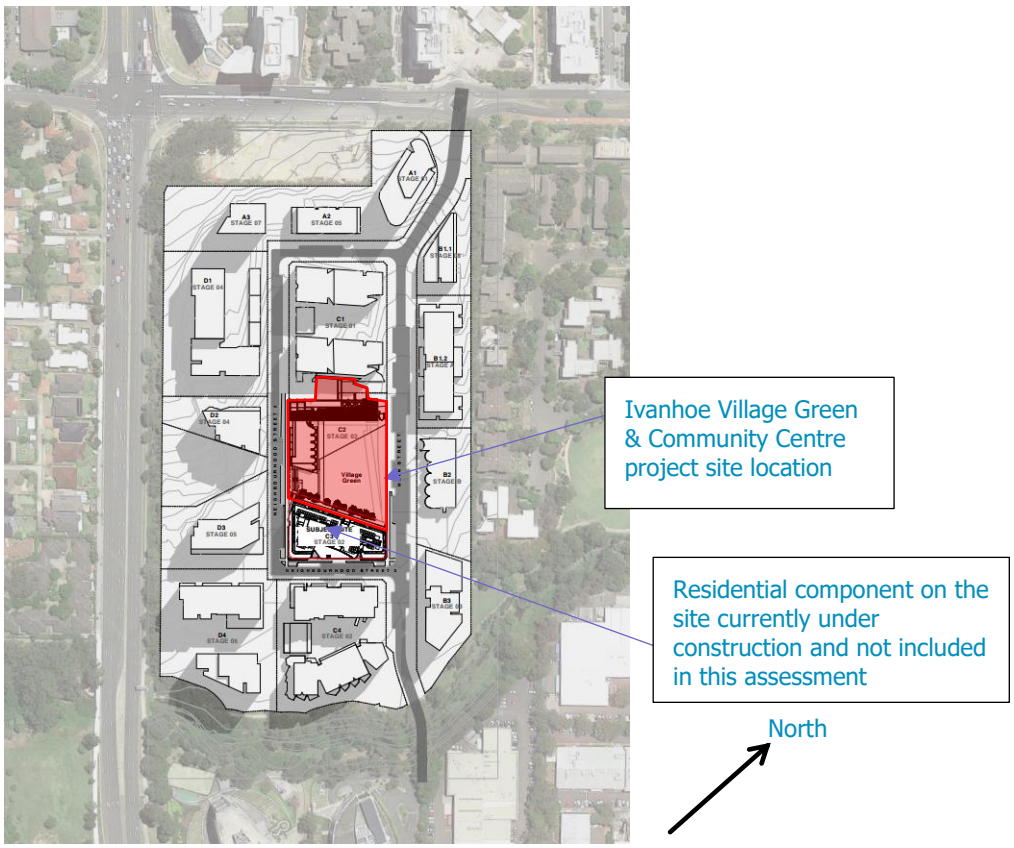
1.1 Site Layout and Development Overview

The project includes the Ivanhoe Precinct, Macquarie Park, Ivanhoe Village Green & Community Centre project

The project is included within the SSD-15822622 approval.

The site is located within the Ivanhoe Estate, Epping Road, Macquarie Park site. The location of Ivanhoe Village Green & Community Centre is detailed in the Figure below.

Figure 1 Location of the Ivanhoe Village Green & Community Centre



Existing receivers within proximity of the site, which are included in this construction noise and vibration management plan, include both residential and a commercial properties within proximity of the project.

Details of the nearest sensitive receivers to the site have been identified below.

Receiver 1: Existing residential dwellings located within Building C1 of Stage 1 of the Ivanhoe Estate.

Receiver 2: Existing residential receivers located to the north of the site.

Receiver 3: Commercial receivers located within the building to the north east of the site.

Receiver 4: Commercial receivers located within the building to the east of the site.

Receiver 5: Existing residential dwellings located to the south of the site, located to the southern side of Epping Road.

It is noted that the residential component of the site is currently under construction and is therefore not included in this assessment.

Details of the site location and surrounding receivers is included in the following figure.

Figure 2 Site Map, Measurement Locations and Surrounding Receivers



1.2 SSD Compliance

This report has been undertaken in accordance with the requirements of Item B37 of the project's conditions of consent.

Details of conditions of consent and sections of the report which include the required items required by the consent are included in the table below.

Table 1 SSD Compliance Table

SSD Condition number	Requirement	Report Reference for Satisfaction
B37	*Prior to the commencement of any works, a Construction Noise and Vibration Management Plan (CNVMP) prepared by a suitably qualified person shall be submitted to the Certifying Authority. The CNVMP must be prepared in consultation with, and address the relevant requirements of the EPA. The CNVMP shall address (but not be limited to):*	-
(a)	*be prepared in accordance with the EPA's Interim Construction Noise Guideline*	Sections 4.1
(b)	*identify nearby sensitive receivers and land uses;*	Sections 1.1
(c)	*identify the noise management levels for the project;*	Section 4.1.1
(d)	*identify the construction methodology and equipment to be used and the key sources of noise and vibration;*	Section 6
(e)	*details of all reasonable and feasible management and mitigation measures to be implemented to minimise construction noise and vibration;*	Section 6.1.1 and 6.1.2
(f)	*be consistent with and incorporate all relevant recommendations and noise and vibration mitigation measures outlined in the Stage 2 DA Acoustic Assessment, prepared by Acoustic Logic, dated July 2021*	Section 6

(g)	*ensure all potentially impacted sensitive receivers are informed by letterbox drops prior to the commencement of construction of the nature of works to be carried out, the expected noise levels and duration, as well as contact details for a construction community liaison officer; and*	Section 6.5.2
(h)	*include a suitable proactive construction noise and vibration monitoring program which aims to ensure the construction noise and vibration criteria in this consent are not exceeded.*	Section 6.4

2 EXISTING ACOUSTIC ENVIRONMENT

Measured noise levels from the attended noise survey undertaken as part of the Acoustic Logic *Proposed Residential Development, Ivanhoe Stage 2, Macquarie Park – Development Application Environmental Noise Impact Assessment* with reference 20210325.1/1607/A/R7/GW and dated 16/7/2021 and referenced in the projects SSD consent have been used in this assessment.

As part of the Acoustic Logic *Proposed Residential Development, Ivanhoe Stage 2, Macquarie Park – Development Application Environmental Noise Impact Assessment* background noise levels within the vicinity of the site has been undertaken in accordance with the NSW EPA's *Noise Policy for Industry.*

The Rating Background Noise Level (RBL) is the background noise level used for assessment purposes and includes the 90th percentile of the daily background noise levels during each assessment period, being day, evening and night. The RBL $L_{A90\ (15minute)}$ and L_{Aeq} noise levels presented within the Acoustic Logic *Proposed Residential Development, Ivanhoe Stage 2, Macquarie Park – Development Application Environmental Noise Impact Assessment* are summarised in Table 2.

Table 2 Measured Ambient Noise Levels corresponding to the NPI's Assessment Time Periods

Measurement Location	Daytime[1] 7:00 am to 6:00 pm	Evening[1] 6:00 pm to 10:00 pm	Night-time[1] 10:00 pm to 7:00 am
	L_{A90}[2] (dBA)	L_{A90}[2] (dBA)	L_{A90}[2] (dBA)
Measurement Location 1	54	52	41
Measurement Location 2	48	43	34
Measurement Location 3	56	49	37
Measurement Location 4	45	43	37
Measurement Location 5	43	41	39
Measurement Location 6	50	48	36

Note 1: For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am

Note 2: The L_{A90} noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

Measured noise levels in accordance with the time periods defined by the NSW EPA RNP 2011 are presented below.

Table 3 Measured Ambient Noise Levels corresponding to the "RNP" Assessment Time Periods

Receiver Location	Daytime [1] 7:00 am to 10:00 pm	Night-time [1] 10:00 pm to 7:00 am
	L_{Aeq} (whole period) [2] (dBA)	L_{Aeq} (whole period) [2] (dBA)
Receiver Location 1	48	34
Receiver Location 2	45	37
Receiver Location 3	43	39
Receiver Location 4	43	39
Receiver Location 5	50	36

Note 1: For Monday to Sunday, Daytime 7:00 am – 10:00 pm; Night-time 10:00 pm – 7:00 am.

Note 2: The L_{Aeq} is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

3 PROJECT SSD REQUIREMENTS

This CNVSP has been prepared in accordance with the SSDA 15822622 consent condition B37 which includes the following:

CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

B37. Prior to the commencement of any works, a **Construction Noise and Vibration Management Plan** (CNVMP) prepared by a suitably qualified person shall be submitted to the Certifying Authority. The CNVMP must be prepared in consultation with, and address the relevant requirements of the EPA. The CNVMP shall address (but not be limited to):

(a) be prepared in accordance with the EPA's *Interim Construction Noise Guideline*

(b) identify nearby sensitive receivers and land uses;

(c) identify the noise management levels for the project;

(d) identify the construction methodology and equipment to be used and the key sources of noise and vibration;

(e) details of all reasonable and feasible management and mitigation measures to be implemented to minimise construction noise and vibration;

(f) be consistent with and incorporate all relevant recommendations and noise and vibration mitigation measures outlined in the Stage 2 DA Acoustic Assessment, prepared by Acoustic Logic, dated July 2021

(g) ensure all potentially impacted sensitive receivers are informed by letterbox drops prior to the commencement of construction of the nature of works to be carried out, the expected noise levels and duration, as well as contact details for a construction community liaison officer; and

(h) include a suitable proactive construction noise and vibration monitoring program which aims to ensure the construction noise and vibration criteria in this consent are not exceeded.

Prior to the commencement of works, a copy of the **CNVMP** demonstrating compliance with the above must be submitted to the Planning Secretary.

4 NOISE AND VIBRATION CRITERIA

Relevant noise and vibration criteria for construction activities are detailed below.

4.1 Construction Noise Objectives

Relevant construction noise objectives applicable to this project are outlined below.

4.1.1 NSW EPA (Former DECC) Interim Construction Noise Guideline (ICNG) 2009

Noise objective for construction and demolition activities are discussed in the *Interim Construction Noise Guideline* (ICNG). The ICNG also recommends procedures to address potential impacts of construction noise on residences and other sensitive land uses. The main objectives of the ICNG are summarised as follows:

- Promote a clear understanding of ways to identify and minimise noise from construction works;
- Focus on applying all "feasible" and "reasonable" work practices to minimise construction noise impacts;
- Encourage construction to be undertaken only during the recommended standard hours unless approval is given for works that cannot be undertaken during these hours;
- Streamline the assessment and approval stages and reduce time spent dealing with complaints at the project implementation stage; and
- Provide flexibility in selecting site-specific feasible and reasonable work practices in order to minimise noise impacts.

The ICNG contains a quantitative assessment method which is applicable to this project. Guidance levels are given for airborne noise at residences and other sensitive land uses.

The quantitative assessment method involves predicting noise levels at sensitive receivers and comparing them with the Noise Management Levels (NMLs). The NML affectation categories for residential receivers have been reproduced from the guideline and are listed in the Table 4 below.

Table 4 NMLs for quantitative assessment at residences

Time of Day	Noise Management Level $L_{Aeq(15minute)}$ [1,2]	How to Apply
Recommended standard hours: During Approved working hours	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside the recommended standard hours above	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should notify the community.
offices, retail outlets: external	$L_{Aeq\ (15\ min)}$ 70 dB(A)	• When in use • During construction, the proponent should regularly update the occupants of the commercial and industrial premises regarding noise levels and hours of work.

Note 1 Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

Note 2 The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Industrial Noise Policy (EPA 2000).

Construction noise levels at other noise receivers are outlined below:

- Construction noise levels within classrooms other educational institutions is not recommended to exceed 45dBA $L_{Aeq,15minute}$, when measured internally.
- Construction noise levels at offices and retail outlets are not recommended to exceed 70dBA LAeq,15minute, when measured externally.

Based on the measured background noise levels summarised in Section 1.2, and the NMLs outlined above, the construction noise criteria to be used in this assessment are listed in Table 5.

Table 5 NMLs as basis for the acoustic assessment

Receiver Types	NML, dB $L_{Aeq(15minute)}$		
	Standard Hours During Approved working hours		**Outside Standard Hours** All hours not listed in the adjacent column.
Receiver 1 – Residential	**NAFL: 58** (RBL (48) + 10dB)	**HNAL: 75**	RBL + 5dB
Receiver 2 – Residential	**NAFL: 55** (RBL (45) + 10dB)		
Receiver 3 – Commercial	**NAFL: 70**		
Receiver 4 – Commercial	**NAFL: 70**		
Receiver 5 – Residential	**NAFL: 60** (RBL (50) + 10dB)		

4.2 Vibration Criteria

Effects of ground borne vibration on buildings may be segregated into the following three categories:

- Human comfort – vibration in which the occupants or users of the building are inconvenienced or possibly disturbed.
- Effects on building contents – where vibration can cause damage to fixtures, fittings and other non-building related objects.
- Effects on building structures – where vibration can compromise the integrity of the building or structure itself.

4.2.1 Vibration Criteria – Human Comfort

Vibration effects relating specifically to the human comfort aspects of the project are taken from AV-TG. This type of impact can be further categorised and assessed using the appropriate criterion as follows:

- Continuous vibration – from uninterrupted sources.
- Impulsive vibration – up to three instances of sudden impact e.g., dropping heavy items, per monitoring period.
- Intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously.

Table 6 Continuous vibration acceleration criteria (m/s^2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Critical working areas (e.g. hospital operating theatres, precision laboratories)	Day or night-time	0.0050	0.010	0.10	0.20
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
		0.04	0.029	0.080	0.058
Workshops	Day or night-time	0.04	0.029	0.080	0.058

Table 7 Impulsive vibration acceleration criteria (m/s^2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Critical working areas (e.g. hospital operating theatres, precision laboratories)	Day or night-time	0.0050	0.010	0.10	0.20
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 8 Intermittent vibration impacts criteria ($m/s^{1.75}$) 1 Hz-80 Hz

Location	Daytime		Night-time	
	Preferred Values	Maximum Values	Preferred Values	Maximum Values
Critical working areas (e.g. hospital operating theatres, precision laboratories)	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

4.2.2 Vibration Criteria – Building Contents and Structure

The vibration effects on the building itself are assessed against international standards as follows:

- For transient vibration: British Standard BS 7385: Part 2-1993 *"Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration"* (BSI 1993); and
- For continuous or repetitive vibration: German DIN 4150: Part 3 – 1999 *"Effects of Vibration on Structure"* (DIN 1999).

4.2.3 Standard BS 7385 Part 2 - 1993

For transient vibration, as discussed in standard BS 7385 Part 2-1993, the criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised below.

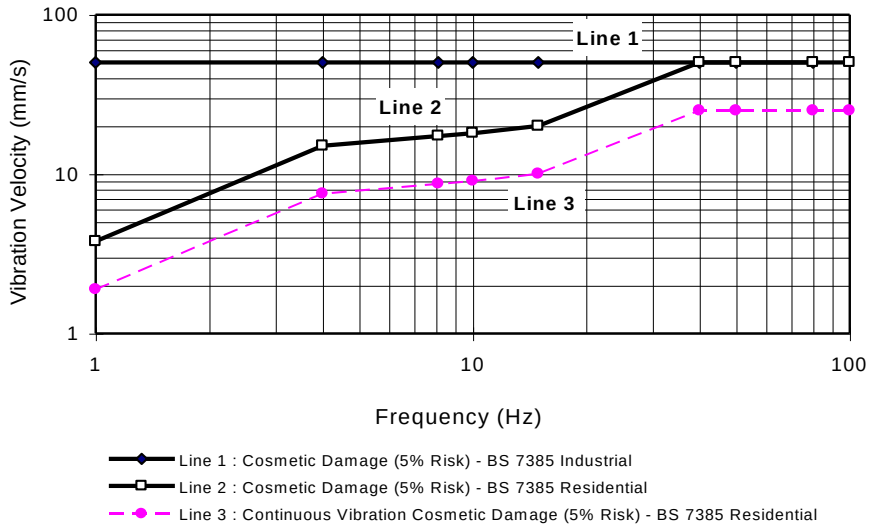
Table 9 Transient vibration criteria as per standard BS 7385 Part 2 - 1993

Line in Figure 3	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Standard BS 7385 Part 2 – 1993 states that the values in Table 9 relate to transient vibration which does not cause resonant responses in buildings.

Where the dynamic loading caused by continuous vibration events is such that it results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 9 may need to be reduced by up to 50% (refer to Line 3 in Figure 3).

Figure 3 BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage



In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the recommended values corresponding to Line 2 are reduced. Below a frequency of 4 Hz, where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 9, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless the calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 9 should not be reduced for fatigue considerations.

4.2.4 Standard DIN 4150 Part 3 - 1999

For continuous or repetitive vibration, standard DIN 4150 Part 3-1999 provides criteria based on values for peak particle velocity (mm/s) measured at the foundation of the building; these are summarised in Table 10. The criteria are frequency dependent and specific to particular categories of structures.

Table 10 Structural damage criteria as per standard DIN 4150 Part 3 - 1999

Type of Structure	Peak Component Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of highest floor at all frequencies
	1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz[1]	
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

Note 1: For frequencies above 100Hz, at least the values specified in this column shall be applied.

4.3 Construction Vibration Criteria

Based on the details included in the sections above the project specific vibration criteria to protect the surrounding residential receivers from structural or architectural damage includes the following:

1. Project construction vibration criteria at all surrounding building structures – 7 mm/s

5 NOISE AND VIBRATION ASSESSMENT

5.1 Construction Noise Assessment

Sound power levels have been predicted for the construction tasks identified in the project program. The equipment anticipated for use in each task is based on previous project experience. The sound power levels for the equipment likely to be used for each of the listed tasks are provided in Table 11 below.

Table 11 Summary of predicted sound power levels

Tasks	Equipment	Sound Power Levels (dBA re 1pW)	Aggregate Sound Power Level per Task (dBA re 1pW)
Site Establishment Works	Mobile crane	110	113
	Power hand tools	109	
	Semi Rigid Vehicle [1]	105	
Ground Works	Excavator	112	119
	Hand held jack hammer [1]	111	
	Dump truck [1]	104	
	Concrete saw [1]	114	
	Skid steer	110	
	Power hand tools	109	
Structure	Hand held jack hammer [1]	106	117
	Concrete saw [1]	114	
	Power hand tools	109	
	Welder	101	
	Concrete pump truck	110	
	Concrete agitator truck	108	
Internal Works	Power hand tools	109	109
Common and External Works (including landscaping)	Concrete agitator truck	108	117
	Saw cutter [1]	104	
	Dump truck [1]	104	
	Concrete saw [1]	114	
	Power hand tools	109	

Note 1: An assumed time correction has been applied, this being 5 minutes of operation in any 15-minute interval.

5.2 Predicted Construction Noise Levels

Predicted construction noise levels are presented below for each of the surrounding receivers in accordance with the NSW EPA ICNG.

Note:

- Predicted noise levels presented below are given in a range, this includes the expected minimums as well as the maximums.
- With regards to the maximum noise levels in the range, these are typically experienced when plant/works are within close proximity to a boundary. In our experience whilst these levels above NML's and considered intrusive they will only occur for a short time and is not a representation of noise levels during the entire construction period.

Table 12 Receiver 1 – Summary of preliminary predicted construction noise levels – Residence to the north west of the site

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	55 to 61	62 to 76	**Standard Construction Hours** **58 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver.
	Power hand tools		54 to 60			
	Semi Rigid Vehicle		51 to 57			
Ground Works and Demolition	Excavator	119	57 to 63	67 to 81	**Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Handheld jack hammer		52 to 58			
	Dump truck		50 to 56			
	Concrete saw		60 to 66			
	Skid steer		55 to 61			
	Power hand tools		54 to 60			
Structure	Handheld jack hammer	117	52 to 58	66 to 80		
	Concrete saw		60 to 66			
	Power hand tools		54 to 60			
	Welder		46 to 52			
	Concrete pump truck		55 to 61			
	Concrete agitator truck		53 to 59			
Internal Works	Power hand tools	109	54 to 60	58 to 72		
Common and External Works	Concrete agitator truck	117	53 to 59	66 to 80		
	Saw cutter		50 to 56			
	Dump truck		50 to 56			
	Concrete saw		60 to 66			
	Power hand tools		54 to 60			

Table 13 Receiver 2 – Summary of predicted construction noise levels – Residence to the north of the site

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	58 to 76	61 to 79	**Standard Construction Hours** **55 dB(A) $L_{Aeq\ 15\ min}$** **Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver. Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Power hand tools		57 to 75			
	Semi Rigid Vehicle		53 to 71			
Ground Works and Demolition	Excavator	119	60 to 78	66 to 84		
	Handheld jack hammer		54 to 72			
	Dump truck		52 to 70			
	Concrete saw		62 to 80			
	Skid steer		58 to 76			
	Power hand tools		57 to 75			
Structure	Handheld jack hammer	117	54 to 72	65 to 83		
	Concrete saw		62 to 80			
	Power hand tools		57 to 75			
	Welder		49 to 67			
	Concrete pump truck		58 to 76			
	Concrete agitator truck		56 to 74			
Internal Works	Power hand tools	109	57 to 75	57 to 75		
Common and External Works	Concrete agitator truck	117	56 to 74	65 to 83		
	Saw cutter		52 to 70			
	Dump truck		52 to 70			
	Concrete saw		62 to 80			
	Power hand tools		57 to 75			

Table 14 Receiver 3 - Summary of predicted construction noise levels – Commercial Receivers to the northeast

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	48 to 54	55 to 69	**Standard Construction Hours** **70 dB(A) $L_{Aeq\ 15\ min}$** **Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver. Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Power hand tools		47 to 53			
	Semi Rigid Vehicle		44 to 50			
Ground Works and Demolition	Excavator	119	50 to 56	60 to 74		
	Handheld jack hammer		45 to 51			
	Dump truck		43 to 49			
	Concrete saw		53 to 59			
	Skid steer		48 to 54			
	Power hand tools		47 to 53			
Structure	Handheld jack hammer	117	45 to 51	59 to 73		
	Concrete saw		53 to 59			
	Power hand tools		47 to 53			
	Welder		39 to 45			
	Concrete pump truck		48 to 54			
	Concrete agitator truck		46 to 52			
Internal Works	Power hand tools	109	47 to 53	51 to 65		
Common and External Works	Concrete agitator truck	117	46 to 52	59 to 73		
	Saw cutter		43 to 49			
	Dump truck		43 to 49			
	Concrete saw		53 to 59			
	Power hand tools		47 to 53			

Table 15 Receiver 4 - Summary of predicted construction noise levels – Commercial Receivers to the southeast

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	52 to 58	56 to 61	**Standard Construction Hours** **70 dB(A) $L_{Aeq\ 15\ min}$** **Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver. Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Power hand tools		51 to 57			
	Semi Rigid Vehicle		48 to 54			
Ground Works and Demolition	Excavator	119	54 to 60	61 to 66		
	Handheld jack hammer		49 to 55			
	Dump truck		47 to 53			
	Concrete saw		57 to 63			
	Skid steer		52 to 58			
	Power hand tools		51 to 57			
Structure	Handheld jack hammer	117	49 to 55	61 to 66		
	Concrete saw		57 to 63			
	Power hand tools		51 to 57			
	Welder		43 to 49			
	Concrete pump truck		52 to 58			
	Concrete agitator truck		50 to 56			
Internal Works	Power hand tools	109	51 to 57	52 to 57		
Common and External Works	Concrete agitator truck	117	50 to 56	60 to 65		
	Saw cutter		47 to 53			
	Dump truck		47 to 53			
	Concrete saw		57 to 63			
	Power hand tools		51 to 57			

Table 16 Receiver 5 - Summary of predicted construction noise levels – Residence located to the southwest

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	52 to 58	56 to 61	**Standard Construction Hours** **60 dB(A) $L_{Aeq\ 15\ min}$** **Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver. Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Power hand tools		51 to 57			
	Semi Rigid Vehicle		48 to 54			
Ground Works and Demolition	Excavator	119	54 to 60	61 to 66		
	Handheld jack hammer		49 to 55			
	Dump truck		47 to 53			
	Concrete saw		57 to 63			
	Skid steer		52 to 58			
	Power hand tools		51 to 57			
Structure	Handheld jack hammer	117	49 to 55	61 to 66		
	Concrete saw		57 to 63			
	Power hand tools		51 to 57			
	Welder		43 to 49			
	Concrete pump truck		52 to 58			
	Concrete agitator truck		50 to 56			
Internal Works	Power hand tools	109	51 to 57	52 to 57		
Common and External Works	Concrete agitator truck	117	50 to 56	60 to 65		
	Saw cutter		47 to 53			
	Dump truck		47 to 53			
	Concrete saw		57 to 63			
	Power hand tools		51 to 57			

5.3 Construction Traffic Noise Assessment

For existing residences and other sensitive land uses affected by additional traffic on existing roads, the NSW *Road Noise Policy (RNP)* states that for noise associated with increased road traffic generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB during both day and night-time periods. An increase of 2 dB represents a minor impact that is considered barely perceptible to the average person.

It is proposed that the construction traffic would access the site via Binalong Road to the east of the site. All construction traffic will access the site and use the surrounding roadways in accordance with the site Construction Management plan.

5.4 Vibration Assessment

In order to maintain compliance with the human comfort vibration criteria discussed in Section 4.2, it is recommended that the indicative safe distances listed in table below should be maintained. These indicative safe distances should be validated prior to the start of construction works by undertaking measurements of vibration levels generated by construction and demolition equipment by the contractor.

Additionally, any vibration levels should be assessed in accordance with the criteria discussed in Section 4.2.

Table 17 Recommended indicative safe working distances for vibration intensive plant

Plant	Rating / Description	Safe Working Distances (m)	
		Cosmetic Damage (BS 7385: Part 2 DIN 4150: Part 3)	Human Comfort (AVTG)
Vibratory roller	< 50 kN (Typically 1 – 2 tonnes)	5	15 – 20
	< 100 kN (Typically 2 – 4 tonnes)	6	20
	< 200 kN (Typically 4 – 6 tonnes)	12	40
	< 300 kN (Typically 7 – 13 tonnes)	15	100
	> 300 kN (Typically more than 13 tonnes)	20	100
Small hydraulic hammer	300 kg, typically 5 – 12 tonnes excavator	2	7
Medium hydraulic hammer	900 kg, typically 12 – 18 tonnes excavator	7	23
Large hydraulic hammer	1600 kg, typically 18 – 34 tonnes excavator	22	73
Vibratory pile driver	Sheet piles	2 – 20	20
Jackhammer	Hand held	1	Avoid contact with structure and steel reinforcements

6 NOISE AND VIBRATION MANAGEMENT PLAN

6.1 Acoustic Management Procedures

Table 18 below summarises the management procedures recommended for airborne noise and vibration impact. These procedures are also further discussed in the report as well as recommended mitigation measures. Hence, where applicable, links to further references are provided in Table 18.

Table 18 Summary of mitigation procedures

Procedure	Abbreviation	Description	Further Reference
General Management Measures	GMM	Introduce best-practice general mitigation measures in the workplace which are aimed at reducing the acoustic impact onto the nearest affected receivers.	Refer to Section 6 For noise impact, also refer to Section 6.1 For vibration impact, also refer to Section 6.3.1
Project Notification	PN	Issue project updates to stakeholders, discussing overviews of current and upcoming works. Advanced warning of potential disruptions can be included. Content and length to be determined on a project-by-project basis.	Refer to Section 6.
Verification Monitoring	V	Monitoring to comprise attended or unattended acoustic surveys. The purpose of the monitoring is to confirm measured levels are consistent with the predictions in the acoustic assessment, and to verify that the mitigation procedures are appropriate for the affected receivers. If the measured levels are higher than those predicted, then the measures will need to be reviewed and the management plan will need to be amended.	For noise impact, refer to Section 6 and Section 6.2.3. For vibration impact, refer to Section 6.3.2
Complaints Management System	CMS	Implement a management system which includes procedures for receiving and addressing complaints from affected stakeholders	Refer to Section 6.6
Specific Notification	SN	Individual letters or phone calls to notify stakeholders that noise levels are likely to exceed noise objectives. Alternatively, contractor could visit stakeholders individually in order to brief them in regards to the noise impact and the mitigation measures that will be implemented.	Refer to Section 6.
Respite Offer	RO	Offer provided to stakeholders subjected to an ongoing impact.	-
Alternative Construction Methodology	AC	Contractor to consider alternative construction options that achieve compliance with relevant criteria. Alternative option to be determined on a case-by-case basis. It is recommended that the selection of the alternative option should also be determined by considering the assessment of on-site measurements (refer to Verification Monitoring above).	-

The application of these procedures is in relation to the exceedances over the relevant criteria. For airborne noise, the criteria are based on NMLs. The allocation of these procedures is discussed in Section 6.1.1

For vibration, the criteria either correspond to human comfort, building damage or scientific and medical equipment. The application of these procedures is discussed in Section 6.1.2.

6.1.1 Allocation of Noise Management Procedures

For residences, the management procedures have been allocated based on noise level exceedances at the affected properties, which occur over the designated NMLs (refer to section 3). The allocation of these procedures is summarised in Table 19 below.

Table 19 Allocation of noise management procedures – residential receivers

Construction Hours	Exceedance over NML (dB)	Management Procedures (see definition above)
Approved Construction Hours Mon – Fri: 7:00 am to 7:00 pm Sat: 8:00 am – 1:00 pm	0 - 3	GMM
	4 - 10	GMM, PN, V [1], CMS, AC
	> 10	GMM, PN, V, CMS, SN, AC
Outside Standard Hours Mon – Fri: 7:00 am to 8:00 am Sat: 7:00 am to 8:00 am	0 - 10	GMM, AC
	11 - 20	GMM, PN, V [1], CMS, AC
	> 20	GMM, PN, V, CMS, SN, RO, AC

Notes

1. Verification monitoring to be undertaken upon complaints received from affected receivers

Please note the following regarding the allocation of these procedures:

- In addition to the above the projects *Conditions of Consent, item C5,* require works to include the following:
    - Rock Breaking, rock hammering, sheet piling and similar activities may only be carried out between the following hours:
        - 9am to 12 midday – Monday to Friday.
        - 2 pm to 5pm – Monday to Friday.
        - 9am to 12 midday – Saturday's.
- The exceedances have been estimated as part of the acoustic assessment, and these are summarised in Section 5.2.
- The allocation of procedures is based on the assumptions used for noise level predictions (refer to Section 5.1). Consequently, these allocations can be further refined once additional details of the construction program become available.

6.1.2 Allocation of Vibration Management Procedures

Table 20 below summarises the vibration management procedures to be adopted based on exceedance scenarios (i.e., whether the exceedance occurs over human comfort criteria, building damage criteria, or criteria for scientific and medical equipment). Please note these management procedures apply for any type of affected receiver (i.e., for residences as well as non-residential receivers).

Table 20 Allocation of vibration management procedures

Construction Hours	Exceedance Scenario	Management Procedures
Approved Construction Hours	Over human comfort criteria (refer to Section 3)	GMM, PN, V, RO
	Over building damage criteria (refer to Section 3)	GMM, V, AC
Outside Standard Hours	Over human comfort criteria (refer to Section 3)	GMM, SN, V, RO, CMS
	Over building damage criteria (refer to Section 3)	GMM, V, AC

6.2 Site Specific Noise Mitigation Measures (including High Noise Affected Levels)

Predicted noise levels outlined in section 5.1 indicate exceedances above the Noise Management Levels (NMLs) as well as the Highly Noise Affected Level (HNAL) when in proximity to a boundary. To militate against any exceedances, the site will need to introduce periods of respite for activities which are creating noise levels above the HNAL and including activities such as piling, hydraulic hammering and the like (i.e. greater than 75dBA). See below.

Table 21 Recommended Respite Periods

Monday to Friday	Saturday
7:00am to 9:00am – No noisy works (Respite Period)	8:00am to 9:00am – No noisy works (Respite Period)
9:00am to 12:00am – Works	9:00am to 12:00pm – Works
12:00pm to 2:00pm – No noisy works (Respite Period)	12:00pm to 1:00pm – No noisy works (Respite Period)
2:00pm to 5:00pm – Works	
5:30pm to 7:00pm – No noisy works (Respite Period)	

The requirements of the above include those required by Condition C5 of the SSD, which includes the following:

C5. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

(a) 9.00 am to 12.00 pm, Monday to Friday;

(b) 2.00 pm to 5.00 pm Monday to Friday; and

(c) 9.00 am to 12.00 pm, Saturday.

6.2.1 General Mitigation Measures

The contractor will, where reasonable and feasible, apply best practice noise mitigation measures. These measures shall include the following:

- Maximising the offset distance between plant items and nearby noise sensitive receivers.
- Preventing noisy plant working simultaneously and adjacent to sensitive receivers.
- Minimising consecutive works in the same site area.
- Orienting equipment away from noise sensitive areas.
- Carrying out loading and unloading away from noise sensitive areas.

In order to minimise noise impacts during the works, the contractor will take all reasonable and feasible measures to mitigate noise effects.

The contractor will also take reasonable steps to control noise from all plant and equipment. Examples of appropriate noise control include efficient silencers and low noise mufflers.

The contractor should apply all feasible and reasonable work practices to meet the NMLs and inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels, duration of noise generating construction works, and the contact details for the proposal. Works will be undertaken in conjunction with the Community Communication Strategy, as required by Item B7 of the Conditions of Consent.

All construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of works outlined in the consent conditions, including item C1, which includes the following:

- 7am to 7pm Monday to Friday
- 8am to 4pm Saturdays

6.2.2 Noise Monitoring

Noise monitoring will be performed by an acoustical consultant directly engaged by the contractor.

Noise monitoring is recommended to be undertaken by attended noise measurements at the start of any new phase of works (i.e. demolition, excavation or remediation works etc.). The statistical parameters to be measured should include the following noise descriptors: L_{Amin}, L_{A90}, L_{A10}, L_{A1}, L_{Amax} and L_{Aeq}. Unattended noise measurements should be conducted over consecutive 15 minute periods at the commencement of demolition and ground works on the site.

This monitoring should also be complemented by undertaking attended noise measurements in order to:

- Differentiate between construction noise sources and other extraneous noise events (such as road traffic and aircraft noise)
- Note and identify any excessive noise emitting machinery or operation.

In addition to the above detailed measurements, should any complaints be received which have not been determined previously, it should be confirmed by conducting additional attended noise measurements.

The survey methodology and any equipment should comply with the requirements discussed in Standard AS 1055.1-1997.

6.2.3 Noise Mitigation Measures for Non-Residential Receivers

Where exceedances have been identified in Section 3, the following mitigation measures are recommended:

- Undertake general mitigation measures as discussed in Section 6.
- Issue project updates to tenants in affected premises. The updates can include overview of current and upcoming works, as well as advanced warning of potential disruptions. These updates can also be issued through an email distribution list or via social media and in accordance with consent condition B7 requiring a Community Communication Strategy.
- Signage to be posted in order to provide stakeholders information regarding project details, emergency contacts and enquiry contact information in accordance with consent condition C1 requiring a site notice.

6.2.4 Alternate Equipment or Process

Exceedance of the site's NMLs should result in an investigation as to whether alternate equipment could be used, or a difference process could be undertaken. The assessment is required to be undertaken in coordination with the contractors undertaking the works to be conducted.

6.2.5 Acoustic Enclosures/Screening

Typically, on a construction site there are three different types of plant that will be used: mobile plant (i.e., excavators, skid steers, etc.), semi mobile plant (i.e., hand tools generally) or static plant i.e. (diesel generators).

For plant items which are static it is recommended that, in the event exceedances are being measured due to operation of the plant item, an acoustic enclosure/screen is constructed to reduce impacts. These systems can be constructed from Fibre Cement (FC) sheeting or, if airflow is required, acoustic attenuators or louvres.

For semi mobile plant, relocation of plant should be investigated to either be operated in an enclosed space or at locations away from a receiver.

With mobile plant it is generally not possible to treat these sources. However, investigations into the machine itself may result in a reduction of noise (i.e., mufflers/attenuators etc) and proactive mechanical maintenance.

6.3 Vibration Mitigation Measures

6.3.1 General Mitigation Measures

As part of the CNVMP, the following vibration mitigation measures should be implemented:

- Any vibration generating plant and equipment is to be in areas within the site in order to lower the vibration impacts to surrounding receivers.
- Investigate the feasibility of rescheduling the hours of operation of major vibration generating plant and equipment to within the allowable time set within the consent conditions which include rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:
  - (a) 9am to 12pm, Monday to Friday;
  - (b) 2pm to 5pm Monday to Friday; and
  - (c) 9am to 12pm, Saturday.
- Use lower vibration generating items of construction plant and equipment; that is, smaller capacity plant.
- Minimise conducting vibration generating works consecutively in the same area (if applicable).
- Schedule a minimum respite period of at least 30 minutes after a period of continuous 2 hours of work.
- Use only dampened rock breakers and/or "city" rock breakers to minimise the impacts associated with rock breaking works.
- Conduct attended measurements of vibration generating plant at commencement of works in order to validate the indicative safe working distances advised in Table 17 and, consequently, to establish safe working distances suitable to the project. Measurements should be conducted at the nearest affected property boundary. These safe working distances should be defined by considering the vibration criteria discussed in Section 4 (i.e., criteria for structural damage, human comfort and impact to scientific or medical equipment).

6.3.2 Vibration Monitoring

Vibration monitoring should be undertaken continuously at the nearest most affected structures.

The monitoring location would be on a stiff part of the structure (at the foundation) on the side of the structure adjacent to the subject demolition and construction works.

The vibration monitoring system will be configured to record the peak vibration levels and to trigger an alarm when predetermined vibration thresholds are exceeded. The thresholds correspond to an "Operator Warning Level" and an "Operator Halt Level", where the Warning Level is 75% of the Halt Level. The Halt Level should be determined based on the vibration criteria for building contents and structure (detailed in section 4.2).

Exceedance of the "Operator Warning Level" would not require excavation or demolition work to cease, but rather, alerts the site manager to proceed with caution at a reduced force or load.

An exceedance of the "Operator Halt Level" would require the contractor to implement an alternative excavation technique pending further analysis of the vibration frequency content in order to determine any potential exceedance of the criteria.

The vibration monitoring equipment would be downloaded and analysed by the acoustical consultant monthly including reporting of the collected data.

Reports of the measured vibration levels and their likely impacts would be prepared by the acoustical consultant and issued to the contractor monthly.

Vibration monitoring should be undertaken including the following:

1. Vibration Monitoring to include long term continuous vibration logging.
2. Monitors set to record maximum vibration levels including Peak Particle Velocity (PPV) magnitudes.
3. Monitors are required to be SMS enabled such that any events recorded above 'alert levels can be instantaneously sent to suitable builder, acoustic consultant and contractor representatives.
4. In the event results re received above 'alert levels the following response to events are required as detailed in the table below.
5. Vibration monitoring should be undertaken for the periods including demolition, exaction and construction of the building structure including installation of concrete to ground floor as a minimum or on agreement with neighbouring stake holders in the event monitoring details no negative impacts during the construction of the project.

Table 22 Required Response to Vibration Events

Location/ Receiver Type	Event Type		
	Trigger	Alert	Alarm, Stop Work
Surrounding Residential Dwellings	6 mm/s	7 mm/s	8 mm/s
See Section below for response to Event Types			

The required response to recorded event types detailed in the table above are included in the following table.

Table 23 Required Response to Vibration Events

Event Type	Required Response
Trigger level	All events above the trigger level are required to be recorded by the vibration monitors.
Alert	Temporarily cease the vibration generating activity and assess the reason for vibration exceedances. Modify the related construction practice to prevent future exceedances. Keep records of subsequent breaches to demonstrate that vibrations for modified activity do not reach Alert Level. All *Alert* events are to be SMS messaged to the building contractor site manager, subcontractor and acoustic consultant.
Alarm	**Stop Work Event** All *Alarm* events are to be SMS messaged to a relevant Richard Crookes, subcontractor and acoustic consultant. The activity generating the vibration levels is to be stopped immediately. Suitable representatives of the building contractor, the relevant Subcontractor, Heritage Consultant and acoustic consultant. Vibration monitoring report to be completed. Visual assessment of affected property will be conducted to assess whether damage is evident. The item/s of work generating the vibration events is not be recommenced until an action plan is agreed and implemented.

6.4 Noise and Vibration Monitoring

As part of the management of noise from the proposed construction activities to be undertaken on the site the following noise and vibration monitoring is to be undertaken:

1. Noise Monitoring– Attended noise monitoring of excavation and construction activities is to be undertaken during the following periods:
    a. Commencement of any rock breaking or sawing on the site.
    b. In response to any ongoing complaints received from neighbours.

2. Vibration – Based on the proximity of the surrounding receivers to the works magnitudes of vibration resulting from construction activities required to be undertaken on the site are not expected to approach vibration limits detailed in Section 4.2 of this report, therefore permanent continuous vibration monitoring is not recommended.

    Attended vibration monitoring is to be undertaken at the following periods:
    a. Commencement of any high vibration generating activities including hydrail hammering, rock breaking or vibration rolling on the site.
    b. receiver location in the event complaints resulting from construction activities resulting from the perception of vibration are experienced by the occupants of buildings within the vicinity of the site.

6.5 Complaints Management Process and Community Communication

A complaints management process and community communications strategy is required to be included for the project, including those developed in compliance with the project Conditions of Consent, including items B11, B12, B13 and B14 which include the following:

COMPLAINTS AND ENQUIRIES PROCEDURE

B11. Prior to the commencement of construction works for each building, or as otherwise agreed by the Planning Secretary, the following must be made available for community enquiries and complaints for the duration of construction:
- (a) a toll-free 24-hour telephone number(s) on which complaints and enquiries about the carrying out of any works may be registered;
- (b) a postal address to which written complaints and enquiries may be sent; and
- (c) an email address to which electronic complaints and enquiries may be transmitted.

COMMUNITY COMMUNICATION STRATEGY

B12. A community Communication Strategy must be prepared to provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction.

B13. The Community Communication Strategy must:
- (a) identify people to be consulted during the design and construction phases;
- (b) include the telephone number, postal address and email required in **Condition B11**
- (c) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;
- (d) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;
- (e) set out procedures and mechanisms:
    - (i) through which the community can discuss or provide feedback to the Applicant;
    - (ii) through which the Applicant will respond to enquiries or feedback from the community; and

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Department of Planning and Environment *(SSD 15822622)*

- (iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.

B14. Details demonstrating compliance with **Condition B11** and **Condition B12** must be submitted to the Certifying Authority and the Planning Secretary no later than one month before the commencement of any work.

6.5.1 Enquiries and complaints management

Community enquires and complaints will be undertaken and managed by the building contractor in accordance with the requirements of item B11 and detailed above.

6.5.2 Community Notifications

Prior to the works onsite being undertaken, it is recommended that community consultation with the neighbouring affected parties be undertaken. These include the locations detailed in the figure below.

Figure 4 Required Community Notification Area



Communication notification, should not be limited to the beginning of the onsite works but throughout, providing the community with constant updates on the progress and upcoming works. In our experience these could include:

- Project website.
- Email notifications; and
- Letterbox drops.

6.5.3 Community Engagement

It is proposed that throughout the duration of the project, continued meetings with both the school principals will be undertaken on a regular basis to monitor and mitigate any impacts of construction noise and vibration on the school community.

Community engagement has been undertaken during the design and approvals basis of the project and detailed in the Community Communication Strategy in accordance with condition B12.

6.6 Complaints Management System

Should complaints arise they must be dealt with in a responsible and uniform manner, therefore, a management system to deal with complaints is detailed above. Complaints will be undertaken in compliance with Condition B11 of the consent.

6.7 Contingency Plans

Contingency plans are required to address noise or vibration problems if excessive levels are measured at surrounding sensitive receivers and/or if justified complaints occur. Such plans include:

- Stop the onsite works.
- Identify the source of the main equipment within specific areas of the site which is producing the most construction noise and vibration at the sensitive receivers; and
- Review the identified equipment and determine if an alternate piece of equipment can be used or the process can be altered.
- In the event an alternate piece of equipment or process can be used, works can re-commence.
- In the event an alternate piece of equipment or process cannot be determined implement a construction assessment to be performed by a suitably qualified acoustic consultant.

The building contractor shall have access to view the Contractor's noise measurement records on request. The Superintendent may undertake noise monitoring if and when required.

6.8 General Mitigation Measures (Australia Standard 2436-2010)

As well as the above project specific noise mitigation controls, AS 2436-2010 "*Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites*" sets out numerous practical recommendations to assist in mitigating construction noise emissions. Examples of strategies that could be implemented on the subject project are listed below, including the typical noise reduction achieved, where applicable.

6.8.1 Additional Recommendations

- Regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration.
- Regular identification of noisy activities and adoption of improvement techniques.
- Avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby sensitive receivers.
- Where possible, avoiding the use of equipment that generates impulsive noise.
- Minimising the need for vehicle reversing for example (particularly at night), by arranging for one-way site traffic routes.
- Use of broadband audible alarms on vehicles and elevating work platforms used on site.

- Minimising the movement of materials and plant and unnecessary metal-on-metal contact.
- Minimising truck movements.

6.8.2 Plant and Equipment

- Choosing quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks.
- Selecting plant and equipment with low vibration generation characteristics.
- Operating plant and equipment in the quietest and most efficient manner.

6.8.3 On Site Noise Mitigation

- Maximising the distance between noise activities and noise sensitive land uses.
- Installing purpose-built noise barriers, acoustic sheds and enclosures.

6.8.4 Work Scheduling

- Providing respite periods which could include restricting very noisy activities to time periods that least affect the nearby noise sensitive locations, restricting the number of nights that after-hours work is conducted near residences or by determining any specific requirements.
- Scheduling work to coincide with non-sensitive periods.
- Planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from the sensitive receivers.
- Optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours.
- Including contract conditions that include penalties for non-compliance with reasonable instructions by the principal to minimise noise or arrange suitable scheduling.

6.8.5 Source Noise Control Strategies

Some ways of controlling noise at the source are:

- Where reasonably practical, noisy plant or processes should be replaced by less noisy alternatives.
- Modify existing equipment: Engines and exhausts are typically the dominant noise sources on mobile plant such as cranes, graders, excavators, trucks, etc. In order to minimise noise emissions, residential grade mufflers should be fitted on all mobile plant utilised on site.
- Siting of equipment: locating noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area; or orienting the equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise.
- Regular and effective maintenance.

6.8.6 Miscellaneous Recommendations

Deliveries should be undertaken, where possible, during standard construction hours.

Maximise hammer penetration (and reduce blows) by using sharp hammer tips. Keep stocks of sharp profiles at site and monitor the profiles in use.

It is advised that mobile plant and trucks operating on site for a significant portion of the project are to have reversing alarm noise emissions minimised. This is to be implemented subject to recognising the need to maintain occupational safety standards without compromising the safety of construction staff and members of the public.

No public address system should be used on site (except for emergency purposes).

7 CONCLUSION

This report details the Construction Noise and Vibration Management Plan for the construction of the Ivanhoe Precinct, Macquarie Park, Ivanhoe Village Green & Community Centre project including item B37 of the SSD-15822622.

An assessment of noise and vibration impacts from the required processes to be undertaken during the construction period of the project (including ground works and construction) has been undertaken and suitable treatments, management controls, perioding measurements and community engagement has been detailed in this report.

Providing the recommendations in this report are included in the construction of the site, compliance with the projects SSD Conditions and the relevant EPA's *Interim Construction Noise Guideline* and the projects *Consent* will be achieved.

For any additional information please do not hesitate to contact the person below.

Regards



Ben White
Director

Pulse White Noise Acoustics

APPENDIX A: ACOUSTIC GLOSSARY

The following is a brief description of the acoustic terminology used in this report:

Ambient Sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
Audible Range	The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.
Character, acoustic	The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.
Decibel [dB]	The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds; 0dB the faintest sound we can hear 30dB a quiet library or in a quiet location in the country 45dB typical office space. Ambience in the city at night 60dB Martin Place at lunch time 70dB the sound of a car passing on the street 80dB loud music played at home 90dB the sound of a truck passing on the street 100dB the sound of a rock band 115dB limit of sound permitted in industry 120dB deafening
dB(A)	*A-weighted decibels* The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.
Frequency	Frequency is synonymous to *pitch*. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on
LMax	The maximum sound pressure level measured over a given period.
LMin	The minimum sound pressure level measured over a given period.
L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L10	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{90} noise level expressed in units of dB(A).
Leq	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
dB (A)	'A' Weighted overall sound pressure level
Sound Pressure Level, LP dB	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.
Sound Power Level, Lw dB	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt

NAFL	Noise Affected Level - As referred to in the EPA's *Interim Construction Noise Guideline* as the affected noise level for the trigger of construction noise mitigation requirements.
HNAL	High Noise Affected Level – As referred to in the EPA's *Interim Construction Noise Guideline.*
AV-TG	NSW EPA *Assessing Vibration Technical Guideline.*

APPENDIX B – BEN WHITE CV AND AAS MEMBERSHIP

Curriculum Vitae – Benjamin White



Employment Experience:

Director – Pule White Noise Acoustics November 2020 – Present

Director - White Noise Acoustics: March 2019 – Present

Director/Engineer - Acoustic Logic Consultancy: March 2001 – July 2018

Experience:

Ben White the Director of White Noise has over 17 years of experience in acoustic.

Ben has significant experience in providing acoustic services and expert advice in the following areas:

- Residential acoustic reports including aircraft noise (AS2021) assessments, traffic noise, train noise and vibration assessments.
- Noise emission assessments for various projects including assessments with planning requirements using EPA, Department of Planning, Council DCP's and similar regulatory requirements.
- Planning approvals including Development Applications for multi dwelling residential developments, commercial developments, hotels and boarding houses, places of entertainment, carparks, mixed use developments, shopping centres and the like.
- Expert court witness including Land and Environment Court and other expert witness work.
- Project planning and specifications for types of projects including residential, commercial, retail, hotel accommodation, warehouses and industrial developments and mixed-use projects.
- Project delivery for all types of projects including, design advice and project delivery requirements at all stages of projects during design and construction.
- Certification works including on site testing for the provision of certification of all types of projects including items required to comply with Part F5 of the BCA as well as project specific acoustic requirements.
- Mechanical design and advice for the treatments of mechanical services with project requirements.
- External façade design and specification.
- Specialised acoustic design advice including areas of projects.
- Issues with existing building include site surveys and audits as well as advice regarding rectification if required.



AUSTRALIAN ACOUSTICAL SOCIETY

This is to certify that

BENJAMIN WHITE

was admitted to the grade of

MEMBER

of the Australian Acoustical Society

on 27th October 2020

and is entitled to use the letters

M.A.A.S.

issued on 26th November 2020

S. Moore

President

General Secretary

AUSTRALIAN ACOUSTICAL SOCIETY A.C.N. 000 712 658 The Common Seal Of

This certificate remains the property of the Australian Acoustical Society

Appendix 4 – Air Quality and Odour Management Plan

Grindley Construction

Air Quality and Odour Management Plan

Ivanhoe Village Green & Community Centre - 1 Ivanhoe Place, Macquarie Park NSW 2113

Purpose:

A plan to monitor and mitigate potential air quality and odour impacts related to site operations.

Prepared for:

Grindley Construction

Document Date:

26 July 2024

Reference:

S-07641.AQOMP.001

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DOCUMENT CONTROL

Project Details:	
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Client Name:	Grindley Constructions
EDP Reference:	S-07206.AQOMP.001
Prepared By:	Gonzalo Serna Diaz
Reviewed By:	Robert Gauthier

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GLOSSARY

Term	Definition
ACM	Asbestos Containing Materials
AS	Australian Standard
AST	Above-ground Storage Tank
Control Measures	The actions to be undertaken to achieve the stated environmental objectives, including any necessary approval, application, consultation or monitoring.
Contractors	Individuals or companies employed to carry out works or services that could potentially have an environmental impact if control measures are not implemented.
Corrective Actions	Nomination of the action being implemented if the stated objectives are not being met or maintained, including responsibility for implementation.
EMP	Environmental Management Plan
ENM	Excavated Natural Material
EPA	Environment Protection Authority
EPL	Environment Protection License
JSEA	Job Safety Environmental Analysis
Monitoring	The process of measuring actual environmental performance.
OEMP	Operational Environmental Management Plan
Receptor	Environment, property, humans, animals or anything else that could be affected by a hazard
Reporting	Description of the required reporting arrangement
SSD	State Significant Development
SWMS	Safe Work Method Statement
Vapour	Refers to a gas phase at a temperature where the same substance can also exist in the liquid or solid state
VENM	Virgin Excavated Natural Material
VOCs	Volatile organic compounds

1. AQOMP CONTEXT AND OBJECTIVES

1.1 Context

This Air Quality and Odour Management Plan (AQOMP) applies to the proposed construction operations undertaken as part of the development of the Ivanhoe Village Green & Community Centre, also known as the Midtown C2 project located at 1 Ivanhoe Place, Macquarie Park NSW 2113 ('Site').

The Midtown C2 project is part of Stage 2 of the greater Ivanhoe Estate Project. The Site is in lot C2 of the greater Ivanhoe Estate site at the former Ivanhoe Estate Social Housing precinct.

The AQOMP describes management and mitigation measures to control operations and excavation works that may hold the potential to generate fugitive impacts to air quality during construction works associated with the Midtown C2 project.

This document has been structured to meet industry-standard requirements for an AQOMP and to enable compliance with the obligations under condition B38 of the State Significant Development (SSD)

1.2 Objectives

The objectives of this AQOMP are to minimise potential impacts associated with odours and air quality (specifically as general/undefined dust), including:

- Adverse impacts of transport of soil/rock from the excavation and materials movement areas, storage, and transport of excavated soil/rock material on site;
- Should an incident occur, effective response and management procedures are achieved;
- Should an odour complaint be received, it is appropriately investigated and responded to
- Provide methods and controls to enable workers to effectively observe, identify, document and manage potential air quality impacts and appropriately control risks

The AQOMP will also include proactive and reactive management strategies, key performance indicators, monitoring measures, record keeping, response mechanisms, and contingency and compliance reporting measures.

Additionally, this AQOMP will address the obligations under condition B38 of the SSD. **Table 1** outlines all the obligations and addressing sections.

Table 1 - SSD obligations and addressing sections

Obligation	Addressing Section
(a) Staged excavation to limit the surface area of exposed odours material	6.5
(b) Application of odours suppressant	6.9
(c) Effective covering of stockpiles and truckloads of excavation spoil	6.5, 6.6
(d) Expedited removal of odours material from the development to a facility legally able to accept those wastes	6.12

2. PROPOSED DEVELOPMENT

The development proposes the following:

- Approximately 3,300m² of open green space between C1 and C3 towers;
- A community centre and social enterprise café located on the upper ground floor, with a total area of 700m²;
- A pool and gym facility on the ground floor that overlooks the park, with a total area of 1,122 m²; and

- Integration with the surrounding landscape, consisting of a community plaza, community terrace and garden, playground, central lawn and community veranda.

To achieve the scope of the proposed development, excavation, pilling, and detailed earthworks will be undertaken.

3. SITE DETAILS

3.1 Site Information

This Site is located at 1 Ivanhoe Place, Macquarie Park NSW 2113. Site location figure is included as **Appendix A**.

Table 2 - Site identification details

Address	1 Ivanhoe Place, Macquarie Park NSW 2113
Title identification	Lot 10 in DP 1262209
Local Government Area	City of Ryde
Area	Ivanhoe Estate Site 82,00 m^2
Zoning	MU1 – Mixed Use
Current land use	The site is under an eight-stage development project to provide over 3000 dwellings with a mix of market, social and affordable housing. Age care facilities, childcare centres, schools, neighbourhood parks, town plazas and the Village Green and Community Centre will be constructed.
Surrounding land uses	North – Herring Road, followed by residential buildings South – Shrimptons Creek, followed by residential buildings East – Ivanhoe Place, followed by residential dwellings West – Epping Road, followed by residential dwellings

3.2 Environmental Considerations

The potential for the construction works to encounter or generate odorous materials is a key consideration of identifying risk areas of the project. Previous investigations across the site were undertaken in accordance with the Secretary's Environmental Assessment Requirements (SEARs) Condition 11: Contamination for Stage 2 development at Ivanhoe Estate, Macquarie Park, NSW:

Consultants Environmental Earth Science NSW (2021) undertook a review of existing data and conducted additional sampling to provide a summary of potential contamination (and potentially odourous materials on site

3.2.1 Fill Material

Following the Douglas Partners (DP, 2017), DLA (DLA, 2018a) and Environmental Earth Sciences (2021a) investigations, an estimated 23,676 cubic metres (m^3) of in situ material was classified as General Solid Waste (GSW) in accordance with the Waste Guidelines, should the material be removed from the site.

A further soil assessment was conducted by Environmental Earth Sciences (2021e) in the area south and southeast of the Midtown sales office whereby an estimated 1,000 m3 of in situ material was classified as GSW in accordance with the Waste Guidelines.

3.2.2 Unconsolidated Natural Layer

Approximately 3,023 m3 (~4,837 tonnes (t)) of unconsolidated soil material was chemically and physically assessed and considered suitable for offsite beneficial reuse as virgin excavated natural material (VENM), as per the definition of VENM documented in Schedule 1 of the POEO Act. Refer to Environmental Earth Sciences (2021b, 2021d and 2021e).

3.2.3 *Bedrock Layer*

Approximately 59,576 m3 (~154,898 t) of bedrock material was subject to assessment as natural material as per the definition of VENM documented in Schedule 1 of the POEO Act. Assessment also included ascertaining the chemical and physical attributes of the material in accordance with chemical testing requirements of the Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (POEO) (Waste) Regulation 2014 - the excavated natural material order 2014 (the "ENM Order"), ENM Order.

Based upon results and findings from this assessment it was concluded that material in this layer met the definition of VENM. This was supported by results of chemical and physical attributes testing which reported concentrations of all samples within acceptable threshold criteria of the ENM Order. Refer to Environmental Earth Sciences (2021b) for further information.

The reviewed data as above provides a reasonable basis to indicate it is unlikely that odorous, anthropogenic material is expected to be encountered during construction activities, and the air quality and odour objectives in this Plan should be designed to manage risk potentially associated with generation of dust or other fugitive impacts as appropriate.

4. LEGISLATIVE OBLIGATIONS AND OTHER REQUIREMENTS

4.1 Environmental Planning and Assessment Act 1979

The air, water and noise pollution legislation administered by the DEC (Department of Environment and Conservation) complements the environmental planning control system in the Environmental Planning & Assessment Act (EP&A Act) by imposing requirements on new projects. Pollution is permitted up to certain levels under a system of work approvals and licences.

This Act enables the Minister for Planning to set Approval Conditions as well as require the assessment of environmental impacts in accordance with Schedule 3 of the Environmental Planning and Assessment Regulation 2000 before approval can be obtained for the proposal to proceed.

4.2 Protection of the Environment Operations Act 1997

This Act is the primary NSW environment protection legislation that covers air, noise, water, land and waste management. It provides a framework to regulate and enforce pollution control in NSW. The Act identifies mechanisms for preventing environmental degradation including, pollution prevention, cleaner production, reduction in discharge levels likely to cause harm to the environment, recycling and progressive environmental improvement.

Under Section 148 of the Protection of the Environment Operations Act (PoEO) Act, there is a duty to notify pollution incidents causing or threatening material harm to the appropriate regulatory authority (ARA). Harm to the environment is defined (s147) as material if it involves actual or potential harm to the health or safety of human beings that is not trivial, or it results in actual or potential loss or property damage exceeding $10,000 (includes clean-up costs). The ARA for this project is the DEC.

Part 5.4 of the PoEO Act prescribes the requirements in relation to air emissions. The occupier of any premises is guilty of an offence if plant is being operated in a way to cause air pollution if that air pollution is caused by the occupier's failure (a) to maintain the plant in an efficient condition, or (b) to operate the plant in a proper or efficient manner (s124).

A similar prohibition exists in relation to causing air pollution by failing to deal with materials in a proper and efficient manner (s126). Materials include raw materials, materials in the process of manufacture, manufactured materials, by-products or waste materials.

4.3 Guidelines

NSW EPA Approved methods for the sampling and analysis of air pollutants. This guideline outlines the methods used for sampling and analysing air pollutants in New South Wales for statutory purposes. The document covers pollutants in emissions from stationary sources, including:

- Continuous monitoring of such emissions;
- Pollutant emissions from motor vehicles;
- Components in, and properties of, petroleum products; and
- Pollutants in ambient air.

This AQOMP aims to minimise the risk of construction activities associated with the Midtown C2 Project, which could result in potential adverse air quality impacts, whereby criteria may be exceeded.

5. ROLES AND RESPONSIBILITIES

This AQOMP is designed to be managed under the responsibilities outlined below in **Table 3.** As such, the principal contractor (Grindley Construction) is responsible for the overall implementation and maintenance of the AQOMP and for ensuring that staff members and sub-contractors have been informed of the requirements of the AQOMP. The responsibilities may be delegated where appropriate (such as contractors during site preparation, development and bulk earthworks) but this must be done in writing and notified to all affected parties.

The supervisor or person-in-charge of any intrusive works that impact the site is responsible for implementing the requirements of the AQOMP during works and must ensure that all occupants of the site and contractors working on the site have been informed of the requirements of the AQOMP prior to commencement of any works.

Table 3 outlines the main parties that may be involved in implementing this AQOMP and their respective roles and responsibilities. This table does not intend to list all responsibilities under relevant legislation but is a brief clarification of the roles and responsibilities in implementing this AQOMP.

Table 3 - Roles and Responsibilities

Roles and Responsibilities
Grindley Construction / Any future Person Conducting and Business or Undertaking (PCBU):
▪ Approve the AQOMP and hold overall responsibility for the implementation and maintenance of the AQOMP; ▪ Advise persons working or operating on the site of the requirements of the AQOMP; ▪ Ensure appropriate consents and licences (as required) are obtained for the works; ▪ Provide training and induction of employees and contractors before and during the works, as appropriate; ▪ Appoint a site manager or Management Plan Controller; ▪ Incorporate this AQOMP into relevant policies and procedures, including the owner's management system and subcontractor agreements; ▪ Be responsible for promoting good environmental and WHS Management; ▪ Provide a copy of the AQOMP to the supervisor or person-in-charge of the works being undertaken; ▪ Engage a suitably qualified environmental consultant to update the AQOMP if the conditions at the site change, and, if necessary, inform other parties of the changes; ▪ Ensure contractors and personnel involved in the works comply with the requirements of the AQOMP; ▪ Ensure construction staff and contractors clearly understand the requirements of the AQOMP and ensure that compliance with the AQOMP is a condition of any agreement with these parties; ▪ Ensure the conditions of the AQOMP are implemented and supplemented, if necessary, by any conditions of development or works approvals; ▪ Ensure the site and site records are maintained in accordance with the AQOMP; ▪ Ensure all non-conformances and/or complaints are recorded and appended to this AQOMP; ▪ Monitor and act to ensure management requirements are implemented throughout the life of the workplace; and ▪ Conduct site inspections for conformance to the AQOMP under normal site use conditions.

AQOMP **Controller :**
▪ Develop protocols and procedures to ensure that the AQOMP is enforced; ▪ Approve all intrusive works via the PCBU; ▪ Ensure risk assessments of ground disturbance activities are carried out by a competent person (i.e. a suitably trained employee, qualified Environmental Consultant) on a regular basis as outlined in this AQOMP, appropriate management procedures are developed and safe work method statements; ▪ Provide inductions to all relevant site personnel as detailed in this AQOMP; ▪ Provide or delegate supervision as required to ensure that the procedures documented in this AQOMP are implemented; ▪ Establish a platform for consultation for all relevant site personnel to ensure responsibilities are understood and feedback can be provided; ▪ Ensure related records are maintained. Records such as the training records, incident reports, contractor licences, SWMS, air monitoring reports and any investigation outcomes are also to be included**;** ▪ Ensure a copy of the AQOMP is made readily accessible for all relevant personnel.
Employees and Sub-Contractors:
▪ Not placing themselves or others at risk of exposure to potential poor air quality or odours; ▪ Understanding and following the procedures outlined in this AQOMP; ▪ Follow instruction from the site manager or controllers regarding the implementation of this AQOMP; ▪ Competency in the identification of unexpected odorous or excessively dusty conditions or similar and the control measures to be adopted when undertaking works at the site; ▪ Reporting hazards, including incidents and unsafe work practices to the AQOMP Controller.
Environmental Consultant (if appointed):
▪ Assess the risk involved with any proposed works prior to commencing proposed works; ▪ Undertake routine inspections and monitoring to assess compliance with this AQOMP. Provide recommendations for updates and enhancements to the AQOMP, as required; ▪ Provide Health, Safety and Environmental advice for proposed changes to site layout, operations or site-specific activities, as required; ▪ Support AQOMP Induction Training, as required; and ▪ Develop documentation for unexpected findings and/or maintenance works.

6. ENVIRONMENTAL MANAGEMENT AND CONTROLS

6.1 Introduction

The air quality and odour management processes and controls outlined in this section have been developed with reference to condition B38 of the State Significant Development (SSD) dated 28th November 2022. Any non-conformance shall be documented and followed-up accordingly, allowing the process to be continually reviewed and potentially refined if necessary.

6.2 Housekeeping and General Requirements

The following general environmental work practices shall apply to all activities at the Site:

- On noticing or becoming aware of any environmental hazard, an employee or contractor shall remove it as soon as practicable, or if this is not possible, shall alert nearby workers to the hazard and report it immediately to the Site Manager.
- Employees and contractors, where relevant, shall take an active part in environmental monitoring meetings, training, and emergency drills.

- Keep workplaces tidy. Rubbish should be cleaned away and deposited in the appropriate bins/containers/receptacles.
- Undertake all work in a sustainable manner, seeking to minimise dust or odour generation to the extent practicable.
- Obey all signs. These signs are located and displayed to advise you of hazards in particular areas.
- If you do not know what something is, do not touch/disturb it. Report it to the Site Manager.
- No employee or contractor shall wilfully or deliberately damage the environment or alter its conditions.
- Employees and contractors shall use the designated equipment and/or wear the designated personal protective equipment required for each task.

6.3 Work Permits

The permit to work system is a formal written system used to control certain types of potentially hazardous work being conducted by contractors. It also is a way of establishing communication and understanding between the principal contractor and the personnel or sub-contractors who are going to execute the work.

Work permits should be issued in accordance with the Grindley Management System for all contractor scopes of work, potentially including:

- Handling
- Pilling;
- Excavation;
- Stockpiling; and
- Transport and disposal works.

Sub-contractors must provide a person on-site who is trained and accredited in accepting and authorising work permits. Responsibilities of the person(s) undertaking the work include the following:

- Be skilled, qualified, trained and competent to perform the work, use any personal protective equipment or equipment required.
- Satisfy themselves that they understand the requirements of the permit.
- Be aware of the hazards that could exist and have the necessary controls in place.
- Adhere to the permit to work requirements.
- Ensure the job is performed in a manner that minimises potential air quality and odour impacts.
- Make equipment and area safe on completion of the task.
- Seek immediate advice if in doubt or if circumstances or conditions change within the work area.
- At the completion of the job, returning the permit to the Issuer for closure.

6.4 Storage and Handling of Hazardous Chemicals

All hazardous chemicals will be stored in a manner to avoid risks of pollution of air and generation of unacceptable odours. All flammable and combustible liquids are stored and handled on-site in accordance with relevant standards such as AS1940-2004 *The storage and handling of flammable and combustible liquids*.

All hazardous chemicals will be stored in such a way as to avoid risks of pollution.

It is anticipated that the chemicals to be on-site may include fuels, oils, and lubricants.

The following procedures shall be implemented for storage and use of hazardous chemicals:

- Where practicable, all chemicals will be removed and safely stored off-site at the end of each workday;
- Chemicals to be stored on-site shall be in labelled sealed containers within a leak proof spill tray and covered with a tarpaulin;
- Chemicals storage area shall be within a designated bunded area;
- Clean-up must not involve the over-use of disinfectants, or the use of environmentally damaging disinfectants;

- Copies of Safety Data Sheet (SDS) for all chemicals are available on-site (site office);
- All herbicides are to be applied in accordance with the manufacturers' recommendations; and
- Disposal of any surplus hazardous substances shall be in accordance with the requirements of the material safety data sheets, environmental authorities and statutory requirements.

6.5 Excavation and Off-site Disposal

Prior to any intrusive works or other disruptive activities carried out on site, consideration must be given to how the work or activity can be undertaken with minimal dust generation. All works should be undertaken with control of dust as a priority. The dust control or avoidance measures should be documented in a SWMS, or similar, prepared for the proposed works.

Should any unexpected hazards arise, the site manager should be contacted immediately so that the risks (health or safety) can be re-evaluated and the appropriate level of management and/or protection can be implemented prior to the recommencement of any works.

The following procedures and techniques mayl aid in controlling dust generation:

- Erection of dust screens around the perimeter of the site;
- A tarpaulin (or equivalent) maybe used to securely cover all loads of soil material entering or leaving the site (if applicable);
- Water sprays may be used across the site over unsealed or bare surfaces;
- HDPE sheeting can be used by to cover excavation faces and stockpiles where necessary; and
- Materials at the site should be processed, handled, moved and stored in a proper and efficient manner in order to minimise exposure.

If the above procedures and techniques are not sufficient to control dust, then further contingency measures may include:

- Reducing the area of disturbed surfaces;
- Installation of perimeter sprays on the remediation site boundary fencing;
- Conducting work in more favourable weather conditions;
- Modifying the manner in which excavation work is conducted at the site;
- Using different equipment which generates less dust; and
- Using equipment in more favourable weather conditions.

6.6 Stockpile Management

The following recommended for soil stockpiled during the works:

- Stockpiles be established on hardstand, HDPE sheeting or geofabric on the ground surface (as required);
- Dust suppression measures will be in place;
- Stockpiles should be limited to 2 m in height where possible and should be of the lowest height practicable;
- Stockpiles may be wetted down with water, subject to considerations for stormwater and surface water management;
- Stockpiles can be covered with weighted HDPE or geofabric if likely to generate fugitive dust;
- Stockpiles can be suitably barricaded or otherwise fenced off to prevent access;
- Stockpiles of soil or other materials should be placed away from drainage lines, gutters or stormwater pits or inlets;
- Stockpiles of soil or other materials likely to generate dust or odours should be covered, if required; and
- Stockpiles should be stored in a secure area and be covered with weighted geofabric or HDPE sheeting if remaining more than 24 hours.

6.7 Wind Speed Work Stoppage

The application of a wind speed work stoppage requirement is designed to control fugitive emissions due to increased air velocity. In the event of high wind speeds, excavation work must be stopped at the site until wind speeds are reduced to a speed that shall not generate visible emissions from the site. For the purposes of this site, work must be stopped when:

- Wind speeds reach a sustained 40 km/h; or
- Any wind speed at which particulates are observed by site personnel to be entrained in the air stream.

If site-specific weather creates conditions that may result in fugitive emissions, work stoppage may occur at wind speeds less than specified above based on decisions of the site supervisor. The site supervisor shall make the decision as to when it is appropriate to restart.

6.8 Unexpected Finds (Asbestos)

In the event that suspected asbestos is encountered during excavation works, and to promote healthy air quality for all the site occupants, the Unexpected Finds Protocol should be followed.

6.9 Odour Generation

Odour should be controlled so that no unacceptable odours are detected at the boundaries of the site during development works. The following procedures may be employed to comply with this requirement such as:

- Use of appropriate covering techniques;
- Use of plastic sheeting to cover excavation faces or stockpiles;
- Use of fine mist sprays;
- Use of a mitigating agent on the impacted areas/materials; and
- Adequate maintenance of equipment and machinery to minimise exhaust emissions.

6.10 Refuelling and Maintenance

Hydrocarbon can generate strong and unpleasant odours The following control measures shall be implemented to manage potential fuel spill risk associated with refuelling and maintenance:

- Only undertaken on hardstand or designed refuelling areas;
- Only to be undertaken by those skilled and trained;
- Refuelling to be undertaken in accordance with documented procedure and manufacturers recommendations;
- Documented procedures shall be kept on-site and be updated if required;
- On-site maintenance to be limited to the extent practicable;
- Spill kits to be present and available during any refuelling or maintenance activities; and
- Immediate clean-up of any incidents, with appropriate reporting.

6.11 On-Site Vehicles and Plant

Dust and exhaust emissions at the Site from on-site vehicles and plants could represent a risk to air quality and odour objectives if not appropriately managed. The following general measures should be implemented as part of routine site activities:

- Ensure that all vehicles, plant and equipment are maintained in good working condition and operated in accordance with manufacturer's recommendations;
- Motorised equipment should be turned off when not in use;
- Ensure that trucks are loaded in accordance with weight restrictions and other relevant compliance requirements;
- Scheduling, to spread traffic volumes throughout the day where possible; and

- Support and promote policy initiatives and technologies to improve fuel efficiency and reduce emissions, provided they are feasible and commercially viable.

6.12 Waste Management

To help minimise odours, routine waste generated at the Site should be managed in accordance with the following principles:

- Dedicated waste receptacles with adequate volume should be provided in various locations across the Site, to ensure waste is appropriately contained prior to off-site disposal;
- Waste bins should be emptied regularly to avoid overflowing;
- Waste minimisation should be be undertaken according to the hierarchy of avoidance, reuse, recycle and disposal. Where possible, recyclable waste should be segregated and sent to appropriate facilities for recycling;
- All waste should be disposed off-site to licenced receivers; and
- Sewerage infrastructure should also be maintained in proper and efficient condition to ensure system integrity and minimise overflows.

7. INDUCTION AND TRAINING

All staff and contractors should be made aware of the AQOMP, its general contents and the following responsibilities as part of standard onboarding and induction protocols:

- Housekeeping and general requirements (Section 6.2);
- Responsibility to ensure Site activities do not cause contamination or pollution, or result in a breach of the environmental legislation;
- Incident reporting requirements;
- Emergency response;
- Record keeping requirements; and
- Complaints procedures.

Contractors shall also be advised of their responsibility to identify potential hazards and appropriate controls for each task, as part of their Safe Work Method Statement preparation.

Specific staff and contractor training is also required for any personnel involved with:

- Excavation, trenching or pilling work;
- Refuelling and maintenance; and
- Chemical storage and handling.

Training and induction records shall be kept on Site and accessible for inspection, if required.

7.1.1 Spills

Spill kits should be readily available across the Site.

If spilling occurs during daily activities, the area should be isolated, and clean-up should occur as soon as possible. Any spilled material will either be treated onsite or disposed to an appropriate NSW EPA approved waste management facility.

NSW Fire and Rescue via its Hazmat Response Unit is the lead combat agency for any spill emergency which cannot be readily contained and managed.

7.2 Complaints and Environmental Incident Register

The receipt of complaints will be handled and responded to according to Grindley Construction policy. The telephone number of the site manager will be displayed on the front gate signage along with the other signage. This person will be the primary contact for complaints.

The purpose of the Complaints and Environmental Incident Register is to maintain a register of complaints from local residents or concerned parties, which will include a record of any action taken with respect to the complaints.

The Complaints and Environmental Incident Register is required to be completed immediately following the receipt of any complaints associated with works undertaken at the Site. Written complaints should be addressed or acknowledged within five days of the complaint being received. Complaints made by telephone or in person should be addressed or acknowledged within two days of receipt..

8. SITE MONITORING AND AQOMP REVIEW

The AQOMP is to be a dynamic document that is revised where necessary to reflect any changes to the site that may result in a change to the exposure risk factors and associated controls. As soon as reasonably practicable, after such a change is identified, the AQOMP shall be revised by a suitably experienced and qualified Environmental Consultant as nominated by the PCBU of the Site. Whenever the AQOMP is amended, all site personnel including contractors shall be inducted to the revisions of the AQOMP and any associated revisions relating to their responsibilities. The AQOMP shall be maintained by the PCBU of the site.

8.1 Site Inspections

In order to monitor the effectiveness of any existing controls protecting against potential poor air quality and odour generation, it is essential that regular inspections are conducted by a suitably trained person appointed by the PCBU. Visual inspections of the Site shall be carried out to ensure that the Site is in good condition and all recommended controls are in place. Examples of when routine inspections should be carried out include:

- Whenever an incident or complaint has been reported; and
- Prior to and following any works that involve new methodology or machinery.

A site inspection checklist shall be completed by suitably trained person appointed by the PCBU during the Site inspections and records kept within this AQOMP. Photographs from each inspection should be kept on record as part of the checklist. Detailed photos should be taken where issues are identified at the Site, such as exposed asbestos, metals or material being uncovered across the exposed ground surface, shall be documented, and recorded to help establish whether further management measures are required.

8.1.1 Daily and Weekly Inspection

Daily and weekly inspections of control measures should be undertaken by Grindley Construction and confirmed to adhere to the requirements of this AQOMP. Daily inspection should typically be undertaken at the beginning and end of the workday to ensure that systems and controls/measures are in place overnight.

Items to be inspected include but are not limited to:

- Site fencing (internal and boundary);
- Stockpiles;
- Open excavations;
- Air Quality controls;
- Waste management; and
- Dust suppression measures.

During completion of the works, where damage to or reduced capacity of, control measures is observed or reported, they should be corrected as soon as is reasonably practicable.

8.1.2 Monitoring

During any planned construction works, monitoring will be conducted to ensure compliance with legislation, as well as the objectives and targets stipulated in this AQOMP.

All regular monitoring activities should be recorded. The frequency and specific monitoring criteria will be assessed periodically throughout the works to ensure that they are consistent with the current level of risk to the environment and human health.

8.1.3 Non-Conformances and Corrective Action

In the event that a non-conformance is identified through the routine inspection, Grindley Construction shall take appropriate action to ensure it is corrected appropriately and as soon as practicable, with reference to the ISO14001 recommended procedure for corrective actions.

Any action to rectify a non-conformance will be recorded and documented.

Follow-up action may result in a requirement for additional monitoring or investigation, and these details will be further assessed.

8.2 Records

Reports are to be prepared by the Project Manager for the works and appended to this AQOMP.

Table 1 - Reporting Requirements

Report	Frequency
Daily inspection walkover registers	Daily (recorded as register)
Site inspection checklist	Weekly
Review of identified corrective actions	Weekly
Complaints management	If required

Examples of reports/records (not exhaustive) which may be required during construction works include:

- Unexpected finds protocol;
- Inspection reports undertaken by suitably qualified personnel;
- Licenses, permits, consents or conditions of approval (as relevant);
- Training and induction records;
- Environmental audits;
- Environmental event/incident and investigation reports;
- MSDS and chemical register training and induction registers;
- Environmental monitoring data and reports; and
- Environmental complaints records.

9. AQOMP REVISION

The effectiveness of this AQOMP will require review by responsible parties at the following intervals:

- Prior to the commencement of works;
- During the course of the proposed works;
- Any changes of scope of work or significant Site changes; and
- Following any incident or unexpected find throughout the works period.

In the event the review identifies amendments to the AQOMP are required (likely due to a change of scope of work, site condition or relevant legislation), the adopted control measures will be assessed and revised accordingly. Any necessary control measures will be implemented following agreement between all involves parties. Any controls identified by Grindley Construction during planned works should be incorporated into the AQOMP.

This AQOMP is required to be reviewed following identification of any change in the understood nature of the project or any significant change in the scope of works. It is the responsibility of the AQOMP Controller to ensure the AQOMP supplied to any person is the current updated or amended version.

STATEMENT OF LIMITATIONS

This document has been prepared in response to specific instructions from the client to whom the report has been addressed. The work has been undertaken with the usual care and thoroughness of the consulting profession. The work is based on generally accepted standards, practices of the time the work was undertaken. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The report has been prepared for the use by the client and the use of this report by other parties may lead to misinterpretation of the issues contained in this report. To avoid misuse of this report, EDP advise that the report should only be relied upon by the client and those parties expressly referred to in the introduction of the report. The report should not be separated or reproduced in part and EDP should be retained to assist other professionals who may be affected by the issues addressed in this report to ensure the report is not misused in any way.

Reliance on Information Provided by Others

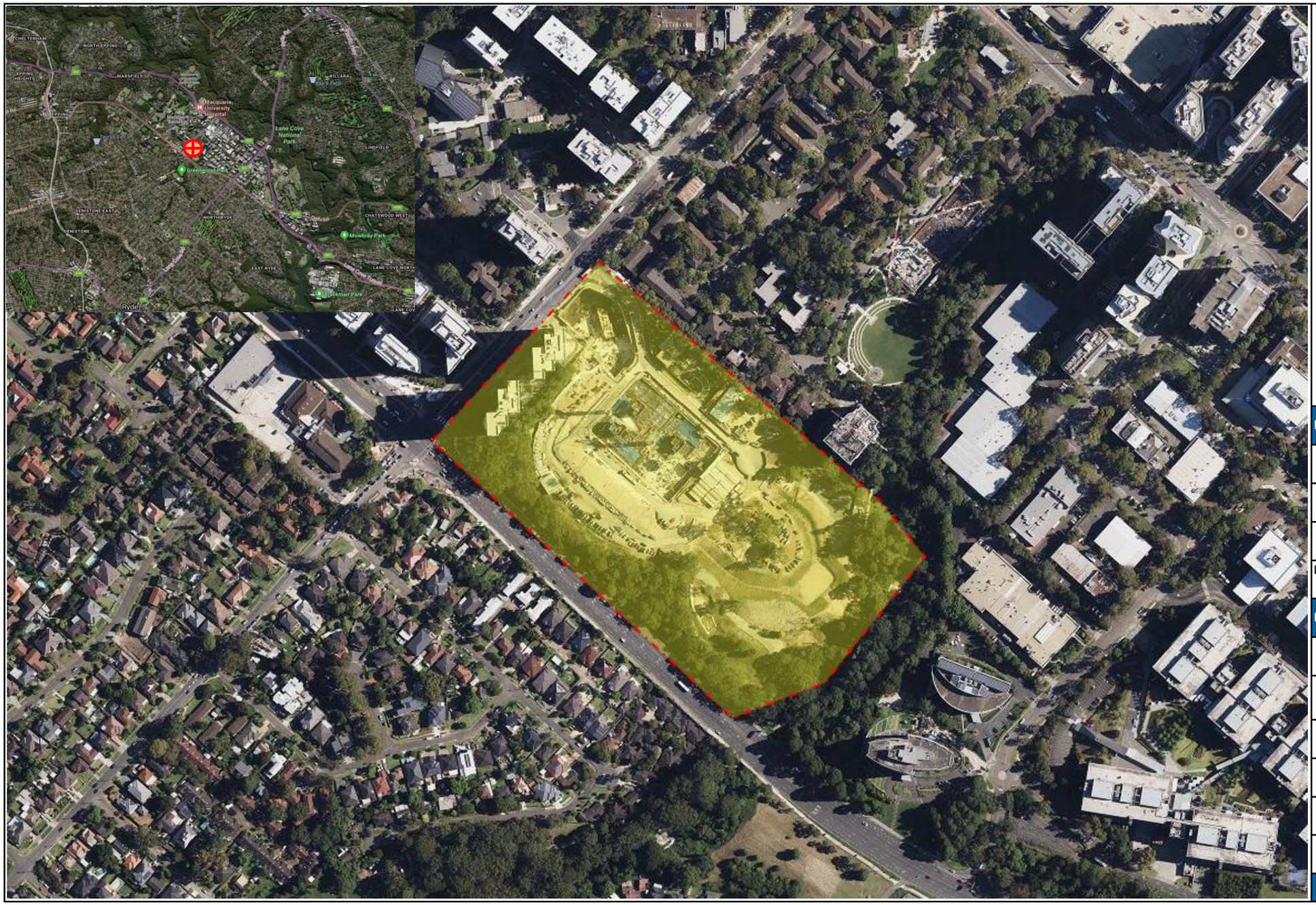
EDP notes that where information has been provided by other parties in order for the works to be undertaken, EDP cannot guarantee the accuracy or completeness of this information the client therefore waives any claim against the company and agrees to indemnify EDP for any loss, claim or liability arising from inaccuracies or omissions in information provided to EDP by third parties. No indications were found during our investigations that information contained in this report, as provided to EDP, is false.

Recommendations for Further Study

The industry recognised methods used in undertaking the works may dictate a staged approach to specific investigations. The findings therefore of this report may represent preliminary findings in accordance with these industry recognised methodologies. In accordance with these methodologies, recommendations contained in this report may include a need for further investigation or analytical analysis. The decision to accept these recommendations and incur additional costs in doing so will be at the sole discretion of the client and EDP recognises that that the client will consider their specific needs and the business risks involved. EDP does not accept any liability for losses incurred as a result of the client not accepting the recommendations made within this report.

APPENDIX A: FIGURES

FIGURE A2: SITE LOCATION



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Ivanhoe Village Green & Community Centre - 1 Ivanhoe Place, Macquarie Park NSW 2113

SITE LOCATION

LEGEND:	
	Approximate greater Ivanhoe Estate site boundary
	Approximate site location

Image from: Nearmap, 28 June 2023

DETAILS:	
Report Name:	Air Quality and Odour Management Plan
Client Name:	Grindley Construction
EDP Reference:	S-07641.AQOMP.001
Figure Number:	1
Figure Name:	Site Location
Assessment Date:	Friday, 26 July 2024

FIGURE A2: SITE LOCATION



edp
an RSK company

13 Bumborah Road, Port Botany NSW 2036

SITE DETAILS

LEGEND:	
	Midtown C2 project location

Image from: Nearmap, 30 May 2023

DETAILS:	
Report Name:	Air Quality and Odour Management Plan
Client Name:	Grindley Construction
EDP Reference:	S-07641.AQOMP.001
Figure Number:	2
Figure Name:	Site Features
Assessment Date:	Friday, 26 July 2024



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Appendix 5 - Construction Wase Management Sub-Plan

Consulting.™
an Elephants Foot Company

Ivanhoe Estate Midtown, Macquarie Park

Mixed Use Development

CONSTRUCTION WASTE MANAGEMENT PLAN

28/06/2024
Revision C

Client

Grindley Construction Pty Ltd.

Architect

CHROFI

ELEPHANTS FOOT

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SCOPE

A Waste Management Plan (WMP) is to be submitted with all development applications for new and change-of-use developments that will generate construction waste.

This WMP applies only to the **construction** phase of the proposed development. The requirements outlined in this WMP must be implemented on site during construction and may be subject to review upon any change to the design. Construction waste management requirements will also be subject to review as part of the Construction Management Plan.

There are no **demolition** works proposed as part of this development application.

The waste management for the **operational** phase of the development is not addressed in this report, and can be provided separately.

REVISION REFERENCE

Revision	Date	Prepared by	Reviewed by	Description
A	27-06-2024	T. McPherson	J. Parker	Draft
B	27-06-2024	T. McPherson	J. Parker	Amendment
C	28-06-2024	T. McPherson	J. Parker	Final

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1 ACKNOWLEDGEMENT OF COUNTRY

Elephants Foot Consulting acknowledges that every project we work on takes place on First Peoples Land. We recognise Aboriginal and Torres Strait Islander People as Traditional Custodians of this land. We pay respect to ancestors and Elders, past and present.

2 INTRODUCTION

2.1 Background

EFC has been tasked to prepare the following waste management plan for Grindley Construction Pty Ltd. for the management of construction waste generated by the mixed use development located at Ivanhoe Estate Midtown, Macquarie Park NSW.

Waste management strategies and auditing are a requirement on construction sites to promote strong sustainability outcomes. It is EFC's belief that a successful waste management strategy contains three key objectives:

i. ***Promote responsible source separation*** to reduce the amount of waste that goes to landfill, by implementing convenient and efficient waste management systems.

ii. ***Ensure adequate waste provisions and robust procedures*** that will cater for potential changes during the operational phase of the development.

iii. ***Comply*** with all relevant Australian Standards, council codes, policies, and guidelines.

2.2 Site Summary

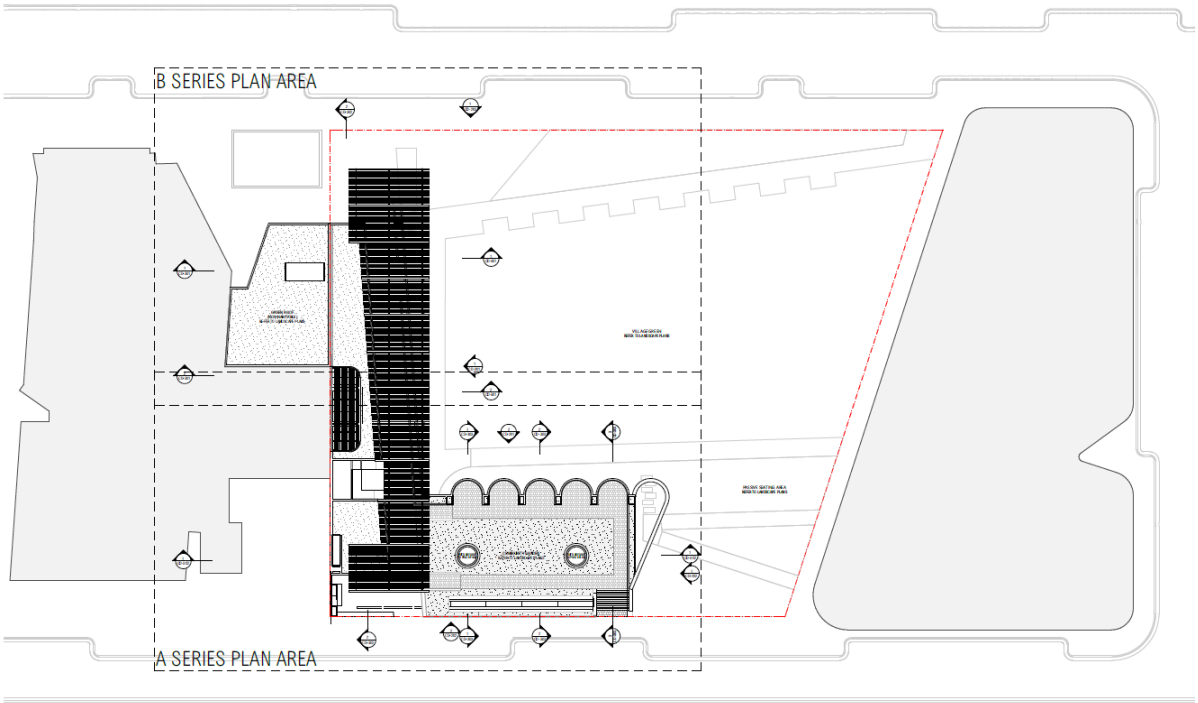
The proposed development falls under the LGA of Ryde City Council. The proposed site (Building C2/Village Green & Community Centre) is located within Frasers Property, Australia's Ivanhoe Estate (Midtown) Development, located in Macquarie Park near the corner of Epping Road and Herring Road. Building C2 is located centrally within the Ivanhoe Estate, and will be situated between Buildings C1 and C3 (per below). The proposed C2 building which forms the basis of this document includes a community centre, local café, gym and pool facilities, and a local village green park area.

All figures and calculations are based on area schedules as advised by our client and shown on architectural drawings.

2.3 Site Location

The site is located at Ivanhoe Estate Midtown, Macquarie Park NSW, as shown below.

Figure 1: Site Plan



Source: CHROFI, Drawing no. A-CD-002, Rev N: Site Plan.

2.4 Legislation and Guidance

Information provided in this WMP comes from a wide range of construction waste management guidance at the local, state, and federal levels. The primary sources of guidance include:

- Ryde Development Control Plan 2014
- Australian Government, Department of Sustainability, Environment, Water, Population and Communities. *Construction and Demolition Waste Guide – Recycling and Re-use Across the Supply Chain*. (2014, November).
- NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021
- NSW Waste Classification Guidelines 2014
- Australia's National Waste Policy 2018

2.5 Waste Diversion Targets

To quantify and measure this sustainable approach to waste management, the NSW WARR Strategy 2014-2021 and green star guidelines outlines specific targets in order to clarify the state's long-term goals and priorities. These targets were supported by industry, community, state, and local governments during the Strategy's consultation phase, and include:

- Increasing construction and demolition recycling rates to 90%
- Increasing waste diverted from landfill to 90%
- Reducing litter by 40%
- Reduce illegal dumping incidents by 30%

2.6 Frasers Property Targets

The below points are representative of Frasers Property targets for the construction phases of the development:

- Materials and waste (**targets** under PDA with LAHC)
- 15-20% Supplementary Cementous Materials (SCM) average in concrete mixes across the site;
- 20% recycled asphalt pavement (RAP) warm-mix asphalt;
- ASI sustainable steel;
- Recycled concrete in place of crushed rock where available;
- Best environmental practice PVC;
- FSC certified timber across the site
- Embodied carbon reduction, and'
- Maximum 1% construction waste to landfill.

Note: the above are targets. The Contractor shall use best endeavours to achieve all above targets in construction with the WUC.

2.7 Report Objectives

Throughout this report, EFC aims to encourage where practical, having regard to the design, the nature of the material to be demolished and the site constraints, the following waste management practices for the duration of the construction stages of the development:

- Re-use of excavated material on-site and disposal of any excess to an approved site;
- Green waste mulched and re-used on-site as appropriate, or recycled off-site;
- Bricks, tiles and concrete re-used on-site as appropriate, or recycled off-site;
- Plasterboard waste returned to supplier for recycling;
- Framing timber re-used on site or recycled off-site;
- Windows, doors and joinery recycled off-site;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Plumbing, fittings and metal elements recycled off site;
- Ordering accurate quantities of materials and prefabrication of materials where possible;
- Re-use of formwork;
- Careful source separation of off-cuts to facilitate re-use, resale or recycling.

2.8 Limitations

This report has been prepared by EFC for the sole purpose of providing a Construction Waste Management Plan (CWMP) to support a development application. The report is provided with the following limitations:

- This report is for the sole use of Grindley Constructions Pty Ltd. (including their officers, employees and advisers) and should not be used or relied upon by any other party without prior written consent from EFC;
- Drawings, estimates and information contained in this report have been prepared by analysing information, plans and documents supplied by the client, or nominated third parties. Any assumptions based on the information contained in the report are outside the control of EFC;
- The calculations presented in the report are estimates only. The amount of waste generated will be dependent on the approach taken by site management, including the levels of training and education offered to site staff and the actions and attitudes of staff themselves.
- The site manager will make adjustments as required based on actual waste volumes (e.g. if waste volumes are greater than estimated, then waste storage capacity and collection frequencies will increase accordingly) and increase the amount of waste storage and collection frequency accordingly;
- The report has been prepared with all due care and attention; however, no assurance or representation is made that the WMP reflects the actual outcome. EFC will not be liable to for any plans or outcomes that are not suitable for purpose, whether as a result of incorrect or unsuitable information or otherwise;
- EFC offer no warranty or representation of accuracy or reliability of the WMP unless specifically stated;
- Examples of equipment provided in this report should be reviewed by the appropriate equipment supplier who will assess the correct equipment for supply. Reference to any other business or product besides EFC and EFC equipment is for information purposes only, and is not officially endorsed or recommended by EFC.

3 GENERAL WASTE MANAGEMENT PROVISIONS

3.1 Stakeholder Roles and Responsibilities

All stakeholders have a responsibility for their own environmental performance and compliance with all legislation.

The Construction Contractor will be responsible for implementing this WMP, although site staff have a responsibility to ensure their own compliance at all times. Where possible, an Environmental Management Representative (EMR) should also be appointed for the project to help ensure compliance. The following table demonstrates the primary roles and responsibilities of the respective stakeholders:

Table 1: Stakeholder Roles and Responsibilities

Roles	Responsibilities
Site Management	• Organise waste collections as required; • Organise replacement or maintenance requirements for bins; • Investigate and ensure prompt clean-up of illegally dumped waste materials; • Notify the Principal Certifying Authority (Council) of the appointment of waste removal, transport or disposal contractors for waste tracking purposes; • Ensure waste related equipment is well maintained; • Ensue accurate calculations so only the required amount of materials are ordered; • Ensure segregation of materials to maximise reuse and recycling; • Check waste sorting and storage areas routinely for cleanliness, hygiene, contamination and OH&S issues; • Ensure all monitoring and audit results are well documented and are carried out as specified in the WMP; • Ensure effective signage, communication and education is provided to site staff/contractors; • Provide staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; • Assess any manual handling risks and prepare a manual handling control plan for waste and bin transfers;
Site Staff/Contractors	• Ensure adequate separation and disposal of waste streams in compliance with the WMP; • Abide by all relevant OH&S legislation, regulations, and guidelines; • Attend training and inductions as required; • Clean and transport bins as required; • Carry out daily visual inspections of waste storage areas; • Organise, maintain and clean the waste storage areas;
Environmental Management Representative (EMR)	• Approach and establish the local commercial reuse of materials where reuse on-site is not practical; • Establish separate skips and recycling bins for effective waste segregation and recycling purposes; • Ensure staff and contractors are aware of site requirements; • Provision of training of the requirements of the WMP and specific waste management strategies adopted for the development; • Contaminated waste management and approval of off-site waste transport, disposal locations and check licensing requirements; • Arrange assessment of suspicious potentially contaminated materials, hazardous materials and liquid waste; • Monitor, inspect and report requirements.
Waste Collection Contractors	• Provide a reliable and appropriate waste collection service; • Provide feedback to site management regarding contamination of waste streams; • Work with site management to customise waste systems where possible.

3.2 Monitoring and Reporting

It is recommended that the following measures be taken to improve construction waste management in future and to provide more reliable waste generation figures:

- Compare projected waste quantities with actual waste quantities produced.
- Conduct waste audits of current projects (where feasible).
- Note waste generated and disposal methods.
- Look at past waste disposal receipts.
- Record this information to help in waste estimations for future waste management plans.

Records of waste volumes recycled, reused or contractor removed are to be maintained. Additionally, dockets/receipts verifying recycling/disposal in accordance with the WMP must be kept and presented to Council or the EPA if and when required.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists/logs recorded for reporting to the Site Manager on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits are to be carried out by the Building Contractor to gauge the effectiveness and efficiency of waste segregation procedures and recycling/reuse initiatives. Where audits show that the above procedures are not carried out effectively, additional staff training should be undertaken and signage re-examined.

All environmental incidents are to be dealt with promptly to minimise potential impacts. An incident register must be maintained on-site at all times and should include the contact details of the 24-hour EPA Pollution line. Likely incidents to occur during the construction stage of the development may involve fuel or chemical spills, seepage or mishandling of hazardous waste, or unlicensed discharge of pollutants to environment.

3.3 Opportunities for Reuse and Recycling

There are many opportunities to reduce the volume of waste generated during construction. Adaptive reuse of building materials should be encouraged, with significant consideration given to methods of reusing or recycling materials onsite as well as sourcing used or recycled materials from elsewhere to be used on site.

The site should facilitate where practical reuse and recycling by 'deconstruction', whereby various materials are carefully dismantled and sorted. Any unwanted reusable materials can be taken to a second-hand building centre, reducing waste disposal costs.

Materials that are individually wrapped should also be avoided where possible, with preference given for materials that can be delivered in returnable packaging such as timber pallets.

The table below gives examples of potential reuse and recycling options for the materials likely to be used/generated in construction at this development:

Table 2: Potential Reuse/Recycling Options for Construction Materials

Material	Reuse/Recycling Potential
Asphalt	Hot in-place recycling or reprocessed into Reclaimed Asphalt Pavement (RAP).
Bricks	Cleaned and/or rendered for reuse, crushed for fill, sold or provided to a recycled materials yard
Cardboard Packaging	Recycled at a paper/cardboard recycling facility
Carpet	Cleaned and reused for the same purpose, reused in landscaping or garages/sheds, recycled at an appropriate processing facility
Concrete, Masonry, Spoil	Reused on-site as fill, levelling or crushed for road base
Doors, Windows, Fittings	Reused in new or existing buildings or sent to second-hand supplier
Glass	Recycled at a glass recycling facility, aggregate for concrete production, crushed for termite barrier, reused as glazing
Green Waste (Organics)	Mulched, composted for reuse, trees chipped for use in landscaping or removed carefully and reused onsite or sold
Hardwood Beams	Reused as floorboards, fencing, furniture or sent to second-hand timber supplier
Insulation Material	Reprocessed to remove impurities and reused for the same purpose or as off-cuts, compressed for ceiling tile manufacture
Metal, Steel/Copper Pipe	Recycled at a metal recycling facility, melted into secondary materials for structural steel, roofing, piping etc. copper sold for re-use
Other Timber	Reused in formwork, ground into mulch for garden or sent to second-hand timber supplier
Plasterboard	Crushed for reuse in manufacture of new plasterboard, returned to supplier or used in landscaping
Plastics	Reused as secondary materials for playgrounds, park benches etc.
Roof Tiles	Cleaned and reused, crushed for reuse for landscaping and driveways or sold or provided to a recycled materials yard
Soil	Stockpiled onsite for reuse as fill
Synthetic & Recycled Rubber	Reused for the same purpose or reprocessed for use in manufacture/construction of safety barriers, speed humps
Topsoil	Stockpiled onsite for reuse in landscaped areas

3.4 Management of Hazardous Waste Materials

For the purpose of this report, hazardous waste materials include any waste that poses a hazard or potential harm to human health or the environment, particularly asbestos waste and asbestos containing material (ACM). The general advice provided in this report is superseded by any specific hazardous materials or remediation control plans prepared for the project.

During the construction phase of the development, there must be a commitment to engage qualified and certified contractors to remove all contaminated/hazardous materials (e.g. asbestos) and dispose of all contaminated/hazardous waste at an appropriately licenced facility, where applicable.

In the event that any contaminated or hazardous materials are unexpectedly uncovered during excavation works, the Site Manager is to stop work immediately in that location and contact the relevant hazardous waste contractor prior to further works being undertaken in the area.

The following general mitigation measures will apply:

- Contaminated material stockpiled on site will be minimised as far as possible and should be stored on HDPE liner, in a bunded location which is protected from inclement weather;
- Sediment fences should be installed around the base of stockpiles and the stockpiles should be covered. Where excavated material requires validations, samples should be taken for NATA laboratory testing as per the requirements of the contamination assessment prior to restoration works, backfilling exercises and disposal;
- Any trucks carrying contaminated materials should be securely and completely covered immediately after loading the materials (to prevent windblown emissions and spillage) and must be licensed by the NSW Environmental Protection Authority (EPA);
- Decontamination of all equipment prior to demobilisation from the site is important so that contaminated materials are not spread off-site.

3.5 Management of Excavation Waste

For the purpose of this report, excavation waste consists of any unwanted material generated from excavation activities such as a reduced level dig, site preparation and levelling and the excavation of foundations, basements, tunnels and service trenches. This will typically consist of soil and rock. The general advice provided in this report is superseded by any specific hazardous materials or remediation control plans prepared for the project.

All excavated material generated on this site may be re-used in the landscaping or used on other sites as fill material, provided no contamination is present. If sandstone is found to be present, this may be sold or incorporated into the building design.

The following measures and safeguards will apply to the development for excavated material:

- Wherever practical, excavation material will be reused as part of the development;
- Excavation material that is not natural (virgin) material will be transported to an approved landfill site or off-site recycling depot;
- A waste classification assessment of the fill material should be undertaken prior to it being acceptable for waste disposal purposes;
- Transportation routes for excavation material removed from site will be identified and used.

Table 3: Excavation Volumes

Material	Volume (m3)	*Tonnes (t)	**Appx. Percentage Recovered
Excavation Material	14,000	14,000	99.8%
Green waste	N/A	N/A	80%
Bricks	N/A	N/A	100%
Tiles	N/A	N/A	100%
Concrete	N/A	N/A	100%
Timber	N/A	N/A	33%
Plasterboard	N/A	N/A	50%
Metals	N/A	N/A	100%
Asbestos	N/A	N/A	0%
Other waste	N/A	N/A	50%
Totals	**14,000**	**14,000**	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <https://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of excavation waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

The table below illustrates how excavation will be managed, and estimates percentage of materials diverted from landfill.

Table 4: Excavation Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Excavation Material	☐	14,000	☒	☒	☒	13965.0
	Total	**14,000**		**Total**		**99.8%**
Total Diversion of Waste from Landfill (Minimum 90%)						

3.6 CONSTRUCTION WASTE VOLUMES AND MANAGEMENT

Waste generated during the construction stage of the development will be managed by the principal contractor and sub-contractors, with materials being reused and recycled wherever possible. Where neither reuse nor recycling are possible, waste will be disposed of as general waste at a licensed landfill site.

Recyclable material generated during construction will largely consist of off-cuts and discarded bricks, timber, steel, concrete, tiles, plasterboard, and piping, as well as packaging materials.

It is important to note that source separation of waste on-site may offer cost savings when compared to the disposal of mixed waste at landfill sites. Further cost savings may be achieved through the use of reusable and recycled-content materials and by reusing materials salvaged.

The table below illustrates the anticipated volumes of materials generated at this development during the construction stage. Volumes have been advised by our client.

Table 5: Construction Waste Conversion

Material	Volume (m3)	*Tonnes (t)	**Approx. Percentage Recovered
Excavation Material	N/A	N/A	99.8%
Green waste	N/A	N/A	80%
Bricks	N/A	N/A	100%
Tiles	0.74	0.7	100%
Concrete	143.64	215.5	100%
Timber	55.25	10.5	33%
Plasterboard	8.64	1.7	50%
Metals	89.85	44.9	100%
Other waste	N/A	N/A	50%
Totals	**298.1**	**273.3**	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <https://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of recycled waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

The table below illustrates how the construction materials will be managed, and estimates percentage of materials diverted from landfill.

Table 6: Construction Waste Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Tiles	☒	0.7	☒	☒	☐	0.7
Concrete	☐	215.5	☒	☒	☐	215.5
Timber	☐	10.5	☒	☒	☒	3.5
Plasterboard	☒	1.7	☒	☒	☒	0.9
Metals	☐	44.9	☒	☒	☐	44.9
Total		**273.3**	**Total**			**265.4**
Total Diversion of Waste from Landfill (Minimum 90%)						**97.1%**

3.7 Recycling Directory

Construction materials removed from site will need to be managed in accordance with the provisions of current legislation and may include segregation by material type classification in accordance with NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste* and disposal at facilities appropriately licensed to receive the particular materials.

Please find the below recommendations for recycling drop off locations for all materials likely to be generated at this development. Only the nearest locations are provided. See www.businessrecycling.com.au for additional locations:

Table 7: Recycling Directory

	Business Name	Suburb	Distance (km)
Excavation Material	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	Bingo Recycling Centre	Auburn	10.6
Green waste	Bingo Recycling Centre	Artarmon	4.6
	Sydney Transwaste Industries	Homebush West	10.1
	Bingo Recycling Centre	Auburn	10.6
Bricks	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	Concrete Recyclers (Group) Pty Ltd	Camelia	8.8
Tiles	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	Concrete Recyclers (Group) Pty Ltd	Camelia	8.8
Concrete	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Concrete Recyclers (Group) Pty Ltd	Camelia	8.8
	Sydney Transwaste Industries	Homebush West	10.1
Timber	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	Ironwood Australia	Rozelle	8.6
Plasterboard	Bingo Recycling Centre	Artarmon	4.6
	Bingo Recycling Centre	Auburn	10.6
	AE Biggs	Oxford Falls	12.8
Metals	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	SMS Municipal Services	Brookvale	4.9

3.8 Site-Specific Operational Measures

Training/Site Inductions

All staff employed during the construction stage of the development must undertake site-specific induction training regarding the procedures for waste management. Employees of the head contractor will undertake a specific induction outlining their duties and how they are to enforce the waste management procedures.

Induction training will include the following at a minimum:

- Legal obligations;
- Emergency response procedures on site;
- Waste storage locations and separation of waste;
- Litter management in transit and on site;
- The implications of poor waste management practices;
- Correct use of general-purpose spill kits;
- Responsibility and reporting (including identification of personnel responsible for waste management and individual responsibilities).

Materials Selection and Ordering

- Selection of all materials will be undertaken by architectural designers;
- Prefabrication of materials off-site where possible;
- Materials requirements are to be accurately calculated to minimise waste from over-ordering;
- Materials ordering process is to aim at minimisation of materials packaging;
- Material Safety Data Sheets (MSDS) are to accompany all materials delivered to site, where required, to ensure that safe handling and storage procedures are implemented.

Waste Avoidance Opportunities

- Limiting unnecessary excavation;
- Selection of construction materials taking into consideration to their long lifespan and potential for reuse;
- Ordering materials to size and ordering pre-cut and prefabricated materials;
- Reuse of formwork;
- Planned work staging;
- Use of naturally ventilating buildings to reduce ductwork;
- Reducing packaging waste on-site by returning packaging to suppliers where possible, purchasing in bulk and requesting cardboard or metal drums rather than plastics;
- Requesting metal straps rather than shrink wrap and using returnable packaging such as pallets and reels;
- Reduction of PVC use;
- Use of low VOC (volatile organic compounds) paints, floor coverings and adhesives;
- Use of fittings and furnishings that have been recycled or incorporate recycled materials;
- Use of building materials, fittings and furnishings with consideration to their longevity, adaptation, disassembly, reuse and recycling potential.

Site Procedures

- Excavated materials will be used onsite where practical;
- Green waste will be mulched and reused in landscaping either onsite or offsite;
- Concrete, tiles and bricks will be reused or recycled offsite;
- Steel will be recycled offsite; all other metals will be recycled where economically viable;
- Framing timber will be reused on-site or recycled off-site;
- Windows, doors and joinery will be recycled off-site where possible;
- Plumbing, fittings and joinery will be recycled off-site where possible;
- Plasterboard will be re-used in landscaping on-site or returned to the supplier for recycling where possible;
- All used crates will be stored for reuse unless damaged;
- All glass that can be economically recycling will be;
- All solid waste timber, brick, concrete, rock, plasterboard and other materials that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Provision for the collection of batteries, fluorescent tubes, smoke detectors and other recyclable resources will be provided on site;
- Beverage container recycling will be provided on-site for employee use;
- All waste and recycling will be disposed of via council approved systems.

3.9 Location and Design of Waste Management Facilities

General Requirements

All waste management facilities onsite should:

- Be conveniently located to enable easy access for on-site movement and collection;
- Be incorporated with other loading/unloading facilities;
- Have sufficient space for the quantity of waste generated and careful source separation of recyclable materials;
- Have sufficient space to contain any on-site treatment facilities, such as compaction equipment;
- Have adequate weather protection and, where required, be enclosed or undercover;
- Be secure and lockable;
- Be well-ventilated and drained to the sewer;
- Be clearly sign-marked to ensure appropriate use.

Waste and Recycling Receptacles

A sufficient quantity of skip bins should be provided for the separate storage of each type of C&D material generated on site. This will assist in maximising source separation and resource recovery, while reducing the costs and quantity of materials disposed of at landfill.

The size of the receptacles should be appropriate to the nature of waste generated and the available storage area. In general, the following options would be acceptable:

Bin Size	Access	Dimensions
2.5m	Top loading	
3m	Drop door walk-in	
4m	Drop door walk-in	
5m	Drop door walk-in	
6m	Double doors walk-in	

Source: Aussie Bins

If the developer chooses to adopt a traditional waste management strategy, whereby waste is deposited into comingled skip bins to be sorted offsite, a single skip bin would be considered sufficient for purpose. However, if the site is to pursue source separation, dedicated skips for the following materials are recommended:

- Timber;
- Plasterboard;
- Concrete;
- Bricks;
- Scrap metal;
- General waste.

Separate receptacles for the safe disposal of hazardous waste types (i.e. light bulbs, batteries, etc) will also be provided where applicable. Where possible, additional bins will be provided in common areas for the collection of commingled recyclables such as beverage containers (glass, plastic, aluminium), paper products, recyclables food containers, etc. Specialised bins for cigarette butts should also be provided.

Safety and Signage

The following safety measures should be considered for the waste storage area:

- Location should not interfere with sight lines of drivers entering or leaving the site;
- Skip bins should be clearly visible and located in well-lit areas;
- Safe paths of travel should be designated using reflective tape, barriers and cones;
- Skip bins must be secured and must not be over-filled to reduce risk of injury through bins moving and falling objects.

Standard signage will be installed in all waste areas, with all skip bins colour coded and labelled appropriately on all sides to allow clear identification of the type of waste to be deposited into each bin.

Refer to the EPA's website for standard construction waste and recycling signs:

www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

Space and Siting Requirements

The waste storage area will be located adjacent to the entrance to the site to enable access and allow sufficient space for the required skip bins and servicing requirements. The storage area will also be flexible in order to cater for change of use throughout construction works.

Where space is restricted, dedicated stockpile areas will be allocated onsite, with regular transfers to the dedicated skip bins for sorting and collections.

The position of the designated waste holding area onsite may change according to building works and the progression of the development. Access, visual amenity and WHS will always be integral to the selection of waste storage area locations. Any stockpile locations will take into account slope and drainage factors to avoid contamination of stormwater drains during rain events.

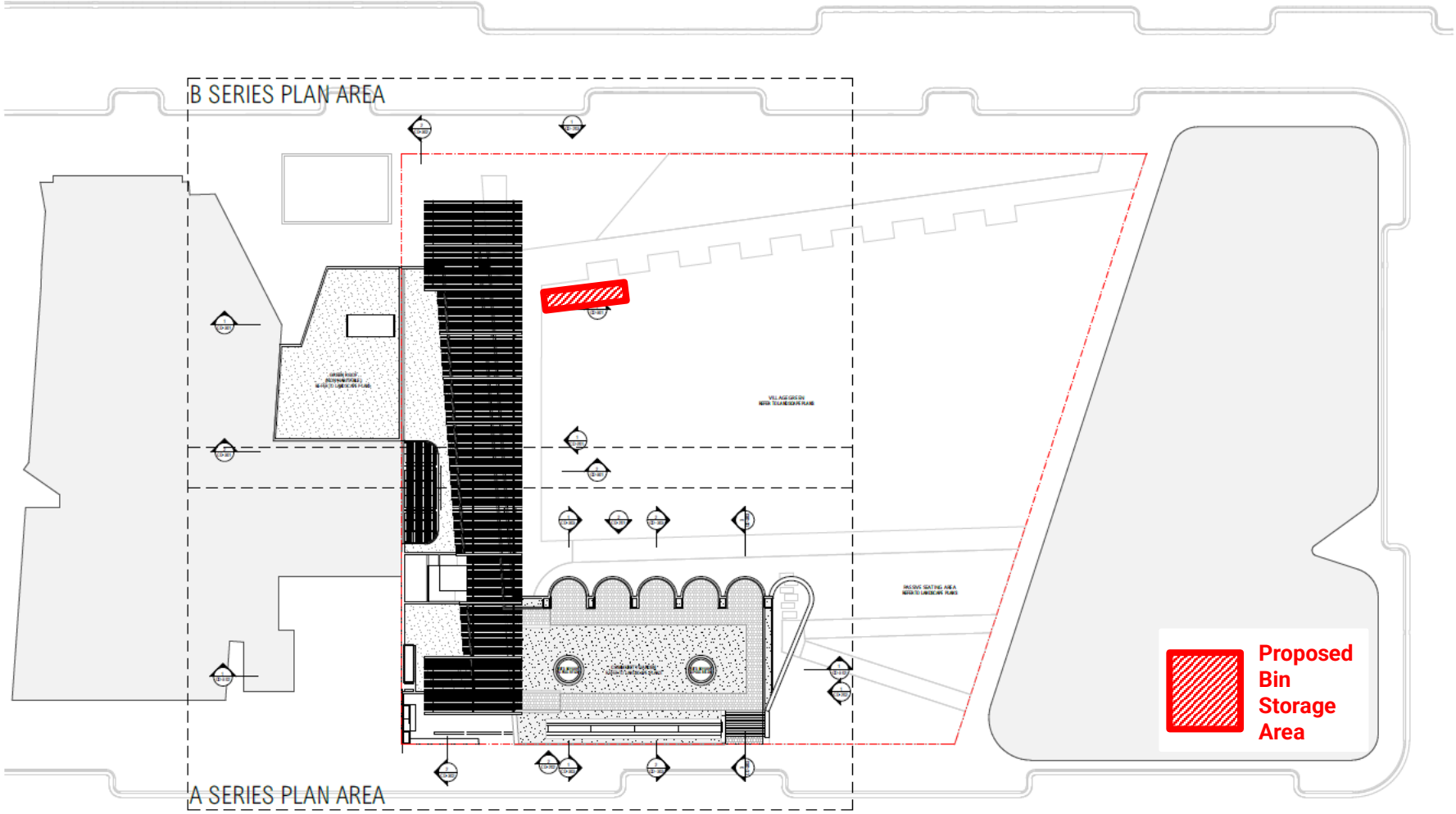
Servicing and Transport

The frequency of waste removal from site will be determined by the volume of materials deposited into the dedicated skip bins. Skip bins will be monitored on a daily basis by the Site Manager to ensure they do not overflow. If skip bins are reaching capacity, removal and replacement should be organised for within 24 hours.

All skip bins leaving the site will be covered with a suitable tarpaulin to reduce spillage of waste while in transit.

All waste collection for construction works will be conducted between approved hours as per Council requirements (typically between 7am and 7pm Monday to Friday, and between 7am and 1pm on Saturdays). All waste generated on site will be transported to an approved and appropriately licensed resource recovery facility and/or landfill site.

Proposal



Note: the proposed bin location is indicative only, this may change based on site logistics.
Source: CHROFI, Drawing no. A-CD-002, Rev N: Site Plan.

Appendix 6 - Construction Soil and Water Management Sub-Plan

CHALOUHI
• DEMOLITION • EXCAVATION • CIVIL CONSTRUCTION



INTEGRATED PROJECT MANAGEMENT PLAN

Ivanhoe Estate Midtown Building C2 Macquarie Park

Grindley

Ivanhoe Place Macquarie Park

July 2024 Revision 0

Business Name: **Square Civil Pty Ltd**

Trading Name: **Chalouhi**

Document Title: **Integrated Project Management Plan**

Document #: **MAN - 001** **Issue# 1** **Date: 18/07/2024**

Distribution List Controlled copies of this site plan have been issued to the following people

No:	Recipient	Position	Issue Date:	Signature
1	Maria Pennisi	Pre-Construction Manager (Grindley)		
2	George Khoury	Construction Manager (Chalouhi)		
3	Deen Fiaz	Project Engineer (Chalouhi)		
4				
5				
6				

Revision Record: Any revision made to this WHS plan is to be recorded below:

Revision	Date	Section	Page	Revision Details

This IMS has been approved by:

Print Name: Vanessa Johnston Dated: 18/07/2024

Signed: 

The Integrated Management Plan (IMP) is developed in conjunction with Development Consent SSD 15822622, the table below lists Development Consent clauses and references the relevant IMP sections within this document.

Development Consent Clause	IMP Ref
B40 a) location and extent of all necessary sediment and erosion control measures for the site	5.1.2
B40 b) catchment plan	5.1.2, 5.1.3
B40 c) sediment basin(s) locations including details showing how runoff from the entire site will be directed to the sediment basin(s).	5.1.2
B40 d) all relevant details and calculations of the sediment basins including sizes, depths, flocculation, outlet design, all relevant sections, pump out systems, and depths	5.1.3
B40 e) all details of basement and other excavation pump out and dewatering treatment systems including flocculation and any proposed discharge from the site from dewatering and pump out systems	5.1.4
B40 f) identification and management of any stormwater run-on to the site from adjacent sites	5.1.4
B40 g) location of any temporary stockpiles (soil, spoil, topsoil or otherwise) and accompanying sediment and erosion control measures	5.1.2
B40 h) location and details of all vehicle wash down bays and associated erosion and sediment control measures such as earthen bunds	5.1.2
B40 i) a daily and weekly site inspection checklist consistent with IECA Best Practice Erosion and Sediment Control documents	5.1.6

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ACONOMYNS & ABBREVIATIONS

AS	Australian Standard
ASS	Acid Sulphate Soils
CLM	Contaminated Land Management
DA	Development Application
EIS	Environmental Impact Statement
EMS	Environment Management System
ENM	Excavated natural materials
EPA	NSW Environment Protection Authority
HSEQ	Health, Safety, Environment & Quality
HSR	Health and Safety Representative
IMP	Integrated Management Plan
ITP	Inspection Test Plan
PASS	Potential Acid Sulphate Soils
PM	Chalouhi Project Manager
POEO Act	Protection of the Environment Operations Act 1997
PPE	Personal protective equipment
RMS	Roadsand Maritime Services
SDS	Safety Data Sheet
SOP	Standard Operating Procedures
SWEMS	Safe Work and Environmental Method Statement
TCP	Traffic Control Plan
TMC	Road and Maritime Services Traffic Management Centre
TMP	Traffic Management Plan
VMP	Vehicle Movement Plan

APPENDIX

Appendix A	Chalouhi Policies
Appendix B	Project risk register
Appendix C	Weekly site safety and environmental walk
Appendix D	Emergency Evacuation Plan
Appendix E	Chalouhi Site Safety rules

1.0 INTRODUCTION

1.1 DEVELOPMENT OVERVIEW

The Ivanhoe Estate Macquarie Park C2 project involves bulk excavation for future construction of community facilities building and landscape work. This project is part of multiple residential/commercial developments that will be constructed within the Ivanhoe Estate development. The site is bordered by Mahogany Avenue, Sandstone Crescent and C3 site.

1.2 CIVIL WORK SUB CONTRACTOR

Chalouhi, engaged by Grindley as the civil contractor for Ivanhoe Estate project to complete site establishment and civil excavation works.

1.3 HEALTH, SAFETY, ENVIRONMENT AND QUALITY CERTIFICATION

Chalouhi is certified under ISO 9001:2015 Quality Management Systems, ISO 14001 Environmental Management Systems and ISO 45001 Occupational Health and Safety Management System.

1.4 CHALOUHI POLICIES

Chalouhi have developed seven company policies to establish expectations and to provide guidance on how to consistently handle workplace situations and how employees will be treated. These policies are reviewed annually in consultation with Safety and Environmental Management and Managing Directors.

The policies are outlined in the site inductions to all site personnel and are displayed on the site notice boards, lunch rooms and site management plans, to be available to relevant interested parties, as appropriate. A copy of the Polices are available in Appendix A.

- Work Health and Safety Policy
- Injury Management Policy
- Environmental Policy
- Quality Policy
- Drugs and Alcohol Policy
- Workplace Harassment Policy
- WHSE Consultation Policy

1.5 PROCUREMENT PROCESS

The following key measures will be considered in the procurement process for all supplies, subcontractors and direct purchase of materials:

- The hierarchy of waste avoidance, reduction, reuse, and recycling will be incorporated into all aspects of the Projects (waste management measures are detailed further within the Construction Waste Management Plan - Section 5.7);
- Suppliers and subcontractors will be made aware of Chalouhi's environmental requirements and their obligations as an environmental supplier. Project specific information relating to the environmental requirements will be included in procurement and subcontract documentation through the contract and scope of works and the performance of suppliers and subcontractors measured and reported;
- Suppliers of chemicals and hazardous substances will be required to submit Safety Data Sheets (SDS) with delivery or prior to chemicals arriving at site. This may include plant and machinery hazardous chemicals such as ; diesel, oil or petrol;
- Ensure that purchase orders and agreements include environmental requirements as necessary; and
- Where practical and in consultation with the site HSEQ Manager and engineering personnel, select materials which minimise the impact on the environment.

1.6 PROJECT OBJECTIVES AND TARGETS

Chalouhi have established and will maintain objectives and targets that will be implemented on site. The company's quality, safety and environmental objectives and targets have been listed in Section 2, 3 and 4 of this Integrated Management Plan. These have been developed for construction activities associated with Ivanhoe Estate and are set out in the IMP safety and environmental management sub-plans. They are realistic, minimise any hazards and risks and ensure the facilitation of continual improvement and have been developed based on the following requirements:

- Requirements in the statutory consent/approvals;
- Ivanhoe Estate project objectives
- Contractual requirements;
- Grindley / Grindley lease conditions;
- Legal requirements; and
- Significant safety and environmental aspects and impacts.

1.7 INTEGRATED MANAGEMENT PLAN (IMP)

This Integrated Management Plan describes the strategy, methods, controls, and requirements for the execution of the project. It stands alone as the master document for site activities, and refers to company procedures for system-based activities.

The IMP is reviewed and signed-off by the HSEQ Manager and Project Manager prior to the first issue. The Project Manager who has the overall responsibility to deliver the project will induct the project team on the requirements of the Integrated Management System and relevant legal references in the Integrated Management Plan.

Site specific information from the IMP will be discussed with site workers during the site induction and documented in Safe work method statements, Tool box discussions, pre-starts, safe work procedure and on-site

training. Any changes to the IPMP which is relevant to site employees will be presented during at site tool-box discussion.

1.8 LEGAL AND OTHER REQUIREMENTS

Below Table 1.8 outlines some of the key legal requirements and other obligations that are applicable to Chalouhi's activities undertaken at during the Ivanhoe Estate construction activities. A soft copy of the below documents is accessible at the Chalouhi Site office. All personnel inducted into the site-specific induction will be consulted into where and how these can be accessed. A soft copy will be accessible to personnel visiting site in the Chalouhi site office.

Table 1.8 - Legal and Other Requirements

#	Title	Key Requirements
A	Commonwealth Laws	
A.1	*Work Health and Safety Act 2011 and Regulations NSW 2017*	The WHS Act and WHS Regulations provide a framework to secure the health and safety of workers and workplaces by protecting workers and other persons against harm to their health, safety and welfare through the elimination of risks arising from work, in accordance with the principle that workers and other persons
A.2	*Environment Protection and Biodiversity Conservation Act 1999* and *Regulations 2000*	Sets out the assessment and approval process for sites that have or are world or national heritage listed, threatened species or ecological communities, migratory species, commonwealth marine areas and nuclear sites.
A.3	*National Greenhouse and Energy Reporting Act 2007* and *Regulations 2008*	Describes the requirements for companies to report on energy use and emission of greenhouse gases. Chalouhi is obligated to report on energy consumption or greenhouse gas emissions.
A.4	*National Environment Protection Council (NEPC) National Environment Protection (Assessment of Site Contamination) Measure 1999 (Amended 2013)*	This Measure provides a consistent approach to the assessment of site contamination to ensure sound environment management practices by the community and stakeholders. Provides information on providing adequate protection of human health and the environment, where site contamination has occurred, through the development of an efficient and affective nation
B	National Codes of Practice	
B.1	*National Code of Practice for the Storage and Handling of Workplace Dangerous Goods*	Requirements for the storage and handling of dangerous goods and references applicable Australian Standards, e.g. AS 1940-2017 The storage and handling of flammable and combustible liquids.
B.2	*National Code of Practice for the Control of Workplace Hazardous Substances*	Provides practical guidance and advice on how to comply with the National Standard for the Control of Workplace Hazardous Substances.
B.3	*National Code of Practice: How to manage work health and safety risks*	Provides guidance how to manage work and safety risks in the workplace
B.4	*National Code of Practice: Excavation Work*	Provides guidance how to manage health and safety risks associated with excavation work
B.5	*National Code of Practice: Managing noise and preventing hearing loss at work code of practice*	Provides guidance how to manage noise and preventing hearing loss in the workplace.
B.6	*National Code of Practice: Managing the work environment and facilities*	Provides practical guidance for persons conducting a business or undertaking on how to provide and maintain a physical work environment that is without risks to health and safety

#	Title	Key Requirements
B.7	*National Code of Practice: Managing the risk of plant in the workplace*	Practical guidance on how to manage health and safety risks of plant once it is in the workplace, from plant installation, commissioning and use through to decommissioning and dismantling
B.8	*National Code of Practice: How to safely remove asbestos*	Provide practical guidance how to manage the safe removal of asbestos from workplaces.
B.9	*National Code of Practice: How to Manage and Control Asbestos in the Workplace*	Provides practical guidance for persons conducting a business r undertaking on how to manage risks associated with asbestos and asbestos contaminated material at the workplace and thereby minimise the incidence of asbestos related diseases.
B.10	*National Code of Practice: Managing the risk of falls at workplaces*	Provides a practical guidance to persons conducting a business or undertaking, on how to manage health and safety risks arising from falls, and information on a range of control measures to eliminate or minimise the risks.
B.11	*Nation Code of Practice: Managing electrical risk in the workplace*	Provides practical guidance for persons conducting a business or undertaking on managing electrical risks in the workplace.
C	NSW Legislation	
C.1	*Contaminated Land Management Act 1997*	The Contaminated Land Management (CLM) Act regulates the investigation and remediation of contaminated land and the various instruments the NSW Environmental Protection Authority (EPA) can use to investigate and order the remediation of contamination land. Section 60 imposes a duty on a person who has conducted activities on land that have resulted in contamination to inform the EPA. This duty also applies to the owner of land. Chalouhi has a contractual duty to inform the Grindley, who has a duty to inform the EPA of any contamination resulting from activities at their sites.
C.3	*Environmentally Hazardous Chemicals Act 1985*	The primary legislation for specifically regulating environmentally hazardous chemicals throughout their life cycle.
C.4	*National Environment Protection Council (NSW) Act 1985*	Provides for the establishment of a National Environment Protection Council that has power to make national environment protection measures. The NSW Government will implement national environment protection measures (NEPMs) in NSW in a variety of ways, including via legislation. NEPMs implemented using EPA legislation include those relating to: • monitoring of ambient air quality; • assessment of site contamination; • used packaging materials; • movement of controlled waste; and • National pollutant inventory.
C.5	*Protection of the Environment Operations Act 1997 (POEO Act)*	This Act is the key environmental regulatory instrument in NSW and describes requirements for air, noise, water, and waste and land pollution. The POEO Act aims to prevent pollution but also provides a two-tiered system to regulate pollution. The EPA is responsible for regulating higher environmental risk activities listed in Schedule 1 by licensing, while local authorities and other public authorities regulate the lower risk non-scheduled activities. Chapter 5 classifies offences into three tiers for water, air, noise and land pollution including waste and litter disposal. Section 148 provides details of the general duty to notify the EPA or the local Council of environmental incidents. This duty applies

#	Title	Key Requirements
		to any incidents occurring on Patrick land where 'material harm' to the environment is caused or threatened.
C.6	*Protection of the Environment Operations (Waste) Regulation 2014*	The main parts of the Waste Regulation relevant to Grindley activities include: • Proximity Principle: Offence for transport of waste; • Prescribed wastes for land pollution offence; and • Reduced licensing thresholds for waste activities. Chalouhi has a duty to ensure wastes are disposed of appropriately and records maintained.
C.7	*Sydney Water Act 1994*	This Act is applicable to the discharge of wastewater to sewer from industrial/commercial premises.
C.8	*Waste Avoidance and Resource Recovery Act 2001*	This Act promotes waste avoidance and resource recovery by developing waste avoidance and resource recovery strategies and programs, such as the extended producer responsibility scheme for industry. This Act allows the development and implementation of state-wide waste reduction strategies (Parts 3 and 4) and extended producer responsibility schemes (Section 15). Chalouhi may choose to follow the following waste hierarchy: • Avoidance of unnecessary resource consumption; then • Resource recovery (including reuse, reprocessing, recycling and energy recovery); and then • Disposal.
C.9	*NSW EPA (2014) – Waste Classification Guidelines – Part 1: Classifying Waste*	This guidelines provides a step by step procedure on classifying wastes into groups that pose similar risk to the environment and human health facilities their management and appropriate disposal.
D	NSW Codes of Practice	
D.1	*NSW Government Codes of Practice – Construction Work (2019)*	This code provided practical guidance on how to achieve the standards of work health and safety required under the WHS ACT and the Work Health Safety Regulation and effective ways to identify and manage risks.
D.2	*WorkCover NSW (2014) – Managing Asbestos in or on soil*	This guide provide general guidance on the assessment and management of asbestos in soil.
D.3	*NSW Government Code of Practice – How to Manage and Control Asbestos in the Workplace (2019)*	This Code provides practical guidance to PCBUs on how to manage risks associated with asbestos, asbestos containing material (ACM) and asbestos-contaminated dust or debris (ACD) at the workplace and thereby minimise the incidence of asbestos-related diseases such as mesothelioma, asbestosis and lung cancer.
D.4	*NSW Government Code of Practice – How to safely remove asbestos (2019)*	This Code provides practical guidance to PCBUs on how to manage health and safety risks associated with removing asbestos or asbestos-containing materials (ACM) from workplaces.
E	Other Legislation, COP & Guidelines	
E.1	*Western Australia Department of Health (WA DoH) (2009) - Guidelines for the Assessment, remediation and Management of Asbestos – Contaminated Sites in Western Australia & Summary Update (2018)*	This Document, prepared by the Western Australian (WA) Department of Health (DOH), provides guidance for the investigation, remediation and management of asbestos-contaminated sites, and it is based on both Australian and international best practices tailored to Western Australian conditions.

1.9 1.9 SCOPE OF WORKS

The scope of the IMP covers the construction activities associated with the Ivanhoe Estate construction package, including:

20 weeks construction duration

- Site Establishment – Works will involve establishing a site compound consisting of amenities for site personnel which will be utilised for the duration of the works. Perimeter temporary security fencing will be established along the works boundary to delineate construction areas and non-construction areas.
- Service Locating – Prior to any demolition and excavation works, a service locating team equipped with specialist equipment will scan the work footprint to ensure all known services are marked on the ground, surveyed and a drawing is generated. This also allows for any unknown services to be located. The site team use this information in addition to all as constructed drawings and forward onto the relevant stakeholders within the project.
- Bulk excavation – Using heavy earthmoving equipment, the existing ground formation will be excavated in accordance with the design drawings to shape for the basement. Excess material generated from these works will be transported away from site.
- Shoring piles – utilizing drill rig for shoring required to landscape area and disposal of spoils
- Treatment to excavation face – progressively the excavation face will be treated as per the design.
- Detailed excavation and back filling: detailed excavation for footings and underground services and disposal to spoils
- Landscape – Preparation of road verge involving cut and fill to nominated level. (Hard and soft landscape by others)

1.10 CONSTRUCTION STAGING AND TIME FRAME

- Chalouhi has been engaged to carry out civil work and expected construction period is 16 weeks from the date of commencement of work at site
- Scheduled commencement work – August 2024 (TBC by Grindley)
- Completion date – November 2024

1.11 CONSTRUCTION SITE LOCATION

Table 1.11– Construction Site Location

Construction site address	Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209)

1.11.1 CONSTRUCTION HOURS

Restricted hours

Chalouhi will only undertake construction activities associated with the project that would generated an audible noise at any residential premises during the following hours shown in the table below:

Table 1.11 – Restriction to Work Hours

Hours of Operation – Construction	
Monday – Friday inclusive	7:00am – 7:00pm
Saturday	8:00am – 4:00pm
Sunday and Public Holidays	At no time

1.11.2 SEEKING APPROVAL TO WORK OUTSIDE THE RESTRICTED HOURS

Chalouhi through Grindley /Grindley may seek approval to conduct construction activities audible at residential premises outside the specified hours on a case-by-case basis. In seeking approval, Chalouhi will demonstrate a need for activities to be conducted during varied hours and how local acoustic amenity will be protected, as well as details of how the EPA's requirements with respect to the variation of hours have been addressed.

1.11.3 EQUIPMENT AND MACHINERY

The equipment and machinery likely to be used for construction of Ivanhoe Estate, and stored on the construction site, will include:

- Excavators
- Trucks
- Crane
- Water cart
- Concrete truck
- Concrete Pump
- Hand tools; and
- Storage containers (chemicals etc.)

1.12 KEY PERSONNEL & STAKEHOLDER CONTACT DETAILS

1.12.1 CONSTRUCTION PERSONNEL CONTACT DETAILS:

Contact names and details for key construction (and project) personnel are detailed in Table 1.12.1

Table 1.12.1 – Construction Personnel and Contact Details

Chalouhi Project Team (on site)		
Site Manager	Niall Mahon	0404 111 721
Construction Manager	George Khoury	0412 693 020
Project Engineer	Deen Fiaz	0424 829 819
Site Engineer	Jamal Merheb	0420 461 906
Chalouhi Project Team (off site)		
Director	Robin Chalouhi	0424 699 299
HSEQ Manager (Return to Work Coordinator)	Rodney Curry	0411 261 130
Grindley Project Team		
Project Manager		

1.13 ROLES, RESPONSIBILITIES & AUTHORITIES

For effective implementation of the IMP experienced members of the Chalouhi team will be assigned roles for the management of Safety, environmental and quality risks by applying controls and processes. All Managers and Site Supervisors will be responsible and accountable for the effective implementation of the project's aspects and as such the defined responsibilities are:

ON SITE:

Project / Construction Manager: George Khoury

- Monitor the implementation of the project IMP and report to the Construction Manager and HSEQ Manager on all Safety and Environmental issues;
- Allocate sufficient human and financial resources to implement the IMP;
- Conducts meetings with Project Site Team and HSEQ Manager and all other site personnel at separate but regular intervals, at which safety, environmental and quality issues are discussed on the agenda;
- With the Project Team and HSEQ Manager, undertake a risk assessment and SWEMS on each high risk activity within Chalouhi's scope of works, in relation to their safety and environmental impacts;
- Provide and maintain and physical work environment that is without risk to health, safety and environmental providing adequate facilities and equipment for workers;
- Provide copies of the IMP to the Grindley for their approval;
- Providing leadership to the Project in following and supporting the IMP in a public manner to help develop a positive environmental culture supporting environmental policy and review the performance reports and take strategic actions to continuously improve the IMP
- Monitoring and adapting to results from inspection and testing in relation to various specifications and QA methodology
- Liaison with relevant suppliers and testing authorities to record and adhere to quality

HSEQ Manager: Rodney Curry

- The overall control of the Project and the IMP.
- The site Environment, and Safety representative.
- Provide and maintain and physical work environment that is without risk to the environment providing adequate facilities and equipment for workers.
- Reviewing and approving the IMP;
- Assist the Project management team in the develop of a risk assessment and SWEMS on each high risk activity within Chalouhi's scope of works, in relation to their safety hazards and environmental impact;
- Conduct investigations into Incidents and Near Misses and assist with the completing of the Non-conformance Report;
- Action all safety and environmental rectifications as listed in either the Chalouhi Site safety and Environmental Evaluations Checklist or the HSEQ Committee Minutes;
- Identify in advance, any training required for specific tasks to be performed on site, including facilitating training for managers and employees on human resources practices and procedures as required;
- Report to the National HSEQ Manager any serious environmental issues;
- Attend annual meeting with the National HSEQ Manager, Construction Manager, Project Manager Team where environmental issues are discussed; and
- In conjunction with the Construction Manager, manage staff grievances and complaints, including conducting internal investigations as required.
- Monitoring and adapting to results from inspection and testing in relation to various specifications and QA methodology
- Responsible for issuing and following up on non-conformance reports

Project Engineer: Deen Fiaz

- Assist the Project management team in the development of risk assessment and SWEMS on each high risk activity within Chalouhi's scope of works, in relation to their environmental impact;
- Report to the Project Manager all safety and environmental issues identified on site; and
- With the Project Team and HSEQ Coordinator, undertake a risk assessment and SWEMS on each high risk activity within Chalouhi's scope of works, in relation to their safety hazards and environmental impact.
- Monitoring and adapting to results from inspection and testing in relation to various specifications and QA methodology
- Liaison with relevant suppliers and testing authorities to record and adhere to quality

Site Engineer: Jamal Merheb

- Being the primary contact point in relation to the HSEQ performance of the construction phase of the project;
- Assist the Project management team in the development of the IMP and safety and Environmental method statements;
- managing procedures and practices for receiving and responding to complaints and inquiries in relation to the environmental performance project;
- Reporting all environmental incidents and near misses to the Grindley and Chalouhi HSEQ Manager
- Facilitating an induction and training program for relevant persons involved with the construction phases;
- Requiring reasonable steps to be taken to avoid or minimize unintended or adverse environmental impacts, and failing the effectiveness of such steps, to direct that relevant actions be ceased immediately should an adverse impact on the environment is likely to occur; and
- ensuring all personnel are inducted into the Project environmental requirements prior to commencement of works on site.
- Monitoring and adapting to results from inspection and testing in relation to various specifications and QA methodology
- Responsible for producing and implementing Inspection and Test Plans (ITP's)

Site Manager: Niall Mahon

- Attend safety and environmental emergencies on site;
- Provide and maintain a physical work environment that is without risk to the environment providing adequate facilities and equipment for workers;
- With the Project Team and HSEQ Coordinator, undertake a risk assessment and SWEMS on each high risk activity within Chalouhi's scope of works, in relation to their environmental impact;
- Maintain employee awareness to environmental issues by conducting site inductions, daily pre-starts and toolbox meetings with the site personnel;
- Ensure that all activities are conducted in accordance with the established SWEMS;
- Action all environmental rectifications as identified through non-conformances, safety and environmental checklists or the HSE Site Committee Minutes; and
- Investigate hazards and ensure that corrective actions are taken to eliminate or control the associated risks.
- Monitoring and adapting to results from inspection and testing in relation to various specifications and QA methodology

<u>OFF SITE</u>

Director:

- Report to the Managing Director on any safety, environmental and quality issues;

- In conjunction with the Construction Manager, Workplace Relations and Human Resources, develop, maintain and promote HR policies and procedures in accordance with legislative requirements;
- Ensure that all personnel that are employed are competent in the tasks they are employed to perform;
- Ensuring that best practice principles are being implemented to construct a high quality finished product
- The business activities are conducted with knowledge of all known environmental risks and other risks that may be controlled through a formal reporting process; and
- Attend Contract or weekly Grindley meetings (if required) to address HSEQ matters when required.
-

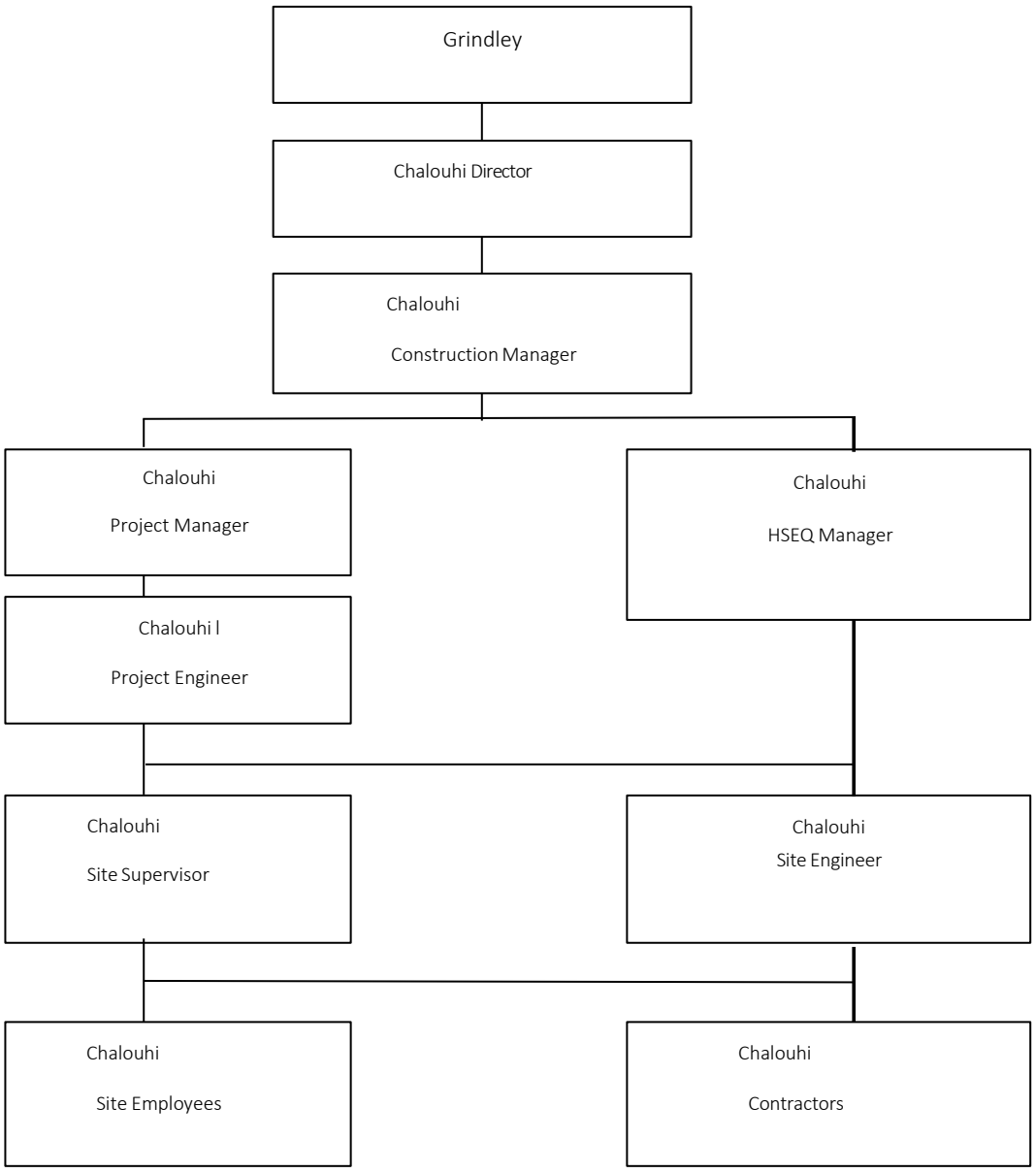
Construction Manager: George Khoury

- Engage staff and contractors to ensure they are aware of the required environmental compliance obligations to be suitably selected to perform the task either permanent or full time;
- Stimulate a high level of environmental awareness at all times and lead by example on these matters; and
- Ensuring that HSEQ practices and procedures are implemented and adhered to
- Attend Contract or weekly Grindley meetings (if required) to address HSEQ matters when required.

1.13.1 PROJECT ORGANISATIONAL CHART

The Chalouhi Organisation Chart has been prepared for the C2 Building. Refer to Figure 1.12.1 –Chalouhi Organisational Chart, which shows the direct relationship of each role on the project, including the positions responsible for environment and safety aspects for the project, and their respective reporting relationships.

Figure 1.12.1 –Chalouhi Organisational Chart



Note 1 – Certificate IV – Environmental Management; Certificate IV – Work, Health & Safety;

Note 2 – Certificate IV – Environmental Management & Sustainability; Certificate IV – Work, Health & Safety;

Note 3 – Risk Management for Supervisors;

1.13.2 SITE SECURITY

The Site Manager/Supervisor is responsible for ensuring site security is integrated with the existing services on site and back to base security requirements. This includes ensuring that the perimeter fencing, doors and gates are secured and if required security patrols organised as required to prevent unauthorised access to the construction site.

All keys issued and returned will be recorded in a key register.

Padlocks will be issued by Chalouhi.

1.14 INSURANCE

Name of Insurer	WORKERS COMPENSATION Icare Policy No: 192574301 Expiry Date: 30/06/2025
Name of Insurer	PUBLIC LIABILITY INSURANCE Lloyds Policy No: GLC 24 000001 Expiry Date: 30/06/2025

Workers Compensation and Public Liability Insurance

The Site Engineer will check the validity of certificates of currency for subcontractors, plant and machinery on hire. Certificates of currency must be received by Chalouhi prior to the subcontractor establishing on site or prior to the equipment arriving on site.

As a minimum, all subcontractors, plant and machinery on hire must have Workers Compensation and Public Liability Insurance. For Workers Compensation Insurance, the category or the tariff rate number must be applicable to the operations of the subcontractor or the operations of the plant and machinery.

The Project Manager will ensure that these certificates are kept on file and kept current by the insured for the duration of the subcontractor's time on site.

Professional Indemnity Insurance

Where components of the works involve design and construct, the Site Engineer will request and ensure that Chalouhi has current insurance certificates of currency from the consultants engaged by Chalouhi.

The Site Engineer will ensure that these certificates are kept on file and kept current for the duration of the consultants' time on site.

2.0 COMMUNICATION AND CONSULTATION

2.1 TOOL BOX MEETINGS

During the course of the works, the Site Supervisor or any other member of the Site Management Team will conduct pre-start Tool Box talks and Daily Prestart Meetings as part of keeping up the safety and environmental awareness of workers.

Specific safety and environmental issues can be addressed, accidents/near misses can be reviewed, SWEMS Statements can be presented, safety alerts discussed or any other health, safety or environmental related issues tabled. It is an open forum for discussion and will be recorded on the "Tool Box Meeting" form, which will be signed off by all those present. These documents can be made available to Grindley upon request.

As a minimum requirement, every Monday morning (or on the first working day of the week), the Site Supervisor shall conduct a Tool Box Meeting Form and a copy of this shall be given to the site HSEQ Manager. A daily Prestart Meeting and sign-in should be done at the commencement of each working day and the record should be kept onsite for the duration of the Project.

2.2 WHSE COMMITTEES AND OTHER AGREED ARRANGEMENTS

2.2.1 CHALOUHI HSR COMMITTEE

Chalouhi have developed a HSR consultation committee to enable all employees to contribute to the making of decisions affecting their health, safety and welfare, any information that the employer and/or employee has from experience, knowledge, publications or from any other source, should be shared. This is to ensure every member will be contributing to the enhancement of their work environment not only for themselves but also for the other employees. Items of discussion will include changes to safe operation procedures and SWMS, injury and illness control measures and protection of the environment.

The HSR representatives are elected by Chalouhi Employees during the annual labourers meeting. The representatives must complete the HSR course to ensure they have a sound knowledge of their responsibilities and identify the hazards and risks in the workplace. On a quarterly basis, or a duration deemed necessary depending on the type of work being carried out, the HSR representatives will meet and discuss site safety issues and any other relevant matters. Minutes will be taken of all the issues and resolutions and a copy will be retained in Chalouhi's head office.

HS&E Representatives have been established to promote health and safety in the workplace and to help resolve health, safety and welfare issues.

2.2.2 HSR COMMITTEE

The Chalouhi HSR committee representative/s for the C2 Building will be confirmed prior to commencement of works when the site team is established. Chalouhi will request each sub-contractor nominate at least one HSR member to attend the site safety and environmental inspection walks (held every Wednesday morning) and site HSR committee meetings. The site HSR representatives will be informed to site employees during the site induction and contact details posted throughout the site.

The functions of the WHS&E Representatives are:

- To consult with employees on WHS and welfare issues;
- Communicate to the employees and HSEQ Manager on issues relating to WHS and welfare;
- Promoting among the employees the reporting of hazards;
- Make recommendations on their training needs as a HSEQ Manager;
- Make recommendations on the HSEQ training of employees;
- Assist with Site Safety walks, when required.
- Be an observer during any formal in-house investigation of an accident or other occurrence at the relevant workplace that is required to be notified to Safe work (there can only be one observer);
- Accompany an employee, at the request of the employee, during an interview by the employer on any WHS&E issue;
- Be an observer when an external inspector provides any formal report to the employer in connection with WHS matters relating to the WHS&E Representative's workgroup.

For the WHS&E Representatives to be effective and successful they must:

- Have completed the Health and Safety representative training course
- Have commitment and support from the employer
- Have all employees be pro-active and inform them on WHS and environmental issues
- Be able to deal with the employer representative who has authority to make decisions
- Consult with the employees they represent
- Focus on ways of improving the systems for managing safety and the environment
- Have clearly defined roles

The Project Manager will ensure that the Site Supervisor provides a Chalouhi site employee to sit on the WHS Site Safety Committee. All safety issues correctly relating to Chalouhi or subcontractors of Chalouhi will be rectified in accordance with the WHS Site Safety Committee findings.

2.2.3 PROCEDURE FOR RESOLUTION OF WHS&E ISSUES

- The employee is to report the problem to their supervisor who will then remedy the problem or discuss it with his manager.
- If the problem is resolved then the supervisor or manager documents and retains a record of the resolution. A toolbox talk shall then be provided to relay the resolution to all employees on that particular site. The supervisor or his manager shall then give a copy of the toolbox minutes to the WHS&E Representatives.
- If the problem is not resolved, then the employee is to report the issue to their respective WHS&E Representative.
- The WHS Representative refers the problem to the WHSE Manager to consider and respond.
- When a WHS&E issue is resolved by the Systems Manager, then a formal instruction will be given to all managers and supervisors who will then conduct a toolbox talk to relay the resolution to all employees.
- If the problem is still unresolved, then the Systems Manager will consult with the Construction Manager to determine what further action will be taken.

- If agreed to by the Construction Manager, the Systems Manager may request the assistance of an external inspector. When such a request is made, the inspector will need to know if the matter had been considered by the employer and the Systems Manager and what action has been taken as a result of the consultation.
- External Inspector attends the workplace and resolves the problem.
- Where the employer wishes to raise HS&E matters, then the employer will either call a general meeting with employees to discuss the issues or issue a formal memorandum to all employees. In addition to this, during the annual meeting held with all labourers, leading hands, operators and sub-foremen, HS&E issues are tabled and discussed in an open forum for all to contribute.

2.2.4 ONSITE COMMUNICATION AND WHSE CONSULATION METHODS

Chalouhi provides avenues for consultation and communication between all levels in the organisation. Workplace consultation will be provided through:

- Daily toolboxes, safety & environmental discussions
- Facilitating elections of Workplace Health, Safety and Environment (WHSE) representatives
- Establishing a Workplace Health, Safety and Environment Committee
- Establishing systems for consultation at its projects with subcontractors and their workers

A Site Noticeboard will be established at each site in the amenities or site office. The Site Noticeboards will be maintained by the Site Supervisor. Information to be posted on boards includes:

- Emergency contacts
- Emergency evacuation plan
- WHS Representatives for the project (this will be updated as contractors change)
- WHS&E issue, complaints and dispute resolution procedure flowchart
- Environment and Safety alerts issued by HSEQ Manager
- WHS&E Committee Minutes and meeting times.

2.3 COMPLAINTS

Performance objectives

Table 2.3 - Complaints Objectives and Targets

	Objectives	Target
Complaints	To efficiently manage complaints from the community or the safety and environmental regulator (including on behalf of a local resident)	Nil complaints attributed to Chalouhi Cavil's operations

2.3.1 RESPONSIBILITY

Chalouhi HSEQ Manager are to ensure the requirements of the safety and environmental complaints handling procedures are implemented.

Chalouhi onsite personnel are to report all complaints to their supervisor immediately and implement corrective and/or preventive actions as instructed.

The onsite HSEQ Manager will oversee any complaints, the implementation of controls and ensuring the effective and appropriate corrective and preventive actions are taken to prevent the recurrence of the source of any complaint.

2.3.2 COMPLAINTS HANDLING PROCEDURE

Complaints can be received from the public or their representative, via the following means:

- In person at our head office at 192-194 Railway Parade Kogarah;
- By phone enquires 24/7 telephone number 0401 160 994 (signage on the front site entrance)
- By email via to Mitch Cole (Chalouhi HSEQ Manager) 'Contact Us' page

Workers will report any complaints received to the site Supervisor, and will be recorded by and tracked in the log sheet maintained by the onsite HSEQ Manager. All site complaints will be recorded using Chalouhi "Complaints Form" and will be filed by the HSEQ Manager into the Incident Register which will be available to Grindley upon request.

The responsible personnel shall consult with the HSEQ Manager to determine the appropriate corrective and preventive actions and to ensure the actions are implemented effectively to rectify the problem.

All environment complaints received from the public and/or regulatory agency are investigated by the site HSEQ Manager. Any changes required to the HSEQ documentation are to be communicated to all relevant staff in a site tool-box discussion. The effectiveness of corrective and preventive actions taken will be reviewed by the onsite HSEQ Manager and Construction Manager.

2.3.3 REPORTING

Records of the complaint and any action taken will be forwarded to Grindley for comment and recorded in Chalouhi's incident reporting system.

2.3.4 COMPLAINTS REGISTER

All complaints received will be recorded by the site HSEQ Manager in the Complaints Register, which will be made available to Grindley on a monthly basis

3.0 QUALITY MANAGEMENT

3.1 MANAGEMENT SYSTEM DOCUMENTATION

3.1.1 QUALITY MANAGEMENT SYSTEM

This plan defines the quality management principles, processes, procedures, systems, tools, and templates implemented for use throughout the duration of the project. This plan is subordinate to the Integrated Management Plan (IMP) which has been developed to:

- satisfy the requirements of the contract; and
- Support the Project Team in completing the requirements of the project.

3.2 PROJECT QUALITY OBJECTIVES AND TARGETS

Chalouhi's project level quality objectives and targets have been listed below.

Quality Aspects	Objectives	Target
Non-conformances	Reduction in site non-conformances	No reported site non-conformances
Customer complaints	Reduction Grindley and neighbouring complaints. 50% annual reduction Grindley and customer complaints	50% annual reduction Grindley and customer complaints
Customer reviews	Aim to receive 75% of all customer reviews	Review all completed forms at project management meetings
Internal and external audit	To complete regular internal and external audits to monitor and maintain compliance. Regular site audits every 8 weeks and external audits bi-annually with less than 3 non-conformances per site	Less than 3 reported non-conformances per site audit

3.3 DOCUMENT AND DATA CONTROL

3.3.1 SITE DIARY

The Site Supervisor is responsible for recording events and activities on site, on a daily basis using the Site Diary. The diary is intended to be a record of all activities, events and occurrences on-site including; plant on hire, trades, incidents and staff. Each week the Site Diary will be reviewed by Project Manager.

3.3.2 DRAWING REGISTER

A drawing register will be maintained throughout the duration of the project to ensure latest drawings are followed by Chalouhi and subcontractors. Chalouhi will upload all drawings to Aconex with Grindley as the Administrator for approval and to amend drawing revision numbers and dates.

3.3.3 REQUESTS FOR INFORMATION (RFI'S)

- RFI's
  - Shall be raised whenever a response is required from a consultant, Grindley or Grindley representative that requires tracking or in cases where if an answer is not received it will affect the contract in terms of time or money.
  - Can be raised by the project manager, site manager, site supervisor or contracts administrator based on Subcontractor or MLC issues. Electronic subject to project size and set up
- The time allowed for the reply should be realistic.
- Issued shall be added and tracked on an RFI Register, closed and open
- Shall be distributed to the relevant parties and a copy filed
- Shall note if safety in design issues are identified and the consultant has conducted the safety risk design assessment
- Weekly print out a report of unanswered RFIs for follow up outstanding
- Distribute the reply to the relevant parties.
- File the reply in the Contract file.

3.4 INSPECTION METHODOLOGY

3.4.1 INSPECTION AND TEST PLANS (ITPS)

Inspection and test plans (ITPs) are prepared using the Inspection and Test Plan template to clearly identify the scope of inspection and testing required for the work activity. ITPs are prepared for each area or discipline as appropriate. Chalouhi ITPs are formulated by the Project Engineer and reviewed and approved by the Project Manager. Where a change is required to an ITP, a new version is prepared, approved, and distributed.

Inspections are conducted throughout the duration of the project as per the ITPs and the project's quality control inspection register. The Project Manager maintains regular contact throughout the duration of the project with the relevant subcontractors.

Subcontractors on site prepare specific ITPs covering all construction activities, which include the following, as a minimum:

- Project title
- Subcontract details
- Process activity
- Acceptance criteria, e.g. standards, procedures, and/ or specifications
- Verification record, e.g. certification/ reports resulting from the process; and
- Intervention/ inspection points, including company and third-party points.

The Project Quality Manager (or delegate) maintains a master copy of each ITP in the project's Document Management System in the Chalouhi intranet. The ITP register is maintained for all ITPs.

3.5 NON-CONFORMANCE AND CORRECTIVE ACTION PREVENTION

A Non-Conformance Report will be raised for:

- Specification deviation or work that fails to meet quality standards
- Non-compliance with the site rules
- Non-compliance with Health, Safety and Environmental Legislation requirements
- Repeated safety or housekeeping issues identified during inspections.

The Non-Conformance shall be completed and issued to the offending party. Non-Conformances shall be registered in the office non-conformance register

The Project Manager / Site Supervisor will decide on the appropriate disposition and corrective actions. Non-conformances raised as a result of a Safety or Environmental issue to be reviewed by the HSEQ Manager to confirm if systems need to be updated and if any company wide alerts, correspondence are required.

3.6 PRODUCT & SERVICES

3.6.1 PURCHASING

Chalouhi Management will ensure all equipment, goods or substances purchased or hired will be assessed against HSEQ Standards. All purchased materials and components are identified with unique numbers, codes or names. The identification is the same as used in drawings, specifications, bills of materials, part lists, purchase orders etc.

Materials and components are identified by marking, labelling or tagging the packaging of containers.

3.6.2 PROCUREMENT PROCESS

The following key measures will be considered in the procurement process for all supplies, subcontractors and direct purchase of materials:

- The hierarchy of waste avoidance, reduction, reuse, and recycling will be incorporated into all aspects of the project (waste management measures are detailed further within the Construction Waste Management Plan - Section 5.7)
- Suppliers and subcontractors will be made aware of Chalouhi's safety and environmental requirements and their obligations as an environmental supplier. Project specific information relating to the environmental requirements will be included in procurement and subcontract documentation through the contract and scope of works and the performance of suppliers and subcontractors measured and reported;
- Suppliers of chemicals and hazardous substances will be required to submit Safety Data Sheets (SDS) with delivery or prior to chemicals arriving at site. This may include plant and machinery hazardous chemicals such as ; diesel, oil or petrol;
- Ensure that purchase orders and agreements include HSEQ requirements as necessary

3.6.3 RECEIPT OF GOODS ON SITE

The Site Supervisor will be responsible for accepting deliveries to site.

Goods will be compared against the supplier's delivery/courier docket and Chalouhi's Purchase Order's where possible.

If goods meet requirements, the delivery/courier docket or copy of purchase order will be signed by the Site Supervisor or other authorized personnel.

If goods do not meet requirements, the receiver will record the discrepancies/issues (e.g. incorrect goods, incorrect quantity, damaged or faulty goods, etc.) on the delivery/courier docket. Any issues should be followed up with the supplier and/or Project Manager/Contract Administrator and resolved/appropriate action taken.

The Site Engineer will reconcile the purchase order, Delivery/Courier Docket and invoice and pass to accounts department.

3.6.4 GRINDLEY SUPPLIED PRODUCT & SERVICES

Product supplied by Grindley will be identified as such.

The Site Manager/Supervisor will check items on delivery to site including but not limited to:

- It is the correct type, model or part number.
- The correct quantity of items was delivered.
- No obvious damage or deterioration.
- The product or equipment is safe to use and meets work health & safety specifications and requirements.

The Site Supervisor will obtain and check the delivery docket for product received and will forward it to the Site Engineer.

3.6.5 SUPPLY AGREEMENTS

Project Managers will review credit applications for all contractors prior to supply agreements. A final review will be completed by the Managing Director for approval

3.6.6 STORAGE OF MATERIALS AND EQUIPMENT

At all times due diligence and care will be necessary to ensure any products or property supplied by Grindley is suitably protected and fit for service. If circumstances arise where this is not the case, Grindley is to be notified promptly of any deficiencies, discrepancies or damage.

- Handling: Chalouhi has put in place safe handling methods to ensure that all products delivered to the site are done so safely to protect the quality of the product and prevent any damage occurring to the product.
- Storage: Chalouhi will use designated areas to store all delivered product to ensure their safety and to prevent any damage to the quality of the product.
- Packaging: It is the requirement of all suppliers or subcontractors that the packaging of all products being delivered to the site is to be of a quality manner and will be inspected on delivery to site for any damage or defects. If any are found the product will be rejected and returned to the supplier or subcontractor for replacement
- Preservation; The Site Supervisor will provide appropriate methods for preservation and segregation of the products being used on the site while the products are under Chalouhi's control.
- Delivery: Chalouhi will arrange for the handover of the product after the final inspection and test.

- Servicing: Any servicing requirements for any product provided will be undertaken prior to handover, to ensure the product conforms to the manufacturer's requirements. All warranties and maintenance periods will be transferred to Grindley upon handover.

3.7 MANAGING SUB CONTRACTORS AND SUPPLIERS

All suppliers and installers of temporary works will be subject to Chalouhi procedures as set out in tender documents, contracts and IMP. Project and/or Site Managers are responsible for ensuring that the review of design of temporary works is conducted prior to contract acceptance.

All subcontractors must submit ITPs along with checklists to Chalouhi prior to commencement on site, or work to ITP's developed by Chalouhi. Any subcontractor supplied quality documentation will be submitted to the Project Manager for approval prior to commencement on site.

All subcontractors will be evaluated on a regular basis for their performance and the requirements to meet the quality standards of Chalouhi and the ISO 14001 Environmental Management Standard during the weekly site safety and Environmental walk and monthly Safe Work Environmental Method Statement (SWEMS) observation. Subcontractors will be assessed on their safety and environmental performance and contractual agreements at completion of the project by the Project Manager Form MC-S-07 Assessment of Subcontractors and suppliers and discussed at the weekly coordination meetings between Chalouhi and Grindley.

Prior to commencement of any subcontracted works, the HSEQ Manager will conduct a review of the Site Management Plans of the subcontractor engaged to perform such works. The review will be carried out using the.

The Subcontractor's site environmental management plan will have ongoing monitoring of their system. A copy of the monitoring review showing any shortfalls in the plan will be issued to the subcontractor for rectification. Chalouhi's IMP will be informed to sub-contractors during site-induction and controls identified in the site Safe work method statements, which will be provided as requested.

The subcontractors SWEMS that are requested prior to works for all high-risk activity are reviewed and evaluated by the site engineer prior to commencement of works.

3.8 PLANT AND EQUIPMENT REGISTER

A Plant and Equipment register will be maintained for all Chalouhi owned equipment held on site. New equipment will be added to the Register by the Site Engineer.

Each month the Site Engineer will print off the latest Plant and Equipment Register and forward it to the Site Supervisor for checking.

3.9 CALIBRATION

Chalouhi maintains a log or register of all inspection, measuring and testing equipment and provides independent certification of calibrations. The calibrations are carried out as per the manufacturer's written recommendations and records of such work will be maintained on site. This includes; water testing kits, noise meters, air monitors and laser meters. If requested by Grindley, the certifications and results of any testing or calibrations will be provided.

3.10 PROJECT AUDITS

3.10.1 INTERNAL AUDITS

During the course of the works on this project, the HSEQ Manager will conduct regular internal reviews on the IMP to ensure that it is being implemented and conforms to Chalouhi's certified Environmental Management System. The IMP will be reviewed every 3 months or unless changes are made prior by HSEQ Manager.

The objective of an Internal Review is to:

- Monitor the management system to seek further improvement and review generated documents, processes and procedures and for any legislative changes.
- Identify any action, process or procedure that may lead to or has caused a non-conformance or does not comply with current road laws and regulations.
- Record all findings in an Internal Review Report to declare the review has been conducted.
- Report any action, process or procedure that has or may cause a non-conformance to the Compliance Manager.
- Investigate why a non-conformance happened / what was the root cause.

On completion, the onsite HSEQ Manager will prepare and submit a report to the onsite Project Manager and Site Supervisor, detailing the findings (including any non-conformances) and list any actions to be taken. On completion of the actions to address Non-Conformances, the document is to be submitted back to the Systems Coordinator/Manager to be closed out, IMP updated and reissued and relevant changes made to policies.

3.10.2 EXTERNAL AUDITS

An independent environmental audit for Chalouhi's HSEQ Certification will be completed for C2 Building by a suitably qualified person/team approved by the site HSEQ Manager as a requirement for Chalouhi's certification.

Auditors will meet the qualification criteria in AS/NZS ISO 19011:2014 Guidelines for quality and/or environmental management systems auditing.

3.10.3 HEAVY VEHICLE AUDITS

HSEQ Manager will conduct regular internal reviews on the contractors to verify operation of system processes and act appropriately by taking corrective actions to minimize the likelihood of a non-conformance reoccurring incompliance with current road transport legislation. To achieve this, all documents records, processes and procedures are subject to regular reviews to verify that all results and activities conform to our policies, procedures and comply with current Acts and Regulations.

Procedure

Six Month Review: Records and documents reviewed during the Six-Month Review include:

- Compliance Statements are up to date
- Driver's medical due dates
- Scheduled maintenance records
- Mass verifications have taken place
- Training records
- Fatigue management: Drivers not taking required rest breaks
- Any Corrective Action Request form not yet closed out

This review should identify but not limited to:

- Driver documentation is being correctly completed
- Journeys have been compliant with mass management
- Vehicles have had all scheduled services carried out
- Training for all staff has been completed and records documented
- Driver medical certificates are up to date

- Whether the management system remains compliant with all current legislation

2. Review Assessment

Findings after any review are to be monitored to gauge whether processes or procedures should be amended or introduced into the management system to better ensure compliance with road transport laws.

After the completion of any review, a Corrective Action Request is to be completed immediately:

- Upon the detection of any non-conformance against this management system.
- Upon a breach of any road law.
- For any infringement or warning issued by a regulatory authority.
- Where drivers have not correctly completed Work Diary pages, Journey Declarations or any other associated journey document.
- For any other action, process or procedure where it has not conformed to this management system.

4.0 SAFETY MANAGEMENT

4.1 GENERAL

Section 4 of the Integrated Management Plan represents the project specific Safety Management. Chalouhi are the principal contractor on this project. Our IMP and this section reflect our WHS duties, and demonstrates our 'due diligence' that is as far as reasonably practicable under the applicable WHS and associated legislation.

Subcontractors will also be required to conform to this Management Plan which will be discussed during the site induction.

4.2 PROJECT SAFETY OBJECTIVES AND TARGETS

WORK HEALTH AND SAFETY		
Safety Aspects	Objectives	Target
Accidents/ Injuries	Incident free across all sites for the duration of works To strive for no accidents in the Chalouhi worksites Increase safety awareness to all staff by on-site training	No workers compensation claims
safety awareness	Chalouhi personnel and sub-contractors have appropriate knowledge and skills to contribute to the continuous improvement of site safety and health Train all Chalouhi workers in accordance with high-risk work activity through weekly-tool box and training workshops and monitor through an annual training calendar	Achieve 100% training in safety requirements -pre-starts/tool-box talks/VOC's Health and safety bi-annual report
Incident reporting	100% of all safety and health incidents reported are investigated by the Site Supervisor and reported to Project Management and Safety team immediately and corrective actions recorded and implemented within 48 hrs.	Health and safety bi-annual report WHSE Incident report

4.3 HAZARD IDENTIFICATION & RISK ASSESSMENT

Chalouhi will not commence any works at the work place unless:

- Chalouhi have undertaken an assessment of the risks associated with the work activities and has provided a written SWEMS for each activity;
- Chalouhi has developed a safety and environmental induction training for all employees and subcontractors;
- Chalouhi has identified the potential hazards of the proposed work activities, assess the risks involved and develops control measures to eliminate, or minimise the risks. The risk management process is to be carried out in consultation with employees through site inductions and tool box meetings; and
- Chalouhi has reviewed any design issues that may cause potential environmental hazards or risks on site.

4.4 PROJECT WHS RISK ASSESSMENT / RISK REPORT

The Project Manager will initiate the development of the Project Risk Register in consultation with the HSEQ Manager. The most recent revision of IMP highlighting the applicable risks associated with the subcontractor's works will be forwarded to subcontractors so they can prepare their respective SWMS accordingly, and communicated to their workforce.

Personnel working on the site will be consulted and their feedback included on the risks via tool box meetings, site induction or by training in revised SWMS, especially following a near miss, incident or accident.

4.5 TRAINING

The Project Manager will ensure that the appropriate training is provided to personnel working on site. This includes as standard:

- Construction Induction Card;
- Project induction;
- Standard Operating Procedures;
- Emergency procedures;
- Health and Safety Representative Competency Training
- Plant verification of competency;
- First Aid certificates;
- Supervisor training.

The HSEQ Manager will coordinate the training and records keeping, maintained and monitored at head office.

4.6 COMMENCEMENT ON SITE

4.6.1 PROJECT INDUCTIONS

Following completion of the Industry Induction Training for Construction Work at an accredited Work Safe training organisation, all site personnel must undertake the following inductions before commencing any work;

- Chalouhi's Site Induction
- Chalouhi's Safe Work and Environmental Method Statement (SWEMS) Induction

Every person must be fully aware of what procedures must be followed, site safety and environmental rules and what services are available should they require them prior to signing the documentation. All staff personnel inducted will be included to the site induction register and an induction sticker will be provided to each person to be placed on their hard hat to identify that they have complete the site induction.

On first arrival to site, all personnel will be required to provide personal details as part of the site-specific induction. The Chalouhi Site Safety and Environmental Rules will also be detailed as part of the induction. The Site Supervisor shall check to ensure that each person has completed an "Industry Induction Training for Construction Work" course and has documentation (Induction card) as evidence of this. Prior to working on site, the worker will be provided with the appropriate personal protective equipment (PPE).

Visitors attending the site are to be accompanied by an inducted person at all times. They will not be required to undertake a full induction, however the key points of the site induction must be communicated to them as per the list provided on the Site Specific Visitor Induction Form HSE-123 Site Specific Visitor Induction. The number of site inductions (including visitors) will be reported to the Grindley as requested.

4.6.2 SITE RULES

The Construction Manager and HSEQ Manager will prepare site rules for the conduct of all personnel in and around the site. The Supervisor will ensure that a copy of the Site rules is displayed in a prominent location and the rules communicated at the site induction.

4.6.3 SITE ATTENDANCE REGISTER

The Site Supervisor will ensure that all site personnel and visitors on site record their attendance and departure in the site pre-start sign in sheet. Records of all Site attendance will be stored on site saved in Chalouhi's intranet.

4.7 SAFE WORK AND ENVIRONMENTAL METHOD STATEMENTS (SWEMS)

4.7.1 GENERAL

The Safe Work and Environmental Method Statements (SWEMS) document the tasks to be carried out as individual steps and the environmental risks associated with each step and the controls necessary to be followed by the workers conducting the task. Any further scope added to Chalouhi's contract as a variation, which requires new or amended SWEMS will be inserted within this IMP and added to the Site SWEMS register.

SWEMS for both Chalouhi and Subcontractor activities are to be monitored as a part of the audit process to ensure their effectiveness and any breaches of safety and environmental concern. This is conducted by the Site Engineer on a weekly basis. The Project Management Team and Safety Management Team are to conduct a review of the SWEMS if it is found the control measures are inadequate, unsafe or environmentally unsuitable. All personnel involved in the works are to be inducted into the revised SWEMS and sign. At minimum the SWEMS will be reviewed bi-annually. High risk construction work activities will be carried out throughout the duration of the works. The NSW Government Code of Practice Construction Work (2019) lists the following as high risk construction;

- Work involving a risk of a person falling more than 2 meters
- Work carried out in or near a shaft or trench with an excavated depth greater than 1.5 meters
- Work carried out in or near a tunnel
- Work carried out on or near pressurized gas distribution mains or pipping
- Work carried out on or near energised electrical installations or services
- Work involving or is likely to involved the disturbance of asbestos

High Risk Construction Work SWMS will be implemented, if and when any of these tasks are undertaken.

4.7.2 SAFE WORK PROCEDURES

A Safe Work Procedure (SWPs) is a document that communicates the preferred way to safely perform work tasks and ensuring workers are adequately trained. Chalouhi have developed statistics for high-risk activities such as:

1. Site establishment
2. Sediment control
3. Excavation
4. Plant and equipment operation
5. Unexpected finds protocol
6. Trailer Decontamination Unit
7. Heat Stress
8. Needles and Syringes Procedure
9. Spill
10. Emergency evacuation

The SWP's are written by a member of staff who has a sound knowledge of the task and has performed the particular task. Consultation with others including Safety Management, Project Management, site representatives and Health and Safety representatives are encouraged to be involved in the process. In some circumstances additional expertise may be required and this should be sought where applicable. This SWP's are subject to reviewed every twelve months and or each time further for variation of works or incident review which requires SWP's to be amended. Staff will be informed of any variations via a site tool box meeting and/or new re-induction to the amended SWP's. All site personnel trained in the safe work procedure are done so by a competent trainer and assessor.

4.7.3 HAZARD NOTIFICATION

Hazards reported by site personnel should be reported to a Chalouhi representative promptly, who will take action to review the reported hazard and close-out the hazard as soon as possible, and eliminate the hazard where practicable to prevent incident. Record the hazard WHSE Incident report and raise it at site Inductions to ensure workers are familiar on the procedure for reporting hazards. Hazards that need to be reviewed in consultation with other stakeholders shall be raised at either the Safety Committee Meetings, and/ or via Consultation at project level at Toolbox Talks.

4.7.4 SITE INSPECTIONS

On a weekly basis the Site Engineers along with the assistance of the HSEQ Manager and/or Site Supervisors will complete a Weekly Site Safety and Environmental Walk (Appendix C) to inspect and identify where controls are adequate, inadequate or not relevant. If any inadequate, unsafe or environmentally unsuitable situations are identified which may be deemed serious or life threatening, or significant or threatening to the environment, then a 'Non-conformance Report' will be instigated detailing the corrective and/or preventive action required.

In consultation with the site HSEQ Manager, the Project Manager will decide on whether it is warranted (based on the severity of the safety and environmental issue) to stop work where a non-conformance applies until the matter is rectified.

4.7.5 PLANT AND EQUIPMENT PRE-START CHECK

On a daily basis, all operators of earthmoving plant and other plant on site will complete a pre-start checks, or plant pre-start checklist as provide by the subcontractor. In doing the pre-start inspection, the operator will confirm that the checks were carried out and any repairs deemed urgent by the operator, will be serviced immediately. Chalouhi will stop the plant from operating until repairs are completed.

Random checks of plant and equipment pre-start inspections will be carried out by the site HSEQ Manager to ensure compliance with this requirement.

4.7.6 MONITORING AND INSPECTIONS

On a daily basis the Site Supervisor will record the daily site activities to assist Site Management with costing and planning of future works with Information including; labour, plant and equipment hire, haulage, material and works for the day.

Chalouhi maintains a log or register of all inspection, measuring and testing equipment and provides independent certification of calibrations. The calibrations are carried out as per the manufacturer's written recommendations and records of such work will be maintained on site. If requested by client, the certifications and results of any testing or calibrations will be provided.

For all plant and machinery (e.g. excavators, dozers, rollers) a plant risk assessment and Plant pre-mobilisation checklist must be developed prior to them arriving on site. This risk assessments and plant checks considers the potential hazards, risks, harm and injury associated with the use of that plant and machinery.

4.7.6.1 PLANT AND EQUIPMENT PRE-START CHECK; MAINTENANCE AND REFUELING ACTIVITIES

4.7.6.1.1 Maintenance of plant and equipment

Plant and equipment used during construction activities will be maintained in a safe and serviceable manner in accordance with the following:

- Plant will be driven and operated only in approved areas only;
- Plant and equipment will be regularly maintained to prevent/fix oil leaks;
- Plant will be serviced and washed-down only in approved areas
- A certified trackable waste transport will then collect any hazardous waste from the plant facility as required; and
- Major servicing is will be carried out off site.

4.7.6.1.2 Plant and equipment refueling activities

Plant and equipment will be refueled by a mobile tanker at a nominated re-fueling position where hydrocarbons can be captured and collected.

Containers of spare fuel will be contained in a purpose-built cage which will contain any leaked or spilt fuel

Figure 4.7.6.1.2– Spare Fuel Contained in Bunded Flammable Cages



4.7.6.1.3 Plant and equipment register

Prior to any plant or equipment coming onto the construction site a Plant pre-mobilisation checklist will need to be carried out on the wet hired plant or equipment and submitted to the Chalouhi site Supervisor. All plant and equipment brought onto the construction site will be included in the site plant and equipment register.

Spill Response Bins are located at the gear store and spare fuel storage area, refer to Figure 4.7.6.1.4

Figure 4.7.6.1.4 – Spill Response Bins

4.7.7 ELECTRICAL EQUIPMENT/WORK

The Site Supervisor will ensure that all electrical equipment (flexible extension cords, portable tools, junction boxes, earth leakage devices and site accommodation appliances and equipment etc.) will be inspected and tested by a suitably qualified person and labeled with a tag of the colour specified in the Electrical Practices for Construction Work Code of Practice appropriate to the month of testing. This inspection, testing and tagging procedure will be undertaken every month throughout the duration of the project.

The inspection, testing and tagging of equipment will be recorded on the Electrical Tagging Log. This log will be maintained throughout the project duration or the duration the equipment is on site. Hired in equipment will be inspected, tested, tagged and logged at the supplier's premises prior to issue. Should an item be delivered to site, which does not have a current tag, then it will be removed from site.

4.7.8 LIFITNG EQUIPMENT

The Site Management Team will ensure that all lifting gear (chains, slings, shackles, hooks etc.) brought on site have a current certificate of test and recorded in the Lifting Equipment Register. Any lifting used by Chalouhi are tested and tagged annually and visually inspected bi-annually. The register will be maintained during the course of the contract. All lifting slings and accessories will be marked with the manufacturer's identification, Safe Work Load (SWL) and the grade of the steel or alloy or will come with a certificate. Prior to use, all lifting gear will be inspected by the Site Supervisor or by a competent person to check for visual defects. Lifting gear that does not have a current test certificate will be removed from site.

4.7.9 HOT WORKS

When hot work activities are carried out on site, a Hot Works Permit must be filled out in conjunction with the Site supervisor and the workers involved in the hot works activity. A hot works permit is valid for 7 days unless advised otherwise by the Principal Contractor

Hot works is defined as any task or work that may produce heat, sparks or having a naked flame. This would include activities such as:

- Oxy and acetylene
- Welding
- Angle grinding

4.7.10 FIRE PROTECTION EQUIPMENT

The Site Management Team will ensure that an adequate number and type of fire extinguishers are available at the workplace and additional extinguishers are located in the immediate vicinity of any work that may create a fire risk. This requirement will apply without exception to any hot works activity and plant operation. All fire extinguishers must be tested and tagged every six months.

Site Personnel and the Site Supervisor will check that extinguishers have not been tampered with prior to having them at the work areas. Combustible materials will not be allowed to accumulate in work areas so as to prevent the creation of a fire risk. A log of all extinguishers will be kept and maintained on site on the *"Fire Protection Register"* which are tested and tagged bi-annually.

4.8 HAZARDOUS SUBSTANCES

The Site Management Team will carry out a Hazardous Substance Risk Assessment on all hazardous substances to be used on site. These assessments will be attached to the Safety Data Sheet (SDS) and kept on site in a register. SDS's obtained must have been produced and/or reviewed by the manufacturer within the five years prior to commencement of site works

The assessment will identify the

- Health hazards;
- Method of use of the substance;
- Controls of the risks;
- PPE requirements;
- The do's and don't's of spills and disposal;
- Storage requirements.

Where practicable, the material with the lowest possible hazard that still meets the technical requirements for the job will be used.

Prior to using any hazardous substance, all workers involved in its use will be provided with adequate information and training to allow safe completion of the required task. This will be covered in the Site Induction and/or in a Tool Box Meeting/Pre start meeting.

Large quantities of concentrated mineral acids, e.g. sulphuric, nitric and hydrochloric acids, must be kept in designated cabinets for corrosive substances. Organic solvents and other flammable substances (petrol, diesel) will be stored in designated flammable storage cabinets. Incompatible chemicals must not be stored together (see relevant Hazard Data Sheet). Hazardous chemicals should never be stored on the floor or on high shelves. Containers should be kept on low shelves or in cabinets. Shelving units should be securely fastened to the wall or floors. Shelves should not be overloaded.

Containers should be inspected regularly for any sign of chemical leakage. Containers of all types should be free of rust and deformation. Caps and covers for containers shall be securely in place whenever the container is not in immediate use. All storage cabinets and rooms must be labelled with the appropriate hazard symbol. Out-of-date and unwanted chemicals will be disposed of regularly.

4.9 HEALTH SURVEILLANCE

4.9.1 DRUGS & ALCOHOL IN THE WORKPLACE

Chalouhi take a serious view in regard to the consumption of alcohol and drugs in the workplace and our goal is to have drug and alcohol-free building and construction sites. This applies to all building and construction sites and to all employees (including subcontractors, consultants and anyone engaged by Chalouhi) working at those sites. Chalouhi and its employees have an obligation not to place at risk the health of people in the workplace.

The consumption of alcohol or illegal drugs on company premises or work sites is prohibited, unless specifically approved by the Managing Director. Any Chalouhi employee (including subcontractors, consultants and anyone engaged by Chalouhi) found to be consuming or bringing onto the work site any alcohol or illegal drugs is in breach of the Chalouhi Drugs and Alcohol Policy and may be subject to disciplinary action, which could lead to dismissal.

Any employee attending work under the effects or influence of alcohol or illicit drugs will not be permitted to commence or continue work. This includes the consumption of alcohol or illicit drugs prior to working hours, which would have the effect that, if tested, the individual would return a positive result.

To ensure the health, safety and welfare of workers, random and casual testing for alcohol and other drugs will be undertaken to assist in determining fitness for duty.

Disciplinary action associated with drugs and alcohol use at the workplace

Any employees found to be under the influence of drugs or alcohol during working hours shall be managed in the following manner:

1. The worker will cease working immediately and will be instructed to sit in the site office;
2. The Project Manager and HSEQ Manager will be informed of the situation immediately;
3. The worker will be asked for the reasons for his actions by the Site Supervisor;

4. The worker will have explained to him the safety risk that he is placing on themselves and other workmates, by the HSEQ Manager;
5. The employee will be tested for drugs or alcohol by the HSEQ Manager as per the procedure;
6. If the result is positive, arrangements will be made for the employee to get home safely;

First positive result in a 12 month period	The worker will be offered transport home by the Company. The worker is to utilise their own leave. The first positive will be considered the worker's first warning. Once a worker has tested positive there will be compulsory testing for that worker in the next round of random tests, until they test negative or reach three (3) consecutive positive results.
Second positive result in a 12 month period	The worker will be offered transport home by the Company. The worker is to utilise their own leave. The worker is required to seek counselling from the EAP provider. The second positive result will be considered the workers final warning.
Third positive result in a 12 month period	A review of their employment status will occur, which may lead to termination.

4.9.2 HEARING LOSS EXPOSURE IN THE WORKPLACE

Prior to the commencement of employment all Chalouhi employees will undergo an Industrial hearing assessment as part of their pre-placement health assessment. Chalouhi provides hearing protection to all workers who carry out any work activities at their work sites. Chalouhi also carry out training with all workers on the possible exposure to loud noise on the site and what controls need to be in place to prevent the possibility of hearing loss of the worker and the public.

On a monthly basis the Site Engineer will complete an on- site noise test to assess the expose on site.

4.9.3 FIRST AID

The Chalouhi will not rely on the First-aid services provided by Grindley.
Where Chalouhi is to provide First-Aid services under the WH&S Act, the following minimum requirements will be provided:

- a First Aid attendant will be on site during site working hours;
- a First Aid shed/room, with First Aid bed and facilities;
- first-aid equipment is located in the designated First-Aid shed/room
- First aid kits will be easily accessible and left unlocked at all times.
- First aid kits shall be kept clean and checked and restocked as necessary, or on a three monthly basis.
- First aid kit locations and trained First Aiders and contact numbers will be displayed on site notice boards.

4.9.4 ACCIDENT & INCIDENT INVESTIGATION AND REPORTING

The two main steps when an employee or subcontractor sustains an injury is to;

- Notify the Site Supervisor as soon as possible;
- Receive appropriate first aid or medical treatment as soon as possible.

The responsibilities in regard to the immediate injury notification and attendance are;

Employee or Subcontractor

- With the escort of a first aid officer, seek immediate treatment for an injury sustained at work or allow assistance from the return-to-work coordinator to provide such treatment including transportation to a doctor/hospital;
- When being treated by the doctor, the doctor is to be informed that the injury was sustained at work or while travelling to/from/between workplaces;

- The employee must obtain from the doctor a Safe Work Medical Certificate of capacity with the "Initial" box ticked.

First Aid Attendant

- Provide first aid treatment to all injured employees;
- If the first aider is an employee of Chalouhi, then the first aider must enter the injury details onto the Injury Register
- The site team will nominate a first aider for the site who will assess the first aid requirements and needs for the project.
- Escort the injured worker to the nearest doctor/hospital for further medical treatment

Site Supervisor

- For workplace injuries, ensure the injured employee receives immediate treatment for injuries from the first aid attendant on site and then from a doctor/hospital (if necessary);
- Complete relevant sections on the "Injury Report" form WHSE Injury Report
- If the first aider is a Chalouhi employee, then the Site Supervisor is to enter the injury details onto the *Injury Register*
- Give a copy of the *Injury Report* to the Project Manager
- Give all the medical receipts (medicines, bandages etc.) and any other document relating to the injury to the HSEQ Manager
- In consultation with all site employees (by means of a Tool Box Meeting), put into action preventive measures to minimise or eliminate the potential of recurrence of such an injury
- Ensure all injured workers are escorted by a first aid officer when seeking further medical treatment

Project Manager, Project Engineer or Site Engineer

- Review the *Injury Report* and sign off on it;
- Give a copy of the *Injury Report* to the HSEQ Manager;
- Conduct a detailed investigation and complete a "*Non-conformance Report*";
- Give a copy of the *Non-conformance Report* to the HSEQ Manager;

Emergency Communication

- In the event of an emergency, communications shall be via the use of UHF radio and mobile phones.
- A list of emergency contact numbers is provided in table 4.9.5 of this document and will be posted on site notice boards.
- The appropriate emergency service shall be notified immediately in the event of an emergency.

The emergency numbers are listed in section 1 of this document and shall be posted on notice boards

4.9.5 EMERGENCY/STAKEHOLDER CONTACT DETAILS

Table 4.9.5 – Emergency Contacts

Contact Name / Service	Name	Ph. Number
POLICE/ AMBULANCE/ FIRE BRIGADE	---	000
STATE EMERGENCY SERVICE (flood and storm)	---	13 25 00
POISONS INFORMATION CENTRE	---	13 11 26
CHALOUHI SITE SUPERVISOR		
CHALOUHI PROJECT MANAGER		
ELECTRICITY	Energy Australia	13 13 88
	Integral Energy	13 10 03
	Country Energy	13 20 80
GAS	AGL Company	13 19 09
WATER	Sydney Water	13 20 90
SAFE WORK	---	13 10 50
DIAL BEFORE YOU DIG	---	11 00
Nearest Medical Centre – Macquarie Park Medical Centre	Shop 456 "the Loft", Macquarie Shopping Centre, Ryde New South Wales 2113	02 9878 6666

4.9.6 INCIDENT / NEAR MISS REGISTER

All Incidents or near misses shall be recorded in the site incident register by the HSEQ Manager or Site Supervisor

4.10 RETURN TO WORK AND INJURY MANAGEMENT PROGRAMME

Injury management is about ensuring the prompt, safe and durable return-to-work of an injured worker. It includes

- Treatment of the injury;
- Rehabilitation back to work;
- Retraining into a new skill or new job;
- Management of the workers compensation claim;
- The employment practices of the worker.

Everyone involved is required to cooperate and participate in injury management (including the injured worker, the insurer, the employer and the treating doctor). The earlier an injury is treated and managed, the sooner the employee will return to work and recover from the injury.

There are two types of plans intended to help the injured employee recover and return to work as soon as possible.

Injury Management Plan:
This is a plan drawn up by the insurance company, after consultation with the injured worker, the employer and the treating doctor. The IMP outlines all the services required for the injured employee to return to work.

Recover at Work Plan
This is a plan written by the Return-To-Work Coordinator or the accredited Rehabilitation Provider with regard to the treating doctor's assessment of injuries. The plan is the written formal offer of suitable duties by the employer to the injured employee.

Suitable Duties

The Return to Work Coordinator will consult with the injured employee's treating doctor to formulate suitable duties, this applies to all injured workers as a part of the Injury Management Plan and Return to Work Plan.

Comprehensive details of the injury management procedures of employees, including rehabilitation and return to work can be provided by the HSEQ Manager.

5.0 ENVIRONMENTAL MANAGEMENT

Chalouhi operates under an ISO 14001 accredited Environmental Management System (EMS), Chalouhi's Environmental Management provides the framework for the onsite construction managers to implement specified corporate standards and practices in a consistent manner. It defines the application of work practices, processes, and systems for engineering / design, acquisition of materials, equipment and services, construction, and other services related to tendering and project execution.

evidence of contaminated material.

5.1 SOIL AND WATER MANAGEMENT PLAN

Compliance requirements

The Soil and Water Management Plan will detail erosion and sediment controls, and:

- Identify the management responses to activities that could cause soil erosion or result in the discharge of sediments and/or other pollutants from the site:
- Specify standards/performance criteria for erosion, sediment, and pollution control including any water sediment basin locations and discharge points, for example parameters, frequency, duration, location and method; and
- Describe what actions and measures will be implemented, the effectiveness these actions and measures and how they will be monitored during the works, clearly indicating who will conduct the monitoring, how the results of the monitoring would be recorded; and if any non-compliance is detected.

5.1.1 POTENTIAL FOR ACID SULPHATES SOILS (PASS)

The potential for acid sulphate Grindley works is unlikely due to the reported findings from previous soil testing of the specific area carried out.

The objective of this plan is to ensure that solid materials are classified and controls put in place to ensure sediment does not enter stormwater drains.

5.1.2 SOIL AND WATER SOURCES AND MITIGATION METHODS

Chalouhi will take all necessary steps to limit the creation of any dust and debris nuisance, which might arise during the preparation of the site and during construction.

Activity	Environmental Impact pre-control measures	Control Measures
Soil (Sand) Management		
All work including, excavation	Prevent sand and rock sediments entering stormwater drains	- Stockpile materials on sealed surfaces (existing roadways) away from stormwater drains (inlets) - Install silt fencing and silt socks where applicable (see below)
Sediment fines	Transported off site via rain water, wind, attaching to vehicles and tracked off site, inadequate dewatering procedures	- Refer to the Dust Management Plan - Install silt fencing as per Figure 5.7.2c - Install silt fencing to the low side of all exposed earth excavations as well as temporary stockpiles, e.g. the stockpile location shown on Figure 5.7.2c - Install metal rumble grid at site exit as per Figure 5.7.2c to facilitate removal of dirt and debris from wheels of exiting vehicles once internal sealed roads have been excavated. - Gravel will be installed beneath the shaker ramp to allow it to act as a wash-down bay where necessary. Water blasters will be used to clean tyres of exiting vehicles as required. Figure 5.7.2a – Silt fencing  Figure 5.7.2b – Rumble Grid 
	Stormwater and/or infiltrated groundwater (considered unlikely due depth of excavation) contaminated with sediment	Install gravel / and filled geotextile socks or coil matts around stormwater drains to prevent sediment runoff Figure.5.7.2c - Silt socks

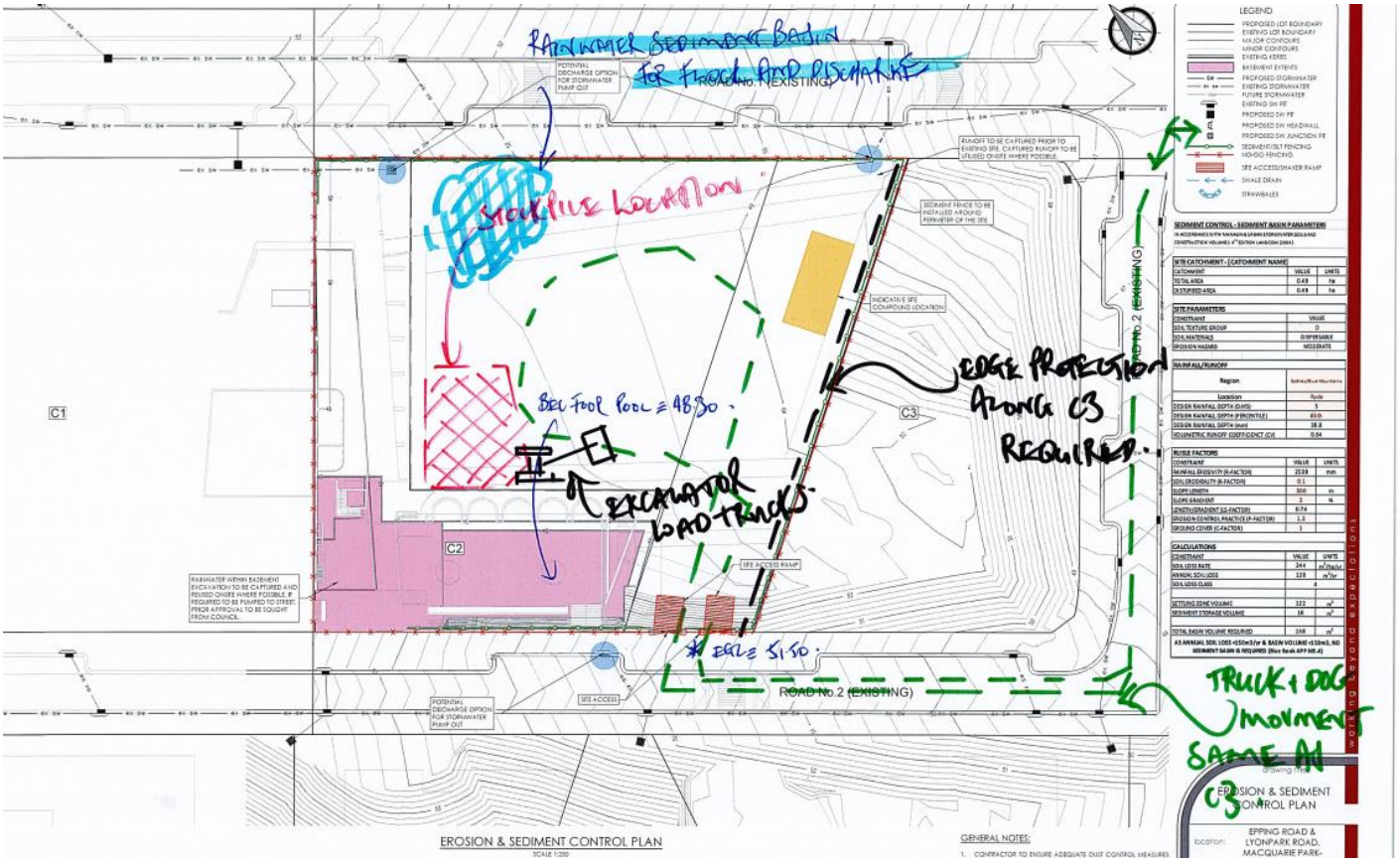
		
Import of bulk supplies of material	Prevent sediments entering stormwater drains	- Stockpile materials on sealed surfaces (existing roadways) away from stormwater drains (inlets) - Install silt fencing and silt socks where applicable (see above)
Water Management		
All work including, excavation and service trenching	Sediment laden water that accumulates within the site and enters the stormwater untreated	- Sediment laden water that accumulates within the site is not to be discharged into any water body or stormwater system without first being treated and tested for pH and turbidity as per Chalouhi's pH and Turbidity Treatment Procedures - Sediment controls (see above) - Dewatering of ponded stormwater or infiltrated groundwater - Subsequent collection to the site water cart for reuse for dust suppression

Table 5.7.2– Soil and Water Sources and Mitigation Methods

5.1.3 TEMPORARY SEDIMENT BASIN

A temporary sediment basin to be constructed by others to intercept sediment-laden site runoff and retain sediment and other materials in order to protect the creek (and other waterways) downstream from pollution. Temporary sediment basin key details are as follows:

- Total Minimum Volume: 1065m3
- Max Ponding Level: 0.54m from base level
- Dimensions: 20m x 35m
- 2x swale inlets with boulders at the basin interface
- 2x 450mm outlet pipes with a sieve-style filtration system that further promotes the capture of pollutants. Water is drained from the basin once the ponding level is greater than that of the outlet pipe, i.e. pumps are not required.
- A weir and rock protected spillway to the South of the basin
- Relevant calculations of temporary sediment basin



5.1.4 CONSTRUCTION SITE RAINWATER TESTING, TREATMENT AND DISCHARGE

Sediment laden water that accumulates within the site is not to be discharged into the existing sediment pond.

Groundwater entitlement is not expected to flow into the excavation zones. According to Douglas Partners Groundwater Monitoring report dated 30 July 2018, project 86043.01 Revision 5.005.Rev0, the ground water levels are typically below the bulk excavation levels of the works and therefore groundwater entitlement into the construction excavations is not expected and highly unlikely.

In addition, a visual inspection (appearance) and smell test for any unusual odour e.g. petrochemical odours.

To ensure this occurs, the following steps will be adhered to by Chalouhi:

- All dewatering must cease immediately where ANY water quality result falls outside the ANZECC water quality reference values;
- The non-conformance is to be documented and reported to the Site Supervisor;
- Trouble shooting should be undertaken to ascertain the reason for the failure and a second test should be undertaken to confirm or refute the non-conforming result;
- Trouble shooting would need to cover a review of the testing equipment, sampling techniques and the extent of flocculation of the water body;
- No dewatering shall recommence until the water quality results meet the ANZECC water quality criteria.

If the pH of sediment pond water is outside the range of 6.5-8.5, it will need to be treated to bring it

- Within the acceptable range. If the water pH is above 8.5, hydrochloric acid is used to lower the pH. Ensure correct PPE worn – Nitrile gloves, respirator mask, apron and safety goggles and follow relevant SDS and SWMS
- A 500mL dose of acid to 7000L of water will lower the pH by approximately 1.5.
- If the water pH is below 6.5, a base such as agricultural lime, with a pH of about 8.2, will be used to raise the pH.

If the turbidity of water is greater than 50 NTU, a flocculent should be used as follows:

- Treating water with flocculent (e.g. gypsum, liquid alum or flocculent blocks) will make the sediments drop to the bottom.
- Dosing rates of 30kg per 100m3 will be used and application methods will be applied as per methods recommended in the Landcom publication *Managing Urban Stormwater, Soils & Construction* (4th edition).
- Note that an even application over the captured water is essential for effective flocculation. Apply evenly in water and wait for the sediment to settle out.
- Only environmentally safe flocculants are to be used based on the HSE Manager's review of SDS information.

5.1.5 MINIMISING SPOIL REMOVAL AND INCREASE REUSE

Throughout the construction activities Chalouhi will actively seek opportunities to:

- Minimise spoil removal and associated impacts on stakeholders, community and the environment;
- Maximise the beneficial reuse of spoil material from the Project;
- Address the Project wide objective to provide certainty of delivery by managing spoil in a manner that avoids impacts on construction activities and timing.

Where feasible and reasonable, spoil would be managed according to the following hierarchy:

- Minimisation of spoil generation through design and management

- Reuse of spoil within the construction area
- Beneficial reuse of spoil outside the project for environmental and community works
- Beneficial reuse of spoil outside of the construction area for site levelling, development or rehabilitation
- Disposal of spoil outside the construction area for non-beneficial uses (landfilling)

The soil type including soil physical and chemical characteristic across the site are carefully assessed and recorded to provide information on the type of valuable resource that are available. The majority of spoil that would be generated from the construction activities is expected to meet the classifications of Virgin excavated natural Material (VENM).

Spoil temporary stockpile location

Any spoil that is to be reused on site will be stockpiled in the temporary stockpile. Material stockpiled will be wetted down to minimise dust. The location of the temporary stockpile position can be seen in Figure 5.7.2d of this report.

Excess spoil would be disposed of at a location that has appropriate approval or licences to accept the material. Solid waste and more highly contaminated materials will not be reused or imported to onsite. Imported materials include; stabilised sand.

5.1.6 EROSION AND SEDIMENT CONTROL INSPECTION CHECKLIST

As part of Chalouhi's weekly site walk, the site sediment controls are inspected to ensure they are compliant with their design intent. In the event of non-conformance, they will be immediately rectified and re-inspected by the site supervisor and site engineer. These controls are also visually monitored daily by the site supervisor to ensure they comply. **Figure 5.7.6a** below is an extract of the erosion and sediment control checklist from the weekly site safety walk.

ENVIRONMENTAL CONTROLS				
Item	Yes	No	N/A	Comments
Liquid Pollution				
Chemicals/fuels are kept in sealed containers and are in dedicated storage locations?				
Spill kit on site and stocked adequately?				
Silt ponds in place?				
Is silt pond water being tested for pH and turbidity prior to discharge?				
Erosion control measures are preventing sediment from entering waterways?				
Silt fence secure and in appropriate locations?				
Silt fence clean and maintained?				
Cattle Grid, maintained and draining within site boundary?				
Storm water grates are protected?				
Re-fuelling of plant is being carried out by mobile re-fuelling companies?				

Figure 5.1.6a – Weekly environmental site inspection checklist

In conjunction with the above figure 5.1.6a, extract from the weekly HSE walk, Chalouhi will implement the Weekly site inspection checklist prepared by the International erosion Control Association (IECA). A copy of this form is located in Appendix C of this Report.

6.0 APPENDICES

6.1 APPENDIX A – CHALOUHI POLICIES

CHALOUHI • DEMOLITION • EXCAVATION • CIVIL CONSTRUCTION	POLICY	Reference: IMS POL-003
	WORK HEALTH & SAFETY (WHS) POLICY	Revision: 2.1
		Date :11/01/2023

Policy
Work Health & Safety (WHS) Policy

Description
Chalouhi has guidelines for all employees regarding the WHS Policy.

Purpose
The purpose of this policy is to explain the general procedures relating to the Chalouhi WHS Policy.

Scope
The following guidelines are to be adhered to by all managers, supervisors and employees.

Procedure

Statement of Intent
Chalouhi is committed to Work Health & Safety ensuring the health and safety of all employees, customers, contractors, visitors and other interested parties.

We believe that our people are our greatest asset and their health & safety is our biggest responsibility. The public, including sub-contractors, shall be given equal priority to that of our employees.

As part of this process we shall
- Fully comply with all WHS Acts and Regulations
- Fully comply with all other reasonably practicable requirements placed upon us

Objectives
- To eliminate work related injury and illness.
- To make health & safety an integral part of every managerial, supervisory and employee position.
- To ensure health & safety is considered in all planning and work activities.
- To involve our employees in the decision-making processes through regular communication, consultation and training.
- To provide a continuous program of education and learning to ensure that our employees work in the safest possible manner.
- To identify and control all potential hazards in the workplace through hazard identification and risk analysis.
- To ensure all potential accident/incidents are controlled and prevented.
- To provide effective injury management and rehabilitation for all employees.

Strategies
- Monitoring the number or type of workplace accidents, health impact issues or near miss incidents.
- Ensuring regular and meaningful consultation methods are in place.
- Reviewing the number, type and close out of actions associated with workplace hazard reporting.
- Reviewing the effectiveness and status of our risk register in identifying and controlling safety risks in the workplace.
- Monitoring of outstanding inspections, safety actions and reviews.

Reporting
The HSEQ Manager and Management are responsible for monitoring and evaluating the implementation and effectiveness of this policy and for reviewing this policy as required.

Dissemination
This policy is provided to all staff upon induction and is to be prominently displayed in the workplace. This policy is available to interested parties upon request.

Review
This policy statement will be reviewed every 24 months or earlier if significant changes occur.

Chief Executive Officer — **Date** 11/01/23

Reference: IMS POL-003	Page: 1/ 1

CHALOUHI • DEMOLITION • EXCAVATION • CIVIL CONSTRUCTION	POLICY	Reference: IMS POL-002
	ENVIRONMENT POLICY	Revision: 2.1
		Date: 11/01/2023

Policy
Environmental Policy

Description
Chalouhi is striving for a sustainable future and as such, the organisation is committed to minimising the impact on the environment from its business operations.

Purpose
Chalouhi is committed to conducting our business in an environmentally aware and responsible manner. We seek the cooperation of our employees in ensuring our work practices are conducted with minimal environmental impact. The purpose of this policy is to explain the general procedures relating to the Environmental Policy

Scope
The following guidelines are to be adhered to by all Management, supervisors and employees.

Procedure
To support this objective, we will seek the assistance of our employees to minimize our environmental impact by:

- Comply with applicable local, state, and federal environmental regulations and legislations
- Comply with all conditions pertaining to our EPA Environmental Protection License
- Comply with all statutory licensing for the removal and disposal of Asbestos Materials
- Implementing systems to decrease the volume of waste we generate
- Where practical use environmentally appropriate packaging and recycle wherever possible
- Identify our environmental impact and any potential risks at all our locations and implement control measures for any potential hazards.
- Continually seek to improve the environmental performance of our business
- Engage employees, clients and suppliers in reducing the organisation's carbon footprint
- Train appropriate employees in sustainability management
- Lead by example and aim to become advocates for sustainability in our sector
- Encourage the development of innovative sustainable products and services
- Adopt sustainable procurement practices
- Actively encourage and support our suppliers to adopt sustainable practices
- Measure and periodically report on our progress towards our sustainability goals
- Use finite resources, including paper, energy, fuel and water as efficiently as possible
- Identify our environmental impact and any potential risks at all our locations and implement control measures for any potential hazards.

In particular we will:

Emissions

- Calculate the carbon footprint of our business operations
- Minimise our carbon footprint through reduction strategies
- Promote energy efficiency to our employees, customers and suppliers
- Consider purchasing carbon offsets where appropriate

Hazardous Substances

- Only Mix Chemicals in the designated areas
- Dispose of chemicals as per the Safety Data Sheets (SDS)
- Never wash chemicals down drains or gutters
- If spills occur, contain and clean up the spills by following Safety Data Sheet (SDS) directions

Waste

- Minimise waste by evaluating procedures to ensure they are as efficient as possible
- Actively promote recycling of paper, cardboard and other materials
- Recycle at every opportunity
- Remove all rubbish and waste from the work area and dispose of it appropriately

Water

- Actively promote water conservation across the organisation
- Wash company plant and vehicles in designated areas, where there are no designated areas for washing plant and vehicles, ensure it is done away from driveways, gutters and roads so run-off does not enter storm water drains.

Flora & Fauna

- Take steps to prevent soil erosion
- Reduce impact of our work on native flora and fauna (e.g. noise, dust)
- Where declared weeds occur on the job site, ensure all soil and seeds are removed from plant and vehicles so transference of weeks is avoided

This policy is explained and discussed at the general induction training given to all new employees and has been communicated to all current employees. All employees are expected to know what the environmental policy means to them and how it affects their job or position within the organisation.

Review
This policy statement will be reviewed every 24 months or earlier if significant changes occur.

Chief Executive Officer — Date: 11/01/23

CHALOUHI	POLICY	Reference: IMS POL-001
	QUALITY POLICY	Revision: 2.1
		Date: 11/01/2023

Policy
Quality Policy

Description
Chalouhi has guidelines for all employees regarding the Quality Policy.

Purpose
The purpose of this policy is to explain the general procedures relating to the Chalouhi Quality Policy

Scope
The following guidelines are to be adhered to by all Employees of Chalouhi Group and its group of companies.

Procedure

Chalouhi is engaged in the business of Civil Contracting and this policy applies to all of the divisions throughout the organisation.

The purpose of this policy is to confirm our commitment to meeting the quality standards expected by our clients in the delivery of our services.

Our quality system is based on the requirements of ISO 9001: 2015

Our quality objectives are to:

- Use the Quality Management System as a tool in achieving best practice outcomes across the organisation;
- Ensure continuous improvement;
- Ensure that there are zero complaints from the clients and every job is completed within the agreed time frame and on budget.

To implement this policy, we shall focus on the needs of our business with particular reference to consistently meeting our customer's requirements and statutory obligations.

Our quality management system will provide mechanisms for detecting system shortfalls and for stimulating process improvements.

Chalouhi will adopt procedures and disciplines to ensure that:

- The system is effectively implemented by undertaking relevant skills training and conducting appropriate quality awareness training;
- Responsibilities for quality are established by communicating these responsibilities clearly to all employees;
- The policy and procedures continue to be appropriate by initiating regular reviews to check its effectiveness and ongoing relevance, and the company regularly review the needs and expectations of our clients and initiate continuous improvement activities to meet these expectations.

Review
This policy statement will be reviewed every 24 months or earlier if significant changes occur.

Chief Executive Officer — **Date** 11/01/2023

6.2 APPENDIX B - PROJECT SAFETY AND ENVIRONMENTAL RISK REGISTER AND CONTROL MEASURES

Consequence	Description	Likelihood	Description
Extraordinary	Catastrophic impact on project. Major incident involving fatalities or permanent disability; toxic release of chemicals, long-term environmental impact; loss of property; very high financial loss	Almost Certain	The event/impact is common and expected to occur in most circumstances *(will occur regularly / 10 times for year)*
Major	Major negative impact on project; Serious injury or disease to workers or the general public; medium-term environmental effects; major property damage; loss of production; high financial loss	Likely	The event/impact has happened before and will probably occur again *(will occur often / 5-10 times per year)*
Moderate	Significant negative impact on project; Medical treatment requiring several days off work; spillage contained with outside assistance; significant property damage; medium- financial loss	Possible	This event/impact could occur at some time *(is likely to occur few 2-3 times per year)*
Minor	Minor negative impact on project; minor injury requiring First aid treatment; spillage contained on site; moderate property damage; low-medium financial loss	Unlikely	This event/impact is not likely to occur *(is unlikely to occur more than once per year)*
Insignificant	Insignificant negative impact on project; No injuries; Minor property or environmental damage; very low financial loss	Rare	This event/impact may occur in exceptional circumstances only *(is unlikely to occur during a year)*

Hazards Against each step	Raw Risk			Control Measures For each of the identified list the control measures required to eliminate or reduce the risk so far as reasonably practicable	Residual Risk			Role Responsible
	Consequence	Likelihood	Risk		Consequence	Likelihood	Risk	
Individuals struck by plant /delivery trucks moving around site	Extraordinary	Likely	death or disability of worker	• hold regular toolbox talks to inform site personnel of new works/access and plant operations • operators to have relevant plant licence and voc • cartage contractor to be consulted in determining the optimal means of site entry/exit and the loading area arrangement suitable for truck and dog. • use traffic control/spotter to co-ordinate movement of trucks into work area, when other machines or individuals are present. • pre start checks on the machine prior to work beginning on stable, level ground. • plant and vehicles to be fitted with yellow flashing light, reverse signal or beeper and horn in good working order • plant /trucks not to exceed 10km/hr on site and follow traffic management plan route • minimise work on foot, remove unnecessary personnel from work area • do not walk in front of or behind the plant while it is in operation. • do not approach moving plant; wait until the plant has ceased operation and signals for you to approach before approaching. • plant operators are to be aware of current entry and exit points for the work area. • machinery and trucks must operate at a safe and manageable velocity (<10km/h). • all machines and trucks are to operate with flashing lights that must be in use at all times whilst on site.	Extraordinary	Rare	death or disability of worker	plant operator, site supervisor and all site personnel

Hazards Against each step	RAW RISK			control measures for each of the identified list the control measures required to eliminate or reduce the risk so far as reasonably practicable	Residual Risk			Role Responsible
	Consequence	Likelihood	risk		Consequence	**Likelihood**	**risk**	
truck striking an individual (delivery to site)	Major	Likely	death or disability of worker broken bones, serious injury minor injury	• cartage contractor to be consulted in determining the optimal means of site entry/exit and the loading area arrangement suitable for truck and dog. all trucks must adhere to routes identified in traffic management plan and tc instructions • spotter with spotter vest) and operator must remain in constant contact via radio or eye contact with all plant and delivery trucks • all trucks to be fitted with audible reversing beacons. • all personnel are to keep a vigilant watchful eye for each other and spot for co-workers on site. • truck drivers shall adhere to the minimum ppe requirements if they exit vehicle-high vis apparel, hard hat and steel capped boots. • any reversing vehicles must have spotter • ensure that there is unrestricted vision between yourself and machine whilst working in the same area. • use of trained person as spotter. • prior to plant working on project site, all plant must have a plant daily pre-start checklist (hse-120), plant maintenance record (hse-145) and plant hazard & risk assessment (hse-132) completed and approved. • excavators are only to travel in the direction that the cabin is facing. • a dedicated spotter must ensure that all personnel are clear from the area of travel and that the excavator is safe to move. • spotter (with spotter vest) and operator must remain in constant contact via radio or eye contact with all plant and delivery trucks • delivery driver to remain in vehicle at all times unless instructed by otherwise by site supervisor. if exiting the vehicle, driver must wear correct ppe as per site requirements • when working near the exclusion zone ensure the operator has visually seen you and is aware of the activity taking place	Major	rare	death or disability of worker broken bones, serious injury minor injury	site supervisor all site personnel

Hazards AGAINST EACH STEP	RAW RISK			control measures for each of the identified list the control measures required to eliminate or reduce the risk so far as reasonably practicable	Residual Risk			Role Responsible
	Consequence	**Likelihood**	**risk**		Consequence	**Likelihood**	**RISK**	
plant colliding with other plant	Major	Likely	death or disability of worker broken bones, serious injury minor injury	• all drivers to follow designated tcp and designated haul route on site • barriers and signage is to be erected onsite prior to the commencement of works, this is to designate pathways and access ways. • delivery trucks to be access site via designated access ways and may be directed by site personnel as required. • competent spotter to be used to co-ordinate movements in and out of shared areas where collisions with other plant may be possible. • plant operators are to be aware of current entry and exit points for the work area. • machinery and trucks must operate at a safe and manageable velocity (<10km/h). • minimise unnecessary traffic through work areas •	MAJOR	unlikely	death or disability of worker broken bones, serious injury minor injury	site supervisor all site personnel
collapse of excavation	Major	Likely	death or disability of worker broken bones, serious injury minor injury	• avoid having persons working around areas where there could be a potential of collapse. • do not park plant and machinery near to excavation walls. • use spotter (identified with spotter vest) to help guide trucks into and out of site. • spotters and plant operators are to have a clear field of vision and maintain eye contact. • barriers & signage may be required to be erected to create exclusion zones as required. • batters are to be made safe prior to entering excavation, and excavators are to maintain a distance of 2m from the edge of a batter while moving. • do not park plant/machinery close to the edge of excavations. • remove loose material from the top of batters or excavation faces.	MAJOR	RARE	death or disability of worker broken bones, serious injury minor injury	site supervisor all site personnel

Hazards Against each step	RAW RISK			control measures for each of the identified list the control measures required to eliminate or reduce the risk so far as reasonably practicable	Residual Risk			Role Responsible
	Consequence	**Likelihood**	**risk**		CONSEQUENCE	**Likelihood**	**RISK**	
hit by falling objects	Major	Likely	death or disability of worker broken bones, serious injury minor injury	• all trucks to be fitted with audible reversing beacons • all personnel are to keep a vigilant watchful eye for each other and spot for co-workers on site • truck drivers shall adhere to the minimum ppe requirements that apply to all other site personnel if they exit their vehicle. this includes high visibility apparel, hard hat and steel capped safety boots • the loading area is a no-go zone for all non-involved personnel during load out • slewing of the excavator shall be at a speed such that material will not project from the bucket • do not move between the truck and the excavator while loading is in progress. • at no time shall personnel move between the truck and the dog.	MAJOR	unlikely	death or disability of worker broken bones, serious injury minor injury	site supervisor all site personnel
electrocution	Major	Likely	death or disability of worker broken bones, serious injury minor injury	• ensure all electrical equipment used in this activity has been tested and tagged by a competent person • there is to be no piggy backing of leads for any electrical equipment used within the confined space. • all connections are to be secured and taped with electrical tape for added assurance that there will be no moisture in the connection. • all leads that are used to supply live electricity to the work zone are to be plugged into a power board fitted with a rcd, the power board is then able to be plugged into the 240 volt electrical outlet. • manage the location of the leads so as they are not getting interfered with during the normal operation of the work site, keep all leads away from any moving parts or equipment to ensure they stay free from damage and in good working order	Major	RARE	death or disability of worker broken bones, serious injury minor injury	site supervisor all site personnel

Hazards Against each step	RAW RISK			control measures For each of the identified list the control measures required to eliminate or reduce the risk so far as reasonably practicable	Residual Risk			Role Responsible
	Consequence	**Likelihood**	**risk**		Consequence	**Likelihood**	**RISK**	
contact with underground services	Major	Very likely	death or disability of worker closure of Ports terminal	• tool box to be completed with all site personnel prior to any works near live services • excavation permit to be completed highlighting live services • safety barriers/fencing has been erected to protect staff and the public in areas that are at risk • spill kit and fire extinguisher to be available near works. operating plant to be fitted with fire-extinguisher • obtain service information: dial before you dig (www.1100.com.au) plans should remain on site and accessible (issued within last 30 days). • service locator to examine service plans and perform detailed scan of site- additional to plans • assets to be clearly labelled with marking paint and/or timber stakes • notification to the access authority- service supplier or its agent that you intend to commence excavation and associated works adjacent to underground assets inside no go zone • once services have been identified, potholing is to be performed with a combination of vacuum excavation and hand excavation to safely expose services. pot-holing must be used to locate existing underground assets to ensure adequate clearances are maintained between assets and to locate other asset crossings. pot-holing at each asset crossing and at regular spacing along assets is recommended	rare	unlikely	death or disability of worker closure of Ports terminal	site supervisor all site personnel

Hazards Against each step	RAW RISK			Control measures For each of the identified list the control measures required to eliminate or reduce the risk so far as reasonably practicable	Residual Risk			Role Responsible
	Consequence	**Likelihood**	**risk**		CONSEQUENCE	**Likelihood**	**RISK**	
contact with underground services (continued)	Major	Very likely	death or disability of worker closure of Ports terminal	full time supervision of spotter who has the full understanding of known services in the vicinity of the work area, with use of 2-way radio should any unidentified objects. marking tape, polymeric plastic slab, trace wire or other labelling be encountered during excavation work, the work must stop until site supervisor is notified.	MAJOR	unlikely	death or disability of worker closure of Ports terminal	site supervisor all site personnel
fire / explosion	Major	Unlikely	death or disability of worker broken bones, serious injury minor injury	• hot works permit obtained and adhered to where required. • appropriate warning signs to be displayed on fuel cages at all times • ensure the equipment being refuelled is switched off before refuelling. • no smoking in the vicinity of fuel containers • no hot works near fuel containers • fire extinguisher to be maintained (6 month inspections) and mounted to the fuel cage • fuel is to be kept in sealed containers and clearly labelled • store fuel containers in well ventilated fuel cages away from direct sunlight • fuel cages are to be accessed by authorized personnel and adequately secured. • no electrical devices and/or mobile phones used near fuel containers • ensure that incompatible chemicals are not stored close to each other	MAJOR	Unlikely	death or disability of worker closure of Ports terminal s	site supervisor all site personnel

Hazards Against each step	RAW RISK			control measures For each of the identified list the control measures required to eliminate or reduce the risk so far as reasonably practicable	Residual Risk			Role RESPONSIBLE
	Consequence	**Likelihood**	**risk**		CONSEQUENCE	LIKELIHOOD	risk	
fire / explosion (continued)	Major	Unlikely	death or disability of worker broken bones, serious injury minor injury	• maintain a fire equipment register. • fuel truck operator to ensure that the fuel nozzle is firmly placed within the fuel tank before the fuel pump is activated • oxy-acetylene bottles should be stored separately and upright. • do not place tanks near any fire or explosive material, or hot surfaces	MAJOR	RARE	death or disability of worker broken bones, serious injury minor injury	site supervisor all site personnel
inhalation of fumes	Moderate	Unlikely	irritation of lungs dizziness	• fuel is to be kept in sealed containers and clearly labelled • store fuel containers in well ventilated fuel cages away from direct sunlight • fuel cages are to be accessed by authorized personnel and adequately secured. • appropriate warning signs to be displayed on fuel cages at all times • no storage of fuel within 50m of a waterway • fuel cages are to be accessed by authorized personnel and adequately secured. • appropriate warning signs to be displayed on fuel cages at all times • wear task specific ppe as required • follow information/direction on the msds. copies of msds will be kept in Chalouhi site office • mobile fuel companies are to provide their own swms which their operators are to be inducted into	MODERATE	rare	irritation of lungs dizziness	site supervisor all site personnel

Hazards AGAINST EACH STEP	RAW RISK			control measures For each of the identified list the control measures required to eliminate or reduce the risk so far as reasonably practicable	Residual Risk			Role RESPONSIBLE
	Consequence	**Likelihood**	**risk**		CONSEQUENCE	LIKELIHOOD	**risk**	
use of damaged equipment	Moderate	Unlikely	death or disability of worker	• daily pre start inspections of all equipment must be carried out prior to use • training provided specific to the type of plant/equipment used including use of angle grinder/oxy-acetylene, demo saw and other power tools) • ensure the angle grinder is fitted with a dead man switch	MODERATE	RARE	death or disability of worker	site supervisor all site personnel
working in hot environment	Moderate	Unlikely	Unlikely	hard hat brims are provided to site and should be worn at all times, especially between 10am-3pm when the sun is at its most intense. wear sunscreen and safety sunglasses. provide shade for rest periods. • where possible, rotate duties to minimize the duration of exposure. • where workers are required to wear ppe that could cause overheating, schedule such work for the cooler times of the day. • a cool fresh water supply is to be provided • plant pre-start daily checks shall be carried out for all mobile plant. • plant operators shall monitor engine temperature gauges, ensure that plant is well-maintained, ensure air conditioner (where fitted) is in good working order and ensure engine has sufficient coolant to carry out works without overheating	Moderate	rare	heat stress heat stroke heat exhaustion plant overheating	site supervisor all site personnel
Dust from vehicles & plant moving around site.	Moderate	Unlikely	Lung infection	• dust control must be in-place such as wetting areas down with water blaster. • dust masks (minimum p2 grade) to be worn for any workers entering excavation works zone • appropriate eye protection, face shield or goggles as required. • all site personnel with risk to exposure to silica are to complete a site fit testing for	moderate	rare	Lung infection SILICOSIS	site supervisor & operators.

(silica exposure)			Silicosis	respiratory masks • dust monitoring to be completed on site to monitor site (hygienist) to monitor site and individual exposure levels • all stockpiles are to be wetted down with use of water gurney prior to load out • water gurney to light spray tracking path of plant to minimise dust. • all mobile plant completing excavation works such as hammering, loading out are to be monitored for dust control at all times with a water gurney • all trucks are to have covered tarps when transporting excavated material				

6.3 APPENDIX D – EMERGENCY EVACUATION PROCEDURES

The accidents or incidents may be significant enough to warrant the evacuation of work areas within sites or the entire site as a whole.

Induction

The Site Supervisor will induct all the people on site, working for or contracted by Chalouhi, onto the Emergency Procedures established for Chalouhi's scope of works.

Entry onto Site

Upon arrival on site, each person (whether a site employee, contractor or visitor) must sign in at the office and on leaving the site, sign out. This form will enable the Site Supervisor to account for all personnel on site in the case of an emergency or evacuation.

Fire Wardens

As part of the emergency control measures the site team must ensure that there is designated emergency personnel are trained in emergency evacuation of the site and Fire wardens are available to assist with the evacuation of the site as per the company procedures (Emergency evacuation drill).

Fire Fighting Equipment

The site team is to ensure that firefighting equipment e.g. Fire Extinguishers are tested and tagged every bi-annually and are located in accessible areas to the work area and any flammable goods. Only if it is safe to do so, and the person is trained to use fire fighting equipment, will fire fighting be carried out.

Emergency Contacts

The Emergency Contacts form will list the phone numbers for Emergency Services, key Chalouhi personnel and utilities, and details for the nearest medical centre, hospital and doctor. This will be available in the site office.

First Aid Services

Chalouhi will not rely on the First-aid services provided by Grindley .
Where Chalouhi is to provide First-Aid services under the WH&S Act, the following minimum requirements will be provided:

- A First Aid attendant will be on site during site working hours;
- first-aid equipment is located in the designated First-Aid shed/room
- First aid kits be located every Chalouhi work vehicle and in the site office(s).
- First aid kits will be easily accessible and left unlocked at all times.
- First aid kits shall be kept clean and checked and restocked as necessary, or on a three monthly basis.
- First aid kit locations and trained First Aiders and contact numbers will be displayed on site notice boards.

Injury Reporting and Investigation

- All injuries relating to activities on site, will be reported to the appropriate First Aider on site;
- Injuries will be recorded in the "Injury Register "by the First Aider or the site supervisor;
- The HSEQ Manager and Site Supervisor will record all injuries onto the Injury Report form;
- The HSEQ Manager will review the report to ensure that corrective measures are adopted and are in place to eliminate or control the likelihood of reoccurrence;
- The HSEQ Manager and Site Supervisor will investigate all injuries within 48 hours;
- Any notifiable injuries will be reported to Safe Work NSW and the Grindley Project Manager by the HSEQ Manager.

Emergency Communication

- In the event of an emergency, communications shall be via the use of UHF radio and mobile phones.

- A list of emergency contact numbers is provided in section 1 of this document and will be posted on site notice boards.
- The appropriate emergency service shall be notified immediately in the event of an emergency.
- The emergency numbers are listed in section 1 of this document and shall be posted on notice boards.

Emergency Assembly Area - TBC

6.4 EVACUATION PROCEDURES – RESPONSIBILITIES

In order for emergency procedures for evacuations to be carried out smoothly and safely, the following responsibilities have been allocated. In carrying out their responsibilities, each site person is to do so if it is safe and it does not present a risk to their health and safety.

Site Supervisor

- When informed of the event or having witnessed the event, make a judgement on the seriousness of the event itself;
- Direct the Site Engineer, Sub-Foreman or a member of the labour force to call everyone to take action in evacuating the work place;
- Direct site personnel to shut down machinery, gas supply, electrical supply etc.;
- Direct site personnel to clear evacuation routes of any obstructions;
- If the incident cannot be safely controlled by site personnel, then arrange for the appropriate emergency services;
- Direct site personnel to clear access routes in order for emergency services to gain access to the event;
- Direct someone to guide the emergency services, ambulance, doctor, etc. to the emergency area;
- Arrange for first aid or medical assistance to anyone who is injured;
- Cordon off the area, if safe to do so;
- Notify public utilities if utilities are affected by the incident;
- If EPA has licensed the activity, then EPA is to be notified of the incident immediately;
- If the works are not EPA licensed, then notify the local council environmental officer;
- Communicate with the appropriate emergency service(s) for assistance;
- Once everyone has arrived to the assembly area, do a head count and check to make sure everyone is present.

Project Engineer / Site Engineer

- Once safe to do so, investigate the event, complete a “Non-conformance Report” and submit the report to the Project Manager or Systems Manager for action.

Site personnel, Contractors, Visitors

- No one is to go the site accommodation sheds to collect personal items;
- All personnel are to immediately make safe any equipment or machinery being used and go to the emergency evacuation muster point and remain until instructed by the Site Manager to do otherwise; and

Recording of Personnel

- The site sign on register shall be maintained by the Site Manager ensuring all personnel, both workers (including subcontractors) and visitors sign in an out of the site office on a daily basis.
- The Deputy shall ensure that this register is taken to the Muster point during an emergency evacuation.

6.5 APPENDIX E - CHALOUHI SITE SAFETY RULES

Breach of any of the following rules may result in immediate removal from site.

1. Mandatory PPE whilst on site; Hard Hat, High Vis Vest and Steel Cap Work Boots, additional PPE required to task specific activity.
2. Use of mobile phones and portable music players are not permitted in work areas during work hours, including all social media.
3. Due to contractual requirements, no site personnel are permitted to post any image of our sites or related material to any social media platform.
4. Follow signs and procedures – control measures are put in place for your safety.
5. Work areas must remain in a clean and safe condition.
6. All persons requiring first aid treatment are to remain on site and contact the First-Aid Attendant for treatment.
7. All persons must report all hazards (including all equipment damage), accidents, incidents and near misses immediately to the Site Supervisor.
8. All site personnel are to maintain an exclusion zone of 3 metres from swing radius of mobile plant or vehicles unless the operator/driver has been informed and the plant or vehicle is immobile.
9. Barricading and signage must be installed around all excavations and exclusion zones.
10. All penetrations must be covered and fixed down or a guard rail installed around the hole to prevent persons falling through.
11. No tools, equipment or machinery to be operated by anyone unless that person has obtained a verification of competency for each tool/machine.
12. Hazardous chemicals and gases are to be stored in an enclosed cages on site. SDS available in site office
13. No water is to be discharged from site without being treated and tested.
14. Any comments, suggestions or complaints from the public in regard to safety and environmental issues in or around the site are to be reported to the Site Supervisor.
15. The consumption of, or being under the influence of alcohol and illegal drugs on site is prohibited
16. The following behaviour is not permitted on site: offensive language, bullying, harassment, racism, sexism, defamatory content or any serious breach of the Work Health and Safety Act,
17. In the event of an emergency all persons must move to the nearest exit muster point

Appendix 7 - Unexpected Finds Protocol

Douglas PARTNERS

GROUNDED EXPERTISE

Report on Unexpected Finds Protocol

Proposed Midtown Building C2
Ivanhoe Place, Macquarie Park NSW

Prepared for Grindley Construction Pty Ltd

Project 86043.26

17 July 2024

Document History

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The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature		Date
Author		17 July 2024
Reviewer		17 July 2024

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Attachments

Notes About this Report

Appendix A: Drawings

Appendix B: Table 1: Summary of Laboratory Analytical Results – Groundwater

Appendix C: Unexpected Finds Form

bsi ISO 9001 Quality Management Systems CERTIFIED FS604853

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

Report on Unexpected Finds Protocol
Proposed Midtown Building C2
Ivanhoe Place, Macquarie Park NSW

1. Introduction

Douglas Partners Pty Ltd (Douglas) was engaged by Grindley Construction Pty Ltd through an email dated 11 July 2024 to prepare this Unexpected Finds Protocol (UFP) for Building C2, Stage 2 (herein referred to as the 'site'. as indicated on Drawing 1, Appendix A) of the broader Midtown Development (located within the former Ivanhoe Estate Social Housing Precinct), Ivanhoe Place, Macquarie Park NSW. The purpose of the UFP is to provide a formal contingency protocol to be followed in the event of an unexpected find (UF) with respect to potential site contamination issues encountered during bulk earthworks.

Douglas understands that no contamination investigations were previously undertaken for the site.

The proposed Building C2 development is located within the central portion of the broader Stage 2 – Midtown Development and comprises a community centre, including landscaped village green and swimming pool facilities. The final ground surface levels are proposed to be generally around Reduced Level (RL) 49.5 m Australian Height Datum (AHD) for landscaping and ground floor levels. Basement floor levels are anticipated to be at RL 47.1 m AHD in local areas towards the western corner for plant rooms and basement foyer areas.

At the time of preparing this UFP, the site is vacant and has been subject to bulk excavation, a photograph of the site conditions is provided in Figure 1 below.



Figure 1: Site condition at the time of preparing this UFP

2. Previous reports

2.1 Expected sub-surface conditions

Douglas has undertaken a brief review of the geotechnical investigation for Building C2 (Douglas, 2021). The geotechnical investigation provided a summary of the expected subsurface condition, which comprises the following:

- **Fill** – variable fill, including concrete, gravelly sand and clay, of apparently variable compaction, to depths of 0.2 m to 1.2 m; underlain by,
- **Sandy Clay and Clayey Sand** – residual soil, typically stiff and very stiff or dense, to depths of 1.5 m to 3.2 m, absent at some locations; underlain by,
- **Sandstone** – variable, typically fractured to highly fractured, very low to medium strength, but including extremely low strength bands, to depths of 1.9 m to 4.3 m; underlain by, typically fractured to slightly fractured, low and medium strength to depths of 3.5 m to 7.3 m; underlain by, typically slightly fractured to unbroken, medium and high strength, with occasional very high strength bands (e.g. Bores 103, 07 and 117) to the limit of investigation (Douglas, 2021).

It should be noted that the site conditions during the geotechnical investigation (Douglas, 2021) are likely to vary from the present site conditions due to construction and site preparations works

undertaken since 2021. The previous geotechnical test locations and the C2 area boundary is indicated on Drawing 1, Appendix A.

No groundwater was observed whilst auguring at the borehole locations. Measurement at the standpipes, after allowing the wells to stabilise following purging, indicated groundwater at a depth of approximately:

- 7.3 m bgl (RL 46.8 m AHD) at Bore 101, with a screen interval from 8.0 m to 11.0 m; and
- 4.93 m bgl (RL 44.6 m AHD) at Bore 106, with a screen interval from 8.0 m to 11.0 m.

It should be noted that groundwater levels are subject to seasonal and temporal variations.

2.2 **Groundwater quality**

One round of the groundwater monitoring was completed as part of the dewatering management plan (Douglas, 2022) from the wells within or near the Stage 2 development.

Groundwater samples were collected from bore locations 109A, 111 and 118A[1] and analysed for a combination of the following suite of common contaminants to inform dewatering requirements:

- Dissolved and total heavy metals (As, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Hg, Ni, Ka and Zn);
- Total petroleum hydrocarbons (TPH);
- Monocyclic Aromatic Hydrocarbons (e.g. BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Volatile Organic Compounds (VOC);
- Organochloride pesticides (OCP);
- Organophosphate pesticides (OPP);
- Polychlorinated Biphenyls (PCB); and
- General Water quality parameters (e.g. pH, total suspended solids, major anions and cations).

Results were compared against the adopted groundwater quality criteria comprising ANZG (2018) Freshwater 95% level of species protection toxicant default guideline value to provide an indication of the groundwater quality.

The results of the groundwater monitoring indicate that chemical concentrations in groundwater were within the adopted screening criteria for all analytes tested with the exception of metals that exceeded the adopted criteria (more specifically, chromium, copper, iron, lead and zinc). However, the elevated metals in groundwater are considered to be associated regional urbanisation and / or mineralogy of the aquifer. Importantly, the groundwater monitoring results indicated an absence of gross groundwater contamination as indicated by non-detect of all other analytes.

[1] Borehole BH118A was installed in 2022 adjacent to BH118.

The extracted table of analytical results of the three groundwater samples (Douglas, 2022) are provided as Table 1, Appendix B.

3. Implementation of the unexpected finds protocol

3.1 Overview

This UFP is a precautionary measure (to be implemented during any civil or construction works at the site) to ensure that unexpected finds of contamination, if any, are appropriately managed. Unexpected finds of potential contamination may be identified by visual (appearance or staining) and / or olfactory (odour) evidence during site works.

3.2 Responsibilities

The site (project) manager is responsible for providing advice and a copy of the UFP to all excavation and construction personnel prior to commencing work and for ensuring that the plan is implemented by contractors during works undertaken at the site.

All site workers must be inducted to the UFP prior to commencement of any works. The induction can be undertaken at the time of a general site induction and toolbox meetings. Induction into the UFP must be performed by a suitably qualified person.

The UFP is to be implemented by the contractor during any site preparation, excavation and construction works where the ground surface is disturbed. Prior to the commencement of site works, a pre-start meeting should be convened between all relevant parties to discuss the requirements of the UFP and to assign roles and responsibilities.

3.3 Timing

This UFP should be implemented over the period of construction and earthworks being carried out at the site. The management of long-term contamination issues (if encountered) is outside the purview of this UFP.

4. Contingency plan

In order to assist in the early identification of unexpected finds and to minimise the potential for unexpected finds to be damaged and / or spread across the site during earthworks and / or development works, a site walkover following excavation works to visually identify areas of uncontrolled filling should be undertaken by a competent person or a suitably qualified environmental consultant. Should any unexpected contamination find be encountered during the site walkover, the management procedure and relevant procedure for the specific find (detailed below) should be implemented.

4.1 Unexpected finds protocol – general

If unexpected conditions with respect to contamination are encountered by the Contractor during the earthworks (such as fragments of suspected asbestos containing material (ACM), buried structures or unexpected contaminated soil or contaminants), the following general approach should be adopted:

- Upon discovery of an UF, works should cease in that area. The Contractor's Site Manager should be notified and the affected area closed off by the use of barrier tape;
- The location of the UF should be surveyed using dGPS with sub-metre accuracy;
- The Site Manager is to contact the Principal's Representative (PR), and the PR is to notify the Environmental Consultant;
- The Environmental Consultant will inspect the area and make an assessment of the significance of the find in terms of the potential impact to human health and the environment with reference to NSW EPA endorsed guidelines including NEPC (2013);
- Provision of advice from the Environmental Consultant to the PR regarding the recommended course of action;
- The Environmental Consultant will prepare a report detailing their assessment, including the extent and methods of remediation, as required;
- The assessment results together with a suitable management plan may be provided to Council / consent authority (as required) prior to the removal or treatment of such contamination;
- The agreed management / remedial strategy shall be implemented; and
- Details of the incident are to be recorded in the site record system.

4.2 **Unexpected finds protocol – asbestos**

In the event that the UF relates to the identification of asbestos, the following protocol will also apply:

- Upon discovery of suspected asbestos, the Site Manager should be notified and the affected area closed off by the use of barrier tape and warning signs. Warning signs shall be specific to Asbestos Hazards and shall comply with the Australian Standard 1319-1994 *Safety Signs for the Occupational Environment*;
- The location of the UF should be surveyed using dGPS with sub-metre accuracy;
- The Site Manager is to contact the Principal's Representative (PR), and the PR is to notify an appropriately qualified Environmental Consultant or Occupational Hygienist;
- The Environmental Consultant or Occupational Hygienist is to confirm the presence of asbestos and assess the extent of remediation works to be undertaken. An assessment report detailing this information will be compiled by the Environmental Consultant or Occupational Hygienist and provided to the PR;
- The Environmental Consultant or Occupational Hygienist should prepare a report detailing their assessment including the extent and methods of management / remediation, as required;
- The assessment results, together with a suitable management plan, may be provided to Council / consent authority (as required) prior to the removal or treatment of the asbestos;
- The agreed management / remedial strategy shall be implemented;
- In dry and windy conditions, any stockpiles or other areas of the site found to contain asbestos should be lightly wetted and covered with plastic sheeting whilst awaiting remediation / disposal;

- All work associated with asbestos in soil will be undertaken by an appropriately licenced contractor;
- Monitoring for airborne asbestos fibres is to be carried out during the soil excavation and remediation (if undertaken);
- Documentary evidence (weighbridge dockets) of correct disposal is to be provided to the contractor's construction manager;
- At the completion of the excavation, a clearance inspection is to be carried out and written confirmation is to be provided by the Environmental Consultant or Occupational Hygienist that the area is safe to be accessed and worked. Validation should include appropriate soil sampling and testing; and
- Details of the UF and the remedy employed should be recorded in the site record system.

4.3 Unexpected finds protocol – buried structures

In the event that buried structures, such as underground storage tanks (USTs), are encountered during site works, in addition to the procedure outlined in Section 4.1 above, the structure(s) and any associated pipework should generally be managed / removed as follows:

- Upon discovery of the structure, the site (project) manager is to be notified and the area barricaded;
- The area will be inspected by a qualified environmental consultant including visual identification of the structure and associated pipework;
- Under the supervision of a competent person or environmental consultant:
    - Remove and dispose of the structure and associated pipework by a qualified contractor. In the case of an UST, the tank must be removed in accordance with Australian Standard AS 4926 - 2008 *The Removal and Disposal of Petroleum Underground Storage Tanks*; and
    - Excavate and stockpile impacted materials (based on field observations) for waste classification).
- Validation of the remedial pit by a qualified environmental consultant for the contaminants of concern at the following sampling density (note: validation works should be undertaken in general accordance with NSW EPA authored and / or endorsed guidance):
    - Base of tank pit excavation: at least one to two samples per tank;
    - Side of tank pit excavation: one sample per 10 linear metre (minimum of 1 sample per side) and one sample per 2 - 3 m depth interval;
    - Fuel feed lines / pipe-work: one sample per 10 linear metre and 2 - 3 m depth interval; and
    - Quality assurance / quality control (QA / QC) sampling and analysis at a rate of at least 10% of the samples collected.
- If required, "chase out' all of the material in the remediation pit identified to be impacted by petroleum hydrocarbons, and undertake further validation sampling and analysis as required to assess appropriate removal of impacted materials;
- Waste classification and off-site disposal of impacted materials in accordance with EPA (2014);

- Based on the extent of impacts, the need for a groundwater investigation should be considered by the environmental consultant; and
- Inclusion of validation, waste classification and disposal documents (including landfill dockets and, in the case of USTs, tank and pipe work destruction certificates) in a validation report for the site.

4.4 Unexpected finds protocol – groundwater

Previous geotechnical investigation (Douglas, 2021) have encountered groundwater at depths of between RL 44.6 and 46.8 m AHD (near bulk excavation levels) and the results of the groundwater monitoring (Douglas, 2022) did not indicate a high risk of groundwater contamination. Notwithstanding if potentially contaminated groundwater (i.e. odorous or stained) is encountered during the proposed development, then:

- Upon discovery of contaminated groundwater, the site (project) manager is to be notified, works in the area halted and the area barricaded;
- The area / impacts should be inspected by a qualified environmental consultant with a view to investigating the nature and extent of the contamination if any. As necessary, the delineation exercise may involve a detailed groundwater investigation; and
- Based on the results, the environmental consultant will provide a report to the project manager / Principal regarding the nature of the contamination, the need for additional investigations and / or the proposed management strategy. In this regard, it is noted that management of contaminated groundwater can be a complex matter and therefore, the type of management strategies will be dependent on the nature and extent of the identified contamination if any.

4.5 Documentation

An unexpected find form is attached at the end of this UFP and should be completed by the Contractor's Site Manager in the event of encountering an UF. The form should be sent to the PR and Environmental Consultant, or Occupational Hygienist, in the event of encountering a UF.

5. Concluding statements

This UFP has been prepared to outline appropriate management procedures and reporting protocols that should be implemented in the event that unexpected contamination is encountered during the proposed development.

It is possible that indications of contamination not specifically covered in this UFP may be encountered at the site. In such a scenario, a precautionary principal will be applied and the general unexpected finds protocol (Section 4.1) should be applied in all circumstances.

6. References

Douglas. (2021). *Report on Geotechnical Investigation of C2 Site.* Stage 2 - Midtown, Herring Road, Macquarie Park, Dated August 2021 (reference: 86043.06.R.001.Rev1) (Douglas, 2021).

Douglas. (2022). *Dewatering Management Plan*. Stage 2 - Midtown, Herring Road, Macquarie Park, Dated May 2022 (reference: 86043.06.R.008.Rev0) (Douglas, 2022).

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (2014). *Waste Classification Guidelines - Part 1: Classification of waste*. Sydney: NSW Environment Protection Authority (EPA).

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

7. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Ivanhoe Place, Macquarie Park NSW in accordance with Douglas' email proposal dated 28 June 2024 and acceptance received from Michael Jones on 11 July 2024. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Grindley Construction Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and / or their agents.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Notes About This Report

About this Report

November 2023

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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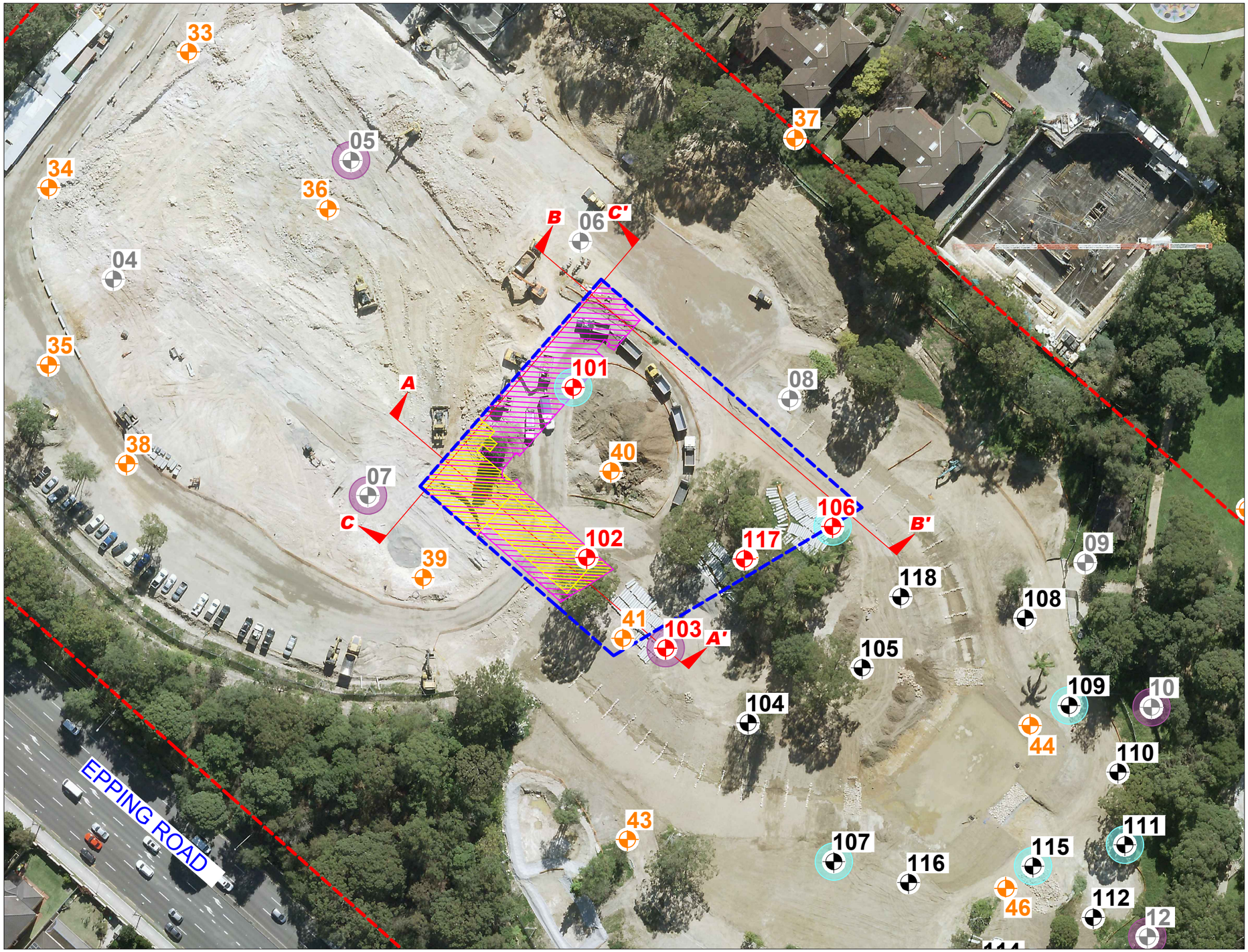
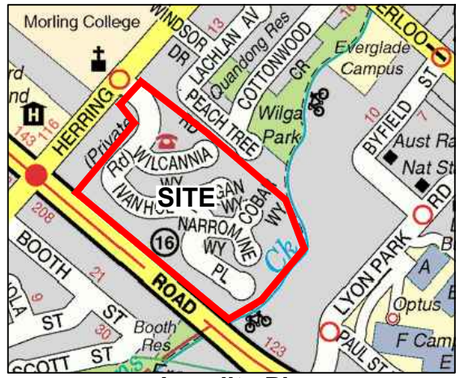
Appendix A

Drawings





Locality Plan

LEGEND

- Borehole Location
- Cored Bore Location (2021, Beyond C2 Site)
- Previous (2017) Cored Bore Location
- Previous (2017) Shallow Cored Bore Location
- Standpipe Location (Current)
- Standpipe Location (Damaged or Missing)
- C2 Area Boundary
- Greater Midtown Site Boundary
- Approximate Proposed Building Footprint
- Approximate Proposed Basement and Pool Footprint

NOTE:
1: Base image from MetroMap (Dated 15.04.2021)

0 10 20 30 40 50 75 100m
1:1000 @ A3

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Frasers Property Ivanhoe Pty Ltd		TITLE: **Test Location Plan - C2 Site** **Proposed Residential Development** **Midtown, Macquarie Park**
OFFICE: Sydney	DRAWN BY: PSCH/MG	
SCALE: 1:1000 @ A3	DATE: 21.05.2021	

PROJECT No: 86043.06
DRAWING No: 201
REVISION: 0

Appendix B

Table 1: Summary of Laboratory Analytical Results - Groundwater

				Sample ID	109A	BD1/20220321	111	118A
				LocCode	109A	109A	111	118A
				WellCode				
				Sample Date	21/03/2022	21/03/2022	21/03/2022	21/03/2022
				Lab_Report_Number	291444	291444	291444	291444
				Matrix_Type	WATER	WATER	WATER	WATER
				ANZG (2018) Freshwater 95% LOSP Toxicant DGVs*				
Chem_Group	**ChemName**	**Units**	**PQL**					
Ion Balance	Carbonate Alkalinity as CaCO3	mg/L	5		<5	-	<5	<5
PAHs in Water - Low Level	Benzo(a)pyrene TEQ	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
	Benzo(b,j+k)fluoranthene	µg/L	0.2		<0.2	<0.2	<0.2	<0.2
	Total +ve PAHs	µg/L	0.1		<0.1	<0.1	<0.1	<0.1
Inorganics	Alkalinity (Hydroxide) as CaCO3	mg/L	5		<5	-	<5	<5
	Alkalinity (total) as CaCO3	mg/L	5		<5	-	65	120
	Alkalinity (Bicarbonate as CaCO3)	mg/L	5		<5	-	65	120
	Chloride	mg/L	1		120	-	110	48
	Ferrous Iron	mg/L	0.05		0.24	-	0.52	1.3
	Ionic Balance	%			-15	-	-5	-11
	Sodium (Filtered)	mg/L	0.5		93	-	74	67
	Sulphate	mg/L	1		170	-	64	95
	TDS	mg/L	5		300	-	320	420
	TSS	mg/L	5		76	-	300	95,000
Metals	Arsenic	mg/L	0.001	0.024	<0.001	-	<0.001	0.006
	Arsenic (Filtered)	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001
	Cadmium	mg/L	0.0001	0.0004	<0.0001	-	<0.0001	0.0002
	Cadmium (Filtered)	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
	Calcium (Filtered)	mg/L	0.5		6	-	27	28
	Chromium (III+VI)	mg/L	0.001	0.0068	0.001	-	0.004	0.058
	Chromium (III+VI) (Filtered)	mg/L	0.001	0.0068	<0.001	<0.001	<0.001	<0.001
	Copper	mg/L	0.001	0.0014	0.003	-	0.006	0.069
	Copper (Filtered)	mg/L	0.001	0.0014	0.002	0.002	<0.001	0.035
	Ferric Iron	mg/L	0.05		<0.05	-	0.21	<0.05
	Iron	mg/L	0.01		0.5	-	2.7	44
	Iron (Filtered)	mg/L	0.01		0.22	0.25	0.73	1.3
	Lead	mg/L	0.001	0.0103	0.005	-	0.006	0.07
	Lead (Filtered)	mg/L	0.001	0.0103	0.004	0.004	<0.001	<0.001
	Magnesium (Filtered)	mg/L	0.5		7.9	-	5	2
	Mercury	mg/L	0.00005	0.0006	<0.00005	-	<0.00005	0.00008
	Mercury (Filtered)	mg/L	0.00005	0.0006	<0.00005	<0.00005	<0.00005	<0.00005
	Nickel	mg/L	0.001	0.0232	0.003	-	0.004	0.019
	Nickel (Filtered)	mg/L	0.001	0.0232	0.002	0.002	0.002	0.003
	Potassium (Filtered)	mg/L	0.5		0.7	-	1	3
	Zinc	mg/L	0.001	0.0168	0.019	-	0.048	0.23
	Zinc (Filtered)	mg/L	0.001	0.0168	0.016	0.016	0.026	0.022
TPH	C10-C16	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	Oil and Grease	mg/L	5		<5	-	<5	-
	F2-NAPHTHALENE	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C6 - C9	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
	C10 - C14	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C15 - C28	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	C29-C36	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	+C10 - C36 (Sum of total)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C10 - C40 (Sum of total)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C6-C10 less BTEX (F1)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
	C6-C10	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
BTEX	Benzene	mg/L	0.001	0.95	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	0.001	0.08	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	0.001	0.18	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/L	0.002		<0.002	<0.002	<0.002	<0.002
	Xylene (o)	mg/L	0.001	0.35	<0.001	<0.001	<0.001	<0.001
MAH	1,2,4-trimethylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,3,5-trimethylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Isopropylbenzene	mg/L	0.001	0.03	<0.001	-	<0.001	<0.001
	n-butylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	n-propylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	p-isopropyltoluene	mg/L	0.001		<0.001	-	<0.001	<0.001
	sec-butylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Styrene	mg/L	0.001		<0.001	-	<0.001	<0.001
	tert-butylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,1,1-trichloroethane	mg/L	0.001	0.27	<0.001	-	<0.001	<0.001
	1,1,2,2-tetrachloroethane	mg/L	0.001	0.4	<0.001	-	<0.001	<0.001
	1,1,2-trichloroethane	mg/L	0.001	6.5	<0.001	-	<0.001	<0.001
	1,1-dichloroethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,1-dichloroethene	mg/L	0.001	0.7	<0.001	-	<0.001	<0.001
	1,1-dichloropropene	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,2,3-trichloropropane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,2-dibromo-3-chloropropane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,2-dichloroethane	mg/L	0.001	1.9	<0.001	-	<0.001	<0.001
	1,2-dichloropropane	mg/L	0.001	0.9	<0.001	-	<0.001	<0.001
	1,3-dichloropropane	mg/L	0.001	1.1	<0.001	-	<0.001	<0.001
	2,2-dichloropropane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromochloromethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromodichloromethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromoform	mg/L	0.001		<0.001	-	<0.001	<0.001
	Carbon tetrachloride	mg/L	0.001	0.24	<0.001	-	<0.001	<0.001
	Chlorodibromomethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Chloroethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	Chloroform	mg/L	0.001	0.77	<0.001	-	<0.001	<0.001
	Chloromethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	cis-1,2-dichloroethene	mg/L	0.001		<0.001	-	<0.001	<0.001

				Sample ID	109A	BD1/20220321	111	118A
				LocCode	109A	109A	111	118A
				WellCode				
				Sample Date	21/03/2022	21/03/2022	21/03/2022	21/03/2022
				Lab_Report_Number	291444	291444	291444	291444
				Matrix_Type	WATER	WATER	WATER	WATER
				ANZG (2018) Freshwater 95% LOSP Toxicant DGVs*				
Chem_Group	**ChemName**	**Units**	**PQL**					
	cis-1,3-dichloropropene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Dibromomethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Hexachlorobutadiene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Trichloroethene	mg/L	0.001	0.33	<0.001	-	<0.001	<0.001
	Tetrachloroethene	mg/L	0.001	0.07	<0.001	-	<0.001	<0.001
	trans-1,2-dichloroethene	mg/L	0.001		<0.001	-	<0.001	<0.001
	trans-1,3-dichloropropene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Vinyl chloride	mg/L	0.01	0.1	<0.01	-	<0.01	<0.01
Halogenated Hydrocarbons	1,2-dibromoethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromomethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	Dichlorodifluoromethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	Trichlorofluoromethane	mg/L	0.01		<0.01	-	<0.01	<0.01
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/L	0.001	0.01	<0.001	-	<0.001	<0.001
	1,2,4-trichlorobenzene	mg/L	0.001	0.17	<0.001	-	<0.001	<0.001
	1,2-dichlorobenzene	mg/L	0.001	0.16	<0.001	-	<0.001	<0.001
	1,3-dichlorobenzene	mg/L	0.001	0.26	<0.001	-	<0.001	<0.001
	1,4-dichlorobenzene	mg/L	0.001	0.06	<0.001	-	<0.001	<0.001
	2-chlorotoluene	mg/L	0.001		<0.001	-	<0.001	<0.001
	4-chlorotoluene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromobenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Chlorobenzene	mg/L	0.001	0.055	<0.001	-	<0.001	<0.001
	Hexachlorobenzene	mg/L	0.000001	0.0001	<0.000001	-	<0.000001	<0.0002
Solvents	Cyclohexane	mg/L	0.001		<0.001	-	<0.001	<0.001
PAH/Phenols	Acenaphthene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthylene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Anthracene	mg/L	0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.0001
	Benz(a)anthracene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a) pyrene	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(g,h,i)perylene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Chrysene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Dibenz(a,h)anthracene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Fluoranthene	mg/L	0.0001	0.0014	<0.0001	<0.0001	<0.0001	<0.0001
	Fluorene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Indeno(1,2,3-c,d)pyrene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Naphthalene	mg/L	0.0002	0.016	<0.0002	<0.0002	<0.0002	<0.0002
	Phenanthrene	mg/L	0.0001	0.002	<0.0001	<0.0001	<0.0001	<0.0001
	Pyrene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Polychlorinated Biphenyls	Arochlor 1016	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1221	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1232	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1242	mg/L	0.00001	0.0006	<0.00001	-	<0.00001	<0.002
	Arochlor 1248	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1254	mg/L	0.00001	0.00003	<0.00001	-	<0.00001	<0.002
	Arochlor 1260	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
Organochlorine Pesticides	4,4-DDE	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	a-BHC	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Aldrin	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	b-BHC	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Chlordane (cis)	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Chlordane (trans)	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	d-BHC	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	DDD	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	DDT	mg/L	0.000001	0.00001	<0.000001	-	<0.000001	<0.0002
	Dieldrin	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Endosulfan I	mg/L	0.000002		<0.000002	-	<0.000002	<0.0002
	Endosulfan II	mg/L	0.000002		<0.000002	-	<0.000002	<0.0002
	Endosulfan sulphate	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Endrin	mg/L	0.000001	0.00002	<0.000001	-	<0.000001	<0.0002
	Endrin aldehyde	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	g-BHC (Lindane)	mg/L	0.000001	0.0002	<0.000001	-	<0.000001	<0.0002
	Heptachlor	mg/L	0.000001	0.00009	<0.000001	-	<0.000001	<0.0002
	Heptachlor epoxide	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Methoxychlor	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
Organophosphorous Pesticides	Azinophos methyl	mg/L	0.00002	0.00002	<0.00002	-	<0.00002	<0.0002
	Bromophos-ethyl	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Chlorpyrifos	mg/L	0.000009	0.00001	<0.000009	-	<0.000009	<0.0002
	Chlorpyrifos-methyl	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Diazinon	mg/L	0.00001	0.00001	<0.00001	-	<0.00001	<0.0002
	Dichlorvos	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Dimethoate	mg/L	0.00015	0.00015	<0.00015	-	<0.00015	<0.0002
	Ethion	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Fenitrothion	mg/L	0.0002	0.0002	<0.0002	-	<0.0002	<0.0002
	Malathion	mg/L	0.00005	0.00005	<0.00005	-	<0.00005	<0.0002
	Methyl parathion	mg/L	0.0002		<0.0002	-	<0.0002	-
	Ronnel	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
Pesticides	Parathion	mg/L	0.000004	0.000004	<0.000004	-	<0.000004	<0.0002

Notes:

a. Criteria for cadmium, chromium, lead, nickel and zinc were hardness adjusted for a hardness of 72 mg/kg of CaCO3

* Where criteria was not available, either a lower or unknown reliabiility criteria was applied, or the laboratory PQL was used as an initial screen

Appendix C

Unexpected Finds Form

Unexpected Find Form

Unexpected Find No.:

Date:

Location:

Actions

Item	Action Taken	Action Taken By
Unexpected find encountered	Affected area closed off by barrier tape	Contractor
	Notify the Principal's Representative	Site Manager
	Notify Environmental Consultant / Occupational Hygienist	Principal's Representative

Information for the Environmental Consultant to be completed by the Contractor's Site Manager

Description of the Unexpected Find	
Does the Unexpected Find potentially involve asbestos	Yes No

Appendix 8 - Community Consultation Strategy



Community Communication Strategy - Stage 2

Midtown Estate
1 Ivanhoe Place, Macquarie Park NSW 2113

Frasers Property Australia (ABN 89 600 448 726)
Level 2, 1C Homebush Bay Dr, Rhodes NSW 2138

7 November 2023

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1. Introduction

1.1 Document summary

This Community Communication Strategy (Strategy) has been prepared in accordance with the relevant conditions of the Ivanhoe Stage 2 Development Consent.

The Strategy provides an overarching framework for communicating with the community as the project moves towards and through the delivery of Stage 2. The Strategy outlines who the community stakeholders are and how to communicate about project milestones and construction impacts, as well as how to share relevant project information and respond to dynamic community feedback.

The objective of this Strategy is to build on the confidence within the community that the urban renewal of Ivanhoe Estate will redefine the way social, affordable and market housing are integrated together to provide a sustainable and inclusive neighbourhood for people from all walks of life.

The objectives of the Strategy will be supported with specific implementation plans, providing concrete information about how the approach outlined herein applies to project phases.

1.2 Background

The Ivanhoe Estate project will transform over 8-hectares at the corner of Herring Road and Epping Road, drawing together world-class urban design, quality facilities and public open spaces to create a sustainable community where people want to live.

The redevelopment of the Ivanhoe Estate is part of the NSW Government Communities Plus program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

Community consultation over the past three years has contributed to the revised masterplan. The revised masterplan features:

» approximately 3,300 new homes

» approximately 6,000 sqm of open space

» the retention of 94 per cent of the existing ecological community along Epping Road

» the protection of Shrimptons Creek

» revised building heights

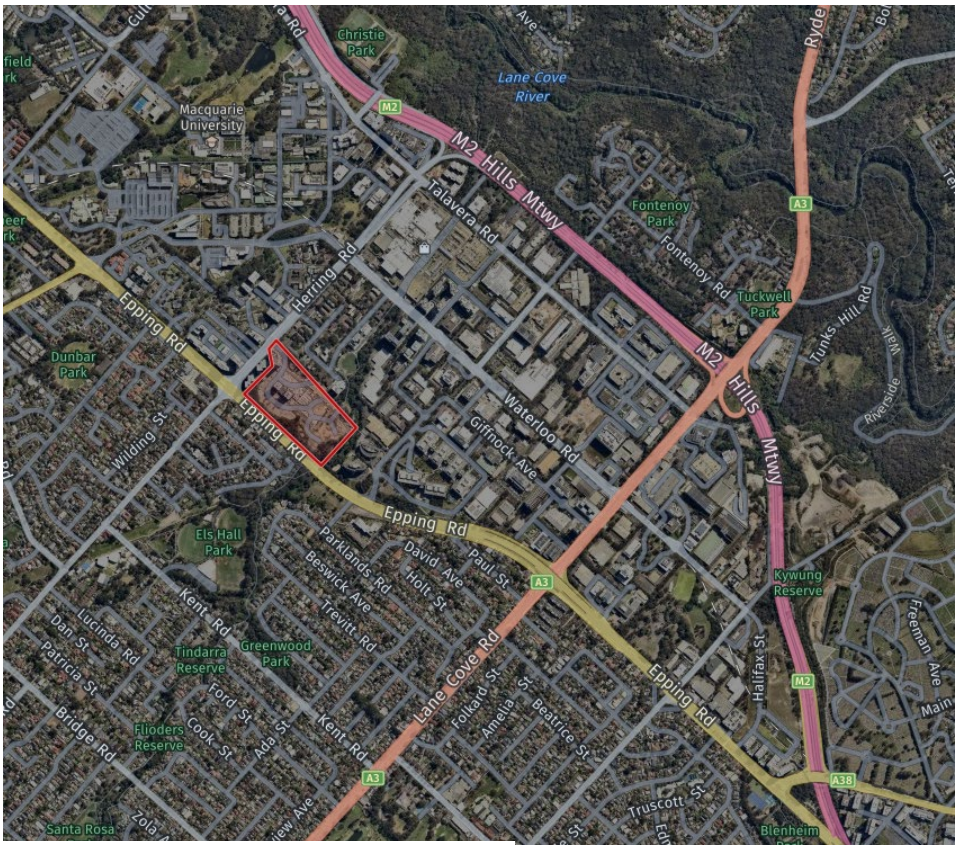
» the realignment of private apartments adjacent to the existing ecology community

» greater amenity

» improved integration with the existing community.

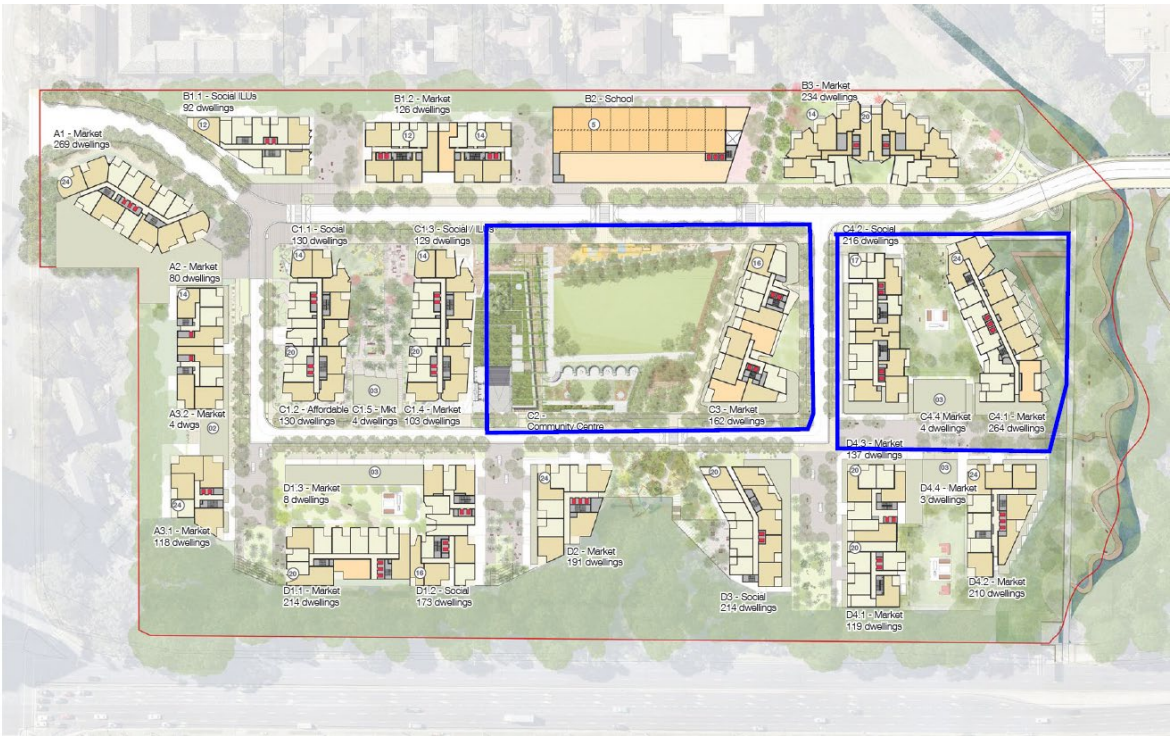
Other features of the urban renewal project include a new primary school, two childcare centres, community centre, gym and pool, a supermarket, cafes and specialty retail shops, nature-based playgrounds and exercise stations and community gardens.

Figure 1: Aerial Photograph of Midtown Estate



Source: Frasers Property

Figure 2: Masterplan – Stage 2 Outlined



1.3 About Stage 2

The Stage 2 plans for the former Ivanhoe Estate were approved in November 2022 by the Minister for Planning and Public Spaces. The Development Consent (SSD-15822622) has been issued, prompting the preparation of this Strategy.

Approved Stage 2 works include:

> excavation and earthworks

> construction of a community facilitates building (Building C2) and two residential apartment buildings (Building C3

> and Building C4) with basement car parking:

- Building C3 with 162 dwellings, 163 car parking spaces and ground floor retail
- Building C4 with 488 dwellings and 396 car parking spaces

> construction of Village Green public open space

> utilities, services infrastructure and public domain areas. tree removal

1.4 About the Community Communication Strategy (Strategy)

This Community Communication Strategy (Strategy) has been developed in response to conditions B12 and B13 of the Development Consent. The Development Consent stipulates the preparation and publishing of a Community Communication Strategy (Strategy) that spans the design and construction of Stage 2, as well as the first 12 months following completion of construction. In line with conditions, this Strategy:

a. identifies the people who need to be consulted and communicated with during design and construction

b. set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;

c. provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;

d. set out procedures and mechanisms:

(i) through which the community can discuss or provide feedback to the Applicant;

(ii) through which the Applicant will respond to enquiries or feedback from the community; and

(iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.

2. Stakeholders and community

Table 1 Development Consent (COMMUNITY COMMUNICATION STRATEGY)

B11. A Community Communication Strategy must be prepared to provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction.

B12. The Community Communication Strategy must:

» identify people to be consulted during the design and construction phases

This Strategy pertains to communications with the community, relating specifically for Stage 2 works. This Strategy expands on the engagement and consultation undertaken with Council and community to date, throughout the planning process and in the lead up to the approvals for Stage 2. The project anticipates a greater emphasis on construction impacts and environmental management as the project shifts from planning to the construction of Stage 2.

'Community' encompasses the following stakeholder groups: [Ref. Table 2]

Table 2 Community stakeholder matrix

Stakeholder category	Likely level of interest	Specific Stage 2 interest	Participation Spectrum [Ref IAP2]
Existing, returning and future social housing residents and staff at Ivanhoe Estate	High	» Delivering socially integrated housing » Staging and timing of Stage 2 construction » High amenity and services » Community involvement	Involve
Existing and prospective market housing owners and renters	High	» Delivering socially integrated housing » Staging and timing of Stage 2 construction » High amenity and services » Community involvement	Involve

Stakeholder category	Likely level of interest	Specific Stage 2 interest	Participation Spectrum [Ref IAP2]
Local Government (General Managers and Elected Representatives – Mayors)	High	» Service delivery » Infrastructure provision » Urban form and density » Delivering a socially integrated community » Impact on existing community, services and infrastructure » Community partnership program and opportunities	*Engagement to be undertaken by consortium and engagement specialists – outside of general community communications
Media and social media	Moderate – High	» Delivering socially integrated housing » Environmental management and construction impacts » Community partnership program and opportunities	Inform
Macquarie University	Moderate	» Delivering socially integrated housing » Environmental management and construction impacts » Community partnership program and opportunities	Consult
Business Councils Chambers of Commerce Business District – including Macquarie Connect	Moderate	» Delivering socially integrated housing » Environmental management and construction impacts » Impact on existing community, services and infrastructure » Community partnership program and opportunities » Staging and timing of Stage 2 construction	Consult

Stakeholder category	Likely level of interest	Specific Stage 2 interest	Participation Spectrum [Ref IAP2]
Neighbours	Moderate – High	» Urban form and management of density impacts » Management of construction impacts on neighbouring road networks and infrastructure » Impact on community, services and programs	Consult
Local businesses (in vicinity of the precinct)	Moderate – High	» Urban form and management of density impacts » Impact on existing community, services and infrastructure » Community partnership program and opportunities » Business expansion	Involve
Community service providers	Moderate – High	» Delivering socially integrated housing » Environmental management and construction impacts » Community partnership program and opportunities	Involve
Businesses within Macquarie University	Moderate – High	» Delivering socially integrated housing » Environmental management and construction impacts » Community partnership program and opportunities	Involve
Local community and residents' groups (including environmental groups)	Moderate – High	» Urban form and management of density impacts » Environmental management and construction impacts » Impact on community, services, infrastructure and programs	Consult

Stakeholder category	Likely level of interest	Specific Stage 2 interest	Participation Spectrum [Ref IAP2]
Local education providers	Moderate – High	» Delivering socially integrated housing » Community partnership program and opportunities	Consult
Transport providers	Moderate – High	» Community partnership program and opportunities	Consult
Aged care / disability care providers (including those operating in the local are)	Moderate – High	» Community partnership program and opportunities	Consult
Community service providers	Moderate – High	» Community partnership program and opportunities	Involve
Childcare providers in the local area	Moderate – High	» Community partnership program and opportunities	Involve
Aboriginal Land Councils	Moderate – High	» Community partnership program and opportunities	Involve

3. Communication approach

Table 3 Development Consent (COMMUNITY COMMUNICATION STRATEGY)

B13. The Community Communication Strategy must:

- » set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development
- » provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development
- » set out procedures and mechanisms

through which the community can discuss or provide feedback to the Applicant

through which the Applicant will respond to enquiries or feedback from the community

to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.

3.1 Objectives of communication and engagement approach

The objectives of the communication approach outlined in this Strategy include:

- » providing accessible, easy-to-understand information about the project to interested stakeholders, including impacted residents and site neighbours
- » listening to and considering a range of stakeholder and community ideas about how the project can deliver a sustainable, cohesive community that is a desirable place to live
- » building and strengthening stakeholder relationships that have been supported throughout the planning phases of the project
- » reinforcing the commitment to delivering world-class urban design, quality facilities and public open spaces in a way that fosters community development
- » meeting and exceeding statutory requirements for notification periods relating to construction impacts and project milestones
- » promoting ongoing opportunities for engagement as the project progresses through and beyond Stage 2.

The objective of this Strategy is to build on the confidence within the community that the urban renewal of Ivanhoe Estate will redefine the way social, affordable and market housing are integrated together to provide a sustainable and inclusive neighbourhood for people from all walks of life.

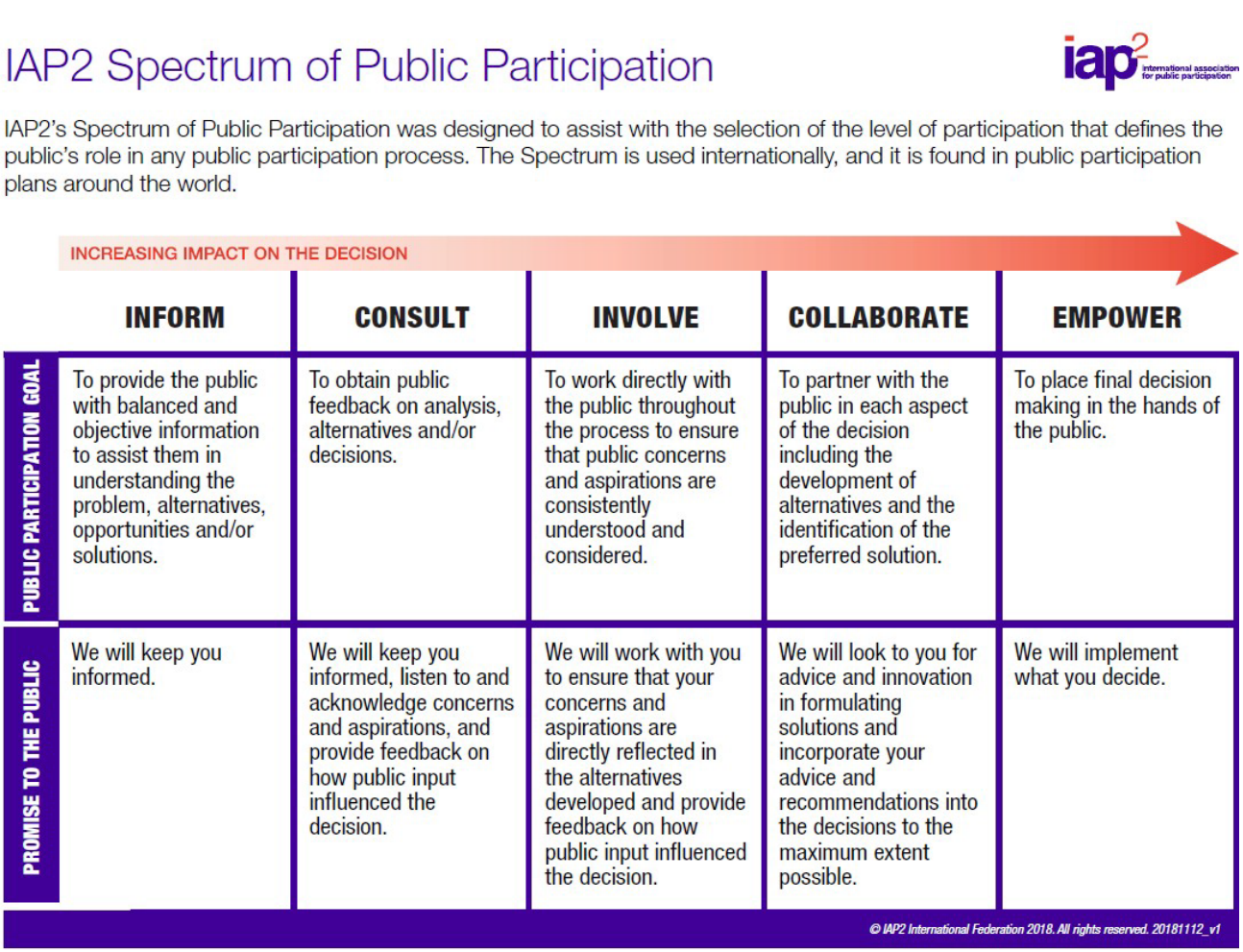
This Strategy will advance the engagement objectives that have guided communications throughout planning and initial phases, including:

- » the establishment of an open and transparent communication process
- » to gain insight into community sentiment as early as possible
- » develop relationships with the community and stakeholders as early as possible
- » to understand the aspirations of different stakeholders towards the future use of the site
- » to communicate the project's benefits
- » identify and mitigate concerns or risks before the master plan is submitted
- » build a sense of confidence and excitement about the site's renewal
- » commit to ongoing engagement

IAP2 public participation spectrum

The International association for public participation (IAP2) public participation spectrum will be the framework for the engagement approach, as required by the Green Star accreditation. The approach outlined in this Strategy combines techniques that inform, consult, involve and/or collaborate with the community.

Figure 1 IAP2 Spectrum of Public Participation [Ref iap2.org.au/resources/spectrum/]



IAP2 Spectrum of Public Participation

IAP2's Spectrum of Public Participation was designed to assist with the selection of the level of participation that defines the public's role in any public participation process. The Spectrum is used internationally, and it is found in public participation plans around the world.

INCREASING IMPACT ON THE DECISION

	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
PUBLIC PARTICIPATION GOAL	To provide the public with balanced and objective information to assist them in understanding the problem, alternatives, opportunities and/or solutions.	To obtain public feedback on analysis, alternatives and/or decisions.	To work directly with the public throughout the process to ensure that public concerns and aspirations are consistently understood and considered.	To partner with the public in each aspect of the decision including the development of alternatives and the identification of the preferred solution.	To place final decision making in the hands of the public.
PROMISE TO THE PUBLIC	We will keep you informed.	We will keep you informed, listen to and acknowledge concerns and aspirations, and provide feedback on how public input influenced the decision.	We will work with you to ensure that your concerns and aspirations are directly reflected in the alternatives developed and provide feedback on how public input influenced the decision.	We will look to you for advice and innovation in formulating solutions and incorporate your advice and recommendations into the decisions to the maximum extent possible.	We will implement what you decide.

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3.2 Feedback and enquiries loop



Figure 2 Feedback and enquiries loop – listening to the community and responding proactively

Receiving and responding to community and stakeholder input

The feedback and enquiries loop illustrates how the communication channels and engagement mechanisms outlined in this Strategy enable the community to discuss and provide feedback on the project to the Project Team. The Project Team will provide relevant and accessible information as is required and will respond to feedback and comments from the community in a timely fashion.

Sharing information and receiving and responding to feedback

Table 4 Procedures to distribute accessible information

This table maps foreseeable project events that warrant communication with community stakeholders against the requisite communication channel.

Event (trigger)	Assessment of interest	Communication channel
Planning approval	High level of interest amongst all stakeholders	» Website » Letter » Newsletter » Media release » Facebook post (linking to website text)

Event (trigger)	Assessment of interest	Communication channel
Construction commences (Stage 2)	High level of interest amongst all stakeholders, especially site neighbours	» Website » Newsletter » Media release » Facebook post (linking to website text) » Equip 1800-number and project email
Construction activities (impactful)	High level of interest amongst site neighbours and local residents	» Website » Newsletter (project notification) » Equip 1800-number and project email » Newspaper advertisement
Project milestones	High level of interest amongst all stakeholders	» Community-based forum » Website » Newsletter » Media release
Key environmental management issues for development	High level of interest amongst environmental groups and site neighbours	» Mobilise dedicated community-based forum, as required » Direct email correspondence to mailing list of interested stakeholders

^In addition to regularly updated information that is always available on the project website

3.3 Mechanisms to distribute information about the development

Table 5 Communication channels

There are several communication channels employed by the Project Team to build and maintain effective communications with the community. This table outlines what the communication channels are and when they will be applied.

Channel	Audience	Details
Community-based forum (aka drop-in Community Information Session)	All stakeholders	» Community-based forum hosted on or near the site to provide project information in a relaxed, face-to-face environment » Exchange project information and feedback from the community and other stakeholders » Accommodate heightened interest in environmental management

Channel	Audience	Details
Website	All stakeholders	» One-stop shop for all project information » 24/7 feedback and ideas portal
Letter	Current Ivanhoe residents	» Providing residents with projects updates, including construction of Stage 2 news » Invitations to community-based forums (as and if required)
Newsletter	Residents proximal to the site	» Project update, including scheduled construction activity (relating to Stage 2) » Invitation to community-based forums (Community Information Session) » Details about how to provide feedback » Project notifications are a short-form newsletter, focusing on immediate project activity and upcoming construction impacts
Fact sheet	Project facts and benefits	» Available on the website, and hardcopy fact sheets distributed at face-to-face forums
Project email and phone number	All stakeholders, especially local residents (enquiries and complaints regarding construction)	» Community can make enquiries, provide feedback and seek information about Stage 2 construction activities » [Email] Disseminate project information, including virtual newsletter distribution and details about upcoming community-based forums (Community Information Sessions). Use database of previous consultation participants
Media release	Wider community	» Relevant project updates » Notification of upcoming community-based forums (Community Information Session) » Details on how to provide feedback and ideas, and promote public communication channels for enquiries and feedback
Ad in local newspapers	Wider community	» Notification of upcoming community-based forums (Community Information Session) » Details on how to provide feedback and ideas, and promote public communication channels for enquiries and feedback
Facebook	Wider community	» Direct construction and development enquiries to website, 1800-number or project email, understanding Facebook is predominantly used as a marketing tool

About the communication channels

Community-based forum

Community-based forums, or Community Information Sessions, are held as relaxed drop-in sessions near the Ivanhoe Estate site. Interested stakeholders, including site neighbours and former residents, can attend at any point to view large information displays and talk about the project with representatives of the project team.

Forums are valuable ways to build stakeholder relationships and to address sensitive issues, such an environmental impacts. Targeted sessions can be held, as required, with a focus on specific elements of planning and construction, including environmental management.

Website

ivanhoeestate.com.au https://www.frasersproperty.com.au/NSW/Midtown

The established project website provides up-to-date information about the project, including planning developments and construction information and progress, with the commencement of Stage 2 works.

Visitors to the website can navigate between information about the Masterplan and contact information to raise specific project enquiries.

The website includes a page that encourages residents to provide ideas about how to make the community a great place to live and ways to connect with the dedicated Community Development Team.

Letter

Letters provide directly impacted stakeholders with important information, customised to their particular interest in the project, in addition to information provided on the website and shared with the wider community. Mail outs alleviate the possibility of correspondence being overlooked in local press or cluttered inboxes, and overcome challenges relating to an individual's internet access.

Newsletter

Newsletters provide project updates at notable delivery milestones or when there is important information to share with the community about activities on site, including construction activities during Stage 2. Project newsletters collate contact information for the project and can promote upcoming community-based forums. Like mail-outs, newsletters alleviate the possibility of correspondence being overlooked in local press or cluttered inboxes, and overcome challenges relating to an individual's internet access.

Fact sheet

Fact sheets present information about the project under areas of interest for the wider community and local residents, such as environment, project staging, Masterplan information and resident relocation. Fact sheets provide more detail about specific aspects of the proposal, rather than an overview, such as on the project website or newsletter.

Project email and phone

The dedicated project email, midtowncommunityfeedback@frasersproperty.com.au and 13 38 38 number provide the community with easy-access, 24/7 platforms to provide comment or ask questions about the project. These communication channels can become more heavily used during construction activities, and this is anticipated during Stage 2 works.

In accordance with Condition B11 - the dedicated postal address for written complaints and enquiries may be sent to 1 Ivanhoe Place Macquarie Park. This postal address shall be noted on the Midtown Macpark website.

Emails are an effective way to disseminate project information to people who've registered interest in the project, including virtual newsletter distribution and details about upcoming community-based forums (Community Information Sessions).

Media release

Media releases provide accurate information about project developments and milestones that may be in the public interest. Possible media coverage provides a platform for reaching a wide local audience with details of engagement opportunities, such as community-based forums, and publishing media releases on the project website can be an effective way to create a single-source-of-truth if misinformation is gaining traction.

Advertisements in local newspapers

Advertisements in local newspapers can promote engagement opportunities and inform a wider local audience about upcoming activities on the site, including construction impacts.

Facebook [social media]

Community building is a core objective of the project, and early community building is happening online, with a project page that provides interested community members with a platform to ask questions, make comments, share ideas and request more information about engagement activities and planning and construction progress.

3.4 Dispute resolution and mediation

In the first instance, the communication and engagement team will identify a prospective or actualised dispute requiring resolution and/or mediation. If or when a dispute has been identified, the communication and engagement specialist will promptly escalate the dispute to the Project Team Lead. In consultation with the communication and engagement specialist, the Project Team Lead will prepare an immediate written response to the stakeholder or stakeholders involved and prepare a clear action plan to achieve timely resolution, in consultation with the project's legal representatives, if required. This action plan should include face-to-face meetings, where possible, that are attended by no less than two project representatives, to ensure accurate minutes are recorded.

3.5 Maintaining a complaint register

B5. At least 48 hours before the commencement of any construction until the completion of all works, the following documents will be made available:

(vii) contact details to enquire about the development or to make a complaint

(viii) a complaints register, updated monthly

All comments, feedback and complaints received from the community through communication channels outlined above, including the 13 38 38 -number and project email (midtowncommunityfeedback@frasersproperty.com.au), will be logged in a complaints register. A report of registered complaints will be prepared monthly to satisfy condition B5 of the Planning Consent.

4 Strategic communications

4.1 Key messages

Project key messages should be used to maintain clear, consistent project messaging. These will be updated throughout Stage 2, and the life of the project, to reflect the changing status of the project and community responsiveness.

Project overview

» The Ivanhoe Estate at the corner of Herring and Epping roads is set to become a vibrant, sustainable community where people want to live.

» Set over 8-hectares, Ivanhoe Estate will draw together world-class urban design, quality facilities and public open spaces.

» The redevelopment of the Ivanhoe Estate is part of the NSW Government Communities Plus program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

» Community consultation over the past three years has contributed to the revised masterplan. The revised masterplan features:

> approximately 3,300 new homes

> approximately 6000 sqm of open space

> the retention of 94 per cent of the existing ecological community along Epping Road

> the protection of Shrimptons Creek

> revised building heights

> the realignment of private apartments adjacent to the existing ecology community

> greater amenity

> improved integration with the existing community.

» Other features of the urban renewal project include a new primary school, two childcare centres, community centre, gym and pool, a supermarket, cafes and specialty retail shops, nature-based playgrounds and exercise stations and community gardens.

The Stage 2 plans for the former Ivanhoe Estate were approved in November 2022 by the Minister for Planning and Public Spaces. The Development Consent (SSD-15822622) has been issued, prompting the preparation of this Strategy.

Approved Stage 2 works include:

> excavation and earthworks

> construction of a community facilitates building (Building C2) and two residential apartment buildings (Building C3

> and Building C4) with basement car parking:

- Building C3 with 162 dwellings, 163 car parking spaces and ground floor retail
- Building C4 with 488 dwellings and 396 car parking spaces

> construction of Village Green public open space

> utilities, services infrastructure and public domain areas. tree removal

Frasers Property Australia and Mission Australia Housing remain dedicated to the project vision for a socially cohesive and sustainable world-class precinct at Ivanhoe Estate, and will continue to work towards this vision.

4.2 Holding statement

NSW Land and Housing Corporation (LAHC) has been working with Frasers Property Australia and Mission Australia Housing since 2017 to transform the former Ivanhoe Estate at the corner of Herring and Epping roads into a vibrant and sustainable community.

The urban renewal project was one of the first projects to progress through the NSW Government's Planning System Acceleration Program, and in May 2020 the revised Masterplan and Stage 1 plans were approved.

Stage 2 marks the next phase of Ivanhoe Estate redevelopment which will see the delivery of market, affordable and social housing, community centre, gym, pool, cafes, retail and public amenity.

The redevelopment of the Ivanhoe Estate is proudly the first major project being delivered under the NSW Government's Future Directions Policy and the Communities Plus Program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

Appendix 9 – Impact Mitigation Plans

Project:	Midtown C2
Project Objective:	Increase amount of waste being recycled, reduce waste costs
Environmental Aspect: Environmental Impact:	Solid waste Landfill, depletion of natural resources
Legal and Other Requirements	Waste Avoidance and Resource Recovery Act 2001
Aspect and Impacts Affected	
Current Performance:	Refer to Landfill Monitoring spreadsheet
Target Performance Level:	85%-90% solid waste recycled across all projects

Project:	Midtown C2
Project Objective:	Reduce the amount of dust being produced from site during certain conditions
Environmental Aspect: Environmental Impact:	Dust generation Deterioration of air quality
Legal and Other Requirements	Protection of the Environment Operations Act 1997
Aspect and Impacts Affected	
Current Performance:	
Target Performance Level:	0 complaints/notices regarding dust from site

SITUATION IN WHICH THIS PLAN MAY COME INTO PLAY

Once consistent dust is being produced through wind gusts, vehicle movement (cars, trucks and plant) excavation/earthwork activities, cutting, crushing (jackhammering) and grinding concrete the following actions must be looked at to find the best course of action to take to reduce the impact to the environment

ACTIONS REQUIRED

Action no.	Task	When is this task required	Person Responsible
1	Use watercart/hose to wet down the whole site/stockpiles etc and reduce dust being created	When wind is creating dust	Site Manager
2	Use watercart/hose to wet down roads within the site	When vehicle movement is creating dust	Site Manager
3	Use hose to wet down area where earthworks are taking place	When earthworks/loading trucks is occurring	Site Manager/Foreman
4	Use hose to wet down any concrete being cut or crushed	When excessive dust is being created through this activity	Site Manager/Foreman

ACTIONS REQUIRED

Action no.	Task	To be completed date or intervals	Action taken	Completed?	Person Responsible
1	Environmental inspection checklist	Weekly			SM
2	Sorting of waste	Ongoing			Contractors/Grindley
3	Re-using materials i.e. Timber, soil, etc	Ongoing			Contractors/Grindley
4	Recycling materials i.e. steel, copper, bricks	Ongoing			Contractors/Grindley
5	Using bin contractors with waste separation	Ongoing			CA
6	Monthly waste recycle reports from bin contractor	Monthly			CA

From: Jeff Jackson <JJackson@grindley.com.au>
Sent: Friday, August 2, 2024 4:52 PM
To: 'cityofryde@ryde.nsw.gov.au' <cityofryde@ryde.nsw.gov.au>
Cc: Peter Wilson <pwilson@grindley.com.au>; Maria Pennisi <mpennisi@grindley.com.au>; Michael Jones <mjones@grindley.com.au>; Mia McFarlane <mmcfarlane@grindley.com.au>
Subject: Application Number: SSD15822622 - Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), DA Condition B35

Dear City of Ryde Council,

In compliance with SSD Condition B35, the proposed Construction Environment Management Plan must be prepared in consultation with Council, available in the link CEMP - Midtown.pdf is the proposed Construction Environment Management Plan prepared by Grindley.

We kindly request written approval of this Management Plan.

Condition of Consent Extract below:

CONSTRUCTION ENVIRONMENTAL MANAGEMENT PLAN

B35. Prior to the commencement of any works, the Applicant shall prepare and implement a **Construction Environmental Management Plan** (CEMP) for the development and be submitted to the Certifying Authority. The CEMP must be prepared in consultation with Council. The CEMP must:

(a) describe the relevant stages and phases of construction including work program outlining relevant timeframes for each stage/phase;

(b) describe all activities to be undertaken on the site during site establishment and construction of the development;

(c) include a Dust Management Plan

(d) clearly outline the stages/phases of construction that require ongoing environmental management monitoring and reporting;

(e) detail statutory and other obligations that the Applicant is required to fulfil during site establishment and construction, including approvals, consultations and agreements required from authorities and other stakeholders, and key legislation and policies;

(f) describe the roles and responsibilities for all relevant employees involved in the site establishment and construction of the works;

(g) detail how the environmental performance of the site preparation and construction works will be monitored, and what actions will be taken to address identified potential environmental impacts, including but not limited to noise, traffic and air impacts;

(h) include measures to ensure adequate groundwater entitlement is sourced in order to account for groundwater flows into the construction excavations, unless any exemption applies;

(i) management of groundwater during construction;

(j) document and incorporate all relevant sub environmental management plans (Sub-Plans), control plans, studies and monitoring programs required under this part of the consent; and

(k) include arrangements for community consultation and complaints handling procedures during construction.

The **CEMP** must not include works that have not been explicitly approved in the development consent. In the event of any inconsistency between the consent and the CEMP, the consent shall prevail.

Prior to the commencement of works, a copy of the CEMP must be submitted to the Planning Secretary.

Regards,

Jeff Jackson
Contracts Manager

m. 0429 148 159 t. (02) 9497 9840 Ext: 140 f. (02) 9988 3575
a. 55 Grandview Street (PO Box 6246) Pymble NSW 2073
e. jjackson@grindley.com.au w. grindley.com.au

Grindley follow

Post Approval

Proponent Details

Personal Details

Title	Mr
First Name	Pat
Last name	Petrulla
Email	Pat.petrulla@facs.nsw.gov.au
Phone	0293743655
Role/Position	A/Program Director, Delivery North Northern Sydney & Central Coast
Address	12 DARCY STREET PARRAMATTA 2150 AUS

Company Details

Applying as a company/business?

Yes

Company Name	New South Wales Land and Housing Corporation
ABN	24960729253
Branch Name	

Primary contact

Title	Mr
First Name	Robert
Last Name	Cauchi
Email	robert.cauchi@fraserspropery.com.au
Phone	0414847370
Role/Position	Consultant

Post Approval Details

Project:

Ivanhoe Estate Redevelopment - Stage 2 - SSD-15822622-PA-11

Name of Document

B35 Construction Environmental Management Plan

Related matter

Management Plan or Strategy

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

Construction Environmental Management Plan attached in compliance to Condition B35

Applicable Conditions

Schedule	Condition
B	35

Consultation through the Major Projects portal

Consultation required as part of the preparation of the document?

No

Attachment of Post Approval application

File Name	Category
B35 - CEMP - Midtown.pdf	Post Approval Document

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS



CONSTRUCTION TRAFFIC AND PEDESTRIAN MANAGEMENT PLAN

Approved Residential Development
Building C2, Ivanhoe Estate Macquarie Park

Reference: 24.277r01v02
Date: July 2024

Suite 2.08, 50 Holt St
Surry Hills, NSW 2010

t: (02) 8324 8700
w: www.traffix.com.au

DOCUMENT VERIFICATION

Job Number	24.277			
Project	Building C2 Ivanhoe Estate Macquarie Park			
Client	Grindley			
Revision	**Date**	**Prepared By**	**Checked By**	**Signed**
v02	11/07/2024	Stephan Hoang	Thomas Yang	

TRAFFIC CONTROL PLAN CERTIFICATES

Prepare a Work Zone Traffic Management Plan			
Name	Thomas Yang	**Card No.**	TCT0028714

TRAFFIX

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Appendix A: Construction Site Establishment Plan
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Appendix C: Traffic Guidance Schemes

1. INTRODUCTION

TRAFFIX has been commissioned by Grindley to prepare a Construction Traffic and Pedestrian Management Plan (CTPMP) report for the approved construction of Building C2 of the Ivanhoe Estate, located at the western corner of Epping Road and Herring Road. The development forms part of Stage 2 of the approved State Significant Development (SSD-15822622), which was granted by the Minister for Planning and Public Spaces on 28 November 2022.

This report documents the construction traffic and pedestrian management arrangements and methodology relating to the approved works and should be read in conjunction with any other construction documentation prepared by the applicant.

The report is structured as follows:

- Section 2: Outlines the CTPMP requirements.
- Section 3: Documents the existing traffic conditions.
- Section 4: Describes the overall construction program.
- Section 5: Describes the proposed traffic management arrangements.
- Section 6: Concludes the report.

2. CTPMP REQUIREMENTS

2.1 Traffic Guidance Schemes

The Traffic Guidance Schemes (TGSs) that are included in this report, should be implemented taking due account of on-site conditions as will occur over the construction period. Accordingly, construction crew are expected to respond in a pro-active manner to ensure that this plan is implemented to maximum effect and with no obvious safety issues being overlooked. In particular, the following matters are considered noteworthy:

- All signs are to be placed where clear visibility is available;
- Installations should be checked intermittently during the course of the day/s; and
- SafeWork NSW certified Traffic Controllers shall be on-site during work hours to supervise vehicle, cyclist, and pedestrian movements.

To improve sign visibility, signs should be positioned utilising existing power poles and signage stems where possible, covered where not applicable, and not positioned between parked cars where possible (to avoid hazard to cyclists and improve visibility for vehicles).

It is noted that TRAFFIX is responsible for the preparation of this CTPMP only and not for its implementation, which is the responsibility of the builder.

2.2 Development Consent CTPMP Requirements

In addition to the above, it is noted that the Notice of Determination (NoD) for SSD-15822622 outlines a requirement for the preparation of a Construction Traffic Management Plan. Specifically, Condition B36 states the following:

B36. *Prior to the commencement of any works, a* ***Construction Pedestrian and Traffic Management Plan*** *(CPTMP) prepared by a suitably qualified person shall be endorsed by TfNSW (Sydney Coordination Office) and submitted to the Certifying Authority. The CPTMP must be prepared in consultation with Council, TfNSW (Sydney Coordination Office), and TfNSW (RMS).*

The CPTMP shall address (but not be limited to):

(a) location of the proposed work zone;

(b) haulage routes;

(c) construction vehicle access and traffic control arrangements;

(d) proposed construction hours;

(e) estimated number of construction vehicle movements (including cumulative impacts from Stage 1);

(f) any changes required to on-street parking;

(g) construction program;

(h) any potential impacts to general traffic, cyclists, pedestrians and bus services within the vicinity of the site from construction vehicles during the construction;

(i) cumulative construction impacts of projects considering any traffic and pedestrian management plans prepare for these projects to ensure that work activities are coordinated and managed to minimise impacts on the road network. Information relating to cumulative construction impacts to be sourced from TfNSW (Sydney Coordination Office);

(j) measures to ensure construction vehicles do not arrive at the site or surrounding areas outside approved hours;

(k) measures proposed to mitigate any associated general traffic, public transport, pedestrian access and cyclist impacts/conflicts;

(l) measures to encourage public transport use and other non-car travel options by construction workers.

Prior to the commencement of works, a copy of the CPTMP demonstrating compliance with the above must be submitted to TfNSW and the Planning Secretary.

2.3 Previous Consent

The subject works form a component of a multi-stage masterplan development of Ivanhoe Estate approved under SSD-8707 and SSD-8903. Stage 1 of the approved masterplan have been completed.

2.4 Location and Site

The subject site is located at western corner of Epping Road and Herring Road. The site is approximately 605 metres south of the Macquarie University Metro Station, approximately 1.1 kilometres west of Macquarie Park Metro Station and approximately 12.7 kilometres northwest of the Sydney Central Business District.

The site is approximately 8.2 hectares and is currently an active construction site. It has a north-west frontage of approximately 210 metres to Herring Road and neighbouring residential developments, and a south-west frontage of approximately 400 metres to Epping Road. It has a north-east boundary to neighbouring residential developments and a south-east boundary to commercial developments.

A Location Plan is presented in **Figure 1** and a Site Plan presented in **Figure 2** which provide an appreciation of the generally character of roads and other key attributes in proximity to the site.

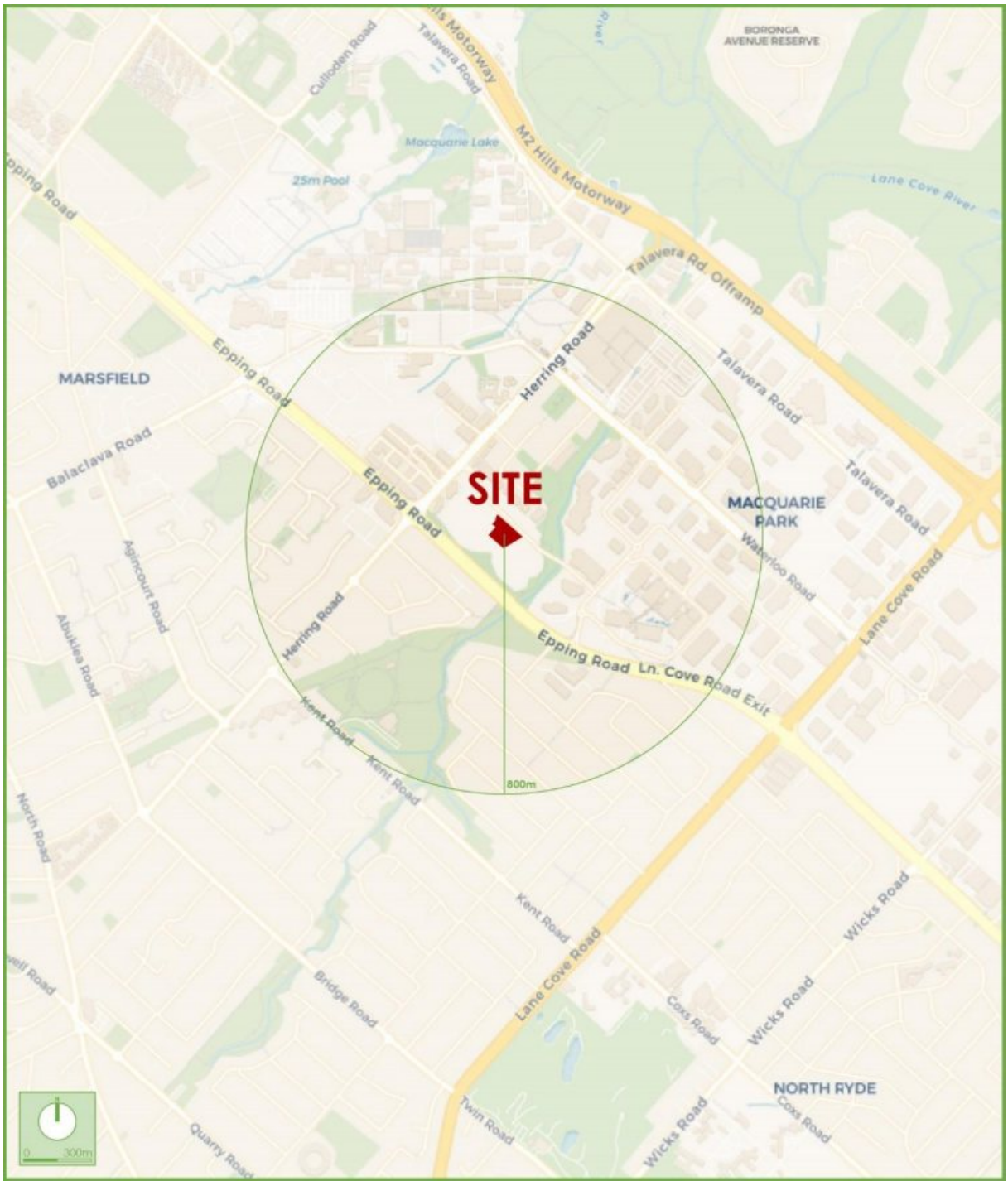


Figure 1: Location Plan



Figure 2: Site Plan

2.5 Road Network

The road hierarchy in the vicinity of the site is shown in **Figure 3** with the following roads of particular interest:

- M2 Motorway: a TfNSW classified State Road (MR 6002) that traverses in an east-west direction between Lane Cove in the east and the Baulkham Hills in the west. Within the vicinity of the site, it is subject to 100km/h speed zoning and accommodates two (2) to three (3) lanes of traffic in each direction.
- Epping Road: a TfNSW classified State Road (MR 373) that generally traverses in an east-west direction between Longueville Road in the east and Beecroft Road in the west. Within the vicinity of the site, it is subject to 70km/h speed zoning and accommodates three (3) lanes of traffic in each direction. Kerbside parking is not permitted in either direction.
- Herring Road: an Unclassified Regional Road (UR 7486) that traverses in a north-south direction between Talevera Road and the M2 Motorway in the north and Bridge Road in the south. Within the vicinity of the site, it is subject to 50km/h speed zoning and accommodates two (2) lanes of traffic in each direction. Kerbside parking is not permitted in either direction.
- Lyonpark Road: a local road that traverses in a north-south direction between Griffnock Avenue in the north and Epping Road in the south. It is subject to a 50km/h speed zoning and accommodates a single lane of traffic in each direction with restricted on-street parking along both sides.

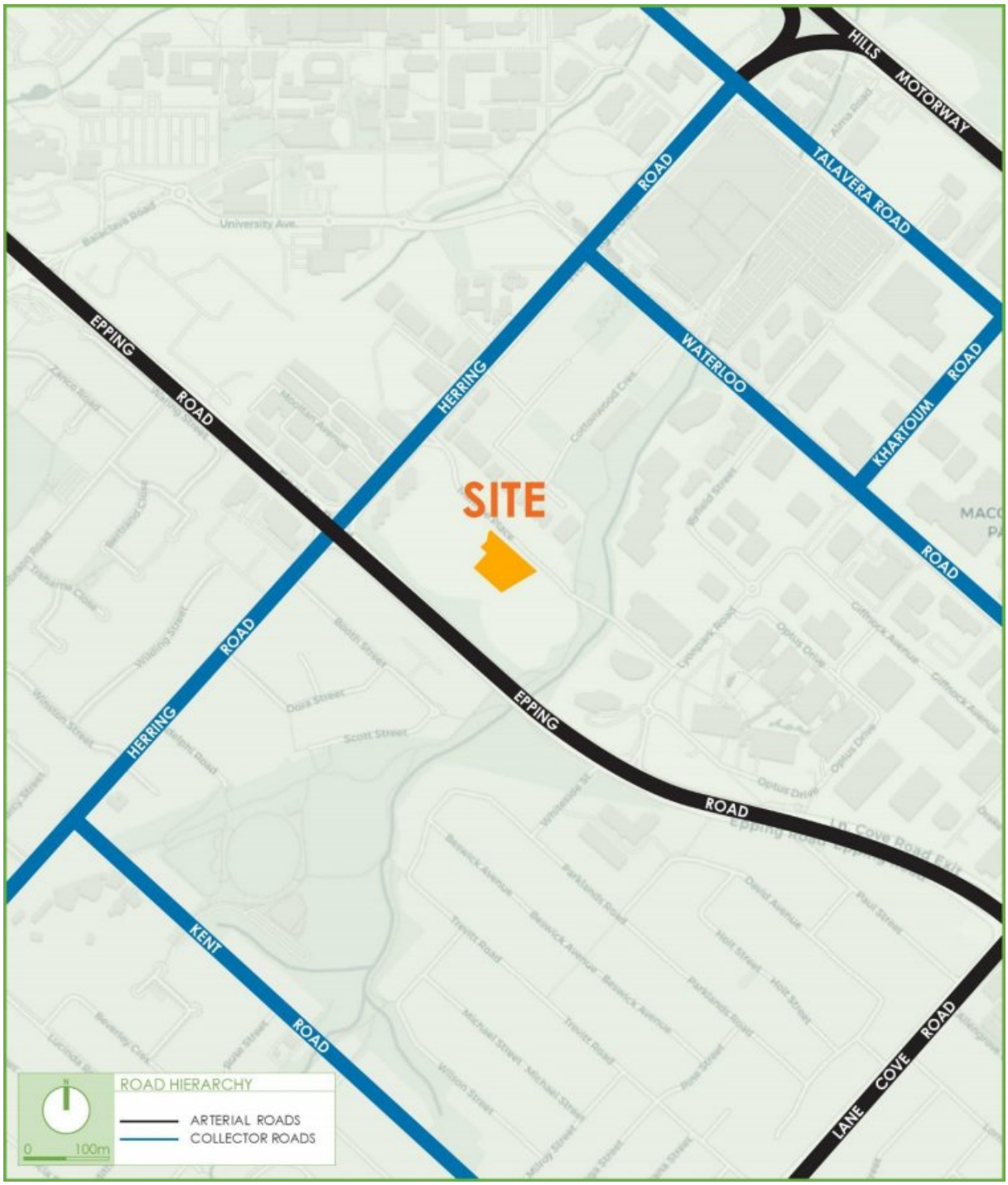


Figure 3: Road Hierarchy

2.6 Public Transport

The site is well located to take advantage of the numerous public transport services that serve the local area. The existing bus services that operate in the locality are shown in **Figure 4** and are summarised as follows:

- 288 – Epping to City Erskine Street
- 290 – Epping to City Erskine St (Night Service)
- 291 – Epping to McMahon Point
- 293 – Marsfield to City Wynyard
- 517 – Macquarie Centre to Ryde
- 518 – Macquarie University to Meadowbank Wharf
- 544 – Macquarie Centre to Auburn

Additionally, the site is located approximately 605 metres south of the Macquarie University Metro Station. This stations provide services along the Metro North West Line, which provide services to Tallawong, Epping, and Chatswood and to be extended into the CBD in 2024 (as per Sydney Metro's November 2023 update).



Figure 4: Public Transport

3. OVERVIEW OF CONSTRUCTION PROGRAM

3.1 Hours of Work and Noise

Construction is expected to occur over approximately 24 months, however further clarification will be provided by the builder. The standard hours of construction are to be in accordance with NoD SSD-15822622 summarised below:

C.1 Construction, including the delivery of materials to and from the site, may only be carried out between the following hours:

(a) between 7.00 am and 7.00 pm, Mondays to Fridays inclusive; and

(b) between 8.00 am and 4.00 pm, Saturdays.

C2. No work may be carried out on Sundays or public holidays.

C3. Activities may be undertaken outside of these hours if required:

(a) by the Police or a public authority for the delivery of vehicles, plant or materials; or

(b) in an emergency to avoid the loss of life, damage to property or to prevent environmental harm.

C4. Notification of such activities must be given to affected residents before undertaking the activities or as soon as is practical afterwards.

C5. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

(a) 9.00 am to 12.00 pm, Monday to Friday;

(b) 2.00 pm to 5.00 pm Monday to Friday; and

(c) 9.00 am to 12.00 pm, Saturday.

3.2 Construction Site Establishment Plan

The construction site establishment plan has been provided in **Appendix A**, indicating the location of the access points to the site, locations of onsite equipment such as cranes, hoists, scaffolding and hoarding to be installed around the perimeter of the site.

3.3 Builder Contact

The below contact information including afterhours contact must be prominently displayed on site and provided to nearby buildings:

- Name: Peter Wilson
- Position: Senior Project Manager
- Email: pwilson@grindley.com.au
- Telephone: (02) 9988 3811
- Mobile: 0414 914 514

Further to the above, Council is generally available to resolve issues relating to traffic, public transport, freight, servicing and pedestrian access during construction in real time if required.

3.4 Excavation Works

This stage will commence in September 2024 with an approximate duration of 14 weeks. The stage will involve a maximum workforce of 12 people on-site at any one time with an average of 10 people. The maximum sized truck to be utilised during this stage will be 20.0m Avs and truck and dog vehicles. It is proposed that excavation works will occur within the site at all times.

This stage will have an average of 30 truck arrivals per day (30 in, 30 out), with a peak of approximately five (5) truck arrivals during the peak hour. This is considered a minor volume and would mirror the vehicle movements of the Stage 1 construction works and hence, the impact on the performance of key intersections in the locality will be negligible.

3.5 Structure Works

This stage will commence over a 50-week period after bulk excavation works and will involve a maximum workforce of 65 people on-site at any one time with an average of 50 people. The maximum sized truck to be utilised during this stage will be 20.0m AVs. It is proposed that structure works will occur within the site at all times.

This stage will have an average of 15 truck arrivals per day (15 in, 15 out), equating to approximately 2 truck arrivals during the peak hour. This is considered a minor volume and would mirror the vehicle movements of the Stage 1 construction works and hence, the impact on the performance of key intersections in the locality will be negligible.

3.6 Fitout & Finishes Works

This stage will commence over a 34-week period after structure works and will involve a maximum workforce of 85 people on-site at any one time with an average of 70 people. The maximum sized truck to be utilised during this stage will be 8.8m MRVs. It is proposed that fitout & finishes works will occur within the site at all times.

This stage will have an average of 15 truck arrivals per day (15 in, 15 out), with a peak of approximately 5 truck arrivals during the peak hour. This is considered a minor volume and would mirror the vehicle movements of the Stage 1 construction works and hence, the impact on the performance of key intersections in the locality will be negligible.

3.7 Public Domain Works

It is noteworthy to mention that any public domain works along the frontage of the development will be subject to a separate submission to Council. This submission will be arranged by the construction contractor.

4. TRAFFIC AND PEDESTRIAN MANAGEMENT ARRANGEMENTS

4.1 Construction Vehicles

It is expected that the maximum sized vehicle to be utilised during the aforementioned construction stages be a 20.0 metre articulated vehicle (AV), which will access and egress the site via Herring Road.

Additionally, 6.4 metre small rigid vehicles (SRV), 8.8 metre medium rigid vehicles (MRV) and 12.5m heavy rigid vehicles (HRV) will be used throughout the construction process and will access and egress the site via Herring Road and Lyonpark Road.

4.2 Vehicular Access

It is proposed all construction vehicles will access and egress the site via the signalised intersection of Herring Road and the site access throughout the construction period as per current construction activities. Additionally, construction vehicles will be advised to use the future access along Lyonpark Road once the access is fully operation. All construction vehicles will access and egress the site in a forward direction.

Swept path analysis has also been undertaken for 20m AVs accessing / egressing the site via Herring Road and 12.5m HRVs accessing / egressing the site via Lyonpark Road during construction demonstrating satisfactory inbound and outbound movements. The swept path analysis is provided in **Appendix B**.

In addition to the above, the following items are noteworthy:

- All loading and unloading activities are to be contained wholly within the site;
- All adjacent property accesses will be maintained at all times;
- All vehicles are not to obstruct any pedestrian crossings or footpaths; and

4.3 Truck Routes

The proposed truck routes make use of Transport for NSW (TfNSW) classified State Roads, where possible. All drivers will be required to radio in prior to arriving onsite, to avoid queuing on surrounding roads. Drivers will not be permitted to park on surrounding roads outside of the site. The proposed truck routes are recommended to allow all vehicles to access the site in a forward direction, noting that truck movements will be restricted to outside the school's morning and afternoon peak periods. A copy of the routes would be provided to all drivers prior to attending the site, with the proposed routes outlined below.

Two (2) proposed inbound and outbound truck routes are presented in **Figure 5** and **Figure 6**, summarised as follows:

4.3.1 Herring Road Access

- Routes to Site (IN):
  1. Arrive on Epping Road, eastbound/westbound.
  2. Turn left/right onto Herring Road, northbound.
  3. Turn right into site, eastbound.
- Routes from Site (Westbound):
  1. Depart the site access, westbound.
  2. Turn right onto Herring Road, northbound.
  3. Continue straight onto the M2 Motorway, westbound.
- Routes from Site (Eastbound):
  1. Depart the site access, westbound.
  2. Turn right onto Herring Road, northbound.
  3. Turn left onto Talavera Road, westbound.
  4. Turn right onto Christie Road, northbound.
  5. Turn right onto the M2 Motorway, eastbound

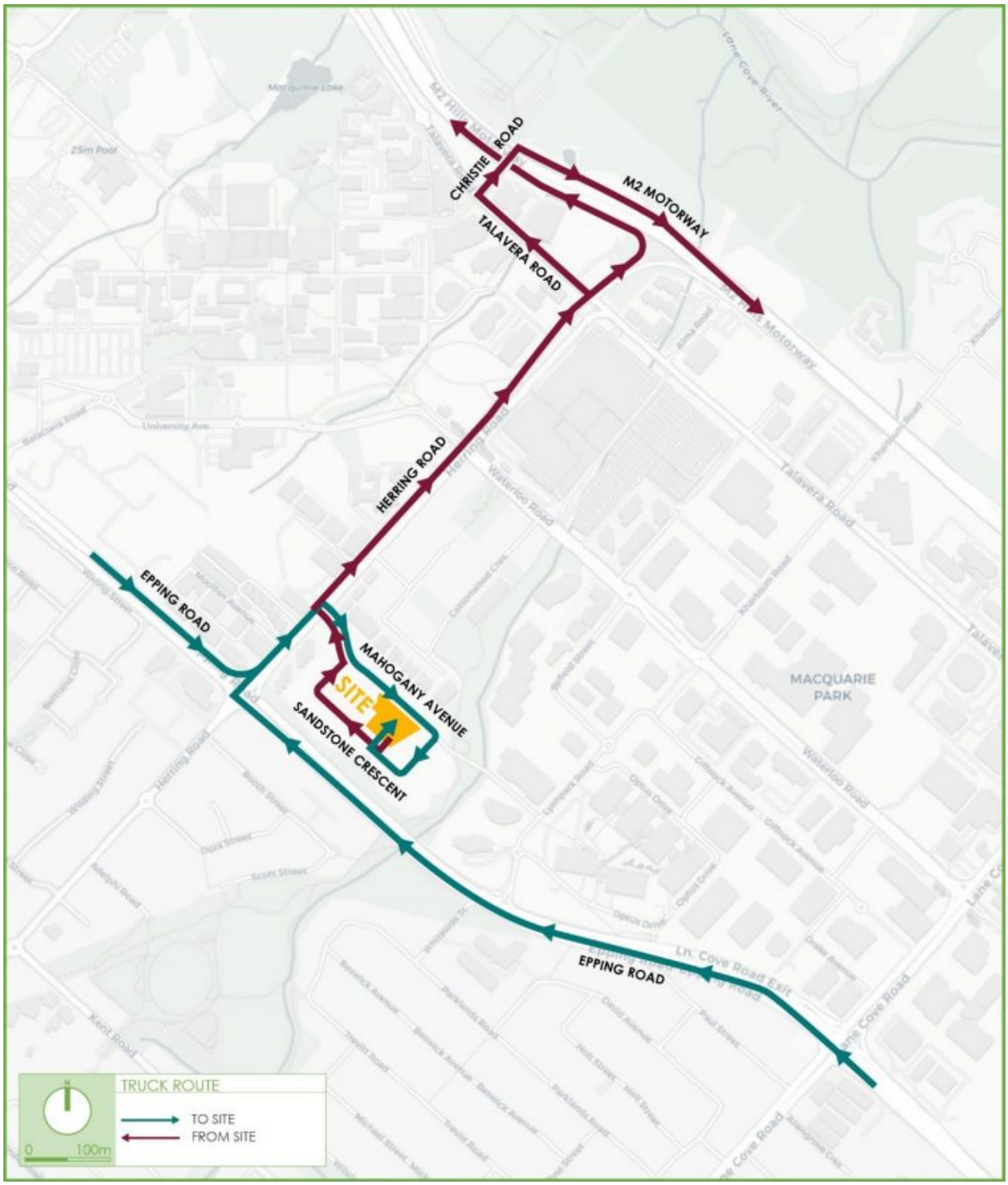


Figure 5. Inbound and Outbound Truck Routes via Herring Road

4.3.2 Lyonpark Road Access

- Routes to Site (IN):
  1. Arrive on Epping Road, eastbound.
  2. Turn left onto Lyonoark Road, northbound.
  3. Turn left into site, westbound.
- Routes from Site (Westbound):
  1. Depart the site access, eastbound.
  2. Turn right onto Lyonpark Road, southbound.
  3. Turn left onto Epping Road, eastbound.
- Routes from Site (Eastbound):
  1. Depart the site access, eastbound.
  2. Turn right onto Lyonpark Road, southbound.
  3. Turn left onto Epping Road, eastbound.
  4. Turn left onto Lane Cove Road, northbound.
  5. Turn left onto the M2 Motorway, westbound.



Figure 6. Inbound and Outbound Truck Routes via Lyonpark Road

4.4 Trucks Arrivals

All trucks will be linked via CB radio and/or hands-free mobile and will only be called to the site when required and when there is sufficient capacity to accommodate the proposed trucks. This management of loading / unloading or deliveries is envisaged to be the same throughout all stages of construction and will ensure no trucks would be required to queue or park on-street.

4.5 Traffic Controllers

SafeWork NSW accredited traffic controllers will be utilised at the site vehicle access points/works zone to assist construction vehicles and pedestrians during work hours. It is noted that traffic controllers are not to stop or slow traffic at any time on public roads to allow trucks to enter or exit the site. Additionally, pedestrians may be held only for very short periods to ensure their safety when trucks are leaving or entering the site, but they are not to be stopped in anticipation – i.e. pedestrians have right of way on the footpath at all times.

4.6 Permits

Permits including out of hours permits, road/lane closure permits, crane permits etc. will be submitted to Council in a separate application.

4.7 Concrete Pumping Activities

All concrete pumping activities will be conducted within the site from the internal loading zones in the site. It should be noted the above activities will be completed using line pumps and/or static lines.

4.8 Crane Requirements

A mobile crane will be utilised throughout the construction of Building C2. The crane will be located within the site and will facilitate loading / unloading of material, machinery plant, etc. from within the site storage area and adjacent loading zones.

It is also noted that the tower crane installation will not impact any of the nearby public trafficable roads (Epping Road and Herring Road).

4.9 Pedestrian Control

Pedestrian access surrounding the work site will be managed safely during all construction stages. In order to maintain pedestrian safety, A-Class hoarding will be installed along the Epping Road and Herring Road frontage to maintain pedestrian thoroughfare. The A-Class hoarding will be maintained from Stage 1 of the Ivanhoe Estate through the construction of Building C2. Additionally, temporary chain mesh fencing will be installed along the perimeter of the C2 building site within the Ivanhoe Estate.

In addition to the above, all material, plant and spoil bin storage is to be accommodated within the site at all times during all stages of construction. No building materials shall be placed, dumped or left on any Council road or footpath area at any time, with footpaths to remain in a safe condition for use by pedestrians at all times. Should the builder require any place of any plant/equipment on Council road or land, an application for relevant approvals will be required.

These pedestrian control arrangements are therefore considered acceptable and will ensure that pedestrian safety is maintained at all times.

4.10 Emergency Vehicle Access

Emergency vehicle access adjacent to the work site will be maintained at all times.

4.11 Access to Neighbouring Properties

All neighbouring properties are to have their vehicular and pedestrian accesses maintained at all times over the course of construction. If at any time, the accesses to the neighbouring properties are obstructed, temporary access arrangements will be provided to the satisfaction of the occupants and Council.

4.12 Worker Vehicles

As the site has ample cleared space for informal parking, workers will have plenty of opportunities to park on-site. However, workers will be encouraged during inductions to utilise the excellent range of public transport services available in the locality. Information relating to the available public transport options will be provided within induction material provided to contractors by the builder.

4.13 Monitoring

A monitoring and review process for the CTPMP will be set out by the Construction Project Manager to ensure that the CTPMP is implemented correctly, in compliance with all regulations and policies and also adapted to reflect any changes or variations during the actual construction process.

4.14 Community Consultation

The Construction Project Manager will be the main point of contact for all enquiries, complaints, feedback, and compliments regarding the issues arising from the traffic management arrangements put in place. This may involve distributing notification letters notifying nearby residents and the community of the proposed traffic management arrangements, their potential impact, the Construction Manager's phone and email contact. Specifically, the disruption to existing travel routes will need to be explicitly made known to community members, parents, students, staff so that their safety is not compromised. The details and direct contact number of the Site Construction/Project Manager shall be provided on all notification letters to the residents and to the community and on a prominent sign displayed on-site.

4.15 Traffic Guidance Schemes

The Traffic Guidance Schemes (TGSs) included in **Appendix C** demonstrates the proposed signage / traffic management measures to be adopted for all stages of construction. The TGSs included will ensure that vehicle and pedestrian movements are managed safely and efficiently:

- TGS No. 1 – Truck Entry via Herring Road
- TGS No. 2 – Truck Entry via Lyonpark Road

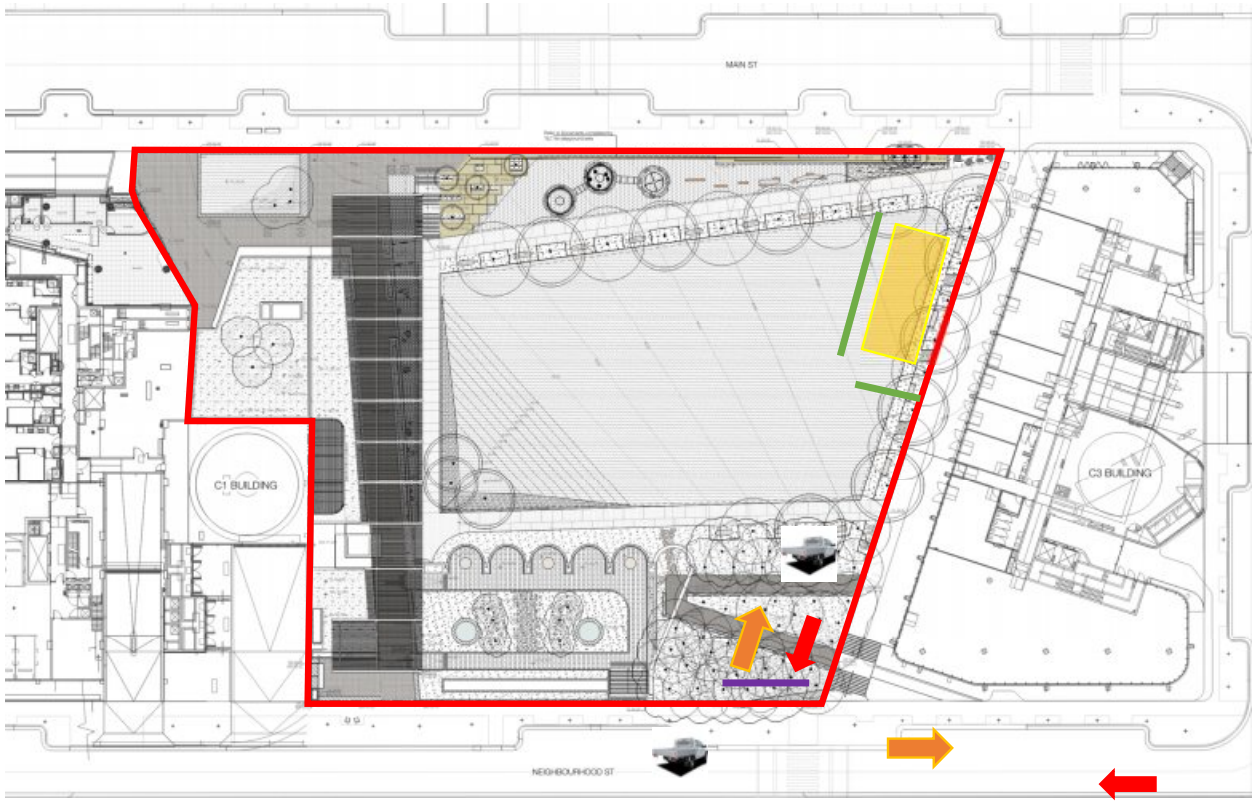
The proposed TGS will ensure that all traffic and pedestrians are managed safely during truck movements. This TGS has been designed in accordance with the requirements of the TfNSW Traffic Control at Work Sites Technical Manual, with copies of the TGSs to be kept on-site at all times.

5. CONCLUSION

This report should be read in conjunction with other documentation prepared by the builder relating to the internal construction activities. The plan outlined above is considered satisfactory and will minimise any disruptions to residents / tenants of neighbouring developments, and pedestrians in the area. This plan meets all requirements of the TfNSW *Traffic Control at Work Sites Manual* and is recommended for adoption.

APPENDIX A

Construction Site Establishment Plan



Site Establishment	Description
	Main site fencing, shade cloth. Erosion & sediment control
	Two sliding gates to allow heavy vehicle entry to site
	Site shedding & amenities
	Vehicle entry – entry & exit
	Protection concrete jersey kerbs













Grindley

Site establishment

APPENDIX B

Swept Path Analysis



Notes:

This drawing is prepared for information purposes only. It is not to be used for construction.

TRAFFIX is responsible for vehicle swept path diagrams and/or drawing mark-ups only. Base drawing prepared by others.

Vehicle swept path diagrams prepared using computer generated turning path software and associated CAD drawing platforms. Vehicle data based upon relevant Australian Standards *(AS/NZS 2890.1:2004 Parking facilities - Off-street car parking,* and/or *AS2890.2:2002 Parking facilities - Off-street commercial vehicle facilities*). These standards embody a degree of tolerance, however the vehicle characteristics in these standards represent a suitable design vehicle and do not account for all variations in vehicle dimensions / specifications and/or driver ability or behaviour.

Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title

12.5m Heavy Rigid Vehicle
Lyonpark Road Entry

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.01	A



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A	Swepth Path Analysis	SH	10-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

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Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title

12.5m Heavy Rigid Vehicle
Lyonpark Road Exit

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.01a	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title

12.5m Heavy Rigid Vehicle
Sandstone Crescent Entry

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.02	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

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t: +61 2 8324 8700
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Drawing Title

12.5m Heavy Rigid Vehicle
Sandstone Crescent Exit

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.02a	A



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Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24
B	Swepth Path Analysis	SH	11-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

TRAFFIX
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Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

Drawing Title

20.0m Articulated Vehicle
Site Entry

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.03	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24
B	Swepth Path Analysis	SH	11-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

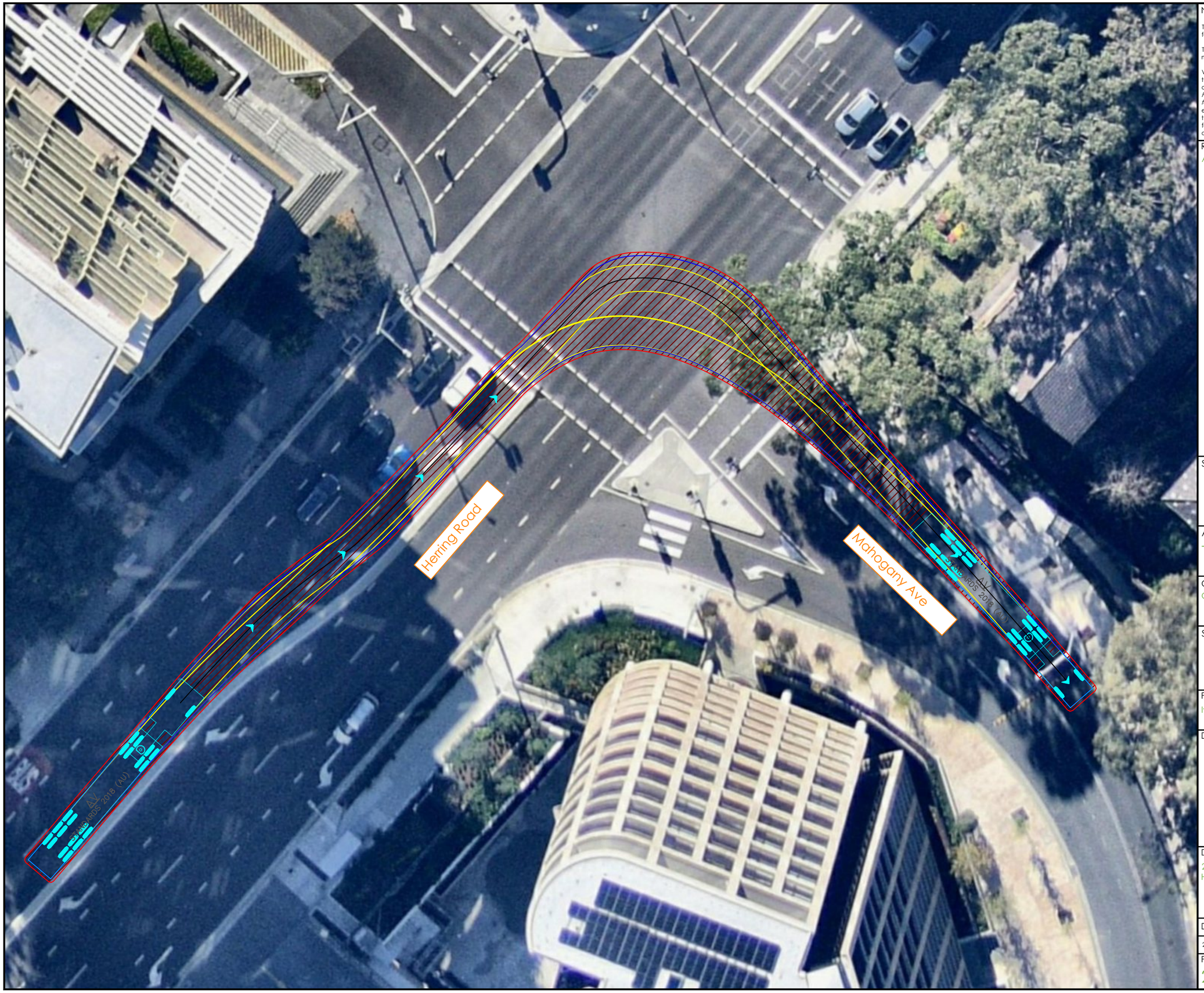
Drawing Title

20.0m Articulated Vehicle
Site Exit

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.03a	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
f: +61 2 9830 4481
w: www.traffix.com.au

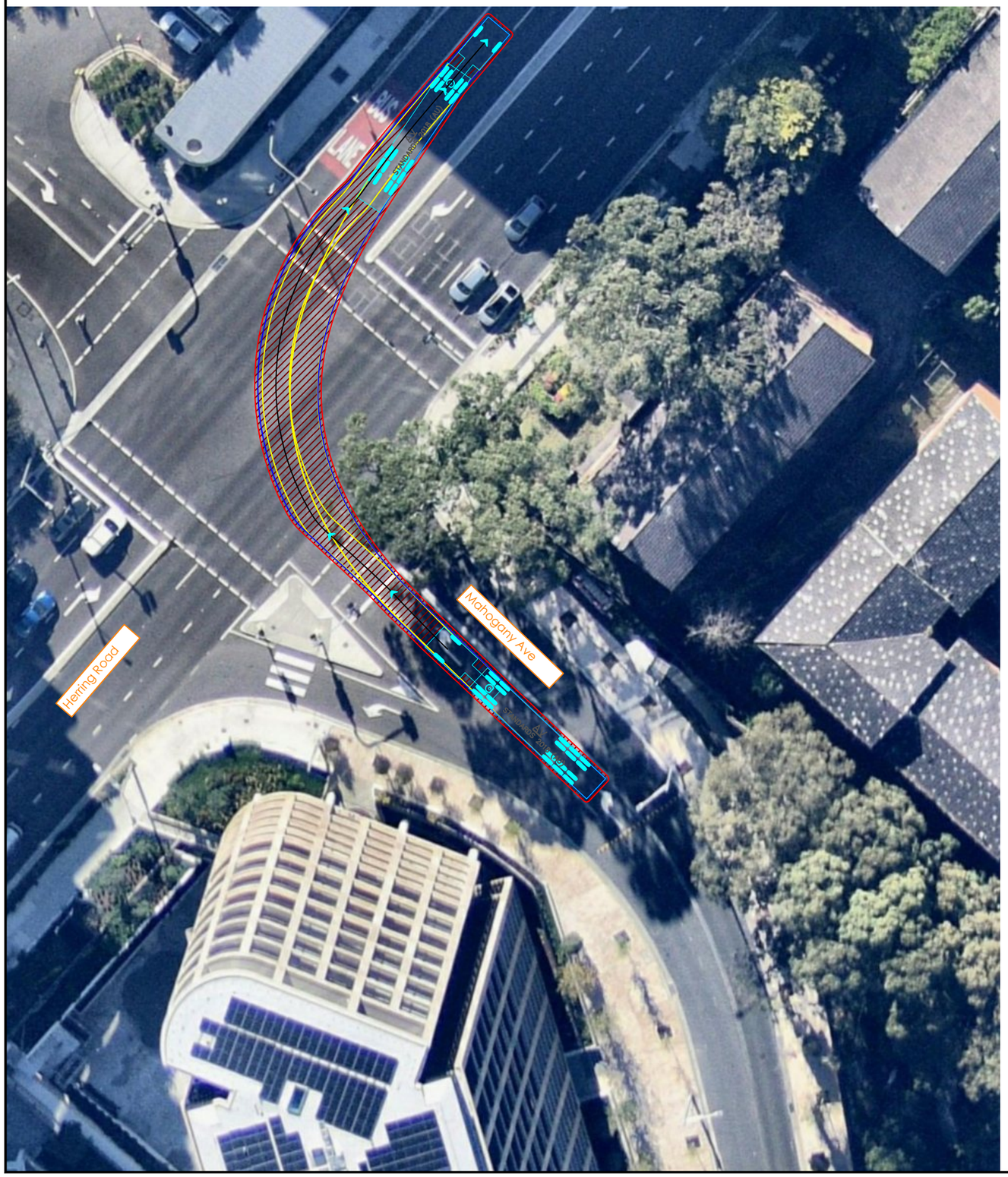
Drawing Title

20.0m Articulated Vehicle
Herring Road Entry

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.04	A



Notes:

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Rev.	Revision Note	By.	Date
A	Swepth Path Analysis	SH	10-07-24

Swept Path Legend

- Wheel Path
- Vehicle Body Envelope
- Clearance Envelope (300mm)

Architect

-

Client

Grindley

Scale / Plan Orientation

0 2 4 6 8m

1:200 @ A3

Project Description

Ivanhoe Estate Building C2

Drawing Prepared By

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TRAFFIC AND TRANSPORT PLANNERS

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Surry Hills, NSW 2010
PO Box 1124
Strawberry Hills, NSW 2012

t: +61 2 8324 8700
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w: www.traffix.com.au

Drawing Title

20.0m Articulated Vehicle
Herring Road Exit

Drawn:	Checked:	Date:
SH	TY	10-07-24

24.277d01v02 TRAFFIX [Aerial] Design Review.dwg

Project No.	Drawing Phase	Drawing No.	Rev.
24.277	CTMP	TX.04a	A

APPENDIX C

Traffic Guidance Schemes



VALUE OF DIMENSION "D"

Speed of Traffic (km/h)	Dimension "D" (m)
50	50

Note:
Herring Road - 50 km/h

Time Period:
Sep 24 - 26 2024

TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
(02) 8324 8700
info@traffix.com.au

LEGEND Site Access

GENERAL NOTES
- Plan not to scale.
- All signage dimension D shall comply with the minimum requirements of TfNSW TCAWS Technical Manual.
- Qualified personnel to undertake a site inspection prior to implementation.
- It must be noted that TRAFFIX is not responsible for the implementation of this TGS, which is the responsibility of the on-site qualified traffic controller.

PROJECT
BLDG C2 IVANHOE ESTATE MACQUARIE PARK

PROJECT NUMBER
24.277

DATE
09.07.2024

CLIENT
PARKVIEW CONSTRUCTIONS PTY LTD

TGS
TGS 01:
TRUCK ACCESS VIA HERRING ROAD

PREPARED BY
STEPHAN HOANG

APPROVED BY
THOMAS YANG

SAFEWORK NSW CARD NUMBER
TCT1026821

SIGNATURE



TRAFFIX
TRAFFIC AND TRANSPORT PLANNERS

Suite 2.08, 50 Holt Street
Surry Hills, NSW 2010
(02) 8324 8700
info@traffix.com.au

LEGEND Truck Access

GENERAL NOTES
- Plan not to scale.
- All signage dimension D shall comply with the minimum requirements of TfNSW TCAWS Technical Manual.
- Qualified personnel to undertake a site inspection prior to implementation.
- It must be noted that TRAFFIX is not responsible for the implementation of this TGS, which is the responsibility of the on-site qualified traffic controller.

PROJECT
BLDG C2 IVANHOE ESTATE MACQUARIE PARK

PROJECT NUMBER
24.277

DATE
09.07.2024

CLIENT
PARKVIEW CONSTRUCTIONS PTY LTD

TGS
TGS 02: TRUCK ACCESS VIA LYONPARK ROAD

PREPARED BY
STEPHAN HOANG

APPROVED BY
THOMAS YANG

SAFEWORK NSW CARD NUMBER
TCT1026821

SIGNATURE

From:	Development Applications
To:	thomas.yang@traffix.com.au
Cc:	Maria Pennisi; Mia McFarlane; Peter Wilson; Jeff Jackson; Michael Murray; Stephan Hoang; Development Applications; Development CTMP CJP
Subject:	FW: Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), Midtown Building C2 - Construction Traffic & Pedestrian Management Plan [TRAFFIX Ref: 24.277]
Date:	Wednesday, 17 July 2024 5:11:02 PM
Attachments:	image001.png image002.png image003.png image004.png image005.png 24.277r01v02 TRAFFIX Building C2 Ivanhoe Estate, Maquarie Park - CTPMP.pdf

---

Hi Thomas,

Transport for NSW (TfNSW), Greater Sydney Division has reviewed the subject CTMP titled*, Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), Midtown Building C2 - Construction Traffic & Pedestrian Management Plan* and endorse the proposed temporary construction arrangements, subject to the following conditions:

- Any Traffic Guidance Schemes (TGS) prepared are to comply with AS1742.3 and Transport for NSW's "Traffic Control at Worksites" manual and be signed by a person with TfNSW certification to prepare a TGS.

- Pedestrian access must be maintained and be always fit for purpose, with all pedestrian ramps and paths to be maintained as wheelchair accessible and aid the visually impaired. Line of sight for both vehicles, pedestrians and all road users must not to be impacted.

- Access must be maintained for residents, businesses, and emergency vehicles at all times.

- All parking restrictions or alterations must be approved and endorsed by The Hills City Council.

- Any truck reversing movements must only be always undertaken under appropriate traffic control.

- No marshalling or queuing of construction vehicles is to occur on any public roads. Arriving vehicles that are not able to be clear of the carriageway must continue to an off-road holding point until space becomes available.

- The proponent must apply and obtain approval from the Transport Management Centre for a Road Occupancy Licence (ROL) for any traffic management that may impact the state road network, and/or where traffic

management is required within 100m of any traffic signals. This is inclusive of any traffic management infrastructure to assist the ingress or egress of any vehicles onto the road network.

- Transport for New South Wales reserve the right to alter the CTMP Conditions at any time to maintain safe and efficient traffic and transport operations, and pedestrian movements in this area.

Endorsement of the CTMP is not an approval to the type of traffic management or delineation devices used, nor is it an approval to any traffic guidance schemes depicted within the CTMP. It is assumed that the proponent has used type approved devices and has developed its traffic guidance schemes in accordance with the relevant Australian Standards and Guidelines

Any alteration of access arrangements or driveway locations/conditions is subject to a separate approval process. This CTMP does not provide approval to any package of permanent infrastructure works associated with this DA.

Please ensure this CTMP is shared and adhered to by all contractors. If the CTMP changes, please forward a copy to Developments.CJP@transport.nsw.gov.au or further review and endorsement.

Thanks,

Operational Change| Customer Journey Planning
25 Garden Street Eveleigh NSW 2015
Transport for NSW

OFFICIAL

OFFICIAL

From: Thomas Yang <thomas.yang@traffix.com.au>
Sent: Thursday, July 11, 2024 10:07 AM
To: Heather Trengove <Heather.Trengove@transport.nsw.gov.au>
Cc: Maria Pennisi <mpennisi@grindley.com.au>; Mia McFarlane <mmcfarlane@grindley.com.au>; Peter Wilson <pwilson@grindley.com.au>; Jeff Jackson

<JJackson@grindley.com.au>; Michael Murray <mmurray@grindley.com.au>; Stephan Hoang <stephan.hoang@traffix.com.au>
Subject: Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), Midtown Building C2 - Construction Traffic & Pedestrian Management Plan [TRAFFIX Ref: 24.277]

You don't often get email from thomas.yang@traffix.com.au. Learn why this is important

CAUTION: This email is sent from an external source. Do not click any links or open attachments unless you recognise the sender and know the content is safe.

Dear Heather,

The purpose of this correspondence is to notify TfNSW that TRAFFIX is the traffic consultant preparing the Construction Traffic and Pedestrian Management Plan (CTPMP) in support of approved works (SSD 15822622) for Stage 2 Ivanhoe Estate, Building C2 located at Lot 100 DP1262209. Development Consent was granted by Minister for Planning and Public Spaces on the 28 November 2022.

We are seeking TfNSW to endorse the attached CTPMP which has been prepared to address Condition B36 of the Development Consent.

The following points are noteworthy with respect to the proposed construction methodology:

- Total construction period expected to occur over a 24-month period.
- Work hours will be in accordance with Condition C1-5.
- All construction works will be undertaken within the site, with no works zone proposed along any public road.
- The largest vehicle to access the site will be 20m Articulated Vehicles (AVs).
- Building C2 is within the Ivanhoe Estate and is a live construction site, 20m AVs will continue to access the site via Herring Road as per existing, and an alternate access for trucks up to 12.5m Heavy Rigid Vehicles (HRVs) is proposed via Lyonpark Road.
- A SafeWork NSW certified traffic controller will be positioned on Mahogany Avenue / Lyonpark Road intersection to assist heavy vehicle movements. Traffic controller will NOT stop traffic along Lyonpark Road.

I am available for a call or meeting if required to discuss the above and welcome any feedback.

Your time is appreciated and we look forward to hearing from you.

Regards,

Thomas Yang
Executive Engineer

TRAFFIX
Suite 2.08, 50 Holt St, Surry Hills, NSW, 2010
02 8324 8700
0433 438 966
www.traffix.com.au

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From: Joey Huang
To: Maria Pennisi
Cc: Amir Mousavi; Peter Wilson; Jeff Jackson; Michael Jones
Subject: RE: Application Number: SSD15822622 - Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), DA Condition B36 - Construction Traffic & Pedestrian Management Plan [TRAFFIX Ref: 24.277]
Date: Wednesday, 31 July 2024 3:10:01 PM
Attachments: image001.png
image002.png
image003.png
image004.png
image005.png
image008.png
image009.png
image010.png
image011.png
image012.png
image013.png
image908900.png

Hi Maria,

Thanks for your replies!

Council have no more comments on the submitted CTPMP.

Kind Regards,

Joey

Joey Huang
Traffic & Development Engineer
TRAFFIC SERVICES
M +61421718187
E JoeyH@ryde.nsw.gov.au
W www.ryde.nsw.gov.au

City of Ryde



Customer Service Centre 1 Pope Street, Ryde (Within Top Ryde City shopping centre)
North Ryde Office Riverview Business Park, Building 0, Level 1, 3 Richardson Place, North Ryde

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The City of Ryde wishes to acknowledge the Traditional Custodians of the Land on which we work and pay our respect to the Elders past, present and emerging, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

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From: Maria Pennisi <mpennisi@grindley.com.au>
Sent: Tuesday, July 30, 2024 4:12 PM
To: Joey Huang <JoeyH@ryde.nsw.gov.au>
Cc: Amir Mousavi <AmirM@ryde.nsw.gov.au>; Peter Wilson <pwilson@grindley.com.au>; Jeff Jackson <JJackson@grindley.com.au>; Michael Jones <mjones@grindley.com.au>
Subject: FW: Application Number: SSD15822622 - Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), DA Condition B36 - Construction Traffic & Pedestrian Management Plan [TRAFFIX Ref: 24.277]

Good afternoon, Joey

Please refer to responses below in red.

I trust this has close out council requirements to satisfy this condition.

Regards

Maria Pennisi
Pre-Construction Manager
m. 0404 837 451 t. (02) 9497 9842 Ext: 142 f. (02) 9988 3575
a. 55 Grandview Street (PO Box 6246) Pymble NSW 2073
e. mpennisi@grindley.com.au w. grindley.com.au

Grindley follow

From: Joey Huang <JoeyH@ryde.nsw.gov.au>
Sent: Tuesday, July 23, 2024 12:14 PM
To: Maria Pennisi <mpennisi@grindley.com.au>
Cc: Subject: RE: Application Number: SSD15822622 - Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), DA Condition B36 - Construction Traffic & Pedestrian Management Plan [TRAFFIX Ref: 24.277]

Hi Maria

Thanks for providing Council with the CPTMP!

In accordance with SSD15822622 Consent Condition B36, the CPTMP of Building C2 must be prepared in consultation with Council. Therefore, Council's Traffic Service Department reviewed the CPTMP and provide following comments for your attention:

1. It is noted that Building C3 CTMP has been consulted with Council and all comments provided by Council as attached have not yet been fully addressed. Most of comments are similar to followings.
2. The provided swept paths show the largest vehicle via the route through Lyonpark Road is 12.5m HRV. Please confirm the largest truck for two routes respectively in the CPTMP report. Grindley confirms that the largest vehicles in 12.5m HRV.

3)The truck routes are proposed via the bridge over Shrimpton Creek and a new road section linking the bridge to Lyonpark Road, which are still privately owned and whose loading limits are unclear. Please provide agreement signed by the owner of the bridge and new link road section to allow the proposed largest trucks to use these traffic facilities. The proposed road is within the approved site which is part of our head contract there is no owners consent required. Please find attached engineer's certificate and note the bridge is designed for SM1600 in accordance with AS5100.

NEW BRIDGE - 2021

DESIGN STANDARD: AS 5100: 2017 SERIES BRIDGE DESIGN

ROAD TRAFFIC LOADING: SM1600
NUMBER OF DESIGN LANES: 2
DESIGN TRAFFIC SPEED: 60km/h

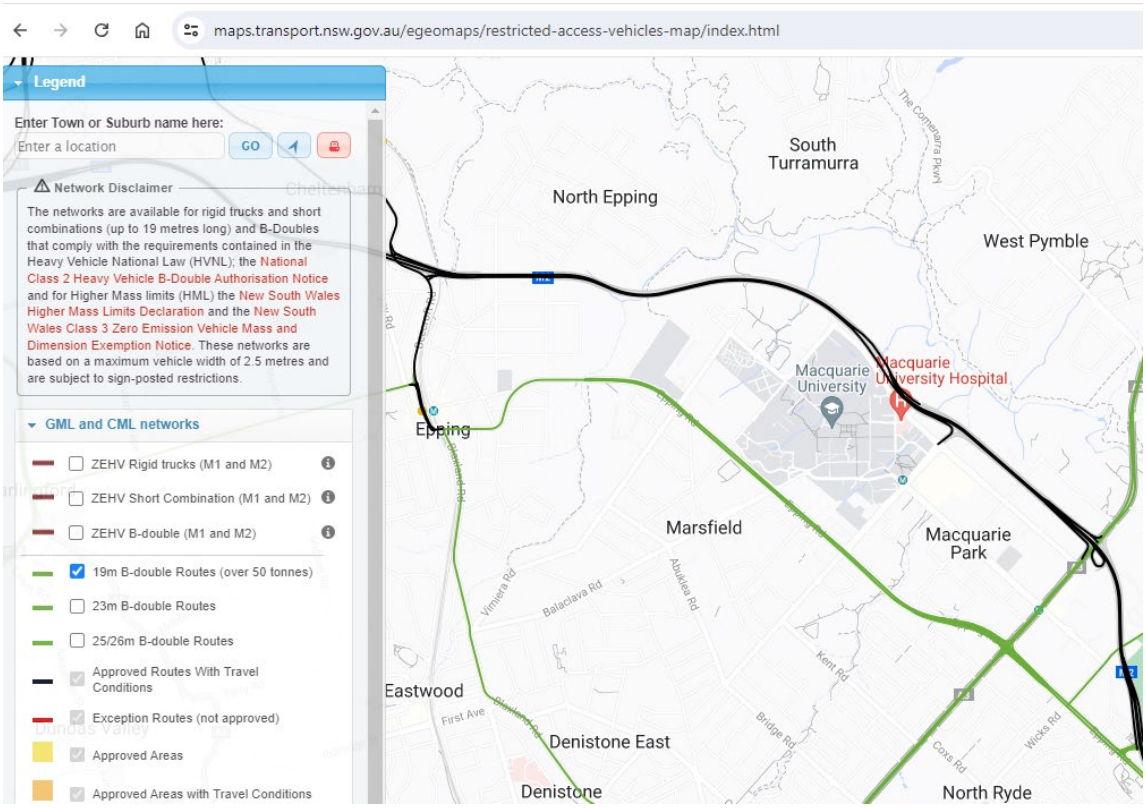
TRAFFIC BARRIER PERFORMANCE LEVEL: MEDIUM

WIND LOADING
WIND TERRAIN CATEGORY: 2
WIND REGION: A2
WIND VELOCITY ULS: 48m/s
WIND VELOCITY SLS: 37m/s
AVERAGE RECURRENCE INTERVAL (ARI) ULS = 2000 YEARS
AVERAGE RECURRENCE INTERVAL (ARI) SLS = 20 YEARS

A couple of months ago, Council's traffic engineer visited the site and a NO ENTRY sign at the north-western side of the bridge over Shrimpton Creek was found, which may regulate the bridge only allowing site outbound vehicles to pass through the bridge without allowing site inbound vehicles to travel through the bridge. If so, 12.5m HRV would not be allowed into the site via the bridge, which indicates it is **unreasonable** for 12.5m HRV swept paths in the CPTMP showing **turning left from Lyonpark Rd onto the new link road** leading to the bridge. The No entry sign is a construction site sign not a permanent street sign this will be replaced to read **"Construction access road no entry permitted all other vehicles."**



3. TfNSW website for higher mass limits and restricted access vehicle shows Herring Road/Lyonpark Road are all not listed RAV routes, which cannot afford vehicles longer 19m truck without NHVR certificate.



Kind Regards,
Joey

Joey Huang
Traffic & Development Engineer
TRAFFIC SERVICES
M +61421718187
E JoeyH@ryde.nsw.gov.au
W www.ryde.nsw.gov.au

City of Ryde



Customer Service Centre 1 Pope Street, Ryde (Within Top Ryde City shopping centre)
North Ryde Office Riverview Business Park, Building 0, Level 1, 3 Richardson Place, North Ryde

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From: Maria Pennisi <mpennisi@grindley.com.au>
Sent: Friday, July 12, 2024 5:11 PM
To: City of Ryde <CityofRyde@ryde.nsw.gov.au>
Cc: Thomas Yang <thomas.yang@traffix.com.au>; Mia McFarlane <mmcfarlane@grindley.com.au>; Peter Wilson <pwilson@grindley.com.au>; Jeff Jackson <JJackson@grindley.com.au>; Michael Murray <mmurray@grindley.com.au>; Stephan Hoang <stephan.hoang@traffix.com.au>; Heather Trengove <Heather.Trengove@transport.nsw.gov.au>; Development CTMP CJP <development.CTMP.CJP@transport.nsw.gov.au>
Subject: Application Number: SSD15822622 - Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), DA Condition B36 - Construction Traffic & Pedestrian Management Plan [TRAFFIX Ref: 24.277]

Dera Sir/Madam

As required DA Condition B36 the CPTMP must be prepared in consultation with Council, attached is Traffix TMP dated July 2024 version V02 for your comment.
Please liaise with Thomas Yang - Executive Engineer with Traffix with your comments or any required information.
0433 438 966
thomas.yang@traffix.com.au

Regards
Maria Pennisi
Pre-Construction Manager
m. 0404 837 451 t. (02) 9497 9842 Ext: 142 f. (02) 9988 3575
a. 55 Grandview Street (PO Box 6246) Pymble NSW 2073
e. mpennisi@grindley.com.au w. grindley.com.au

Grindley follow

From: Heather Trengove <Heather.Trengove@transport.nsw.gov.au>
Sent: Thursday, July 11, 2024 7:22 PM
To: Development CTMP CJP <development.CTMP.CJP@transport.nsw.gov.au>
Cc: Thomas Yang <thomas.yang@traffix.com.au>; Maria Pennisi <mpennisi@grindley.com.au>; Mia McFarlane <mmcfarlane@grindley.com.au>; Peter Wilson <pwilson@grindley.com.au>; Jeff Jackson <JJackson@grindley.com.au>; Michael Murray <mmurray@grindley.com.au>; Stephan Hoang <stephan.hoang@traffix.com.au>
Subject: FW: Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), Midtown Building C2 - Construction Traffic & Pedestrian Management Plan [TRAFFIX Ref: 24.277]

Hi Maryam,

This one is for your area.

Kind Regards,

Heather Trengove
Principal Transport Planner
Customer Journey Planning
Greater Sydney
Transport for NSW

231 Elizabeth Street, Sydney 2000
Note: I work Mon, Tue, Wed

OFFICIAL

From: Thomas Yang <thomas.yang@traffix.com.au>
Sent: Thursday, July 11, 2024 10:07 AM
To: Heather Trengove <Heather.Trengove@transport.nsw.gov.au>
Cc: Maria Pennisi <mpennisi@grindley.com.au>; Mia McFarlane <mmcfarlane@grindley.com.au>; Peter Wilson <pwilson@grindley.com.au>; Jeff Jackson <JJackson@grindley.com.au>; Michael Murray <mmurray@grindley.com.au>; Stephan Hoang <stephan.hoang@traffix.com.au>
Subject: Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), Midtown Building C2 - Construction Traffic & Pedestrian Management Plan [TRAFFIX Ref: 24.277]

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Dear Heather,

The purpose of this correspondence is to notify TfNSW that TRAFFIX is the traffic consultant preparing the Construction Traffic and Pedestrian Management Plan (CTPMP) in support of approved works (SSD 15822622) for Stage 2 Ivanhoe Estate, Building C2 located at Lot 100 DP1262209. Development Consent was granted by Minister for Planning and Public Spaces on the 28 November 2022.

We are seeking TfNSW to endorse the attached CTPMP which has been prepared to address Condition B36 of the Development Consent.

The following points are noteworthy with respect to the proposed construction methodology:

- Total construction period expected to occur over a 24-month period.
- Work hours will be in accordance with Condition C1-5.
- All construction works will be undertaken within the site, with no works zone proposed along any public road.
- The largest vehicle to access the site will be 20m Articulated Vehicles (AVs).
- Building C2 is within the Ivanhoe Estate and is a live construction site, 20m AVs will continue to access the site via Herring Road as per existing, and an alternate access for trucks up to 12.5m Heavy Rigid Vehicles (HRVs) is proposed via Lyonpark Road.
- A SafeWork NSW certified traffic controller will be positioned on Mahogany Avenue / Lyonpark Road intersection to assist heavy vehicle movements. Traffic controller will NOT stop traffic along Lyonpark Road.

I am available for a call or meeting if required to discuss the above and welcome any feedback.

Your time is appreciated and we look forward to hearing from you.

Regards,

Thomas Yang
Executive Engineer

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Ivanhoe Green & Community Centre (C2 Building)

Construction Noise and Vibration Management Plan

Ivanhoe Precinct – Midtown Macquarie Park

Grindley

Report number: 240360-Ivanhoe BC2 Community-CNVMSP_BW_R0
Date: 1 July 2024
Version: For Information

Project Number: 240360

PULSE WHITE NOISE ACOUSTICS Suite 601, L6, 32 Walker St, North Sydney NSW 2060
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DOCUMENT CONTROL

Project Name	Ivanhoe Green & Community Centre
Project Number	240360
Report Reference	240360-Ivanhoe BC2 Community-CNVMSP_BW_R0
Client:	Grindley

Revision	Description	Reference	Date	Prepared	Checked	Authorised
0	For Information	240360-Ivanhoe BC2 Community-CNVMSP_BW_R0	24 June 2024	Ben White	Matt Furlong	Ben White

PREPARED BY:

Pulse White Noise Acoustics Pty Ltd
ABN 95 642 886 306
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1800 4 PULSE

This report has been prepared by Pulse White Noise Acoustics Pty Ltd with all reasonable skill, care and diligence, and taking account of the timescale and resources allocated to it by agreement with the Grindley. Information reported herein is based on the interpretation of data collected, which has been accepted in good faith as being accurate and valid.

This report is for the exclusive use of Grindley
No warranties or guarantees are expressed or should be inferred by any third parties.
This report may not be relied upon by other parties without written consent from Pulse White Noise Acoustics.

This report remains the property of Pulse White Noise Acoustics Pty Ltd until paid for in full by the client, Grindley.

Pulse White Noise Acoustics disclaims any responsibility to the Client and others in respect of any matters outside the agreed scope of the work.

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1 INTRODUCTION

Pulse White Noise Acoustics (PWNA) has been engaged to prepare a Construction Noise and Vibration Management Plan (CNVMP) for the construction activities to be undertaken as part of the Ivanhoe Precinct, Macquarie Park, Ivanhoe Village Green & Community Centre project including item B37 of the SSD-15822622.

Onsite unattended and attended noise levels have previously been determined for the project and included in the Acoustic Logic *Proposed Residential Development, Ivanhoe Stage 2, Macquarie Park – Development Application Environmental Noise Impact Assessment* with reference 20210325.1/1607/A/R7/GW and dated 16/7/2021 and referenced in the projects SSD consent. The details of the acoustic survey included in the Acoustic Logic report have been used in this assessment.

A glossary of acoustic terminology used throughout this report is included in Appendix A.

The author of this report is a director of Pulse White Noise Acoustics who is a member of the Australian Acoustic Society, details including Ben's CV and membership of the AAS are included in Appendix B.

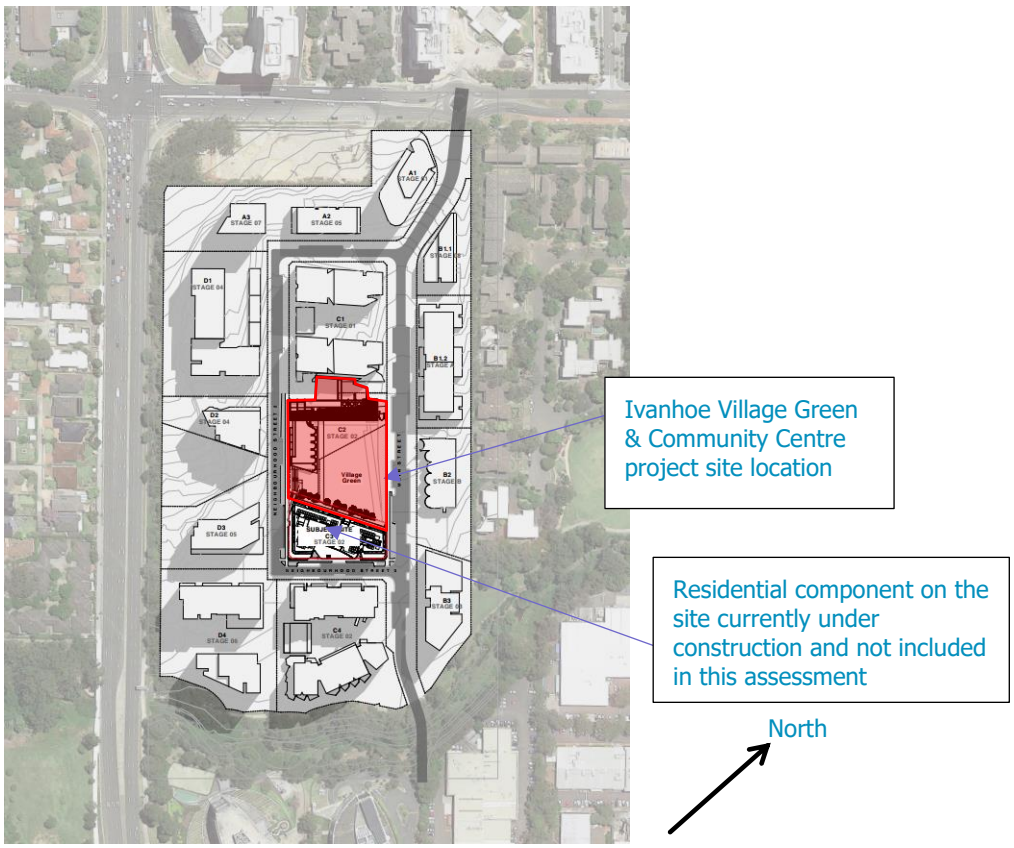
1.1 Site Layout and Development Overview

The project includes the Ivanhoe Precinct, Macquarie Park, Ivanhoe Village Green & Community Centre project

The project is included within the SSD-15822622 approval.

The site is located within the Ivanhoe Estate, Epping Road, Macquarie Park site. The location of Ivanhoe Village Green & Community Centre is detailed in the Figure below.

Figure 1 Location of the Ivanhoe Village Green & Community Centre



Existing receivers within proximity of the site, which are included in this construction noise and vibration management plan, include both residential and a commercial properties within proximity of the project.

Details of the nearest sensitive receivers to the site have been identified below.

Receiver 1: Existing residential dwellings located within Building C1 of Stage 1 of the Ivanhoe Estate.

Receiver 2: Existing residential receivers located to the north of the site.

Receiver 3: Commercial receivers located within the building to the north east of the site.

Receiver 4: Commercial receivers located within the building to the east of the site.

Receiver 5: Existing residential dwellings located to the south of the site, located to the southern side of Epping Road.

It is noted that the residential component of the site is currently under construction and is therefore not included in this assessment.

Details of the site location and surrounding receivers is included in the following figure.

Figure 2 Site Map, Measurement Locations and Surrounding Receivers



1.2 SSD Compliance

This report has been undertaken in accordance with the requirements of Item B37 of the project's conditions of consent.

Details of conditions of consent and sections of the report which include the required items required by the consent are included in the table below.

Table 1 SSD Compliance Table

SSD Condition number	Requirement	Report Reference for Satisfaction
B37	*Prior to the commencement of any works, a Construction Noise and Vibration Management Plan (CNVMP) prepared by a suitably qualified person shall be submitted to the Certifying Authority. The CNVMP must be prepared in consultation with, and address the relevant requirements of the EPA. The CNVMP shall address (but not be limited to):*	-
(a)	*be prepared in accordance with the EPA's Interim Construction Noise Guideline*	Sections 4.1
(b)	*identify nearby sensitive receivers and land uses;*	Sections 1.1
(c)	*identify the noise management levels for the project;*	Section 4.1.1
(d)	*identify the construction methodology and equipment to be used and the key sources of noise and vibration;*	Section 6
(e)	*details of all reasonable and feasible management and mitigation measures to be implemented to minimise construction noise and vibration;*	Section 6.1.1 and 6.1.2
(f)	*be consistent with and incorporate all relevant recommendations and noise and vibration mitigation measures outlined in the Stage 2 DA Acoustic Assessment, prepared by Acoustic Logic, dated July 2021*	Section 6

(g)	*ensure all potentially impacted sensitive receivers are informed by letterbox drops prior to the commencement of construction of the nature of works to be carried out, the expected noise levels and duration, as well as contact details for a construction community liaison officer; and*	Section 6.5.2
(h)	*include a suitable proactive construction noise and vibration monitoring program which aims to ensure the construction noise and vibration criteria in this consent are not exceeded.*	Section 6.4

2 EXISTING ACOUSTIC ENVIRONMENT

Measured noise levels from the attended noise survey undertaken as part of the Acoustic Logic *Proposed Residential Development, Ivanhoe Stage 2, Macquarie Park – Development Application Environmental Noise Impact Assessment* with reference 20210325.1/1607/A/R7/GW and dated 16/7/2021 and referenced in the projects SSD consent have been used in this assessment.

As part of the Acoustic Logic *Proposed Residential Development, Ivanhoe Stage 2, Macquarie Park – Development Application Environmental Noise Impact Assessment* background noise levels within the vicinity of the site has been undertaken in accordance with the NSW EPA's *Noise Policy for Industry.*

The Rating Background Noise Level (RBL) is the background noise level used for assessment purposes and includes the 90th percentile of the daily background noise levels during each assessment period, being day, evening and night. The RBL $L_{A90\ (15minute)}$ and L_{Aeq} noise levels presented within the Acoustic Logic *Proposed Residential Development, Ivanhoe Stage 2, Macquarie Park – Development Application Environmental Noise Impact Assessment* are summarised in Table 2.

Table 2 Measured Ambient Noise Levels corresponding to the NPI's Assessment Time Periods

Measurement Location	Daytime[1] 7:00 am to 6:00 pm	Evening[1] 6:00 pm to 10:00 pm	Night-time[1] 10:00 pm to 7:00 am
	L_{A90}[2] (dBA)	L_{A90}[2] (dBA)	L_{A90}[2] (dBA)
Measurement Location 1	54	52	41
Measurement Location 2	48	43	34
Measurement Location 3	56	49	37
Measurement Location 4	45	43	37
Measurement Location 5	43	41	39
Measurement Location 6	50	48	36

Note 1: For Monday to Saturday, Daytime 7:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 7:00 am. On Sundays and Public Holidays, Daytime 8:00 am – 6:00 pm; Evening 6:00 pm – 10:00 pm; Night-time 10:00 pm – 8:00 am

Note 2: The L_{A90} noise level is representative of the "average minimum background sound level" (in the absence of the source under consideration), or simply the background level.

Measured noise levels in accordance with the time periods defined by the NSW EPA RNP 2011 are presented below.

Table 3 Measured Ambient Noise Levels corresponding to the "RNP" Assessment Time Periods

Receiver Location	Daytime [1] 7:00 am to 10:00 pm	Night-time [1] 10:00 pm to 7:00 am
	L_{Aeq} (whole period) [2] (dBA)	L_{Aeq} (whole period) [2] (dBA)
Receiver Location 1	48	34
Receiver Location 2	45	37
Receiver Location 3	43	39
Receiver Location 4	43	39
Receiver Location 5	50	36

Note 1: For Monday to Sunday, Daytime 7:00 am – 10:00 pm; Night-time 10:00 pm – 7:00 am.

Note 2: The L_{Aeq} is the energy average sound level. It is defined as the steady sound level that contains the same amount of acoustical energy as a given time-varying sound.

3 PROJECT SSD REQUIREMENTS

This CNVSP has been prepared in accordance with the SSDA 15822622 consent condition B37 which includes the following:

CONSTRUCTION NOISE AND VIBRATION MANAGEMENT PLAN

B37. Prior to the commencement of any works, a **Construction Noise and Vibration Management Plan** (CNVMP) prepared by a suitably qualified person shall be submitted to the Certifying Authority. The CNVMP must be prepared in consultation with, and address the relevant requirements of the EPA. The CNVMP shall address (but not be limited to):

(a) be prepared in accordance with the EPA's *Interim Construction Noise Guideline*

(b) identify nearby sensitive receivers and land uses;

(c) identify the noise management levels for the project;

(d) identify the construction methodology and equipment to be used and the key sources of noise and vibration;

(e) details of all reasonable and feasible management and mitigation measures to be implemented to minimise construction noise and vibration;

(f) be consistent with and incorporate all relevant recommendations and noise and vibration mitigation measures outlined in the Stage 2 DA Acoustic Assessment, prepared by Acoustic Logic, dated July 2021

(g) ensure all potentially impacted sensitive receivers are informed by letterbox drops prior to the commencement of construction of the nature of works to be carried out, the expected noise levels and duration, as well as contact details for a construction community liaison officer; and

(h) include a suitable proactive construction noise and vibration monitoring program which aims to ensure the construction noise and vibration criteria in this consent are not exceeded.

Prior to the commencement of works, a copy of the **CNVMP** demonstrating compliance with the above must be submitted to the Planning Secretary.

4 NOISE AND VIBRATION CRITERIA

Relevant noise and vibration criteria for construction activities are detailed below.

4.1 Construction Noise Objectives

Relevant construction noise objectives applicable to this project are outlined below.

4.1.1 NSW EPA (Former DECC) Interim Construction Noise Guideline (ICNG) 2009

Noise objective for construction and demolition activities are discussed in the *Interim Construction Noise Guideline* (ICNG). The ICNG also recommends procedures to address potential impacts of construction noise on residences and other sensitive land uses. The main objectives of the ICNG are summarised as follows:

- Promote a clear understanding of ways to identify and minimise noise from construction works;
- Focus on applying all "feasible" and "reasonable" work practices to minimise construction noise impacts;
- Encourage construction to be undertaken only during the recommended standard hours unless approval is given for works that cannot be undertaken during these hours;
- Streamline the assessment and approval stages and reduce time spent dealing with complaints at the project implementation stage; and
- Provide flexibility in selecting site-specific feasible and reasonable work practices in order to minimise noise impacts.

The ICNG contains a quantitative assessment method which is applicable to this project. Guidance levels are given for airborne noise at residences and other sensitive land uses.

The quantitative assessment method involves predicting noise levels at sensitive receivers and comparing them with the Noise Management Levels (NMLs). The NML affectation categories for residential receivers have been reproduced from the guideline and are listed in the Table 4 below.

Table 4 NMLs for quantitative assessment at residences

Time of Day	Noise Management Level $L_{Aeq(15minute)}$ [1,2]	How to Apply
Recommended standard hours: During Approved working hours	Noise affected RBL + 10 dB	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq(15minute) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	The highly noise affected level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. 2. If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside the recommended standard hours above	Noise affected RBL + 5 dB	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dB above the noise affected level, the proponent should notify the community.
offices, retail outlets: external	$L_{Aeq\ (15\ min)}$ 70 dB(A)	• When in use • During construction, the proponent should regularly update the occupants of the commercial and industrial premises regarding noise levels and hours of work.

Note 1 Noise levels apply at the property boundary that is most exposed to construction noise, and at a height of 1.5 m above ground level. If the property boundary is more than 30 m from the residence, the location for measuring or predicting noise levels is at the most noise-affected point within 30 m of the residence. Noise levels may be higher at upper floors of the noise affected residence.

Note 2 The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours). The term RBL is described in detail in the NSW Industrial Noise Policy (EPA 2000).

Construction noise levels at other noise receivers are outlined below:

- Construction noise levels within classrooms other educational institutions is not recommended to exceed 45dBA $L_{Aeq,15minute}$, when measured internally.
- Construction noise levels at offices and retail outlets are not recommended to exceed 70dBA LAeq,15minute, when measured externally.

Based on the measured background noise levels summarised in Section 1.2, and the NMLs outlined above, the construction noise criteria to be used in this assessment are listed in Table 5.

Table 5 NMLs as basis for the acoustic assessment

Receiver Types	NML, dB $L_{Aeq(15minute)}$		
	Standard Hours During Approved working hours		**Outside Standard Hours** All hours not listed in the adjacent column.
Receiver 1 – Residential	**NAFL: 58** (RBL (48) + 10dB)	**HNAL: 75**	RBL + 5dB
Receiver 2 – Residential	**NAFL: 55** (RBL (45) + 10dB)		
Receiver 3 – Commercial	**NAFL: 70**		
Receiver 4 – Commercial	**NAFL: 70**		
Receiver 5 – Residential	**NAFL: 60** (RBL (50) + 10dB)		

4.2 Vibration Criteria

Effects of ground borne vibration on buildings may be segregated into the following three categories:

- Human comfort – vibration in which the occupants or users of the building are inconvenienced or possibly disturbed.
- Effects on building contents – where vibration can cause damage to fixtures, fittings and other non-building related objects.
- Effects on building structures – where vibration can compromise the integrity of the building or structure itself.

4.2.1 Vibration Criteria – Human Comfort

Vibration effects relating specifically to the human comfort aspects of the project are taken from AV-TG. This type of impact can be further categorised and assessed using the appropriate criterion as follows:

- Continuous vibration – from uninterrupted sources.
- Impulsive vibration – up to three instances of sudden impact e.g., dropping heavy items, per monitoring period.
- Intermittent vibration – such as from drilling, compacting or activities that would result in continuous vibration if operated continuously.

Table 6 Continuous vibration acceleration criteria (m/s^2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Critical working areas (e.g. hospital operating theatres, precision laboratories)	Day or night-time	0.0050	0.010	0.10	0.20
Residences	Daytime	0.010	0.0071	0.020	0.014
	Night-time	0.007	0.005	0.014	0.010
Offices, schools, educational institutions and places of worship	Day or night-time	0.020	0.014	0.040	0.028
		0.04	0.029	0.080	0.058
Workshops	Day or night-time	0.04	0.029	0.080	0.058

Table 7 Impulsive vibration acceleration criteria (m/s^2) 1 Hz-80 Hz

Location	Assessment period	Preferred Values		Maximum Values	
		z-axis	x- and y-axis	z-axis	x- and y-axis
Critical working areas (e.g. hospital operating theatres, precision laboratories)	Day or night-time	0.0050	0.010	0.10	0.20
Residences	Daytime	0.30	0.21	0.60	0.42
	Night-time	0.10	0.071	0.20	0.14
Offices, schools, educational institutions and places of worship	Day or night-time	0.64	0.46	1.28	0.92
Workshops	Day or night-time	0.64	0.46	1.28	0.92

Table 8 Intermittent vibration impacts criteria ($m/s^{1.75}$) 1 Hz-80 Hz

Location	Daytime		Night-time	
	Preferred Values	Maximum Values	Preferred Values	Maximum Values
Critical working areas (e.g. hospital operating theatres, precision laboratories)	0.10	0.20	0.10	0.20
Residences	0.20	0.40	0.13	0.26
Offices, schools, educational institutions and places of worship	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.60

4.2.2 Vibration Criteria – Building Contents and Structure

The vibration effects on the building itself are assessed against international standards as follows:

- For transient vibration: British Standard BS 7385: Part 2-1993 *"Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration"* (BSI 1993); and
- For continuous or repetitive vibration: German DIN 4150: Part 3 – 1999 *"Effects of Vibration on Structure"* (DIN 1999).

4.2.3 Standard BS 7385 Part 2 - 1993

For transient vibration, as discussed in standard BS 7385 Part 2-1993, the criteria are based on peak particle velocity (mm/s) which is to be measured at the base of the building. These are summarised below.

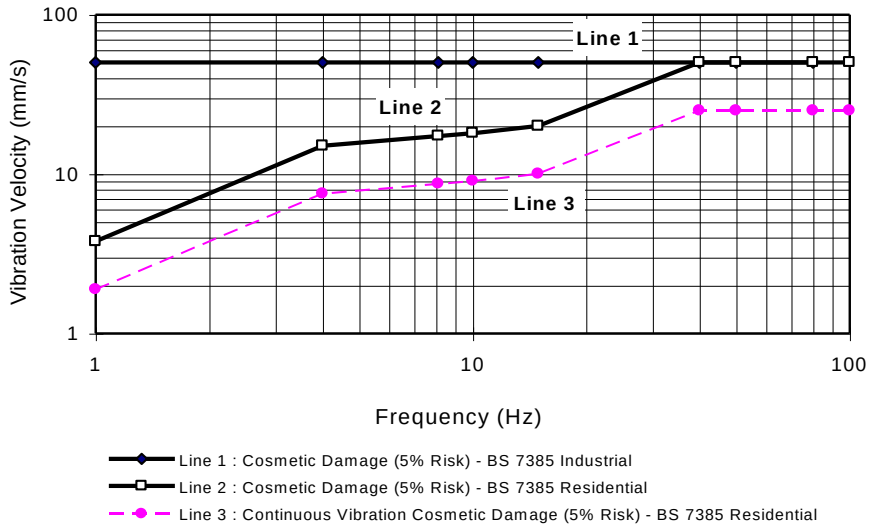
Table 9 Transient vibration criteria as per standard BS 7385 Part 2 - 1993

Line in Figure 3	Type of Building	Peak Component Particle Velocity in Frequency Range of Predominant Pulse	
		4 Hz to 15 Hz	15 Hz and Above
1	Reinforced or framed structures Industrial and heavy commercial buildings.	50 mm/s at 4 Hz and above	
2	Unreinforced or light framed structures Residential or light commercial type buildings	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

Standard BS 7385 Part 2 – 1993 states that the values in Table 9 relate to transient vibration which does not cause resonant responses in buildings.

Where the dynamic loading caused by continuous vibration events is such that it results in dynamic magnification due to resonance (especially at the lower frequencies where lower guide values apply), then the values in Table 9 may need to be reduced by up to 50% (refer to Line 3 in Figure 3).

Figure 3 BS 7385 Part 2 – 1993, graph of transient vibration values for cosmetic damage



In the lower frequency region where strains associated with a given vibration velocity magnitude are higher, the recommended values corresponding to Line 2 are reduced. Below a frequency of 4 Hz, where a high displacement is associated with the relatively low peak component particle velocity value, a maximum displacement of 0.6 mm (zero to peak) is recommended. This displacement is equivalent to a vibration velocity of 3.7 mm/s at 1 Hz.

The standard also states that minor damage is possible at vibration magnitudes which are greater than twice those given in Table 9, and major damage to a building structure may occur at values greater than four times the tabulated values.

Fatigue considerations are also addressed in the standard and it is concluded that unless the calculation indicates that the magnitude and number of load reversals is significant (in respect of the fatigue life of building materials) then the values in Table 9 should not be reduced for fatigue considerations.

4.2.4 Standard DIN 4150 Part 3 - 1999

For continuous or repetitive vibration, standard DIN 4150 Part 3-1999 provides criteria based on values for peak particle velocity (mm/s) measured at the foundation of the building; these are summarised in Table 10. The criteria are frequency dependent and specific to particular categories of structures.

Table 10 Structural damage criteria as per standard DIN 4150 Part 3 - 1999

Type of Structure	Peak Component Particle Velocity, mm/s			
	Vibration at the foundation at a frequency of			Vibration of horizontal plane of highest floor at all frequencies
	1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz[1]	
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50	40
Dwellings and buildings of similar design and/or use	5	5 to 15	15 to 20	15
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and are of great intrinsic value (e.g. buildings that are under a preservation order)	3	3 to 8	8 to 10	8

Note 1: For frequencies above 100Hz, at least the values specified in this column shall be applied.

4.3 Construction Vibration Criteria

Based on the details included in the sections above the project specific vibration criteria to protect the surrounding residential receivers from structural or architectural damage includes the following:

1. Project construction vibration criteria at all surrounding building structures – 7 mm/s

5 NOISE AND VIBRATION ASSESSMENT

5.1 Construction Noise Assessment

Sound power levels have been predicted for the construction tasks identified in the project program. The equipment anticipated for use in each task is based on previous project experience. The sound power levels for the equipment likely to be used for each of the listed tasks are provided in Table 11 below.

Table 11 Summary of predicted sound power levels

Tasks	Equipment	Sound Power Levels (dBA re 1pW)	Aggregate Sound Power Level per Task (dBA re 1pW)
Site Establishment Works	Mobile crane	110	113
	Power hand tools	109	
	Semi Rigid Vehicle [1]	105	
Ground Works	Excavator	112	119
	Hand held jack hammer [1]	111	
	Dump truck [1]	104	
	Concrete saw [1]	114	
	Skid steer	110	
	Power hand tools	109	
Structure	Hand held jack hammer [1]	106	117
	Concrete saw [1]	114	
	Power hand tools	109	
	Welder	101	
	Concrete pump truck	110	
	Concrete agitator truck	108	
Internal Works	Power hand tools	109	109
Common and External Works (including landscaping)	Concrete agitator truck	108	117
	Saw cutter [1]	104	
	Dump truck [1]	104	
	Concrete saw [1]	114	
	Power hand tools	109	

Note 1: An assumed time correction has been applied, this being 5 minutes of operation in any 15-minute interval.

5.2 Predicted Construction Noise Levels

Predicted construction noise levels are presented below for each of the surrounding receivers in accordance with the NSW EPA ICNG.

Note:

- Predicted noise levels presented below are given in a range, this includes the expected minimums as well as the maximums.
- With regards to the maximum noise levels in the range, these are typically experienced when plant/works are within close proximity to a boundary. In our experience whilst these levels above NML's and considered intrusive they will only occur for a short time and is not a representation of noise levels during the entire construction period.

Table 12 Receiver 1 – Summary of preliminary predicted construction noise levels – Residence to the north west of the site

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	55 to 61	62 to 76	**Standard Construction Hours** **58 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver.
	Power hand tools		54 to 60			
	Semi Rigid Vehicle		51 to 57			
Ground Works and Demolition	Excavator	119	57 to 63	67 to 81	**Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Handheld jack hammer		52 to 58			
	Dump truck		50 to 56			
	Concrete saw		60 to 66			
	Skid steer		55 to 61			
	Power hand tools		54 to 60			
Structure	Handheld jack hammer	117	52 to 58	66 to 80		
	Concrete saw		60 to 66			
	Power hand tools		54 to 60			
	Welder		46 to 52			
	Concrete pump truck		55 to 61			
	Concrete agitator truck		53 to 59			
Internal Works	Power hand tools	109	54 to 60	58 to 72		
Common and External Works	Concrete agitator truck	117	53 to 59	66 to 80		
	Saw cutter		50 to 56			
	Dump truck		50 to 56			
	Concrete saw		60 to 66			
	Power hand tools		54 to 60			

Table 13 Receiver 2 – Summary of predicted construction noise levels – Residence to the north of the site

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	58 to 76	61 to 79	**Standard Construction Hours** **55 dB(A) $L_{Aeq\ 15\ min}$** **Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver. Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Power hand tools		57 to 75			
	Semi Rigid Vehicle		53 to 71			
Ground Works and Demolition	Excavator	119	60 to 78	66 to 84		
	Handheld jack hammer		54 to 72			
	Dump truck		52 to 70			
	Concrete saw		62 to 80			
	Skid steer		58 to 76			
	Power hand tools		57 to 75			
Structure	Handheld jack hammer	117	54 to 72	65 to 83		
	Concrete saw		62 to 80			
	Power hand tools		57 to 75			
	Welder		49 to 67			
	Concrete pump truck		58 to 76			
	Concrete agitator truck		56 to 74			
Internal Works	Power hand tools	109	57 to 75	57 to 75		
Common and External Works	Concrete agitator truck	117	56 to 74	65 to 83		
	Saw cutter		52 to 70			
	Dump truck		52 to 70			
	Concrete saw		62 to 80			
	Power hand tools		57 to 75			

Table 14 Receiver 3 - Summary of predicted construction noise levels – Commercial Receivers to the northeast

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	48 to 54	55 to 69	**Standard Construction Hours** **70 dB(A) $L_{Aeq\ 15\ min}$** **Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver. Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Power hand tools		47 to 53			
	Semi Rigid Vehicle		44 to 50			
Ground Works and Demolition	Excavator	119	50 to 56	60 to 74		
	Handheld jack hammer		45 to 51			
	Dump truck		43 to 49			
	Concrete saw		53 to 59			
	Skid steer		48 to 54			
	Power hand tools		47 to 53			
Structure	Handheld jack hammer	117	45 to 51	59 to 73		
	Concrete saw		53 to 59			
	Power hand tools		47 to 53			
	Welder		39 to 45			
	Concrete pump truck		48 to 54			
	Concrete agitator truck		46 to 52			
Internal Works	Power hand tools	109	47 to 53	51 to 65		
Common and External Works	Concrete agitator truck	117	46 to 52	59 to 73		
	Saw cutter		43 to 49			
	Dump truck		43 to 49			
	Concrete saw		53 to 59			
	Power hand tools		47 to 53			

Table 15 Receiver 4 - Summary of predicted construction noise levels – Commercial Receivers to the southeast

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	52 to 58	56 to 61	**Standard Construction Hours** **70 dB(A) $L_{Aeq\ 15\ min}$** **Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver. Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Power hand tools		51 to 57			
	Semi Rigid Vehicle		48 to 54			
Ground Works and Demolition	Excavator	119	54 to 60	61 to 66		
	Handheld jack hammer		49 to 55			
	Dump truck		47 to 53			
	Concrete saw		57 to 63			
	Skid steer		52 to 58			
	Power hand tools		51 to 57			
Structure	Handheld jack hammer	117	49 to 55	61 to 66		
	Concrete saw		57 to 63			
	Power hand tools		51 to 57			
	Welder		43 to 49			
	Concrete pump truck		52 to 58			
	Concrete agitator truck		50 to 56			
Internal Works	Power hand tools	109	51 to 57	52 to 57		
Common and External Works	Concrete agitator truck	117	50 to 56	60 to 65		
	Saw cutter		47 to 53			
	Dump truck		47 to 53			
	Concrete saw		57 to 63			
	Power hand tools		51 to 57			

Table 16 Receiver 5 - Summary of predicted construction noise levels – Residence located to the southwest

Phase	Activity	Aggregate Sound Power Level (dBA re 1pW)	Predicted Individual Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Predicted Combined Noise Level at Receiver dBA $L_{Aeq\ 15\ minutes}$	Noise Management Levels dBA $L_{Aeq\ 15\ minutes}$	Summary of Result
Site Establishment Works	Mobile crane	113	52 to 58	56 to 61	**Standard Construction Hours** **60 dB(A) $L_{Aeq\ 15\ min}$** **Highly Noise Affected Level** Standard Construction Hours **75 dB(A) $L_{Aeq\ 15\ min}$**	Works indicatively predicted to have the potential to exceed the noise management level when working near a receiver. Mitigations of construction noise required to be undertaken including measures detailed in Section 6 of this report.
	Power hand tools		51 to 57			
	Semi Rigid Vehicle		48 to 54			
Ground Works and Demolition	Excavator	119	54 to 60	61 to 66		
	Handheld jack hammer		49 to 55			
	Dump truck		47 to 53			
	Concrete saw		57 to 63			
	Skid steer		52 to 58			
	Power hand tools		51 to 57			
Structure	Handheld jack hammer	117	49 to 55	61 to 66		
	Concrete saw		57 to 63			
	Power hand tools		51 to 57			
	Welder		43 to 49			
	Concrete pump truck		52 to 58			
	Concrete agitator truck		50 to 56			
Internal Works	Power hand tools	109	51 to 57	52 to 57		
Common and External Works	Concrete agitator truck	117	50 to 56	60 to 65		
	Saw cutter		47 to 53			
	Dump truck		47 to 53			
	Concrete saw		57 to 63			
	Power hand tools		51 to 57			

5.3 Construction Traffic Noise Assessment

For existing residences and other sensitive land uses affected by additional traffic on existing roads, the NSW *Road Noise Policy (RNP)* states that for noise associated with increased road traffic generated by land use developments, any increase in the total traffic noise level should be limited to 2 dB during both day and night-time periods. An increase of 2 dB represents a minor impact that is considered barely perceptible to the average person.

It is proposed that the construction traffic would access the site via Binalong Road to the east of the site. All construction traffic will access the site and use the surrounding roadways in accordance with the site Construction Management plan.

5.4 Vibration Assessment

In order to maintain compliance with the human comfort vibration criteria discussed in Section 4.2, it is recommended that the indicative safe distances listed in table below should be maintained. These indicative safe distances should be validated prior to the start of construction works by undertaking measurements of vibration levels generated by construction and demolition equipment by the contractor.

Additionally, any vibration levels should be assessed in accordance with the criteria discussed in Section 4.2.

Table 17 Recommended indicative safe working distances for vibration intensive plant

Plant	Rating / Description	Safe Working Distances (m)	
		Cosmetic Damage (BS 7385: Part 2 DIN 4150: Part 3)	Human Comfort (AVTG)
Vibratory roller	< 50 kN (Typically 1 – 2 tonnes)	5	15 – 20
	< 100 kN (Typically 2 – 4 tonnes)	6	20
	< 200 kN (Typically 4 – 6 tonnes)	12	40
	< 300 kN (Typically 7 – 13 tonnes)	15	100
	> 300 kN (Typically more than 13 tonnes)	20	100
Small hydraulic hammer	300 kg, typically 5 – 12 tonnes excavator	2	7
Medium hydraulic hammer	900 kg, typically 12 – 18 tonnes excavator	7	23
Large hydraulic hammer	1600 kg, typically 18 – 34 tonnes excavator	22	73
Vibratory pile driver	Sheet piles	2 – 20	20
Jackhammer	Hand held	1	Avoid contact with structure and steel reinforcements

6 NOISE AND VIBRATION MANAGEMENT PLAN

6.1 Acoustic Management Procedures

Table 18 below summarises the management procedures recommended for airborne noise and vibration impact. These procedures are also further discussed in the report as well as recommended mitigation measures. Hence, where applicable, links to further references are provided in Table 18.

Table 18 Summary of mitigation procedures

Procedure	Abbreviation	Description	Further Reference
General Management Measures	GMM	Introduce best-practice general mitigation measures in the workplace which are aimed at reducing the acoustic impact onto the nearest affected receivers.	Refer to Section 6 For noise impact, also refer to Section 6.1 For vibration impact, also refer to Section 6.3.1
Project Notification	PN	Issue project updates to stakeholders, discussing overviews of current and upcoming works. Advanced warning of potential disruptions can be included. Content and length to be determined on a project-by-project basis.	Refer to Section 6.
Verification Monitoring	V	Monitoring to comprise attended or unattended acoustic surveys. The purpose of the monitoring is to confirm measured levels are consistent with the predictions in the acoustic assessment, and to verify that the mitigation procedures are appropriate for the affected receivers. If the measured levels are higher than those predicted, then the measures will need to be reviewed and the management plan will need to be amended.	For noise impact, refer to Section 6 and Section 6.2.3. For vibration impact, refer to Section 6.3.2
Complaints Management System	CMS	Implement a management system which includes procedures for receiving and addressing complaints from affected stakeholders	Refer to Section 6.6
Specific Notification	SN	Individual letters or phone calls to notify stakeholders that noise levels are likely to exceed noise objectives. Alternatively, contractor could visit stakeholders individually in order to brief them in regards to the noise impact and the mitigation measures that will be implemented.	Refer to Section 6.
Respite Offer	RO	Offer provided to stakeholders subjected to an ongoing impact.	-
Alternative Construction Methodology	AC	Contractor to consider alternative construction options that achieve compliance with relevant criteria. Alternative option to be determined on a case-by-case basis. It is recommended that the selection of the alternative option should also be determined by considering the assessment of on-site measurements (refer to Verification Monitoring above).	-

The application of these procedures is in relation to the exceedances over the relevant criteria. For airborne noise, the criteria are based on NMLs. The allocation of these procedures is discussed in Section 6.1.1

For vibration, the criteria either correspond to human comfort, building damage or scientific and medical equipment. The application of these procedures is discussed in Section 6.1.2.

6.1.1 Allocation of Noise Management Procedures

For residences, the management procedures have been allocated based on noise level exceedances at the affected properties, which occur over the designated NMLs (refer to section 3). The allocation of these procedures is summarised in Table 19 below.

Table 19 Allocation of noise management procedures – residential receivers

Construction Hours	Exceedance over NML (dB)	Management Procedures (see definition above)
Approved Construction Hours Mon – Fri: 7:00 am to 7:00 pm Sat: 8:00 am – 1:00 pm	0 - 3	GMM
	4 - 10	GMM, PN, V [1], CMS, AC
	> 10	GMM, PN, V, CMS, SN, AC
Outside Standard Hours Mon – Fri: 7:00 am to 8:00 am Sat: 7:00 am to 8:00 am	0 - 10	GMM, AC
	11 - 20	GMM, PN, V [1], CMS, AC
	> 20	GMM, PN, V, CMS, SN, RO, AC

Notes

1. Verification monitoring to be undertaken upon complaints received from affected receivers

Please note the following regarding the allocation of these procedures:

- In addition to the above the projects *Conditions of Consent, item C5,* require works to include the following:
    - Rock Breaking, rock hammering, sheet piling and similar activities may only be carried out between the following hours:
        - 9am to 12 midday – Monday to Friday.
        - 2 pm to 5pm – Monday to Friday.
        - 9am to 12 midday – Saturday's.
- The exceedances have been estimated as part of the acoustic assessment, and these are summarised in Section 5.2.
- The allocation of procedures is based on the assumptions used for noise level predictions (refer to Section 5.1). Consequently, these allocations can be further refined once additional details of the construction program become available.

6.1.2 Allocation of Vibration Management Procedures

Table 20 below summarises the vibration management procedures to be adopted based on exceedance scenarios (i.e., whether the exceedance occurs over human comfort criteria, building damage criteria, or criteria for scientific and medical equipment). Please note these management procedures apply for any type of affected receiver (i.e., for residences as well as non-residential receivers).

Table 20 Allocation of vibration management procedures

Construction Hours	Exceedance Scenario	Management Procedures
Approved Construction Hours	Over human comfort criteria (refer to Section 3)	GMM, PN, V, RO
	Over building damage criteria (refer to Section 3)	GMM, V, AC
Outside Standard Hours	Over human comfort criteria (refer to Section 3)	GMM, SN, V, RO, CMS
	Over building damage criteria (refer to Section 3)	GMM, V, AC

6.2 Site Specific Noise Mitigation Measures (including High Noise Affected Levels)

Predicted noise levels outlined in section 5.1 indicate exceedances above the Noise Management Levels (NMLs) as well as the Highly Noise Affected Level (HNAL) when in proximity to a boundary. To militate against any exceedances, the site will need to introduce periods of respite for activities which are creating noise levels above the HNAL and including activities such as piling, hydraulic hammering and the like (i.e. greater than 75dBA). See below.

Table 21 Recommended Respite Periods

Monday to Friday	Saturday
7:00am to 9:00am – No noisy works (Respite Period)	8:00am to 9:00am – No noisy works (Respite Period)
9:00am to 12:00am – Works	9:00am to 12:00pm – Works
12:00pm to 2:00pm – No noisy works (Respite Period)	12:00pm to 1:00pm – No noisy works (Respite Period)
2:00pm to 5:00pm – Works	
5:30pm to 7:00pm – No noisy works (Respite Period)	

The requirements of the above include those required by Condition C5 of the SSD, which includes the following:

C5. Rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:

(a) 9.00 am to 12.00 pm, Monday to Friday;

(b) 2.00 pm to 5.00 pm Monday to Friday; and

(c) 9.00 am to 12.00 pm, Saturday.

6.2.1 General Mitigation Measures

The contractor will, where reasonable and feasible, apply best practice noise mitigation measures. These measures shall include the following:

- Maximising the offset distance between plant items and nearby noise sensitive receivers.
- Preventing noisy plant working simultaneously and adjacent to sensitive receivers.
- Minimising consecutive works in the same site area.
- Orienting equipment away from noise sensitive areas.
- Carrying out loading and unloading away from noise sensitive areas.

In order to minimise noise impacts during the works, the contractor will take all reasonable and feasible measures to mitigate noise effects.

The contractor will also take reasonable steps to control noise from all plant and equipment. Examples of appropriate noise control include efficient silencers and low noise mufflers.

The contractor should apply all feasible and reasonable work practices to meet the NMLs and inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels, duration of noise generating construction works, and the contact details for the proposal. Works will be undertaken in conjunction with the Community Communication Strategy, as required by Item B7 of the Conditions of Consent.

All construction vehicles (including concrete agitator trucks) do not arrive at the site or surrounding residential precincts outside of the construction hours of works outlined in the consent conditions, including item C1, which includes the following:

- 7am to 7pm Monday to Friday
- 8am to 4pm Saturdays

6.2.2 Noise Monitoring

Noise monitoring will be performed by an acoustical consultant directly engaged by the contractor.

Noise monitoring is recommended to be undertaken by attended noise measurements at the start of any new phase of works (i.e. demolition, excavation or remediation works etc.). The statistical parameters to be measured should include the following noise descriptors: L_{Amin}, L_{A90}, L_{A10}, L_{A1}, L_{Amax} and L_{Aeq}. Unattended noise measurements should be conducted over consecutive 15 minute periods at the commencement of demolition and ground works on the site.

This monitoring should also be complemented by undertaking attended noise measurements in order to:

- Differentiate between construction noise sources and other extraneous noise events (such as road traffic and aircraft noise)
- Note and identify any excessive noise emitting machinery or operation.

In addition to the above detailed measurements, should any complaints be received which have not been determined previously, it should be confirmed by conducting additional attended noise measurements.

The survey methodology and any equipment should comply with the requirements discussed in Standard AS 1055.1-1997.

6.2.3 Noise Mitigation Measures for Non-Residential Receivers

Where exceedances have been identified in Section 3, the following mitigation measures are recommended:

- Undertake general mitigation measures as discussed in Section 6.
- Issue project updates to tenants in affected premises. The updates can include overview of current and upcoming works, as well as advanced warning of potential disruptions. These updates can also be issued through an email distribution list or via social media and in accordance with consent condition B7 requiring a Community Communication Strategy.
- Signage to be posted in order to provide stakeholders information regarding project details, emergency contacts and enquiry contact information in accordance with consent condition C1 requiring a site notice.

6.2.4 Alternate Equipment or Process

Exceedance of the site's NMLs should result in an investigation as to whether alternate equipment could be used, or a difference process could be undertaken. The assessment is required to be undertaken in coordination with the contractors undertaking the works to be conducted.

6.2.5 Acoustic Enclosures/Screening

Typically, on a construction site there are three different types of plant that will be used: mobile plant (i.e., excavators, skid steers, etc.), semi mobile plant (i.e., hand tools generally) or static plant i.e. (diesel generators).

For plant items which are static it is recommended that, in the event exceedances are being measured due to operation of the plant item, an acoustic enclosure/screen is constructed to reduce impacts. These systems can be constructed from Fibre Cement (FC) sheeting or, if airflow is required, acoustic attenuators or louvres.

For semi mobile plant, relocation of plant should be investigated to either be operated in an enclosed space or at locations away from a receiver.

With mobile plant it is generally not possible to treat these sources. However, investigations into the machine itself may result in a reduction of noise (i.e., mufflers/attenuators etc) and proactive mechanical maintenance.

6.3 Vibration Mitigation Measures

6.3.1 General Mitigation Measures

As part of the CNVMP, the following vibration mitigation measures should be implemented:

- Any vibration generating plant and equipment is to be in areas within the site in order to lower the vibration impacts to surrounding receivers.
- Investigate the feasibility of rescheduling the hours of operation of major vibration generating plant and equipment to within the allowable time set within the consent conditions which include rock breaking, rock hammering, sheet piling, pile driving and similar activities may only be carried out between the following hours:
  - (a) 9am to 12pm, Monday to Friday;
  - (b) 2pm to 5pm Monday to Friday; and
  - (c) 9am to 12pm, Saturday.
- Use lower vibration generating items of construction plant and equipment; that is, smaller capacity plant.
- Minimise conducting vibration generating works consecutively in the same area (if applicable).
- Schedule a minimum respite period of at least 30 minutes after a period of continuous 2 hours of work.
- Use only dampened rock breakers and/or "city" rock breakers to minimise the impacts associated with rock breaking works.
- Conduct attended measurements of vibration generating plant at commencement of works in order to validate the indicative safe working distances advised in Table 17 and, consequently, to establish safe working distances suitable to the project. Measurements should be conducted at the nearest affected property boundary. These safe working distances should be defined by considering the vibration criteria discussed in Section 4 (i.e., criteria for structural damage, human comfort and impact to scientific or medical equipment).

6.3.2 Vibration Monitoring

Vibration monitoring should be undertaken continuously at the nearest most affected structures.

The monitoring location would be on a stiff part of the structure (at the foundation) on the side of the structure adjacent to the subject demolition and construction works.

The vibration monitoring system will be configured to record the peak vibration levels and to trigger an alarm when predetermined vibration thresholds are exceeded. The thresholds correspond to an "Operator Warning Level" and an "Operator Halt Level", where the Warning Level is 75% of the Halt Level. The Halt Level should be determined based on the vibration criteria for building contents and structure (detailed in section 4.2).

Exceedance of the "Operator Warning Level" would not require excavation or demolition work to cease, but rather, alerts the site manager to proceed with caution at a reduced force or load.

An exceedance of the "Operator Halt Level" would require the contractor to implement an alternative excavation technique pending further analysis of the vibration frequency content in order to determine any potential exceedance of the criteria.

The vibration monitoring equipment would be downloaded and analysed by the acoustical consultant monthly including reporting of the collected data.

Reports of the measured vibration levels and their likely impacts would be prepared by the acoustical consultant and issued to the contractor monthly.

Vibration monitoring should be undertaken including the following:

1. Vibration Monitoring to include long term continuous vibration logging.
2. Monitors set to record maximum vibration levels including Peak Particle Velocity (PPV) magnitudes.
3. Monitors are required to be SMS enabled such that any events recorded above 'alert levels can be instantaneously sent to suitable builder, acoustic consultant and contractor representatives.
4. In the event results re received above 'alert levels the following response to events are required as detailed in the table below.
5. Vibration monitoring should be undertaken for the periods including demolition, exaction and construction of the building structure including installation of concrete to ground floor as a minimum or on agreement with neighbouring stake holders in the event monitoring details no negative impacts during the construction of the project.

Table 22 Required Response to Vibration Events

Location/ Receiver Type	Event Type		
	Trigger	Alert	Alarm, Stop Work
Surrounding Residential Dwellings	6 mm/s	7 mm/s	8 mm/s
See Section below for response to Event Types			

The required response to recorded event types detailed in the table above are included in the following table.

Table 23 Required Response to Vibration Events

Event Type	Required Response
Trigger level	All events above the trigger level are required to be recorded by the vibration monitors.
Alert	Temporarily cease the vibration generating activity and assess the reason for vibration exceedances. Modify the related construction practice to prevent future exceedances. Keep records of subsequent breaches to demonstrate that vibrations for modified activity do not reach Alert Level. All *Alert* events are to be SMS messaged to the building contractor site manager, subcontractor and acoustic consultant.
Alarm	**Stop Work Event** All *Alarm* events are to be SMS messaged to a relevant Richard Crookes, subcontractor and acoustic consultant. The activity generating the vibration levels is to be stopped immediately. Suitable representatives of the building contractor, the relevant Subcontractor, Heritage Consultant and acoustic consultant. Vibration monitoring report to be completed. Visual assessment of affected property will be conducted to assess whether damage is evident. The item/s of work generating the vibration events is not be recommenced until an action plan is agreed and implemented.

6.4 Noise and Vibration Monitoring

As part of the management of noise from the proposed construction activities to be undertaken on the site the following noise and vibration monitoring is to be undertaken:

1. Noise Monitoring– Attended noise monitoring of excavation and construction activities is to be undertaken during the following periods:
    a. Commencement of any rock breaking or sawing on the site.
    b. In response to any ongoing complaints received from neighbours.

2. Vibration – Based on the proximity of the surrounding receivers to the works magnitudes of vibration resulting from construction activities required to be undertaken on the site are not expected to approach vibration limits detailed in Section 4.2 of this report, therefore permanent continuous vibration monitoring is not recommended.

    Attended vibration monitoring is to be undertaken at the following periods:
    a. Commencement of any high vibration generating activities including hydrail hammering, rock breaking or vibration rolling on the site.
    b. receiver location in the event complaints resulting from construction activities resulting from the perception of vibration are experienced by the occupants of buildings within the vicinity of the site.

6.5 Complaints Management Process and Community Communication

A complaints management process and community communications strategy is required to be included for the project, including those developed in compliance with the project Conditions of Consent, including items B11, B12, B13 and B14 which include the following:

COMPLAINTS AND ENQUIRIES PROCEDURE

B11. Prior to the commencement of construction works for each building, or as otherwise agreed by the Planning Secretary, the following must be made available for community enquiries and complaints for the duration of construction:
- (a) a toll-free 24-hour telephone number(s) on which complaints and enquiries about the carrying out of any works may be registered;
- (b) a postal address to which written complaints and enquiries may be sent; and
- (c) an email address to which electronic complaints and enquiries may be transmitted.

COMMUNITY COMMUNICATION STRATEGY

B12. A community Communication Strategy must be prepared to provide mechanisms to facilitate communication between the Applicant, the relevant Council and the community (including adjoining affected landowners and businesses, and others directly impacted by the development), during the design and construction of the development and for a minimum of 12 months following the completion of construction.

B13. The Community Communication Strategy must:
- (a) identify people to be consulted during the design and construction phases;
- (b) include the telephone number, postal address and email required in **Condition B11**
- (c) set out procedures and mechanisms for the regular distribution of accessible information about or relevant to the development;
- (d) provide for the formation of community-based forums, if required, that focus on key environmental management issues for the development;
- (e) set out procedures and mechanisms:
    - (i) through which the community can discuss or provide feedback to the Applicant;
    - (ii) through which the Applicant will respond to enquiries or feedback from the community; and

NSW Government *13* *Ivanhoe Estate Redevelopment Stage 2*
Department of Planning and Environment *(SSD 15822622)*

- (iii) to resolve any issues and mediate any disputes that may arise in relation to construction and operation of the development, including disputes regarding rectification or compensation.

B14. Details demonstrating compliance with **Condition B11** and **Condition B12** must be submitted to the Certifying Authority and the Planning Secretary no later than one month before the commencement of any work.

6.5.1 Enquiries and complaints management

Community enquires and complaints will be undertaken and managed by the building contractor in accordance with the requirements of item B11 and detailed above.

6.5.2 Community Notifications

Prior to the works onsite being undertaken, it is recommended that community consultation with the neighbouring affected parties be undertaken. These include the locations detailed in the figure below.

Figure 4 Required Community Notification Area



Communication notification, should not be limited to the beginning of the onsite works but throughout, providing the community with constant updates on the progress and upcoming works. In our experience these could include:

- Project website.
- Email notifications; and
- Letterbox drops.

6.5.3 Community Engagement

It is proposed that throughout the duration of the project, continued meetings with both the school principals will be undertaken on a regular basis to monitor and mitigate any impacts of construction noise and vibration on the school community.

Community engagement has been undertaken during the design and approvals basis of the project and detailed in the Community Communication Strategy in accordance with condition B12.

6.6 Complaints Management System

Should complaints arise they must be dealt with in a responsible and uniform manner, therefore, a management system to deal with complaints is detailed above. Complaints will be undertaken in compliance with Condition B11 of the consent.

6.7 Contingency Plans

Contingency plans are required to address noise or vibration problems if excessive levels are measured at surrounding sensitive receivers and/or if justified complaints occur. Such plans include:

- Stop the onsite works.
- Identify the source of the main equipment within specific areas of the site which is producing the most construction noise and vibration at the sensitive receivers; and
- Review the identified equipment and determine if an alternate piece of equipment can be used or the process can be altered.
- In the event an alternate piece of equipment or process can be used, works can re-commence.
- In the event an alternate piece of equipment or process cannot be determined implement a construction assessment to be performed by a suitably qualified acoustic consultant.

The building contractor shall have access to view the Contractor's noise measurement records on request. The Superintendent may undertake noise monitoring if and when required.

6.8 General Mitigation Measures (Australia Standard 2436-2010)

As well as the above project specific noise mitigation controls, AS 2436-2010 "*Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites*" sets out numerous practical recommendations to assist in mitigating construction noise emissions. Examples of strategies that could be implemented on the subject project are listed below, including the typical noise reduction achieved, where applicable.

6.8.1 Additional Recommendations

- Regular reinforcement (such as at toolbox talks) of the need to minimise noise and vibration.
- Regular identification of noisy activities and adoption of improvement techniques.
- Avoiding the use of portable radios, public address systems or other methods of site communication that may unnecessarily impact upon nearby sensitive receivers.
- Where possible, avoiding the use of equipment that generates impulsive noise.
- Minimising the need for vehicle reversing for example (particularly at night), by arranging for one-way site traffic routes.
- Use of broadband audible alarms on vehicles and elevating work platforms used on site.

- Minimising the movement of materials and plant and unnecessary metal-on-metal contact.
- Minimising truck movements.

6.8.2 Plant and Equipment

- Choosing quieter plant and equipment based on the optimal power and size to most efficiently perform the required tasks.
- Selecting plant and equipment with low vibration generation characteristics.
- Operating plant and equipment in the quietest and most efficient manner.

6.8.3 On Site Noise Mitigation

- Maximising the distance between noise activities and noise sensitive land uses.
- Installing purpose-built noise barriers, acoustic sheds and enclosures.

6.8.4 Work Scheduling

- Providing respite periods which could include restricting very noisy activities to time periods that least affect the nearby noise sensitive locations, restricting the number of nights that after-hours work is conducted near residences or by determining any specific requirements.
- Scheduling work to coincide with non-sensitive periods.
- Planning deliveries and access to the site to occur quietly and efficiently and organising parking only within designated areas located away from the sensitive receivers.
- Optimising the number of deliveries to the site by amalgamating loads where possible and scheduling arrivals within designated hours.
- Including contract conditions that include penalties for non-compliance with reasonable instructions by the principal to minimise noise or arrange suitable scheduling.

6.8.5 Source Noise Control Strategies

Some ways of controlling noise at the source are:

- Where reasonably practical, noisy plant or processes should be replaced by less noisy alternatives.
- Modify existing equipment: Engines and exhausts are typically the dominant noise sources on mobile plant such as cranes, graders, excavators, trucks, etc. In order to minimise noise emissions, residential grade mufflers should be fitted on all mobile plant utilised on site.
- Siting of equipment: locating noisy equipment behind structures that act as barriers, or at the greatest distance from the noise-sensitive area; or orienting the equipment so that noise emissions are directed away from any sensitive areas, to achieve the maximum attenuation of noise.
- Regular and effective maintenance.

6.8.6 Miscellaneous Recommendations

Deliveries should be undertaken, where possible, during standard construction hours.

Maximise hammer penetration (and reduce blows) by using sharp hammer tips. Keep stocks of sharp profiles at site and monitor the profiles in use.

It is advised that mobile plant and trucks operating on site for a significant portion of the project are to have reversing alarm noise emissions minimised. This is to be implemented subject to recognising the need to maintain occupational safety standards without compromising the safety of construction staff and members of the public.

No public address system should be used on site (except for emergency purposes).

7 CONCLUSION

This report details the Construction Noise and Vibration Management Plan for the construction of the Ivanhoe Precinct, Macquarie Park, Ivanhoe Village Green & Community Centre project including item B37 of the SSD-15822622.

An assessment of noise and vibration impacts from the required processes to be undertaken during the construction period of the project (including ground works and construction) has been undertaken and suitable treatments, management controls, perioding measurements and community engagement has been detailed in this report.

Providing the recommendations in this report are included in the construction of the site, compliance with the projects SSD Conditions and the relevant EPA's *Interim Construction Noise Guideline* and the projects *Consent* will be achieved.

For any additional information please do not hesitate to contact the person below.

Regards



Ben White
Director

Pulse White Noise Acoustics

APPENDIX A: ACOUSTIC GLOSSARY

The following is a brief description of the acoustic terminology used in this report:

Ambient Sound	The totally encompassing sound in a given situation at a given time, usually composed of sound from all sources near and far.
Audible Range	The limits of frequency which are audible or heard as sound. The normal ear in young adults detects sound having frequencies in the region 20 Hz to 20 kHz, although it is possible for some people to detect frequencies outside these limits.
Character, acoustic	The total of the qualities making up the individuality of the noise. The pitch or shape of a sound's frequency content (spectrum) dictate a sound's character.
Decibel [dB]	The level of noise is measured objectively using a Sound Level Meter. The following are examples of the decibel readings of every day sounds; 0dB the faintest sound we can hear 30dB a quiet library or in a quiet location in the country 45dB typical office space. Ambience in the city at night 60dB Martin Place at lunch time 70dB the sound of a car passing on the street 80dB loud music played at home 90dB the sound of a truck passing on the street 100dB the sound of a rock band 115dB limit of sound permitted in industry 120dB deafening
dB(A)	*A-weighted decibels* The ear is not as effective in hearing low frequency sounds as it is hearing high frequency sounds. That is, low frequency sounds of the same dB level are not heard as loud as high frequency sounds. The sound level meter replicates the human response of the ear by using an electronic filter which is called the "A" filter. A sound level measured with this filter switched on is denoted as dB(A). Practically all noise is measured using the A filter. The sound pressure level in dB(A) gives a close indication of the subjective loudness of the noise.
Frequency	Frequency is synonymous to *pitch*. Sounds have a pitch which is peculiar to the nature of the sound generator. For example, the sound of a tiny bell has a high pitch and the sound of a bass drum has a low pitch. Frequency or pitch can be measured on a scale in units of Hertz or Hz.
Loudness	A rise of 10 dB in sound level corresponds approximately to a doubling of subjective loudness. That is, a sound of 85 dB is twice as loud as a sound of 75 dB which is twice as loud as a sound of 65 dB and so on
LMax	The maximum sound pressure level measured over a given period.
LMin	The minimum sound pressure level measured over a given period.
L1	The sound pressure level that is exceeded for 1% of the time for which the given sound is measured.
L10	The sound pressure level that is exceeded for 10% of the time for which the given sound is measured.
L90	The level of noise exceeded for 90% of the time. The bottom 10% of the sample is the L_{90} noise level expressed in units of dB(A).
Leq	The "equivalent noise level" is the summation of noise events and integrated over a selected period of time.
dB (A)	'A' Weighted overall sound pressure level
Sound Pressure Level, LP dB	A measurement obtained directly using a microphone and sound level meter. Sound pressure level varies with distance from a source and with changes to the measuring environment. Sound pressure level equals 20 times the logarithm to the base 10 of the ratio of the rms sound pressure to the reference sound pressure of 20 micro Pascals.
Sound Power Level, Lw dB	Sound power level is a measure of the sound energy emitted by a source, does not change with distance, and cannot be directly measured. Sound power level of a machine may vary depending on the actual operating load and is calculated from sound pressure level measurements with appropriate corrections for distance and/or environmental conditions. Sound power levels is equal to 10 times the logarithm to the base 10 of the ratio of the sound power of the source to the reference sound power of 1 picoWatt

NAFL	Noise Affected Level - As referred to in the EPA's *Interim Construction Noise Guideline* as the affected noise level for the trigger of construction noise mitigation requirements.
HNAL	High Noise Affected Level – As referred to in the EPA's *Interim Construction Noise Guideline.*
AV-TG	NSW EPA *Assessing Vibration Technical Guideline.*

APPENDIX B – BEN WHITE CV AND AAS MEMBERSHIP

Curriculum Vitae – Benjamin White



Employment Experience:

Director – Pule White Noise Acoustics November 2020 – Present

Director - White Noise Acoustics: March 2019 – Present

Director/Engineer - Acoustic Logic Consultancy: March 2001 – July 2018

Experience:

Ben White the Director of White Noise has over 17 years of experience in acoustic.

Ben has significant experience in providing acoustic services and expert advice in the following areas:

- Residential acoustic reports including aircraft noise (AS2021) assessments, traffic noise, train noise and vibration assessments.
- Noise emission assessments for various projects including assessments with planning requirements using EPA, Department of Planning, Council DCP's and similar regulatory requirements.
- Planning approvals including Development Applications for multi dwelling residential developments, commercial developments, hotels and boarding houses, places of entertainment, carparks, mixed use developments, shopping centres and the like.
- Expert court witness including Land and Environment Court and other expert witness work.
- Project planning and specifications for types of projects including residential, commercial, retail, hotel accommodation, warehouses and industrial developments and mixed-use projects.
- Project delivery for all types of projects including, design advice and project delivery requirements at all stages of projects during design and construction.
- Certification works including on site testing for the provision of certification of all types of projects including items required to comply with Part F5 of the BCA as well as project specific acoustic requirements.
- Mechanical design and advice for the treatments of mechanical services with project requirements.
- External façade design and specification.
- Specialised acoustic design advice including areas of projects.
- Issues with existing building include site surveys and audits as well as advice regarding rectification if required.



AUSTRALIAN ACOUSTICAL SOCIETY

This is to certify that

BENJAMIN WHITE

was admitted to the grade of

MEMBER

of the Australian Acoustical Society

on 27th October 2020

and is entitled to use the letters

M.A.A.S.

issued on 26th November 2020

S. Moore

President

General Secretary

AUSTRALIAN ACOUSTICAL SOCIETY A.C.N. 000 712 658 The Common Seal Of

This certificate remains the property of the Australian Acoustical Society

Post Approval

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Applying as a company/business?

Yes

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Branch Name	

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Role/Position	Consultant

Post Approval Details

Project:

Ivanhoe Estate Redevelopment - Stage 2 - SSD-15822622-PA-8

Name of Document

Building C2 - CNVMP

Related matter

Management Plan or Strategy

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

In compliance with Condition B37 - Construction Noise and Vibration Management Plan (CNVMP)

Applicable Conditions

Schedule	Condition
B	37

Consultation through the Major Projects portal

Consultation required as part of the preparation of the document?

Yes

Consultation made through the Department's portal

No

Attachment of Post Approval application

File Name	Category
240360-Ivanhoe BC2 Community-CNVMSP_BW_R0.pdf	Post Approval Document

Grindley Construction

Air Quality and Odour Management Plan

Ivanhoe Village Green & Community Centre - 1 Ivanhoe Place, Macquarie Park NSW 2113

Purpose:

A plan to monitor and mitigate potential air quality and odour impacts related to site operations.

Prepared for:

Grindley Construction

Document Date:

26 July 2024

Reference:

S-07641.AQOMP.001

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DOCUMENT CONTROL

Project Details:	
Report Name:	Air Quality and Odours Management Plan: Ivanhoe Village Green & Community Centre - 1 Ivanhoe Place, Macquarie Park NSW 2113
Client Name:	Grindley Constructions
EDP Reference:	S-07206.AQOMP.001
Prepared By:	Gonzalo Serna Diaz
Reviewed By:	Robert Gauthier

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GLOSSARY

Term	Definition
ACM	Asbestos Containing Materials
AS	Australian Standard
AST	Above-ground Storage Tank
Control Measures	The actions to be undertaken to achieve the stated environmental objectives, including any necessary approval, application, consultation or monitoring.
Contractors	Individuals or companies employed to carry out works or services that could potentially have an environmental impact if control measures are not implemented.
Corrective Actions	Nomination of the action being implemented if the stated objectives are not being met or maintained, including responsibility for implementation.
EMP	Environmental Management Plan
ENM	Excavated Natural Material
EPA	Environment Protection Authority
EPL	Environment Protection License
JSEA	Job Safety Environmental Analysis
Monitoring	The process of measuring actual environmental performance.
OEMP	Operational Environmental Management Plan
Receptor	Environment, property, humans, animals or anything else that could be affected by a hazard
Reporting	Description of the required reporting arrangement
SSD	State Significant Development
SWMS	Safe Work Method Statement
Vapour	Refers to a gas phase at a temperature where the same substance can also exist in the liquid or solid state
VENM	Virgin Excavated Natural Material
VOCs	Volatile organic compounds

1. AQOMP CONTEXT AND OBJECTIVES

1.1 Context

This Air Quality and Odour Management Plan (AQOMP) applies to the proposed construction operations undertaken as part of the development of the Ivanhoe Village Green & Community Centre, also known as the Midtown C2 project located at 1 Ivanhoe Place, Macquarie Park NSW 2113 ('Site').

The Midtown C2 project is part of Stage 2 of the greater Ivanhoe Estate Project. The Site is in lot C2 of the greater Ivanhoe Estate site at the former Ivanhoe Estate Social Housing precinct.

The AQOMP describes management and mitigation measures to control operations and excavation works that may hold the potential to generate fugitive impacts to air quality during construction works associated with the Midtown C2 project.

This document has been structured to meet industry-standard requirements for an AQOMP and to enable compliance with the obligations under condition B38 of the State Significant Development (SSD)

1.2 Objectives

The objectives of this AQOMP are to minimise potential impacts associated with odours and air quality (specifically as general/undefined dust), including:

- Adverse impacts of transport of soil/rock from the excavation and materials movement areas, storage, and transport of excavated soil/rock material on site;
- Should an incident occur, effective response and management procedures are achieved;
- Should an odour complaint be received, it is appropriately investigated and responded to
- Provide methods and controls to enable workers to effectively observe, identify, document and manage potential air quality impacts and appropriately control risks

The AQOMP will also include proactive and reactive management strategies, key performance indicators, monitoring measures, record keeping, response mechanisms, and contingency and compliance reporting measures.

Additionally, this AQOMP will address the obligations under condition B38 of the SSD. **Table 1** outlines all the obligations and addressing sections.

Table 1 - SSD obligations and addressing sections

Obligation	Addressing Section
(a) Staged excavation to limit the surface area of exposed odours material	6.5
(b) Application of odours suppressant	6.9
(c) Effective covering of stockpiles and truckloads of excavation spoil	6.5, 6.6
(d) Expedited removal of odours material from the development to a facility legally able to accept those wastes	6.12

2. PROPOSED DEVELOPMENT

The development proposes the following:

- Approximately 3,300m² of open green space between C1 and C3 towers;
- A community centre and social enterprise café located on the upper ground floor, with a total area of 700m²;
- A pool and gym facility on the ground floor that overlooks the park, with a total area of 1,122 m²; and

- Integration with the surrounding landscape, consisting of a community plaza, community terrace and garden, playground, central lawn and community veranda.

To achieve the scope of the proposed development, excavation, pilling, and detailed earthworks will be undertaken.

3. SITE DETAILS

3.1 Site Information

This Site is located at 1 Ivanhoe Place, Macquarie Park NSW 2113. Site location figure is included as **Appendix A**.

Table 2 - Site identification details

Address	1 Ivanhoe Place, Macquarie Park NSW 2113
Title identification	Lot 10 in DP 1262209
Local Government Area	City of Ryde
Area	Ivanhoe Estate Site 82,00 m^2
Zoning	MU1 – Mixed Use
Current land use	The site is under an eight-stage development project to provide over 3000 dwellings with a mix of market, social and affordable housing. Age care facilities, childcare centres, schools, neighbourhood parks, town plazas and the Village Green and Community Centre will be constructed.
Surrounding land uses	North – Herring Road, followed by residential buildings South – Shrimptons Creek, followed by residential buildings East – Ivanhoe Place, followed by residential dwellings West – Epping Road, followed by residential dwellings

3.2 Environmental Considerations

The potential for the construction works to encounter or generate odorous materials is a key consideration of identifying risk areas of the project. Previous investigations across the site were undertaken in accordance with the Secretary's Environmental Assessment Requirements (SEARs) Condition 11: Contamination for Stage 2 development at Ivanhoe Estate, Macquarie Park, NSW:

Consultants Environmental Earth Science NSW (2021) undertook a review of existing data and conducted additional sampling to provide a summary of potential contamination (and potentially odourous materials on site

3.2.1 Fill Material

Following the Douglas Partners (DP, 2017), DLA (DLA, 2018a) and Environmental Earth Sciences (2021a) investigations, an estimated 23,676 cubic metres (m^3) of in situ material was classified as General Solid Waste (GSW) in accordance with the Waste Guidelines, should the material be removed from the site.

A further soil assessment was conducted by Environmental Earth Sciences (2021e) in the area south and southeast of the Midtown sales office whereby an estimated 1,000 m3 of in situ material was classified as GSW in accordance with the Waste Guidelines.

3.2.2 Unconsolidated Natural Layer

Approximately 3,023 m3 (~4,837 tonnes (t)) of unconsolidated soil material was chemically and physically assessed and considered suitable for offsite beneficial reuse as virgin excavated natural material (VENM), as per the definition of VENM documented in Schedule 1 of the POEO Act. Refer to Environmental Earth Sciences (2021b, 2021d and 2021e).

3.2.3 *Bedrock Layer*

Approximately 59,576 m3 (~154,898 t) of bedrock material was subject to assessment as natural material as per the definition of VENM documented in Schedule 1 of the POEO Act. Assessment also included ascertaining the chemical and physical attributes of the material in accordance with chemical testing requirements of the Resource Recovery Order under Part 9, Clause 93 of the Protection of the Environment Operations (POEO) (Waste) Regulation 2014 - the excavated natural material order 2014 (the "ENM Order"), ENM Order.

Based upon results and findings from this assessment it was concluded that material in this layer met the definition of VENM. This was supported by results of chemical and physical attributes testing which reported concentrations of all samples within acceptable threshold criteria of the ENM Order. Refer to Environmental Earth Sciences (2021b) for further information.

The reviewed data as above provides a reasonable basis to indicate it is unlikely that odorous, anthropogenic material is expected to be encountered during construction activities, and the air quality and odour objectives in this Plan should be designed to manage risk potentially associated with generation of dust or other fugitive impacts as appropriate.

4. LEGISLATIVE OBLIGATIONS AND OTHER REQUIREMENTS

4.1 Environmental Planning and Assessment Act 1979

The air, water and noise pollution legislation administered by the DEC (Department of Environment and Conservation) complements the environmental planning control system in the Environmental Planning & Assessment Act (EP&A Act) by imposing requirements on new projects. Pollution is permitted up to certain levels under a system of work approvals and licences.

This Act enables the Minister for Planning to set Approval Conditions as well as require the assessment of environmental impacts in accordance with Schedule 3 of the Environmental Planning and Assessment Regulation 2000 before approval can be obtained for the proposal to proceed.

4.2 Protection of the Environment Operations Act 1997

This Act is the primary NSW environment protection legislation that covers air, noise, water, land and waste management. It provides a framework to regulate and enforce pollution control in NSW. The Act identifies mechanisms for preventing environmental degradation including, pollution prevention, cleaner production, reduction in discharge levels likely to cause harm to the environment, recycling and progressive environmental improvement.

Under Section 148 of the Protection of the Environment Operations Act (PoEO) Act, there is a duty to notify pollution incidents causing or threatening material harm to the appropriate regulatory authority (ARA). Harm to the environment is defined (s147) as material if it involves actual or potential harm to the health or safety of human beings that is not trivial, or it results in actual or potential loss or property damage exceeding $10,000 (includes clean-up costs). The ARA for this project is the DEC.

Part 5.4 of the PoEO Act prescribes the requirements in relation to air emissions. The occupier of any premises is guilty of an offence if plant is being operated in a way to cause air pollution if that air pollution is caused by the occupier's failure (a) to maintain the plant in an efficient condition, or (b) to operate the plant in a proper or efficient manner (s124).

A similar prohibition exists in relation to causing air pollution by failing to deal with materials in a proper and efficient manner (s126). Materials include raw materials, materials in the process of manufacture, manufactured materials, by-products or waste materials.

4.3 Guidelines

NSW EPA Approved methods for the sampling and analysis of air pollutants. This guideline outlines the methods used for sampling and analysing air pollutants in New South Wales for statutory purposes. The document covers pollutants in emissions from stationary sources, including:

- Continuous monitoring of such emissions;
- Pollutant emissions from motor vehicles;
- Components in, and properties of, petroleum products; and
- Pollutants in ambient air.

This AQOMP aims to minimise the risk of construction activities associated with the Midtown C2 Project, which could result in potential adverse air quality impacts, whereby criteria may be exceeded.

5. ROLES AND RESPONSIBILITIES

This AQOMP is designed to be managed under the responsibilities outlined below in **Table 3.** As such, the principal contractor (Grindley Construction) is responsible for the overall implementation and maintenance of the AQOMP and for ensuring that staff members and sub-contractors have been informed of the requirements of the AQOMP. The responsibilities may be delegated where appropriate (such as contractors during site preparation, development and bulk earthworks) but this must be done in writing and notified to all affected parties.

The supervisor or person-in-charge of any intrusive works that impact the site is responsible for implementing the requirements of the AQOMP during works and must ensure that all occupants of the site and contractors working on the site have been informed of the requirements of the AQOMP prior to commencement of any works.

Table 3 outlines the main parties that may be involved in implementing this AQOMP and their respective roles and responsibilities. This table does not intend to list all responsibilities under relevant legislation but is a brief clarification of the roles and responsibilities in implementing this AQOMP.

Table 3 - Roles and Responsibilities

Roles and Responsibilities
Grindley Construction / Any future Person Conducting and Business or Undertaking (PCBU):
▪ Approve the AQOMP and hold overall responsibility for the implementation and maintenance of the AQOMP; ▪ Advise persons working or operating on the site of the requirements of the AQOMP; ▪ Ensure appropriate consents and licences (as required) are obtained for the works; ▪ Provide training and induction of employees and contractors before and during the works, as appropriate; ▪ Appoint a site manager or Management Plan Controller; ▪ Incorporate this AQOMP into relevant policies and procedures, including the owner's management system and subcontractor agreements; ▪ Be responsible for promoting good environmental and WHS Management; ▪ Provide a copy of the AQOMP to the supervisor or person-in-charge of the works being undertaken; ▪ Engage a suitably qualified environmental consultant to update the AQOMP if the conditions at the site change, and, if necessary, inform other parties of the changes; ▪ Ensure contractors and personnel involved in the works comply with the requirements of the AQOMP; ▪ Ensure construction staff and contractors clearly understand the requirements of the AQOMP and ensure that compliance with the AQOMP is a condition of any agreement with these parties; ▪ Ensure the conditions of the AQOMP are implemented and supplemented, if necessary, by any conditions of development or works approvals; ▪ Ensure the site and site records are maintained in accordance with the AQOMP; ▪ Ensure all non-conformances and/or complaints are recorded and appended to this AQOMP; ▪ Monitor and act to ensure management requirements are implemented throughout the life of the workplace; and ▪ Conduct site inspections for conformance to the AQOMP under normal site use conditions.

AQOMP **Controller :**
▪ Develop protocols and procedures to ensure that the AQOMP is enforced; ▪ Approve all intrusive works via the PCBU; ▪ Ensure risk assessments of ground disturbance activities are carried out by a competent person (i.e. a suitably trained employee, qualified Environmental Consultant) on a regular basis as outlined in this AQOMP, appropriate management procedures are developed and safe work method statements; ▪ Provide inductions to all relevant site personnel as detailed in this AQOMP; ▪ Provide or delegate supervision as required to ensure that the procedures documented in this AQOMP are implemented; ▪ Establish a platform for consultation for all relevant site personnel to ensure responsibilities are understood and feedback can be provided; ▪ Ensure related records are maintained. Records such as the training records, incident reports, contractor licences, SWMS, air monitoring reports and any investigation outcomes are also to be included**;** ▪ Ensure a copy of the AQOMP is made readily accessible for all relevant personnel.
Employees and Sub-Contractors:
▪ Not placing themselves or others at risk of exposure to potential poor air quality or odours; ▪ Understanding and following the procedures outlined in this AQOMP; ▪ Follow instruction from the site manager or controllers regarding the implementation of this AQOMP; ▪ Competency in the identification of unexpected odorous or excessively dusty conditions or similar and the control measures to be adopted when undertaking works at the site; ▪ Reporting hazards, including incidents and unsafe work practices to the AQOMP Controller.
Environmental Consultant (if appointed):
▪ Assess the risk involved with any proposed works prior to commencing proposed works; ▪ Undertake routine inspections and monitoring to assess compliance with this AQOMP. Provide recommendations for updates and enhancements to the AQOMP, as required; ▪ Provide Health, Safety and Environmental advice for proposed changes to site layout, operations or site-specific activities, as required; ▪ Support AQOMP Induction Training, as required; and ▪ Develop documentation for unexpected findings and/or maintenance works.

6. ENVIRONMENTAL MANAGEMENT AND CONTROLS

6.1 Introduction

The air quality and odour management processes and controls outlined in this section have been developed with reference to condition B38 of the State Significant Development (SSD) dated 28th November 2022. Any non-conformance shall be documented and followed-up accordingly, allowing the process to be continually reviewed and potentially refined if necessary.

6.2 Housekeeping and General Requirements

The following general environmental work practices shall apply to all activities at the Site:

- On noticing or becoming aware of any environmental hazard, an employee or contractor shall remove it as soon as practicable, or if this is not possible, shall alert nearby workers to the hazard and report it immediately to the Site Manager.
- Employees and contractors, where relevant, shall take an active part in environmental monitoring meetings, training, and emergency drills.

- Keep workplaces tidy. Rubbish should be cleaned away and deposited in the appropriate bins/containers/receptacles.
- Undertake all work in a sustainable manner, seeking to minimise dust or odour generation to the extent practicable.
- Obey all signs. These signs are located and displayed to advise you of hazards in particular areas.
- If you do not know what something is, do not touch/disturb it. Report it to the Site Manager.
- No employee or contractor shall wilfully or deliberately damage the environment or alter its conditions.
- Employees and contractors shall use the designated equipment and/or wear the designated personal protective equipment required for each task.

6.3 Work Permits

The permit to work system is a formal written system used to control certain types of potentially hazardous work being conducted by contractors. It also is a way of establishing communication and understanding between the principal contractor and the personnel or sub-contractors who are going to execute the work.

Work permits should be issued in accordance with the Grindley Management System for all contractor scopes of work, potentially including:

- Handling
- Pilling;
- Excavation;
- Stockpiling; and
- Transport and disposal works.

Sub-contractors must provide a person on-site who is trained and accredited in accepting and authorising work permits. Responsibilities of the person(s) undertaking the work include the following:

- Be skilled, qualified, trained and competent to perform the work, use any personal protective equipment or equipment required.
- Satisfy themselves that they understand the requirements of the permit.
- Be aware of the hazards that could exist and have the necessary controls in place.
- Adhere to the permit to work requirements.
- Ensure the job is performed in a manner that minimises potential air quality and odour impacts.
- Make equipment and area safe on completion of the task.
- Seek immediate advice if in doubt or if circumstances or conditions change within the work area.
- At the completion of the job, returning the permit to the Issuer for closure.

6.4 Storage and Handling of Hazardous Chemicals

All hazardous chemicals will be stored in a manner to avoid risks of pollution of air and generation of unacceptable odours. All flammable and combustible liquids are stored and handled on-site in accordance with relevant standards such as AS1940-2004 *The storage and handling of flammable and combustible liquids*.

All hazardous chemicals will be stored in such a way as to avoid risks of pollution.

It is anticipated that the chemicals to be on-site may include fuels, oils, and lubricants.

The following procedures shall be implemented for storage and use of hazardous chemicals:

- Where practicable, all chemicals will be removed and safely stored off-site at the end of each workday;
- Chemicals to be stored on-site shall be in labelled sealed containers within a leak proof spill tray and covered with a tarpaulin;
- Chemicals storage area shall be within a designated bunded area;
- Clean-up must not involve the over-use of disinfectants, or the use of environmentally damaging disinfectants;

- Copies of Safety Data Sheet (SDS) for all chemicals are available on-site (site office);
- All herbicides are to be applied in accordance with the manufacturers' recommendations; and
- Disposal of any surplus hazardous substances shall be in accordance with the requirements of the material safety data sheets, environmental authorities and statutory requirements.

6.5 Excavation and Off-site Disposal

Prior to any intrusive works or other disruptive activities carried out on site, consideration must be given to how the work or activity can be undertaken with minimal dust generation. All works should be undertaken with control of dust as a priority. The dust control or avoidance measures should be documented in a SWMS, or similar, prepared for the proposed works.

Should any unexpected hazards arise, the site manager should be contacted immediately so that the risks (health or safety) can be re-evaluated and the appropriate level of management and/or protection can be implemented prior to the recommencement of any works.

The following procedures and techniques mayl aid in controlling dust generation:

- Erection of dust screens around the perimeter of the site;
- A tarpaulin (or equivalent) maybe used to securely cover all loads of soil material entering or leaving the site (if applicable);
- Water sprays may be used across the site over unsealed or bare surfaces;
- HDPE sheeting can be used by to cover excavation faces and stockpiles where necessary; and
- Materials at the site should be processed, handled, moved and stored in a proper and efficient manner in order to minimise exposure.

If the above procedures and techniques are not sufficient to control dust, then further contingency measures may include:

- Reducing the area of disturbed surfaces;
- Installation of perimeter sprays on the remediation site boundary fencing;
- Conducting work in more favourable weather conditions;
- Modifying the manner in which excavation work is conducted at the site;
- Using different equipment which generates less dust; and
- Using equipment in more favourable weather conditions.

6.6 Stockpile Management

The following recommended for soil stockpiled during the works:

- Stockpiles be established on hardstand, HDPE sheeting or geofabric on the ground surface (as required);
- Dust suppression measures will be in place;
- Stockpiles should be limited to 2 m in height where possible and should be of the lowest height practicable;
- Stockpiles may be wetted down with water, subject to considerations for stormwater and surface water management;
- Stockpiles can be covered with weighted HDPE or geofabric if likely to generate fugitive dust;
- Stockpiles can be suitably barricaded or otherwise fenced off to prevent access;
- Stockpiles of soil or other materials should be placed away from drainage lines, gutters or stormwater pits or inlets;
- Stockpiles of soil or other materials likely to generate dust or odours should be covered, if required; and
- Stockpiles should be stored in a secure area and be covered with weighted geofabric or HDPE sheeting if remaining more than 24 hours.

6.7 Wind Speed Work Stoppage

The application of a wind speed work stoppage requirement is designed to control fugitive emissions due to increased air velocity. In the event of high wind speeds, excavation work must be stopped at the site until wind speeds are reduced to a speed that shall not generate visible emissions from the site. For the purposes of this site, work must be stopped when:

- Wind speeds reach a sustained 40 km/h; or
- Any wind speed at which particulates are observed by site personnel to be entrained in the air stream.

If site-specific weather creates conditions that may result in fugitive emissions, work stoppage may occur at wind speeds less than specified above based on decisions of the site supervisor. The site supervisor shall make the decision as to when it is appropriate to restart.

6.8 Unexpected Finds (Asbestos)

In the event that suspected asbestos is encountered during excavation works, and to promote healthy air quality for all the site occupants, the Unexpected Finds Protocol should be followed.

6.9 Odour Generation

Odour should be controlled so that no unacceptable odours are detected at the boundaries of the site during development works. The following procedures may be employed to comply with this requirement such as:

- Use of appropriate covering techniques;
- Use of plastic sheeting to cover excavation faces or stockpiles;
- Use of fine mist sprays;
- Use of a mitigating agent on the impacted areas/materials; and
- Adequate maintenance of equipment and machinery to minimise exhaust emissions.

6.10 Refuelling and Maintenance

Hydrocarbon can generate strong and unpleasant odours The following control measures shall be implemented to manage potential fuel spill risk associated with refuelling and maintenance:

- Only undertaken on hardstand or designed refuelling areas;
- Only to be undertaken by those skilled and trained;
- Refuelling to be undertaken in accordance with documented procedure and manufacturers recommendations;
- Documented procedures shall be kept on-site and be updated if required;
- On-site maintenance to be limited to the extent practicable;
- Spill kits to be present and available during any refuelling or maintenance activities; and
- Immediate clean-up of any incidents, with appropriate reporting.

6.11 On-Site Vehicles and Plant

Dust and exhaust emissions at the Site from on-site vehicles and plants could represent a risk to air quality and odour objectives if not appropriately managed. The following general measures should be implemented as part of routine site activities:

- Ensure that all vehicles, plant and equipment are maintained in good working condition and operated in accordance with manufacturer's recommendations;
- Motorised equipment should be turned off when not in use;
- Ensure that trucks are loaded in accordance with weight restrictions and other relevant compliance requirements;
- Scheduling, to spread traffic volumes throughout the day where possible; and

- Support and promote policy initiatives and technologies to improve fuel efficiency and reduce emissions, provided they are feasible and commercially viable.

6.12 Waste Management

To help minimise odours, routine waste generated at the Site should be managed in accordance with the following principles:

- Dedicated waste receptacles with adequate volume should be provided in various locations across the Site, to ensure waste is appropriately contained prior to off-site disposal;
- Waste bins should be emptied regularly to avoid overflowing;
- Waste minimisation should be be undertaken according to the hierarchy of avoidance, reuse, recycle and disposal. Where possible, recyclable waste should be segregated and sent to appropriate facilities for recycling;
- All waste should be disposed off-site to licenced receivers; and
- Sewerage infrastructure should also be maintained in proper and efficient condition to ensure system integrity and minimise overflows.

7. INDUCTION AND TRAINING

All staff and contractors should be made aware of the AQOMP, its general contents and the following responsibilities as part of standard onboarding and induction protocols:

- Housekeeping and general requirements (Section 6.2);
- Responsibility to ensure Site activities do not cause contamination or pollution, or result in a breach of the environmental legislation;
- Incident reporting requirements;
- Emergency response;
- Record keeping requirements; and
- Complaints procedures.

Contractors shall also be advised of their responsibility to identify potential hazards and appropriate controls for each task, as part of their Safe Work Method Statement preparation.

Specific staff and contractor training is also required for any personnel involved with:

- Excavation, trenching or pilling work;
- Refuelling and maintenance; and
- Chemical storage and handling.

Training and induction records shall be kept on Site and accessible for inspection, if required.

7.1.1 Spills

Spill kits should be readily available across the Site.

If spilling occurs during daily activities, the area should be isolated, and clean-up should occur as soon as possible. Any spilled material will either be treated onsite or disposed to an appropriate NSW EPA approved waste management facility.

NSW Fire and Rescue via its Hazmat Response Unit is the lead combat agency for any spill emergency which cannot be readily contained and managed.

7.2 Complaints and Environmental Incident Register

The receipt of complaints will be handled and responded to according to Grindley Construction policy. The telephone number of the site manager will be displayed on the front gate signage along with the other signage. This person will be the primary contact for complaints.

The purpose of the Complaints and Environmental Incident Register is to maintain a register of complaints from local residents or concerned parties, which will include a record of any action taken with respect to the complaints.

The Complaints and Environmental Incident Register is required to be completed immediately following the receipt of any complaints associated with works undertaken at the Site. Written complaints should be addressed or acknowledged within five days of the complaint being received. Complaints made by telephone or in person should be addressed or acknowledged within two days of receipt..

8. SITE MONITORING AND AQOMP REVIEW

The AQOMP is to be a dynamic document that is revised where necessary to reflect any changes to the site that may result in a change to the exposure risk factors and associated controls. As soon as reasonably practicable, after such a change is identified, the AQOMP shall be revised by a suitably experienced and qualified Environmental Consultant as nominated by the PCBU of the Site. Whenever the AQOMP is amended, all site personnel including contractors shall be inducted to the revisions of the AQOMP and any associated revisions relating to their responsibilities. The AQOMP shall be maintained by the PCBU of the site.

8.1 Site Inspections

In order to monitor the effectiveness of any existing controls protecting against potential poor air quality and odour generation, it is essential that regular inspections are conducted by a suitably trained person appointed by the PCBU. Visual inspections of the Site shall be carried out to ensure that the Site is in good condition and all recommended controls are in place. Examples of when routine inspections should be carried out include:

- Whenever an incident or complaint has been reported; and
- Prior to and following any works that involve new methodology or machinery.

A site inspection checklist shall be completed by suitably trained person appointed by the PCBU during the Site inspections and records kept within this AQOMP. Photographs from each inspection should be kept on record as part of the checklist. Detailed photos should be taken where issues are identified at the Site, such as exposed asbestos, metals or material being uncovered across the exposed ground surface, shall be documented, and recorded to help establish whether further management measures are required.

8.1.1 Daily and Weekly Inspection

Daily and weekly inspections of control measures should be undertaken by Grindley Construction and confirmed to adhere to the requirements of this AQOMP. Daily inspection should typically be undertaken at the beginning and end of the workday to ensure that systems and controls/measures are in place overnight.

Items to be inspected include but are not limited to:

- Site fencing (internal and boundary);
- Stockpiles;
- Open excavations;
- Air Quality controls;
- Waste management; and
- Dust suppression measures.

During completion of the works, where damage to or reduced capacity of, control measures is observed or reported, they should be corrected as soon as is reasonably practicable.

8.1.2 Monitoring

During any planned construction works, monitoring will be conducted to ensure compliance with legislation, as well as the objectives and targets stipulated in this AQOMP.

All regular monitoring activities should be recorded. The frequency and specific monitoring criteria will be assessed periodically throughout the works to ensure that they are consistent with the current level of risk to the environment and human health.

8.1.3 Non-Conformances and Corrective Action

In the event that a non-conformance is identified through the routine inspection, Grindley Construction shall take appropriate action to ensure it is corrected appropriately and as soon as practicable, with reference to the ISO14001 recommended procedure for corrective actions.

Any action to rectify a non-conformance will be recorded and documented.

Follow-up action may result in a requirement for additional monitoring or investigation, and these details will be further assessed.

8.2 Records

Reports are to be prepared by the Project Manager for the works and appended to this AQOMP.

Table 1 - Reporting Requirements

Report	Frequency
Daily inspection walkover registers	Daily (recorded as register)
Site inspection checklist	Weekly
Review of identified corrective actions	Weekly
Complaints management	If required

Examples of reports/records (not exhaustive) which may be required during construction works include:

- Unexpected finds protocol;
- Inspection reports undertaken by suitably qualified personnel;
- Licenses, permits, consents or conditions of approval (as relevant);
- Training and induction records;
- Environmental audits;
- Environmental event/incident and investigation reports;
- MSDS and chemical register training and induction registers;
- Environmental monitoring data and reports; and
- Environmental complaints records.

9. AQOMP REVISION

The effectiveness of this AQOMP will require review by responsible parties at the following intervals:

- Prior to the commencement of works;
- During the course of the proposed works;
- Any changes of scope of work or significant Site changes; and
- Following any incident or unexpected find throughout the works period.

In the event the review identifies amendments to the AQOMP are required (likely due to a change of scope of work, site condition or relevant legislation), the adopted control measures will be assessed and revised accordingly. Any necessary control measures will be implemented following agreement between all involves parties. Any controls identified by Grindley Construction during planned works should be incorporated into the AQOMP.

This AQOMP is required to be reviewed following identification of any change in the understood nature of the project or any significant change in the scope of works. It is the responsibility of the AQOMP Controller to ensure the AQOMP supplied to any person is the current updated or amended version.

STATEMENT OF LIMITATIONS

This document has been prepared in response to specific instructions from the client to whom the report has been addressed. The work has been undertaken with the usual care and thoroughness of the consulting profession. The work is based on generally accepted standards, practices of the time the work was undertaken. No other warranty, expressed or implied, is made as to the professional advice included in this report.

The report has been prepared for the use by the client and the use of this report by other parties may lead to misinterpretation of the issues contained in this report. To avoid misuse of this report, EDP advise that the report should only be relied upon by the client and those parties expressly referred to in the introduction of the report. The report should not be separated or reproduced in part and EDP should be retained to assist other professionals who may be affected by the issues addressed in this report to ensure the report is not misused in any way.

Reliance on Information Provided by Others

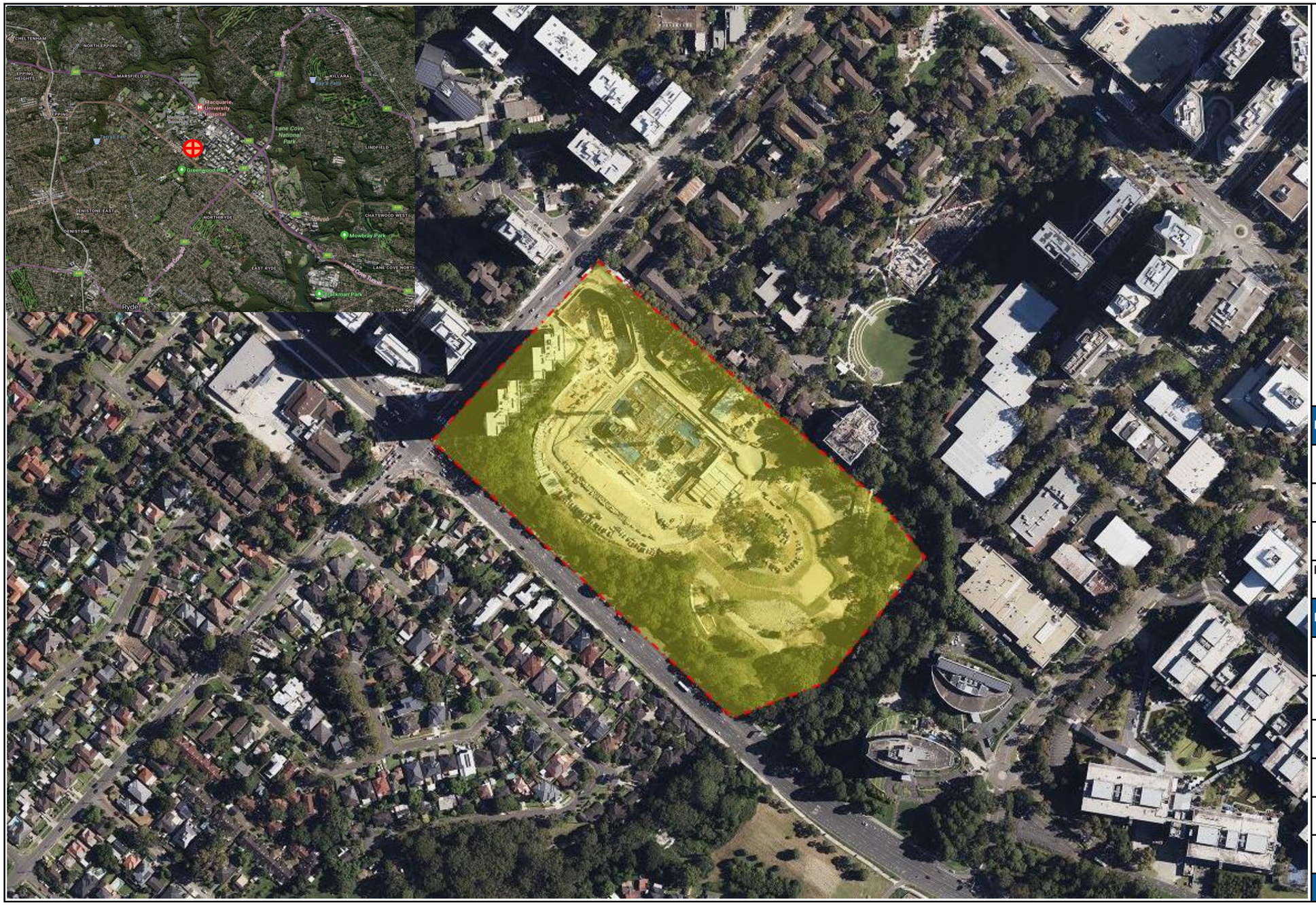
EDP notes that where information has been provided by other parties in order for the works to be undertaken, EDP cannot guarantee the accuracy or completeness of this information the client therefore waives any claim against the company and agrees to indemnify EDP for any loss, claim or liability arising from inaccuracies or omissions in information provided to EDP by third parties. No indications were found during our investigations that information contained in this report, as provided to EDP, is false.

Recommendations for Further Study

The industry recognised methods used in undertaking the works may dictate a staged approach to specific investigations. The findings therefore of this report may represent preliminary findings in accordance with these industry recognised methodologies. In accordance with these methodologies, recommendations contained in this report may include a need for further investigation or analytical analysis. The decision to accept these recommendations and incur additional costs in doing so will be at the sole discretion of the client and EDP recognises that that the client will consider their specific needs and the business risks involved. EDP does not accept any liability for losses incurred as a result of the client not accepting the recommendations made within this report.

APPENDIX A: FIGURES

FIGURE A2: SITE LOCATION



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Ivanhoe Village Green & Community Centre - 1 Ivanhoe Place, Macquarie Park NSW 2113

SITE LOCATION

LEGEND:	
	Approximate greater Ivanhoe Estate site boundary
	Approximate site location

Image from: Nearmap, 28 June 2023

DETAILS:	
Report Name:	Air Quality and Odour Management Plan
Client Name:	Grindley Construction
EDP Reference:	S-07641.AQOMP.001
Figure Number:	1
Figure Name:	Site Location
Assessment Date:	Friday, 26 July 2024

FIGURE A2: SITE LOCATION



edp
an RSK company

13 Bumborah Road, Port Botany NSW 2036

SITE DETAILS

LEGEND:	
	Midtown C2 project location

Image from: Nearmap, 30 May 2023

DETAILS:	
Report Name:	Air Quality and Odour Management Plan
Client Name:	Grindley Construction
EDP Reference:	S-07641.AQOMP.001
Figure Number:	2
Figure Name:	Site Features
Assessment Date:	Friday, 26 July 2024



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an Elephants Foot Company

Ivanhoe Estate Midtown, Macquarie Park

Mixed Use Development

CONSTRUCTION WASTE MANAGEMENT PLAN

28/06/2024
Revision C

Client

Grindley Construction Pty Ltd.

Architect

CHROFI

ELEPHANTS FOOT

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SCOPE

A Waste Management Plan (WMP) is to be submitted with all development applications for new and change-of-use developments that will generate construction waste.

This WMP applies only to the **construction** phase of the proposed development. The requirements outlined in this WMP must be implemented on site during construction and may be subject to review upon any change to the design. Construction waste management requirements will also be subject to review as part of the Construction Management Plan.

There are no **demolition** works proposed as part of this development application.

The waste management for the **operational** phase of the development is not addressed in this report, and can be provided separately.

REVISION REFERENCE

Revision	Date	Prepared by	Reviewed by	Description
A	27-06-2024	T. McPherson	J. Parker	Draft
B	27-06-2024	T. McPherson	J. Parker	Amendment
C	28-06-2024	T. McPherson	J. Parker	Final

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1 ACKNOWLEDGEMENT OF COUNTRY

Elephants Foot Consulting acknowledges that every project we work on takes place on First Peoples Land. We recognise Aboriginal and Torres Strait Islander People as Traditional Custodians of this land. We pay respect to ancestors and Elders, past and present.

2 INTRODUCTION

2.1 Background

EFC has been tasked to prepare the following waste management plan for Grindley Construction Pty Ltd. for the management of construction waste generated by the mixed use development located at Ivanhoe Estate Midtown, Macquarie Park NSW.

Waste management strategies and auditing are a requirement on construction sites to promote strong sustainability outcomes. It is EFC's belief that a successful waste management strategy contains three key objectives:

i. ***Promote responsible source separation*** to reduce the amount of waste that goes to landfill, by implementing convenient and efficient waste management systems.

ii. ***Ensure adequate waste provisions and robust procedures*** that will cater for potential changes during the operational phase of the development.

iii. ***Comply*** with all relevant Australian Standards, council codes, policies, and guidelines.

2.2 Site Summary

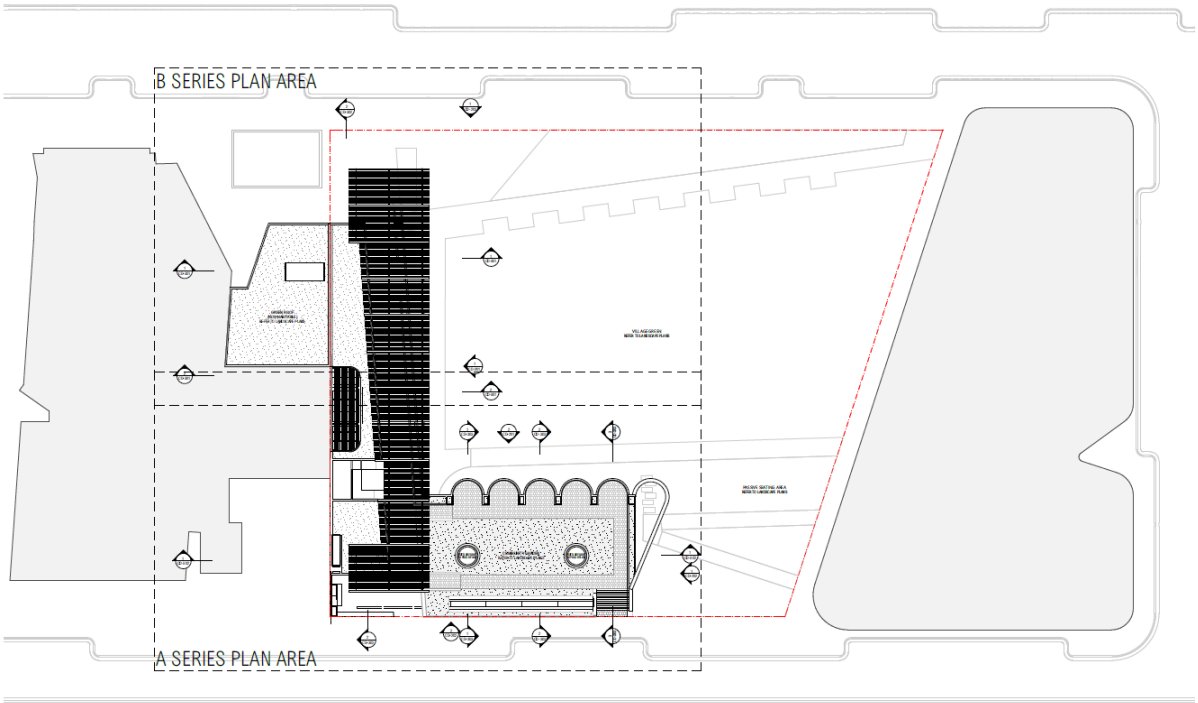
The proposed development falls under the LGA of Ryde City Council. The proposed site (Building C2/Village Green & Community Centre) is located within Frasers Property, Australia's Ivanhoe Estate (Midtown) Development, located in Macquarie Park near the corner of Epping Road and Herring Road. Building C2 is located centrally within the Ivanhoe Estate, and will be situated between Buildings C1 and C3 (per below). The proposed C2 building which forms the basis of this document includes a community centre, local café, gym and pool facilities, and a local village green park area.

All figures and calculations are based on area schedules as advised by our client and shown on architectural drawings.

2.3 Site Location

The site is located at Ivanhoe Estate Midtown, Macquarie Park NSW, as shown below.

Figure 1: Site Plan



Source: CHROFI, Drawing no. A-CD-002, Rev N: Site Plan.

2.4 Legislation and Guidance

Information provided in this WMP comes from a wide range of construction waste management guidance at the local, state, and federal levels. The primary sources of guidance include:

- Ryde Development Control Plan 2014
- Australian Government, Department of Sustainability, Environment, Water, Population and Communities. *Construction and Demolition Waste Guide – Recycling and Re-use Across the Supply Chain*. (2014, November).
- NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-2021
- NSW Waste Classification Guidelines 2014
- Australia's National Waste Policy 2018

2.5 Waste Diversion Targets

To quantify and measure this sustainable approach to waste management, the NSW WARR Strategy 2014-2021 and green star guidelines outlines specific targets in order to clarify the state's long-term goals and priorities. These targets were supported by industry, community, state, and local governments during the Strategy's consultation phase, and include:

- Increasing construction and demolition recycling rates to 90%
- Increasing waste diverted from landfill to 90%
- Reducing litter by 40%
- Reduce illegal dumping incidents by 30%

2.6 Frasers Property Targets

The below points are representative of Frasers Property targets for the construction phases of the development:

- Materials and waste (**targets** under PDA with LAHC)
- 15-20% Supplementary Cementous Materials (SCM) average in concrete mixes across the site;
- 20% recycled asphalt pavement (RAP) warm-mix asphalt;
- ASI sustainable steel;
- Recycled concrete in place of crushed rock where available;
- Best environmental practice PVC;
- FSC certified timber across the site
- Embodied carbon reduction, and'
- Maximum 1% construction waste to landfill.

Note: the above are targets. The Contractor shall use best endeavours to achieve all above targets in construction with the WUC.

2.7 Report Objectives

Throughout this report, EFC aims to encourage where practical, having regard to the design, the nature of the material to be demolished and the site constraints, the following waste management practices for the duration of the construction stages of the development:

- Re-use of excavated material on-site and disposal of any excess to an approved site;
- Green waste mulched and re-used on-site as appropriate, or recycled off-site;
- Bricks, tiles and concrete re-used on-site as appropriate, or recycled off-site;
- Plasterboard waste returned to supplier for recycling;
- Framing timber re-used on site or recycled off-site;
- Windows, doors and joinery recycled off-site;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Plumbing, fittings and metal elements recycled off site;
- Ordering accurate quantities of materials and prefabrication of materials where possible;
- Re-use of formwork;
- Careful source separation of off-cuts to facilitate re-use, resale or recycling.

2.8 Limitations

This report has been prepared by EFC for the sole purpose of providing a Construction Waste Management Plan (CWMP) to support a development application. The report is provided with the following limitations:

- This report is for the sole use of Grindley Constructions Pty Ltd. (including their officers, employees and advisers) and should not be used or relied upon by any other party without prior written consent from EFC;
- Drawings, estimates and information contained in this report have been prepared by analysing information, plans and documents supplied by the client, or nominated third parties. Any assumptions based on the information contained in the report are outside the control of EFC;
- The calculations presented in the report are estimates only. The amount of waste generated will be dependent on the approach taken by site management, including the levels of training and education offered to site staff and the actions and attitudes of staff themselves.
- The site manager will make adjustments as required based on actual waste volumes (e.g. if waste volumes are greater than estimated, then waste storage capacity and collection frequencies will increase accordingly) and increase the amount of waste storage and collection frequency accordingly;
- The report has been prepared with all due care and attention; however, no assurance or representation is made that the WMP reflects the actual outcome. EFC will not be liable to for any plans or outcomes that are not suitable for purpose, whether as a result of incorrect or unsuitable information or otherwise;
- EFC offer no warranty or representation of accuracy or reliability of the WMP unless specifically stated;
- Examples of equipment provided in this report should be reviewed by the appropriate equipment supplier who will assess the correct equipment for supply. Reference to any other business or product besides EFC and EFC equipment is for information purposes only, and is not officially endorsed or recommended by EFC.

3 GENERAL WASTE MANAGEMENT PROVISIONS

3.1 Stakeholder Roles and Responsibilities

All stakeholders have a responsibility for their own environmental performance and compliance with all legislation.

The Construction Contractor will be responsible for implementing this WMP, although site staff have a responsibility to ensure their own compliance at all times. Where possible, an Environmental Management Representative (EMR) should also be appointed for the project to help ensure compliance. The following table demonstrates the primary roles and responsibilities of the respective stakeholders:

Table 1: Stakeholder Roles and Responsibilities

Roles	Responsibilities
Site Management	• Organise waste collections as required; • Organise replacement or maintenance requirements for bins; • Investigate and ensure prompt clean-up of illegally dumped waste materials; • Notify the Principal Certifying Authority (Council) of the appointment of waste removal, transport or disposal contractors for waste tracking purposes; • Ensure waste related equipment is well maintained; • Ensue accurate calculations so only the required amount of materials are ordered; • Ensure segregation of materials to maximise reuse and recycling; • Check waste sorting and storage areas routinely for cleanliness, hygiene, contamination and OH&S issues; • Ensure all monitoring and audit results are well documented and are carried out as specified in the WMP; • Ensure effective signage, communication and education is provided to site staff/contractors; • Provide staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities; • Assess any manual handling risks and prepare a manual handling control plan for waste and bin transfers;
Site Staff/Contractors	• Ensure adequate separation and disposal of waste streams in compliance with the WMP; • Abide by all relevant OH&S legislation, regulations, and guidelines; • Attend training and inductions as required; • Clean and transport bins as required; • Carry out daily visual inspections of waste storage areas; • Organise, maintain and clean the waste storage areas;
Environmental Management Representative (EMR)	• Approach and establish the local commercial reuse of materials where reuse on-site is not practical; • Establish separate skips and recycling bins for effective waste segregation and recycling purposes; • Ensure staff and contractors are aware of site requirements; • Provision of training of the requirements of the WMP and specific waste management strategies adopted for the development; • Contaminated waste management and approval of off-site waste transport, disposal locations and check licensing requirements; • Arrange assessment of suspicious potentially contaminated materials, hazardous materials and liquid waste; • Monitor, inspect and report requirements.
Waste Collection Contractors	• Provide a reliable and appropriate waste collection service; • Provide feedback to site management regarding contamination of waste streams; • Work with site management to customise waste systems where possible.

3.2 Monitoring and Reporting

It is recommended that the following measures be taken to improve construction waste management in future and to provide more reliable waste generation figures:

- Compare projected waste quantities with actual waste quantities produced.
- Conduct waste audits of current projects (where feasible).
- Note waste generated and disposal methods.
- Look at past waste disposal receipts.
- Record this information to help in waste estimations for future waste management plans.

Records of waste volumes recycled, reused or contractor removed are to be maintained. Additionally, dockets/receipts verifying recycling/disposal in accordance with the WMP must be kept and presented to Council or the EPA if and when required.

Daily visual inspections of waste storage areas will be undertaken by site personnel and inspection checklists/logs recorded for reporting to the Site Manager on a weekly basis or as required. These inspections will be used to identify and rectify any resource and waste management issues.

Waste audits are to be carried out by the Building Contractor to gauge the effectiveness and efficiency of waste segregation procedures and recycling/reuse initiatives. Where audits show that the above procedures are not carried out effectively, additional staff training should be undertaken and signage re-examined.

All environmental incidents are to be dealt with promptly to minimise potential impacts. An incident register must be maintained on-site at all times and should include the contact details of the 24-hour EPA Pollution line. Likely incidents to occur during the construction stage of the development may involve fuel or chemical spills, seepage or mishandling of hazardous waste, or unlicensed discharge of pollutants to environment.

3.3 Opportunities for Reuse and Recycling

There are many opportunities to reduce the volume of waste generated during construction. Adaptive reuse of building materials should be encouraged, with significant consideration given to methods of reusing or recycling materials onsite as well as sourcing used or recycled materials from elsewhere to be used on site.

The site should facilitate where practical reuse and recycling by 'deconstruction', whereby various materials are carefully dismantled and sorted. Any unwanted reusable materials can be taken to a second-hand building centre, reducing waste disposal costs.

Materials that are individually wrapped should also be avoided where possible, with preference given for materials that can be delivered in returnable packaging such as timber pallets.

The table below gives examples of potential reuse and recycling options for the materials likely to be used/generated in construction at this development:

Table 2: Potential Reuse/Recycling Options for Construction Materials

Material	Reuse/Recycling Potential
Asphalt	Hot in-place recycling or reprocessed into Reclaimed Asphalt Pavement (RAP).
Bricks	Cleaned and/or rendered for reuse, crushed for fill, sold or provided to a recycled materials yard
Cardboard Packaging	Recycled at a paper/cardboard recycling facility
Carpet	Cleaned and reused for the same purpose, reused in landscaping or garages/sheds, recycled at an appropriate processing facility
Concrete, Masonry, Spoil	Reused on-site as fill, levelling or crushed for road base
Doors, Windows, Fittings	Reused in new or existing buildings or sent to second-hand supplier
Glass	Recycled at a glass recycling facility, aggregate for concrete production, crushed for termite barrier, reused as glazing
Green Waste (Organics)	Mulched, composted for reuse, trees chipped for use in landscaping or removed carefully and reused onsite or sold
Hardwood Beams	Reused as floorboards, fencing, furniture or sent to second-hand timber supplier
Insulation Material	Reprocessed to remove impurities and reused for the same purpose or as off-cuts, compressed for ceiling tile manufacture
Metal, Steel/Copper Pipe	Recycled at a metal recycling facility, melted into secondary materials for structural steel, roofing, piping etc. copper sold for re-use
Other Timber	Reused in formwork, ground into mulch for garden or sent to second-hand timber supplier
Plasterboard	Crushed for reuse in manufacture of new plasterboard, returned to supplier or used in landscaping
Plastics	Reused as secondary materials for playgrounds, park benches etc.
Roof Tiles	Cleaned and reused, crushed for reuse for landscaping and driveways or sold or provided to a recycled materials yard
Soil	Stockpiled onsite for reuse as fill
Synthetic & Recycled Rubber	Reused for the same purpose or reprocessed for use in manufacture/construction of safety barriers, speed humps
Topsoil	Stockpiled onsite for reuse in landscaped areas

3.4 Management of Hazardous Waste Materials

For the purpose of this report, hazardous waste materials include any waste that poses a hazard or potential harm to human health or the environment, particularly asbestos waste and asbestos containing material (ACM). The general advice provided in this report is superseded by any specific hazardous materials or remediation control plans prepared for the project.

During the construction phase of the development, there must be a commitment to engage qualified and certified contractors to remove all contaminated/hazardous materials (e.g. asbestos) and dispose of all contaminated/hazardous waste at an appropriately licenced facility, where applicable.

In the event that any contaminated or hazardous materials are unexpectedly uncovered during excavation works, the Site Manager is to stop work immediately in that location and contact the relevant hazardous waste contractor prior to further works being undertaken in the area.

The following general mitigation measures will apply:

- Contaminated material stockpiled on site will be minimised as far as possible and should be stored on HDPE liner, in a bunded location which is protected from inclement weather;
- Sediment fences should be installed around the base of stockpiles and the stockpiles should be covered. Where excavated material requires validations, samples should be taken for NATA laboratory testing as per the requirements of the contamination assessment prior to restoration works, backfilling exercises and disposal;
- Any trucks carrying contaminated materials should be securely and completely covered immediately after loading the materials (to prevent windblown emissions and spillage) and must be licensed by the NSW Environmental Protection Authority (EPA);
- Decontamination of all equipment prior to demobilisation from the site is important so that contaminated materials are not spread off-site.

3.5 Management of Excavation Waste

For the purpose of this report, excavation waste consists of any unwanted material generated from excavation activities such as a reduced level dig, site preparation and levelling and the excavation of foundations, basements, tunnels and service trenches. This will typically consist of soil and rock. The general advice provided in this report is superseded by any specific hazardous materials or remediation control plans prepared for the project.

All excavated material generated on this site may be re-used in the landscaping or used on other sites as fill material, provided no contamination is present. If sandstone is found to be present, this may be sold or incorporated into the building design.

The following measures and safeguards will apply to the development for excavated material:

- Wherever practical, excavation material will be reused as part of the development;
- Excavation material that is not natural (virgin) material will be transported to an approved landfill site or off-site recycling depot;
- A waste classification assessment of the fill material should be undertaken prior to it being acceptable for waste disposal purposes;
- Transportation routes for excavation material removed from site will be identified and used.

Table 3: Excavation Volumes

Material	Volume (m3)	*Tonnes (t)	**Appx. Percentage Recovered
Excavation Material	14,000	14,000	99.8%
Green waste	N/A	N/A	80%
Bricks	N/A	N/A	100%
Tiles	N/A	N/A	100%
Concrete	N/A	N/A	100%
Timber	N/A	N/A	33%
Plasterboard	N/A	N/A	50%
Metals	N/A	N/A	100%
Asbestos	N/A	N/A	0%
Other waste	N/A	N/A	50%
Totals	**14,000**	**14,000**	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <https://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of excavation waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

The table below illustrates how excavation will be managed, and estimates percentage of materials diverted from landfill.

Table 4: Excavation Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Excavation Material	☐	14,000	☒	☒	☒	13965.0
	Total	**14,000**		**Total**		**99.8%**
Total Diversion of Waste from Landfill (Minimum 90%)						

3.6 CONSTRUCTION WASTE VOLUMES AND MANAGEMENT

Waste generated during the construction stage of the development will be managed by the principal contractor and sub-contractors, with materials being reused and recycled wherever possible. Where neither reuse nor recycling are possible, waste will be disposed of as general waste at a licensed landfill site.

Recyclable material generated during construction will largely consist of off-cuts and discarded bricks, timber, steel, concrete, tiles, plasterboard, and piping, as well as packaging materials.

It is important to note that source separation of waste on-site may offer cost savings when compared to the disposal of mixed waste at landfill sites. Further cost savings may be achieved through the use of reusable and recycled-content materials and by reusing materials salvaged.

The table below illustrates the anticipated volumes of materials generated at this development during the construction stage. Volumes have been advised by our client.

Table 5: Construction Waste Conversion

Material	Volume (m3)	*Tonnes (t)	**Approx. Percentage Recovered
Excavation Material	N/A	N/A	99.8%
Green waste	N/A	N/A	80%
Bricks	N/A	N/A	100%
Tiles	0.74	0.7	100%
Concrete	143.64	215.5	100%
Timber	55.25	10.5	33%
Plasterboard	8.64	1.7	50%
Metals	89.85	44.9	100%
Other waste	N/A	N/A	50%
Totals	**298.1**	**273.3**	

**The conversion of materials from volume to tonnes is based on the information provided in a consultation paper published by WA Department of Water and Environmental Regulation <https://www.der.wa.gov.au/images/documents/our-work/consultation/current-consultation/Consultation%20Sheet%20-Approved%20method%20for%20recyclers.pdf>*

***The percentage of recycled waste is estimated by BINGO, and is based on the average quantities of materials received and recovered at their facilities.*

The table below illustrates how the construction materials will be managed, and estimates percentage of materials diverted from landfill.

Table 6: Construction Waste Management

			How Waste will be Managed			
Type of Material	**Less than 10m³**	**Estimated Tonnage**	**Reuse On-Site**	**Recycle**	**Landfill**	**Estimated Tonnage of Material Diverted from Landfill**
Tiles	☒	0.7	☒	☒	☐	0.7
Concrete	☐	215.5	☒	☒	☐	215.5
Timber	☐	10.5	☒	☒	☒	3.5
Plasterboard	☒	1.7	☒	☒	☒	0.9
Metals	☐	44.9	☒	☒	☐	44.9
Total		**273.3**	**Total**			**265.4**
Total Diversion of Waste from Landfill (Minimum 90%)						**97.1%**

3.7 Recycling Directory

Construction materials removed from site will need to be managed in accordance with the provisions of current legislation and may include segregation by material type classification in accordance with NSW EPA (2014) *Waste Classification Guidelines, Part 1: Classifying Waste* and disposal at facilities appropriately licensed to receive the particular materials.

Please find the below recommendations for recycling drop off locations for all materials likely to be generated at this development. Only the nearest locations are provided. See www.businessrecycling.com.au for additional locations:

Table 7: Recycling Directory

	Business Name	Suburb	Distance (km)
Excavation Material	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	Bingo Recycling Centre	Auburn	10.6
Green waste	Bingo Recycling Centre	Artarmon	4.6
	Sydney Transwaste Industries	Homebush West	10.1
	Bingo Recycling Centre	Auburn	10.6
Bricks	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	Concrete Recyclers (Group) Pty Ltd	Camelia	8.8
Tiles	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	Concrete Recyclers (Group) Pty Ltd	Camelia	8.8
Concrete	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Concrete Recyclers (Group) Pty Ltd	Camelia	8.8
	Sydney Transwaste Industries	Homebush West	10.1
Timber	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	Ironwood Australia	Rozelle	8.6
Plasterboard	Bingo Recycling Centre	Artarmon	4.6
	Bingo Recycling Centre	Auburn	10.6
	AE Biggs	Oxford Falls	12.8
Metals	Cleanaway Ryde Resource Recovery Centre	North Ryde	1.4
	Bingo Recycling Centre	Artarmon	4.6
	SMS Municipal Services	Brookvale	4.9

3.8 Site-Specific Operational Measures

Training/Site Inductions

All staff employed during the construction stage of the development must undertake site-specific induction training regarding the procedures for waste management. Employees of the head contractor will undertake a specific induction outlining their duties and how they are to enforce the waste management procedures.

Induction training will include the following at a minimum:

- Legal obligations;
- Emergency response procedures on site;
- Waste storage locations and separation of waste;
- Litter management in transit and on site;
- The implications of poor waste management practices;
- Correct use of general-purpose spill kits;
- Responsibility and reporting (including identification of personnel responsible for waste management and individual responsibilities).

Materials Selection and Ordering

- Selection of all materials will be undertaken by architectural designers;
- Prefabrication of materials off-site where possible;
- Materials requirements are to be accurately calculated to minimise waste from over-ordering;
- Materials ordering process is to aim at minimisation of materials packaging;
- Material Safety Data Sheets (MSDS) are to accompany all materials delivered to site, where required, to ensure that safe handling and storage procedures are implemented.

Waste Avoidance Opportunities

- Limiting unnecessary excavation;
- Selection of construction materials taking into consideration to their long lifespan and potential for reuse;
- Ordering materials to size and ordering pre-cut and prefabricated materials;
- Reuse of formwork;
- Planned work staging;
- Use of naturally ventilating buildings to reduce ductwork;
- Reducing packaging waste on-site by returning packaging to suppliers where possible, purchasing in bulk and requesting cardboard or metal drums rather than plastics;
- Requesting metal straps rather than shrink wrap and using returnable packaging such as pallets and reels;
- Reduction of PVC use;
- Use of low VOC (volatile organic compounds) paints, floor coverings and adhesives;
- Use of fittings and furnishings that have been recycled or incorporate recycled materials;
- Use of building materials, fittings and furnishings with consideration to their longevity, adaptation, disassembly, reuse and recycling potential.

Site Procedures

- Excavated materials will be used onsite where practical;
- Green waste will be mulched and reused in landscaping either onsite or offsite;
- Concrete, tiles and bricks will be reused or recycled offsite;
- Steel will be recycled offsite; all other metals will be recycled where economically viable;
- Framing timber will be reused on-site or recycled off-site;
- Windows, doors and joinery will be recycled off-site where possible;
- Plumbing, fittings and joinery will be recycled off-site where possible;
- Plasterboard will be re-used in landscaping on-site or returned to the supplier for recycling where possible;
- All used crates will be stored for reuse unless damaged;
- All glass that can be economically recycling will be;
- All solid waste timber, brick, concrete, rock, plasterboard and other materials that cannot be reused or recycled will be taken to an appropriate facility for treatment to recover further resources or for disposal to landfill in an approved manner;
- All asbestos, hazardous and/or intractable wastes are to be disposed of in accordance with WorkCover Authority and EPA requirements;
- Provision for the collection of batteries, fluorescent tubes, smoke detectors and other recyclable resources will be provided on site;
- Beverage container recycling will be provided on-site for employee use;
- All waste and recycling will be disposed of via council approved systems.

3.9 Location and Design of Waste Management Facilities

General Requirements

All waste management facilities onsite should:

- Be conveniently located to enable easy access for on-site movement and collection;
- Be incorporated with other loading/unloading facilities;
- Have sufficient space for the quantity of waste generated and careful source separation of recyclable materials;
- Have sufficient space to contain any on-site treatment facilities, such as compaction equipment;
- Have adequate weather protection and, where required, be enclosed or undercover;
- Be secure and lockable;
- Be well-ventilated and drained to the sewer;
- Be clearly sign-marked to ensure appropriate use.

Waste and Recycling Receptacles

A sufficient quantity of skip bins should be provided for the separate storage of each type of C&D material generated on site. This will assist in maximising source separation and resource recovery, while reducing the costs and quantity of materials disposed of at landfill.

The size of the receptacles should be appropriate to the nature of waste generated and the available storage area. In general, the following options would be acceptable:

Bin Size	Access	Dimensions
2.5m	Top loading	
3m	Drop door walk-in	
4m	Drop door walk-in	
5m	Drop door walk-in	
6m	Double doors walk-in	

Source: Aussie Bins

If the developer chooses to adopt a traditional waste management strategy, whereby waste is deposited into comingled skip bins to be sorted offsite, a single skip bin would be considered sufficient for purpose. However, if the site is to pursue source separation, dedicated skips for the following materials are recommended:

- Timber;
- Plasterboard;
- Concrete;
- Bricks;
- Scrap metal;
- General waste.

Separate receptacles for the safe disposal of hazardous waste types (i.e. light bulbs, batteries, etc) will also be provided where applicable. Where possible, additional bins will be provided in common areas for the collection of commingled recyclables such as beverage containers (glass, plastic, aluminium), paper products, recyclables food containers, etc. Specialised bins for cigarette butts should also be provided.

Safety and Signage

The following safety measures should be considered for the waste storage area:

- Location should not interfere with sight lines of drivers entering or leaving the site;
- Skip bins should be clearly visible and located in well-lit areas;
- Safe paths of travel should be designated using reflective tape, barriers and cones;
- Skip bins must be secured and must not be over-filled to reduce risk of injury through bins moving and falling objects.

Standard signage will be installed in all waste areas, with all skip bins colour coded and labelled appropriately on all sides to allow clear identification of the type of waste to be deposited into each bin.

Refer to the EPA's website for standard construction waste and recycling signs:

www.epa.nsw.gov.au/wastetools/signs-posters-symbols.htm

Space and Siting Requirements

The waste storage area will be located adjacent to the entrance to the site to enable access and allow sufficient space for the required skip bins and servicing requirements. The storage area will also be flexible in order to cater for change of use throughout construction works.

Where space is restricted, dedicated stockpile areas will be allocated onsite, with regular transfers to the dedicated skip bins for sorting and collections.

The position of the designated waste holding area onsite may change according to building works and the progression of the development. Access, visual amenity and WHS will always be integral to the selection of waste storage area locations. Any stockpile locations will take into account slope and drainage factors to avoid contamination of stormwater drains during rain events.

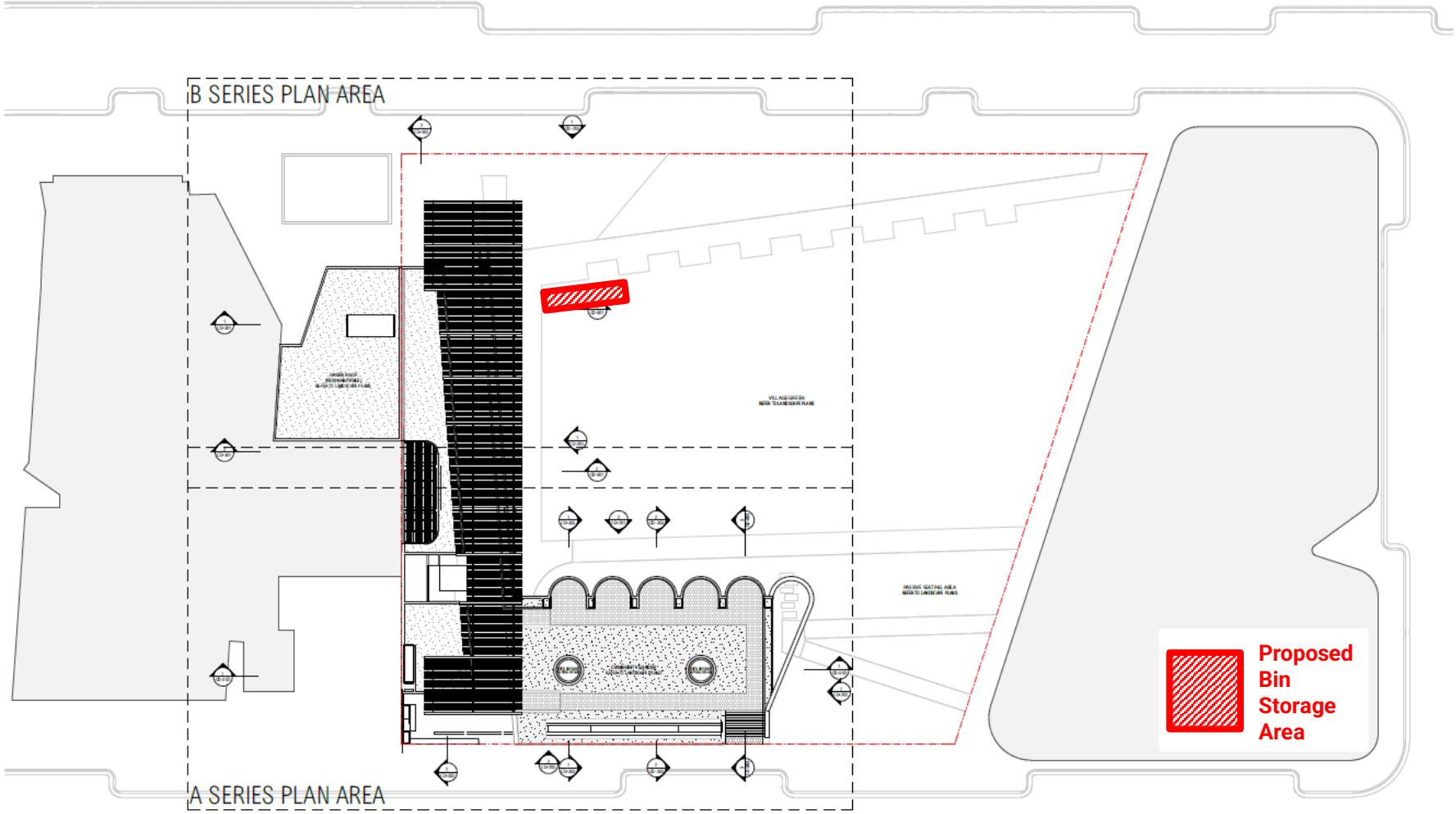
Servicing and Transport

The frequency of waste removal from site will be determined by the volume of materials deposited into the dedicated skip bins. Skip bins will be monitored on a daily basis by the Site Manager to ensure they do not overflow. If skip bins are reaching capacity, removal and replacement should be organised for within 24 hours.

All skip bins leaving the site will be covered with a suitable tarpaulin to reduce spillage of waste while in transit.

All waste collection for construction works will be conducted between approved hours as per Council requirements (typically between 7am and 7pm Monday to Friday, and between 7am and 1pm on Saturdays). All waste generated on site will be transported to an approved and appropriately licensed resource recovery facility and/or landfill site.

Proposal



Note: the proposed bin location is indicative only, this may change based on site logistics.
Source: CHROFI, Drawing no. A-CD-002, Rev N: Site Plan.

From: Maria Pennisi
To: cityofryde@ryde.nsw.gov.au
Cc: Jeff Jackson; Peter Wilson; andy.huang1@frasersproperty.com.au; Chris Michaels; bernardos@cityplan.com.au
Subject: FW: SSD Approval SSD 15822622 - DA condition B39 Construction Waste Management plan
Date: Wednesday, 3 July 2024 8:01:00 AM
Attachments: DA Approval 28-11-22.pdf
image003.png
image004.png
image005.png
image006.png
B39 - Construction Waste Management plan.pdf

Dear Sir /Madam

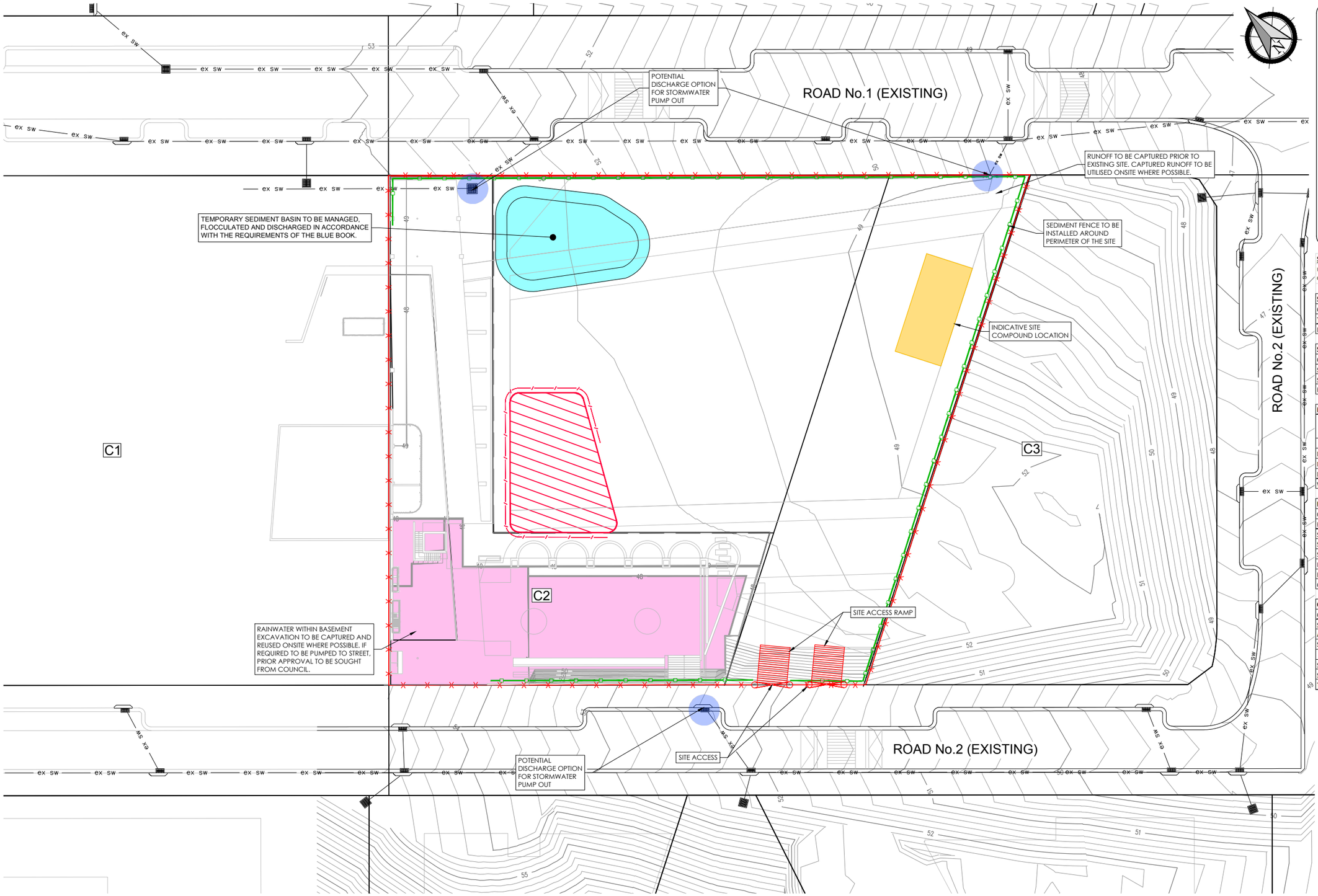
Please find attached Construction waste management plan prepared by Elephants foot dated 27.6.2024 addressing the **SSD Approval SSD 15822622** condition **B39 Construction Waste management plan** noting the below (Copy of DA attached)

a

Please confirm receipt of the attached.

Regards

Maria Pennisi
Pre-Construction Manager
m. 0404 837 451 t. (02) 9497 9842 Ext: 142 f. (02) 9988 3575
a. 55 Grandview Street (PO Box 6246) Pymble NSW 2073
e. mpennisi@grindley.com.au w. grindley.com.au



LEGEND

- PROPOSED LOT BOUNDARY
- EXISTING LOT BOUNDARY
- MAJOR CONTOURS
- MINOR CONTOURS
- EXISTING KERBS
- BASEMENT EXTENTS
- SW — PROPOSED STORMWATER
- ex sw — EXISTING STORMWATER
- FSW — FUTURE STORMWATER
- EXISTING SW PIT
- PROPOSED SW PIT
- PROPOSED SW HEADWALL
- PROPOSED SW JUNCTION PIT
- SEDIMENT/SILT FENCING
- NO-GO FENCING
- SITE ACCESS/SHAKER RAMP
- SWALE DRAIN
- STRAWBALES
- PROPOSED STOCKPILE LOCATION

SEDIMENT CONTROL - SEDIMENT BASIN PARAMETERS

IN ACCORDANCE WITH 'MANAGING URBAN STORMWATER:SOILS AND CONSTRUCTION' VOLUME 1 4TH EDITION LANDCOM (2004)

SITE CATCHMENT - [CATCHMENT NAME]	VALUE	UNITS
CATCHMENT		
TOTAL AREA	0.49	ha
DISTURBED AREA	0.49	ha

SITE PARAMETERS	
CONSTRAINT	VALUE
SOIL TEXTURE GROUP	D
SOIL MATERIALS	DISPERSABLE
EROSION HAZARD	MODERATE

RAINFALL/RUNOFF	
Region	Sydney/Blue Mountains
Location	Ryde
DESIGN RAINFALL DEPTH (DAYS)	5
DESIGN RAINFALL DEPTH (PERCENTILE)	85th
DESIGN RAINFALL DEPTH (mm)	38.8
VOLUMETRIC RUNOFF COEFFICIENCT (CV)	0.64

RUSLE FACTORS	VALUE	UNITS
CONSTRAINT		
RAINFALL EROSIVITY (R-FACTOR)	2539	mm
SOIL ERODIBILITY (K-FACTOR)	0.1	
SLOPE LENGTH	300	m
SLOPE GRADIENT	2	%
LENGTH/GRADIENT (LS-FACTOR)	0.74	
EROSION CONTROL PRACTICE (P-FACTOR)	1.3	
GROUND COVER (C-FACTOR)	1	

CALCULATIONS	VALUE	UNITS
CONSTRAINT		
SOIL LOSS RATE	244	m^3/ha/yr
ANNUAL SOIL LOSS	120	m^3/yr
SOIL LOSS CLASS	4	
SETTLING ZONE VOLUME	122	m^3
SEDIMENT STORAGE VOLUME	16	m^3
TOTAL BASIN VOLUME REQURIED	4	m^3

EROSION & SEDIMENT CONTROL PLAN

SCALE 1:250

GENERAL NOTES:

1. CONTRACTOR TO ENSURE ADEQUATE DUST CONTROL MEASURES ARE IN PLACE AT ALL TIMES DURING EXCAVATION WORKS.
2. REFER TO ESK 267 FOR EROSION & SEDIMENT CONTROL DETAILS & NOTES.
3. EXISTING LINTELS MAY BE USED FOR STORMWATER PUMPOUT SUBJECT TO COUNCIL APPROVAL.
4. SEDIMENT BASIN SIZING UNDERTAKEN IN ACCORDANCE WITH THE BLUE BOOK.
5. CONTRACTOR TO COMPLETE A DAILY AND WEEKLY SITE INSPECTION CHECKLIST CONSISTENT WITH IECA BEST PRACTICE EROSION AND SEDIMENT CONTROL DOCUMENTS.

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
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drawing title:

EROSION & SEDIMENT CONTROL PLAN

location: EPPING ROAD & LYONPARK ROAD, MACQUARIE PARK-

council: CITY OF RYDE

dwg ref: 300001-ESK-266

client: Grindley

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working beyond expectations

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Plotted By: Jerson Filho Plot Date: 17/07/24 1:14:41 PM Cad File: S:\300001\DRAWINGS\GENERAL\300001-ESK-266-268[D].DWG
This plan includes coloured information. If you have a black and white copy you do not have all of the information. This note is coloured RED.
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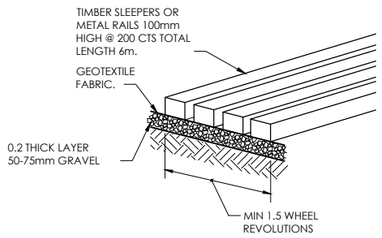
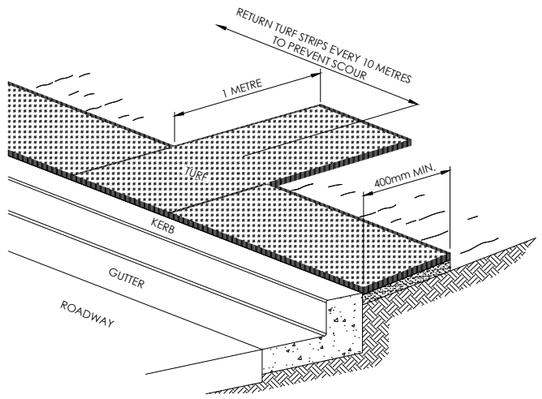
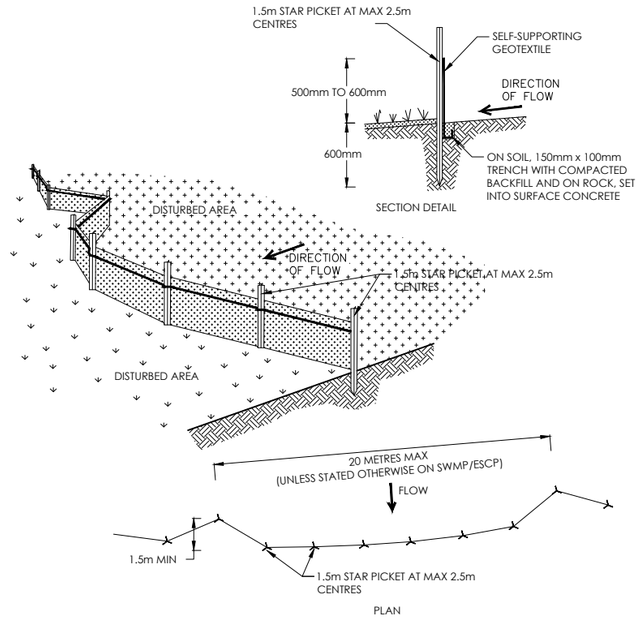


SHAKER RAMP
N.T.S.



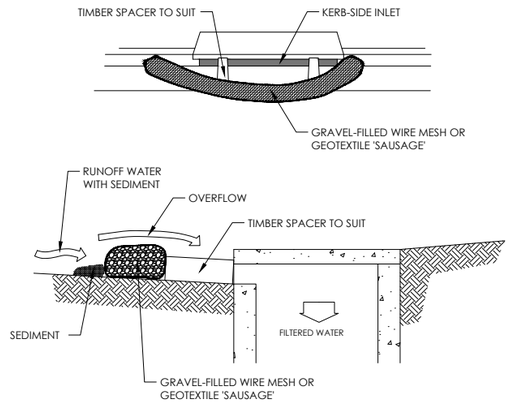
KERBSIDE TURF STRIP (SD6-13)
N.T.S.

CONSTRUCTION NOTES:
1. INSTALL A 400mm MINIMUM WIDE ROLL OF TURF ON THE FOOTPATH NEXT TO THE KERB AND AT THE SAME LEVEL AS THE TOP OF KERB.
2. LAY 1.4 METRE LONG TURF STRIPS NORMAL TO THE KERB EVERY 10 METRES.
3. REHABILITATE DISTURBED SOIL BEHIND KERB.



SEDIMENT FENCE (SD6-8)
N.T.S.

CONSTRUCTION NOTES:
1. CONSTRUCT SEDIMENT FENCES AS CLOSE AS POSSIBLE TO BEING PARALLEL TO THE CONTOURS OF THE SITE, BUT WITH SMALL RETURNS AS SHOWN IN THE DRAWING TO LIMIT THE CATCHMENT AREA OF ANY ONE SECTION. THE CATCHMENT AREA SHOULD BE SMALL ENOUGH TO LIMIT WATER FLOW IF CONCENTRATED AT ONE POINT TO 50 LITRES PER SECOND IN THE DESIGN STORM EVENT, USUALLY THE 10-YEAR EVENT.
2. CUT A 150mm DEEP TRENCH ALONG THE UPSLOPE LINE OF THE FENCE FOR THE BOTTOM OF THE FABRIC TO BE ENTRENCHED.
3. DRIVE 1.5m LONG STAR PICKETS INTO GROUND AT 2.5 METRE INTERVALS (MAX) AT DOWNSLOPE EDGE OF THE TRENCH. ENSURE ANY STAR PICKETS ARE FITTED WITH SAFETY CAPS.
4. FIX SELF-SUPPORTING GEOTEXTILE TO THE UPSLOPE SIDE OF THE POSTS ENSURING IT GOES TO THE BASE OF THE TRENCH. FIX THE GEOTEXTILE WITH WIRE TIES OR AS RECOMMENDED BY THE MANUFACTURER. ONLY USE GEOTEXTILE SPECIFICALLY PRODUCED FOR SEDIMENT FENCING. THE USE OF SHADE CLOTH FOR THIS PURPOSE IS NOT SATISFACTORY.
5. JOIN SECTIONS OF FABRIC AT A SUPPORT POST WITH A 150mm OVERLAP.
6. BACKFILL THE TRENCH OVER THE BASE OF THE FABRIC AND COMPACT IT THOROUGHLY OVER THE GEOTEXTILE.



NOTE: THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN AN APPROVED SWMP/ESCP.

MESH AND GRAVEL INLET FILTER (SD6-11)
N.T.S.

CONSTRUCTION NOTES:
1. INSTALL FILTERS TO KERB INLETS ONLY ONLY AT SAG POINTS.
2. FABRICATE A SLEEVE MADE FROM GEOTEXTILE OR WIRE MESH LONGER THAN THE LENGTH OF THE INLET PIT AND FILL IT WITH 25mm TO 50mm GRAVEL.
3. FORM AN ELLIPTICAL CROSS SECTION ABOUT 150mm HIGH x 400mm WIDE.
4. PLACE THE FILTER AT THE OPENING LEAVING AT LEAST A 100mm SPACE BETWEEN IT AND THE KERB INLET. MAINTAIN THE OPENING WITH SPACER BLOCKS.
5. FORM A SEAL WITH THE KERB TO PREVENT SEDIMENT BYPASSING THE FILTER.
6. SANDBAGS FILLED WITH GRAVEL CAN SUBSTITUTE FOR THE MESH OR GEOTEXTILE PROVIDING THEY ARE PLACED SO THAT THEY FIRMLY ABUT EACH OTHER AND SEDIMENT-LADEN WATERS CANNOT PASS BETWEEN.

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
D	17.07.2024	REVISED ISSUE	MH	BM	DATUM: CONTOUR INTERVAL:	NOT TO SCALE	

drawing title:
EROSION & SEDIMENT CONTROL DETAILS & NOTES

location: EPPING ROAD & LYONPARK ROAD, MACQUARIE PARK-
council: CITY OF RYDE
dwg ref: 300001-ESK-267
client: Grindley

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

Plotted By: Jerson Filho Plot Date: 17/07/24 1:14:42PM Cad File: S:\300001\DRAWINGS\GENERAL\300001-ESK-266-268[D].DWG
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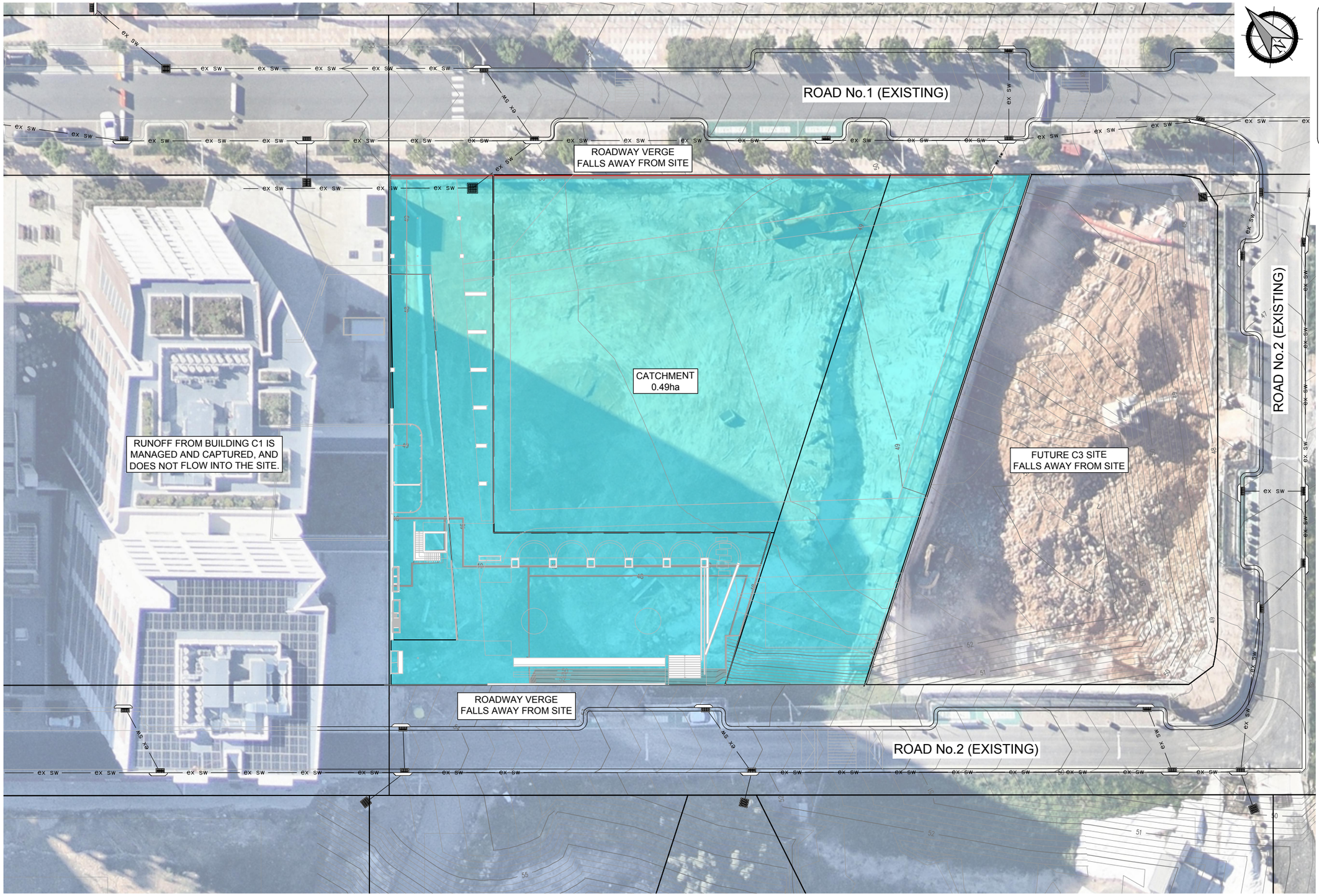
300001-ESK-266-268[D]



LEGEND

- PROPOSED LOT BOUNDARY
- EXISTING LOT BOUNDARY
- MAJOR CONTOURS
- MINOR CONTOURS
- EXISTING KERBS
- SW — PROPOSED STORMWATER
- ex sw — EXISTING STORMWATER
- FSW — FUTURE STORMWATER
- EXISTING SW PIT
- PROPOSED SW PIT
- PROPOSED SW HEADWALL
- PROPOSED SW JUNCTION PIT

CATCHMENT PLAN

SCALE 1:250

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
D	17.07.2024	REVISED ISSUE	ER	BM	DATUM: GDA94 MGA56 CONTOUR INTERVAL: 0.2m	A1 1:250 — 0 5.0 10.0 12.5m — A3 1:500	

• project management • civil engineering • infrastructure • superintendency • social impact • town planning • surveying • development feasibility • visualisation • urban design

drawing title:

CATCHMENT PLAN

location: EPPING ROAD & LYONPARK ROAD, MACQUARIE PARK-

council: CITY OF RYDE

dwg ref: 300001-ESK-268

client: Grindley

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hunter office ph: (02) 4978 5100
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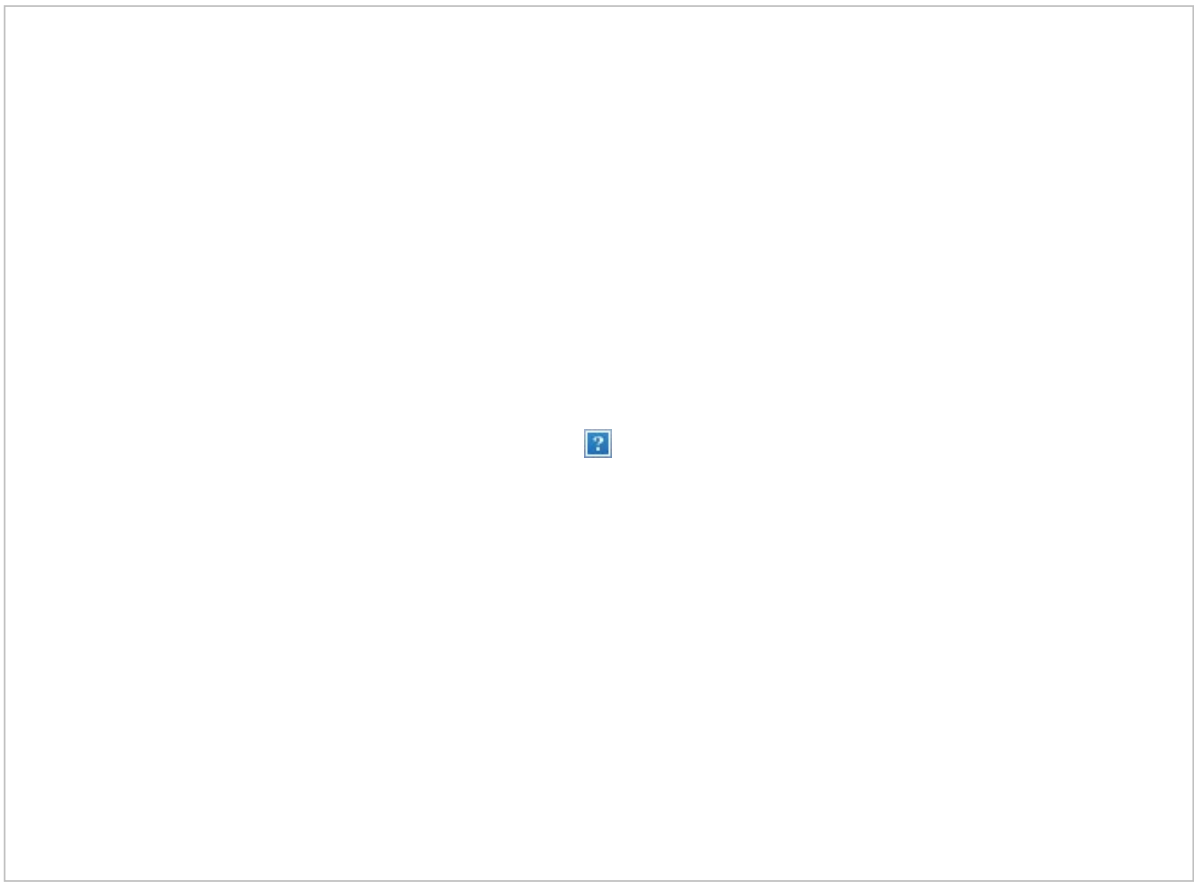
From:	Maria Pennisi
To:	"cityofryde@ryde.nsw.gov.au"
Cc:	Peter Wilson; Michael Jones; Mia McFarlane; Jeff Jackson
Subject:	Application Number: SSD15822622 - Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209), DA Condition B40
Date:	Friday, 26 July 2024 2:11:00 PM
Attachments:	DA Condition B40 - Soil and Water Management plan.pdf image001.png image002.png image003.png

Dear City of Ryde Council,

In compliance with SSD Condition B40 - the proposed Construction soil and water management plan must be prepared in consultation with Council, attached is proposed Construction soil and water management plan prepared by Chalouhi dated 18th July 2024 rev 0 .

Condition of Consent Extract below:



We kindly request written Comment/Approval of the attached to enable the issue of a CC .

Regards

Maria Pennisi
Pre-Construction Manager
m. 0404 837 451 t. (02) 9497 9842 Ext: 142 f. (02) 9988 3575
a. 55 Grandview Street (PO Box 6246) Pymble NSW 2073
e. mpennisi@grindley.com.au w. grindley.com.au

Compliance Statement Telecommunication Installation.

Site Address: Stage 1A, 1 Ivanhoe Pl, Macquarie Park NSW 2113

Certificate Number: PRJ0010101-BF3D63CF
Carrier identification: Licence no 486

To Whom It may concern,

a) This is to certify that works undertaken at "Stage 1A, 1 Ivanhoe Pl, Macquarie Park NSW 2113" has been completed in accordance with Telecommunication (Low-Impact facilities) determination 1997 and the Telecommunications codes of Practice 1997 in accordance with ACMA guidelines for installation of underground cabling and cable pits.

b) In accordance with Section 3- Telecommunications Code of Practice civil works and pit installation occurred with requirements being met and completed.

c) In accordance with condition D43 the telecommunications pit and pipe have been installed underground as indicated in the design.

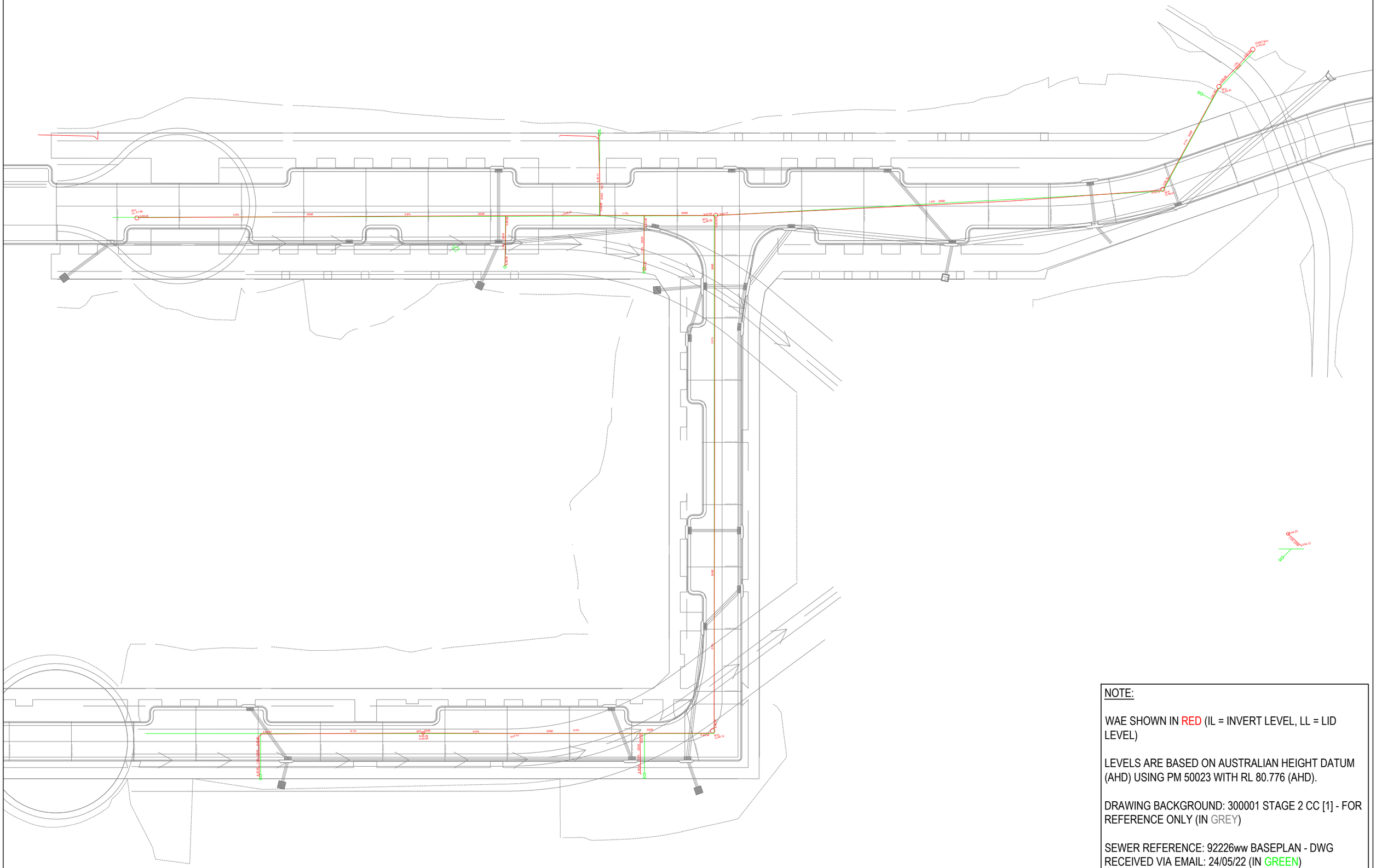
d) In accordance with Infrastructure in New Developments Bill 2020 Part 20A of the Telecommunications Act 1997 (the Act) Fiberpro Pty Ltd t/a Fibercorp have provided a 'functional fibre-ready facility' to each premise (FTTP). The fiber backbone has also been used to offer additional technology services. The dwelling has been fitted with a network termination device and active fiber connection for move in ready internet capabilities.

Kind Regards

Joel Clarke
CIO
Fiberpro Pty Ltd t/a Fibercorp

Sam Scoutas
CEO
Fiberpro Pty Ltd t/a Fibercorp

PO Box 6058, Alexandria NSW 2015
1300 342 372
www.fiber-corp.com
support@fiber-corp.com
ABN: 96 624 074 406


EXIST MH
CL43.34
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EXIST MH
CL44.12
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5.9%
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CABLE
CABLE
CABLE

Douglas PARTNERS

GROUNDED EXPERTISE

Report on Unexpected Finds Protocol

Proposed Midtown Building C2
Ivanhoe Place, Macquarie Park NSW

Prepared for Grindley Construction Pty Ltd

Project 86043.26

17 July 2024

Document History

Details

Project No.	86043.26
Document Title	Report on Unexpected Finds Protocol
Site Address	Ivanhoe Place, Macquarie Park NSW
Report Prepared For	Grindley Construction Pty Ltd
Filename	86043.26.R.001.Rev0

Status and Review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Zihan Wang	Nizam Ahamed	17 July 2024

Distribution of Copies

Status	Issued to
Revision 0	Michael Jones, Grindley Construction Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

Signature		Date
Author		17 July 2024
Reviewer		17 July 2024

Douglas PARTNERS | GROUNDED EXPERTISE

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Attachments

Notes About this Report

Appendix A: Drawings

Appendix B: Table 1: Summary of Laboratory Analytical Results – Groundwater

Appendix C: Unexpected Finds Form

bsi ISO 9001 Quality Management Systems CERTIFIED FS604853

Douglas Partners acknowledges Australia's First Peoples as the Traditional Owners of the Land and Sea on which we operate. We pay our respects to Elders past and present and to all Aboriginal and Torres Strait Islander peoples across the many communities in which we live, visit and work. We recognise and respect their ongoing cultural and spiritual connection to Country.

Report on Unexpected Finds Protocol
Proposed Midtown Building C2
Ivanhoe Place, Macquarie Park NSW

1. Introduction

Douglas Partners Pty Ltd (Douglas) was engaged by Grindley Construction Pty Ltd through an email dated 11 July 2024 to prepare this Unexpected Finds Protocol (UFP) for Building C2, Stage 2 (herein referred to as the 'site'. as indicated on Drawing 1, Appendix A) of the broader Midtown Development (located within the former Ivanhoe Estate Social Housing Precinct), Ivanhoe Place, Macquarie Park NSW. The purpose of the UFP is to provide a formal contingency protocol to be followed in the event of an unexpected find (UF) with respect to potential site contamination issues encountered during bulk earthworks.

Douglas understands that no contamination investigations were previously undertaken for the site.

The proposed Building C2 development is located within the central portion of the broader Stage 2 – Midtown Development and comprises a community centre, including landscaped village green and swimming pool facilities. The final ground surface levels are proposed to be generally around Reduced Level (RL) 49.5 m Australian Height Datum (AHD) for landscaping and ground floor levels. Basement floor levels are anticipated to be at RL 47.1 m AHD in local areas towards the western corner for plant rooms and basement foyer areas.

At the time of preparing this UFP, the site is vacant and has been subject to bulk excavation, a photograph of the site conditions is provided in Figure 1 below.



Figure 1: Site condition at the time of preparing this UFP

2. Previous reports

2.1 Expected sub-surface conditions

Douglas has undertaken a brief review of the geotechnical investigation for Building C2 (Douglas, 2021). The geotechnical investigation provided a summary of the expected subsurface condition, which comprises the following:

- **Fill** – variable fill, including concrete, gravelly sand and clay, of apparently variable compaction, to depths of 0.2 m to 1.2 m; underlain by,
- **Sandy Clay and Clayey Sand** – residual soil, typically stiff and very stiff or dense, to depths of 1.5 m to 3.2 m, absent at some locations; underlain by,
- **Sandstone** – variable, typically fractured to highly fractured, very low to medium strength, but including extremely low strength bands, to depths of 1.9 m to 4.3 m; underlain by, typically fractured to slightly fractured, low and medium strength to depths of 3.5 m to 7.3 m; underlain by, typically slightly fractured to unbroken, medium and high strength, with occasional very high strength bands (e.g. Bores 103, 07 and 117) to the limit of investigation (Douglas, 2021).

It should be noted that the site conditions during the geotechnical investigation (Douglas, 2021) are likely to vary from the present site conditions due to construction and site preparations works

undertaken since 2021. The previous geotechnical test locations and the C2 area boundary is indicated on Drawing 1, Appendix A.

No groundwater was observed whilst auguring at the borehole locations. Measurement at the standpipes, after allowing the wells to stabilise following purging, indicated groundwater at a depth of approximately:

- 7.3 m bgl (RL 46.8 m AHD) at Bore 101, with a screen interval from 8.0 m to 11.0 m; and
- 4.93 m bgl (RL 44.6 m AHD) at Bore 106, with a screen interval from 8.0 m to 11.0 m.

It should be noted that groundwater levels are subject to seasonal and temporal variations.

2.2 **Groundwater quality**

One round of the groundwater monitoring was completed as part of the dewatering management plan (Douglas, 2022) from the wells within or near the Stage 2 development.

Groundwater samples were collected from bore locations 109A, 111 and 118A[1] and analysed for a combination of the following suite of common contaminants to inform dewatering requirements:

- Dissolved and total heavy metals (As, Cd, Ca, Cr, Cu, Fe, Pb, Mg, Hg, Ni, Ka and Zn);
- Total petroleum hydrocarbons (TPH);
- Monocyclic Aromatic Hydrocarbons (e.g. BTEX);
- Polycyclic Aromatic Hydrocarbons (PAH);
- Volatile Organic Compounds (VOC);
- Organochloride pesticides (OCP);
- Organophosphate pesticides (OPP);
- Polychlorinated Biphenyls (PCB); and
- General Water quality parameters (e.g. pH, total suspended solids, major anions and cations).

Results were compared against the adopted groundwater quality criteria comprising ANZG (2018) Freshwater 95% level of species protection toxicant default guideline value to provide an indication of the groundwater quality.

The results of the groundwater monitoring indicate that chemical concentrations in groundwater were within the adopted screening criteria for all analytes tested with the exception of metals that exceeded the adopted criteria (more specifically, chromium, copper, iron, lead and zinc). However, the elevated metals in groundwater are considered to be associated regional urbanisation and / or mineralogy of the aquifer. Importantly, the groundwater monitoring results indicated an absence of gross groundwater contamination as indicated by non-detect of all other analytes.

[1] Borehole BH118A was installed in 2022 adjacent to BH118.

The extracted table of analytical results of the three groundwater samples (Douglas, 2022) are provided as Table 1, Appendix B.

3. Implementation of the unexpected finds protocol

3.1 Overview

This UFP is a precautionary measure (to be implemented during any civil or construction works at the site) to ensure that unexpected finds of contamination, if any, are appropriately managed. Unexpected finds of potential contamination may be identified by visual (appearance or staining) and / or olfactory (odour) evidence during site works.

3.2 Responsibilities

The site (project) manager is responsible for providing advice and a copy of the UFP to all excavation and construction personnel prior to commencing work and for ensuring that the plan is implemented by contractors during works undertaken at the site.

All site workers must be inducted to the UFP prior to commencement of any works. The induction can be undertaken at the time of a general site induction and toolbox meetings. Induction into the UFP must be performed by a suitably qualified person.

The UFP is to be implemented by the contractor during any site preparation, excavation and construction works where the ground surface is disturbed. Prior to the commencement of site works, a pre-start meeting should be convened between all relevant parties to discuss the requirements of the UFP and to assign roles and responsibilities.

3.3 Timing

This UFP should be implemented over the period of construction and earthworks being carried out at the site. The management of long-term contamination issues (if encountered) is outside the purview of this UFP.

4. Contingency plan

In order to assist in the early identification of unexpected finds and to minimise the potential for unexpected finds to be damaged and / or spread across the site during earthworks and / or development works, a site walkover following excavation works to visually identify areas of uncontrolled filling should be undertaken by a competent person or a suitably qualified environmental consultant. Should any unexpected contamination find be encountered during the site walkover, the management procedure and relevant procedure for the specific find (detailed below) should be implemented.

4.1 Unexpected finds protocol – general

If unexpected conditions with respect to contamination are encountered by the Contractor during the earthworks (such as fragments of suspected asbestos containing material (ACM), buried structures or unexpected contaminated soil or contaminants), the following general approach should be adopted:

- Upon discovery of an UF, works should cease in that area. The Contractor's Site Manager should be notified and the affected area closed off by the use of barrier tape;
- The location of the UF should be surveyed using dGPS with sub-metre accuracy;
- The Site Manager is to contact the Principal's Representative (PR), and the PR is to notify the Environmental Consultant;
- The Environmental Consultant will inspect the area and make an assessment of the significance of the find in terms of the potential impact to human health and the environment with reference to NSW EPA endorsed guidelines including NEPC (2013);
- Provision of advice from the Environmental Consultant to the PR regarding the recommended course of action;
- The Environmental Consultant will prepare a report detailing their assessment, including the extent and methods of remediation, as required;
- The assessment results together with a suitable management plan may be provided to Council / consent authority (as required) prior to the removal or treatment of such contamination;
- The agreed management / remedial strategy shall be implemented; and
- Details of the incident are to be recorded in the site record system.

4.2 **Unexpected finds protocol – asbestos**

In the event that the UF relates to the identification of asbestos, the following protocol will also apply:

- Upon discovery of suspected asbestos, the Site Manager should be notified and the affected area closed off by the use of barrier tape and warning signs. Warning signs shall be specific to Asbestos Hazards and shall comply with the Australian Standard 1319-1994 *Safety Signs for the Occupational Environment*;
- The location of the UF should be surveyed using dGPS with sub-metre accuracy;
- The Site Manager is to contact the Principal's Representative (PR), and the PR is to notify an appropriately qualified Environmental Consultant or Occupational Hygienist;
- The Environmental Consultant or Occupational Hygienist is to confirm the presence of asbestos and assess the extent of remediation works to be undertaken. An assessment report detailing this information will be compiled by the Environmental Consultant or Occupational Hygienist and provided to the PR;
- The Environmental Consultant or Occupational Hygienist should prepare a report detailing their assessment including the extent and methods of management / remediation, as required;
- The assessment results, together with a suitable management plan, may be provided to Council / consent authority (as required) prior to the removal or treatment of the asbestos;
- The agreed management / remedial strategy shall be implemented;
- In dry and windy conditions, any stockpiles or other areas of the site found to contain asbestos should be lightly wetted and covered with plastic sheeting whilst awaiting remediation / disposal;

- All work associated with asbestos in soil will be undertaken by an appropriately licenced contractor;
- Monitoring for airborne asbestos fibres is to be carried out during the soil excavation and remediation (if undertaken);
- Documentary evidence (weighbridge dockets) of correct disposal is to be provided to the contractor's construction manager;
- At the completion of the excavation, a clearance inspection is to be carried out and written confirmation is to be provided by the Environmental Consultant or Occupational Hygienist that the area is safe to be accessed and worked. Validation should include appropriate soil sampling and testing; and
- Details of the UF and the remedy employed should be recorded in the site record system.

4.3 Unexpected finds protocol – buried structures

In the event that buried structures, such as underground storage tanks (USTs), are encountered during site works, in addition to the procedure outlined in Section 4.1 above, the structure(s) and any associated pipework should generally be managed / removed as follows:

- Upon discovery of the structure, the site (project) manager is to be notified and the area barricaded;
- The area will be inspected by a qualified environmental consultant including visual identification of the structure and associated pipework;
- Under the supervision of a competent person or environmental consultant:
    - Remove and dispose of the structure and associated pipework by a qualified contractor. In the case of an UST, the tank must be removed in accordance with Australian Standard AS 4926 - 2008 *The Removal and Disposal of Petroleum Underground Storage Tanks*; and
    - Excavate and stockpile impacted materials (based on field observations) for waste classification).
- Validation of the remedial pit by a qualified environmental consultant for the contaminants of concern at the following sampling density (note: validation works should be undertaken in general accordance with NSW EPA authored and / or endorsed guidance):
    - Base of tank pit excavation: at least one to two samples per tank;
    - Side of tank pit excavation: one sample per 10 linear metre (minimum of 1 sample per side) and one sample per 2 - 3 m depth interval;
    - Fuel feed lines / pipe-work: one sample per 10 linear metre and 2 - 3 m depth interval; and
    - Quality assurance / quality control (QA / QC) sampling and analysis at a rate of at least 10% of the samples collected.
- If required, "chase out' all of the material in the remediation pit identified to be impacted by petroleum hydrocarbons, and undertake further validation sampling and analysis as required to assess appropriate removal of impacted materials;
- Waste classification and off-site disposal of impacted materials in accordance with EPA (2014);

- Based on the extent of impacts, the need for a groundwater investigation should be considered by the environmental consultant; and
- Inclusion of validation, waste classification and disposal documents (including landfill dockets and, in the case of USTs, tank and pipe work destruction certificates) in a validation report for the site.

4.4 Unexpected finds protocol – groundwater

Previous geotechnical investigation (Douglas, 2021) have encountered groundwater at depths of between RL 44.6 and 46.8 m AHD (near bulk excavation levels) and the results of the groundwater monitoring (Douglas, 2022) did not indicate a high risk of groundwater contamination. Notwithstanding if potentially contaminated groundwater (i.e. odorous or stained) is encountered during the proposed development, then:

- Upon discovery of contaminated groundwater, the site (project) manager is to be notified, works in the area halted and the area barricaded;
- The area / impacts should be inspected by a qualified environmental consultant with a view to investigating the nature and extent of the contamination if any. As necessary, the delineation exercise may involve a detailed groundwater investigation; and
- Based on the results, the environmental consultant will provide a report to the project manager / Principal regarding the nature of the contamination, the need for additional investigations and / or the proposed management strategy. In this regard, it is noted that management of contaminated groundwater can be a complex matter and therefore, the type of management strategies will be dependent on the nature and extent of the identified contamination if any.

4.5 Documentation

An unexpected find form is attached at the end of this UFP and should be completed by the Contractor's Site Manager in the event of encountering an UF. The form should be sent to the PR and Environmental Consultant, or Occupational Hygienist, in the event of encountering a UF.

5. Concluding statements

This UFP has been prepared to outline appropriate management procedures and reporting protocols that should be implemented in the event that unexpected contamination is encountered during the proposed development.

It is possible that indications of contamination not specifically covered in this UFP may be encountered at the site. In such a scenario, a precautionary principal will be applied and the general unexpected finds protocol (Section 4.1) should be applied in all circumstances.

6. References

Douglas. (2021). *Report on Geotechnical Investigation of C2 Site.* Stage 2 - Midtown, Herring Road, Macquarie Park, Dated August 2021 (reference: 86043.06.R.001.Rev1) (Douglas, 2021).

Douglas. (2022). *Dewatering Management Plan*. Stage 2 - Midtown, Herring Road, Macquarie Park, Dated May 2022 (reference: 86043.06.R.008.Rev0) (Douglas, 2022).

NEPC. (2013). *National Environment Protection (Assessment of Site Contamination) Measure 1999 (as amended 2013) [NEPM]*. Australian Government Publishing Services Canberra: National Environment Protection Council.

NSW EPA. (2014). *Waste Classification Guidelines - Part 1: Classification of waste*. Sydney: NSW Environment Protection Authority (EPA).

NSW EPA. (2020). *Guidelines for Consultants Reporting on Contaminated Land*. Contaminated Land Guidelines: NSW Environment Protection Authority.

7. Limitations

Douglas Partners Pty Ltd (Douglas) has prepared this report for this project at Ivanhoe Place, Macquarie Park NSW in accordance with Douglas' email proposal dated 28 June 2024 and acceptance received from Michael Jones on 11 July 2024. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Grindley Construction Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of Douglas, does so entirely at its own risk and without recourse to Douglas for any loss or damage. In preparing this report Douglas has necessarily relied upon information provided by the client and / or their agents.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. Douglas cannot be held responsible for interpretations or conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by Douglas. This is because this report has been written as advice and opinion rather than instructions for construction.

Notes About This Report

About this Report

November 2023

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

continued next page

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.

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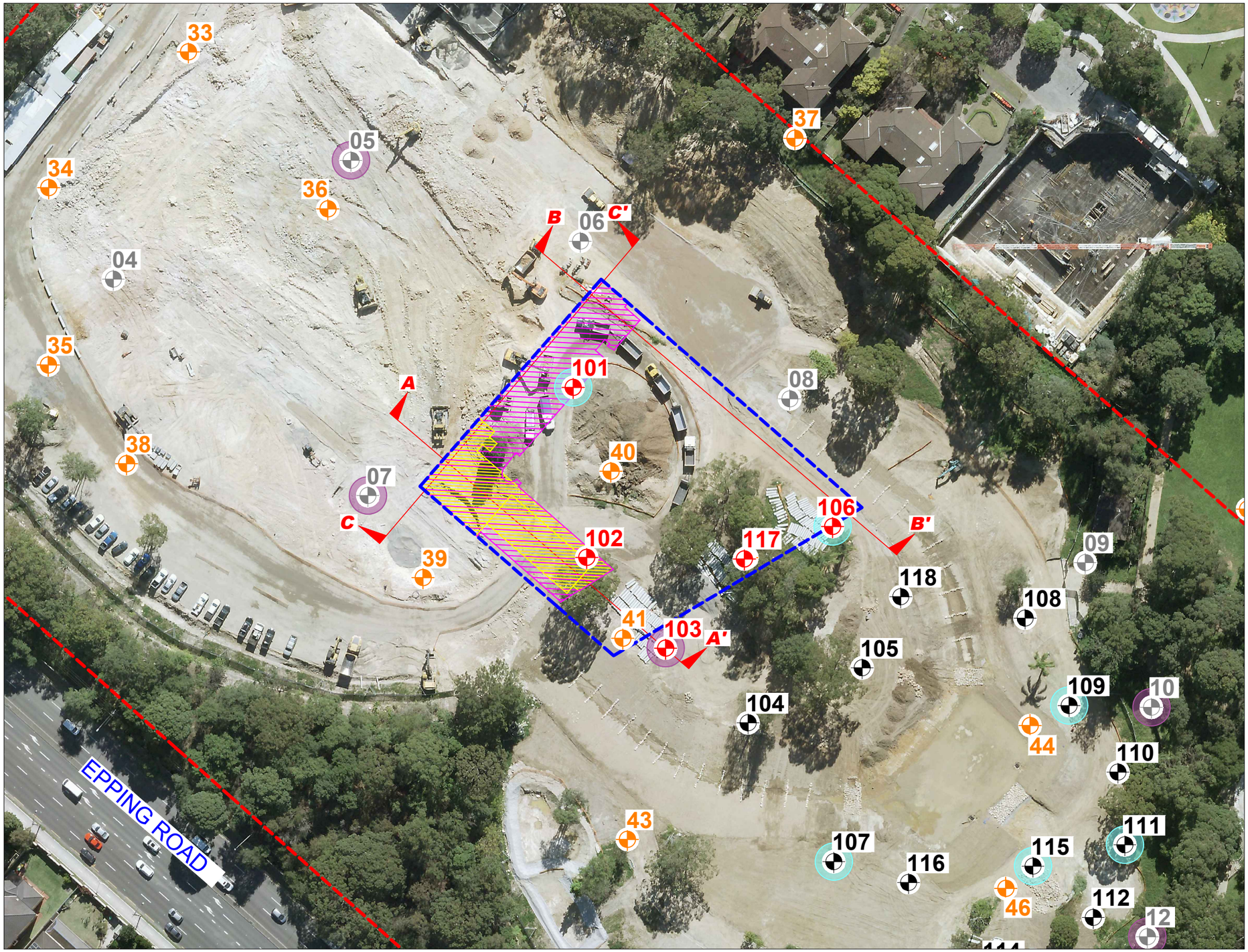
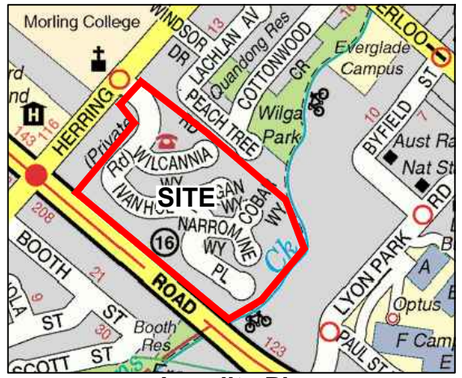
Appendix A

Drawings





Locality Plan

LEGEND

- Borehole Location
- Cored Bore Location (2021, Beyond C2 Site)
- Previous (2017) Cored Bore Location
- Previous (2017) Shallow Cored Bore Location
- Standpipe Location (Current)
- Standpipe Location (Damaged or Missing)
- C2 Area Boundary
- Greater Midtown Site Boundary
- Approximate Proposed Building Footprint
- Approximate Proposed Basement and Pool Footprint

NOTE:
1: Base image from MetroMap (Dated 15.04.2021)

0 10 20 30 40 50 75 100m
1:1000 @ A3

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Frasers Property Ivanhoe Pty Ltd		TITLE: **Test Location Plan - C2 Site** **Proposed Residential Development** **Midtown, Macquarie Park**
OFFICE: Sydney	DRAWN BY: PSCH/MG	
SCALE: 1:1000 @ A3	DATE: 21.05.2021	

PROJECT No: 86043.06
DRAWING No: 201
REVISION: 0

Appendix B

Table 1: Summary of Laboratory Analytical Results - Groundwater

				Sample ID	109A	BD1/20220321	111	118A
				LocCode	109A	109A	111	118A
				WellCode				
				Sample Date	21/03/2022	21/03/2022	21/03/2022	21/03/2022
				Lab_Report_Number	291444	291444	291444	291444
				Matrix_Type	WATER	WATER	WATER	WATER
				ANZG (2018) Freshwater 95% LOSP Toxicant DGVs*				
Chem_Group	**ChemName**	**Units**	**PQL**					
Ion Balance	Carbonate Alkalinity as CaCO3	mg/L	5		<5	-	<5	<5
PAHs in Water - Low Level	Benzo(a)pyrene TEQ	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
	Benzo(b,j+k)fluoranthene	µg/L	0.2		<0.2	<0.2	<0.2	<0.2
	Total +ve PAHs	µg/L	0.1		<0.1	<0.1	<0.1	<0.1
Inorganics	Alkalinity (Hydroxide) as CaCO3	mg/L	5		<5	-	<5	<5
	Alkalinity (total) as CaCO3	mg/L	5		<5	-	65	120
	Alkalinity (Bicarbonate as CaCO3)	mg/L	5		<5	-	65	120
	Chloride	mg/L	1		120	-	110	48
	Ferrous Iron	mg/L	0.05		0.24	-	0.52	1.3
	Ionic Balance	%			-15	-	-5	-11
	Sodium (Filtered)	mg/L	0.5		93	-	74	67
	Sulphate	mg/L	1		170	-	64	95
	TDS	mg/L	5		300	-	320	420
	TSS	mg/L	5		76	-	300	95,000
Metals	Arsenic	mg/L	0.001	0.024	<0.001	-	<0.001	0.006
	Arsenic (Filtered)	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001
	Cadmium	mg/L	0.0001	0.0004	<0.0001	-	<0.0001	0.0002
	Cadmium (Filtered)	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
	Calcium (Filtered)	mg/L	0.5		6	-	27	28
	Chromium (III+VI)	mg/L	0.001	0.0068	0.001	-	0.004	0.058
	Chromium (III+VI) (Filtered)	mg/L	0.001	0.0068	<0.001	<0.001	<0.001	<0.001
	Copper	mg/L	0.001	0.0014	0.003	-	0.006	0.069
	Copper (Filtered)	mg/L	0.001	0.0014	0.002	0.002	<0.001	0.035
	Ferric Iron	mg/L	0.05		<0.05	-	0.21	<0.05
	Iron	mg/L	0.01		0.5	-	2.7	44
	Iron (Filtered)	mg/L	0.01		0.22	0.25	0.73	1.3
	Lead	mg/L	0.001	0.0103	0.005	-	0.006	0.07
	Lead (Filtered)	mg/L	0.001	0.0103	0.004	0.004	<0.001	<0.001
	Magnesium (Filtered)	mg/L	0.5		7.9	-	5	2
	Mercury	mg/L	0.00005	0.0006	<0.00005	-	<0.00005	0.00008
	Mercury (Filtered)	mg/L	0.00005	0.0006	<0.00005	<0.00005	<0.00005	<0.00005
	Nickel	mg/L	0.001	0.0232	0.003	-	0.004	0.019
	Nickel (Filtered)	mg/L	0.001	0.0232	0.002	0.002	0.002	0.003
	Potassium (Filtered)	mg/L	0.5		0.7	-	1	3
	Zinc	mg/L	0.001	0.0168	0.019	-	0.048	0.23
	Zinc (Filtered)	mg/L	0.001	0.0168	0.016	0.016	0.026	0.022
TPH	C10-C16	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	Oil and Grease	mg/L	5		<5	-	<5	-
	F2-NAPHTHALENE	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C6 - C9	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
	C10 - C14	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C15 - C28	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	C29-C36	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	+C10 - C36 (Sum of total)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C10 - C40 (Sum of total)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C6-C10 less BTEX (F1)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
	C6-C10	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
BTEX	Benzene	mg/L	0.001	0.95	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	0.001	0.08	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	0.001	0.18	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/L	0.002		<0.002	<0.002	<0.002	<0.002
	Xylene (o)	mg/L	0.001	0.35	<0.001	<0.001	<0.001	<0.001
MAH	1,2,4-trimethylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,3,5-trimethylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Isopropylbenzene	mg/L	0.001	0.03	<0.001	-	<0.001	<0.001
	n-butylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	n-propylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	p-isopropyltoluene	mg/L	0.001		<0.001	-	<0.001	<0.001
	sec-butylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Styrene	mg/L	0.001		<0.001	-	<0.001	<0.001
	tert-butylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,1,1-trichloroethane	mg/L	0.001	0.27	<0.001	-	<0.001	<0.001
	1,1,2,2-tetrachloroethane	mg/L	0.001	0.4	<0.001	-	<0.001	<0.001
	1,1,2-trichloroethane	mg/L	0.001	6.5	<0.001	-	<0.001	<0.001
	1,1-dichloroethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,1-dichloroethene	mg/L	0.001	0.7	<0.001	-	<0.001	<0.001
	1,1-dichloropropene	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,2,3-trichloropropane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,2-dibromo-3-chloropropane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,2-dichloroethane	mg/L	0.001	1.9	<0.001	-	<0.001	<0.001
	1,2-dichloropropane	mg/L	0.001	0.9	<0.001	-	<0.001	<0.001
	1,3-dichloropropane	mg/L	0.001	1.1	<0.001	-	<0.001	<0.001
	2,2-dichloropropane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromochloromethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromodichloromethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromoform	mg/L	0.001		<0.001	-	<0.001	<0.001
	Carbon tetrachloride	mg/L	0.001	0.24	<0.001	-	<0.001	<0.001
	Chlorodibromomethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Chloroethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	Chloroform	mg/L	0.001	0.77	<0.001	-	<0.001	<0.001
	Chloromethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	cis-1,2-dichloroethene	mg/L	0.001		<0.001	-	<0.001	<0.001

				Sample ID	109A	BD1/20220321	111	118A
				LocCode	109A	109A	111	118A
				WellCode				
				Sample Date	21/03/2022	21/03/2022	21/03/2022	21/03/2022
				Lab_Report_Number	291444	291444	291444	291444
				Matrix_Type	WATER	WATER	WATER	WATER
				ANZG (2018) Freshwater 95% LOSP Toxicant DGVs*				
Chem_Group	**ChemName**	**Units**	**PQL**					
	cis-1,3-dichloropropene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Dibromomethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Hexachlorobutadiene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Trichloroethene	mg/L	0.001	0.33	<0.001	-	<0.001	<0.001
	Tetrachloroethene	mg/L	0.001	0.07	<0.001	-	<0.001	<0.001
	trans-1,2-dichloroethene	mg/L	0.001		<0.001	-	<0.001	<0.001
	trans-1,3-dichloropropene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Vinyl chloride	mg/L	0.01	0.1	<0.01	-	<0.01	<0.01
Halogenated Hydrocarbons	1,2-dibromoethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromomethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	Dichlorodifluoromethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	Trichlorofluoromethane	mg/L	0.01		<0.01	-	<0.01	<0.01
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/L	0.001	0.01	<0.001	-	<0.001	<0.001
	1,2,4-trichlorobenzene	mg/L	0.001	0.17	<0.001	-	<0.001	<0.001
	1,2-dichlorobenzene	mg/L	0.001	0.16	<0.001	-	<0.001	<0.001
	1,3-dichlorobenzene	mg/L	0.001	0.26	<0.001	-	<0.001	<0.001
	1,4-dichlorobenzene	mg/L	0.001	0.06	<0.001	-	<0.001	<0.001
	2-chlorotoluene	mg/L	0.001		<0.001	-	<0.001	<0.001
	4-chlorotoluene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromobenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Chlorobenzene	mg/L	0.001	0.055	<0.001	-	<0.001	<0.001
	Hexachlorobenzene	mg/L	0.000001	0.0001	<0.000001	-	<0.000001	<0.0002
Solvents	Cyclohexane	mg/L	0.001		<0.001	-	<0.001	<0.001
PAH/Phenols	Acenaphthene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthylene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Anthracene	mg/L	0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.0001
	Benz(a)anthracene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a) pyrene	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(g,h,i)perylene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Chrysene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Dibenz(a,h)anthracene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Fluoranthene	mg/L	0.0001	0.0014	<0.0001	<0.0001	<0.0001	<0.0001
	Fluorene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Indeno(1,2,3-c,d)pyrene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Naphthalene	mg/L	0.0002	0.016	<0.0002	<0.0002	<0.0002	<0.0002
	Phenanthrene	mg/L	0.0001	0.002	<0.0001	<0.0001	<0.0001	<0.0001
	Pyrene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Polychlorinated Biphenyls	Arochlor 1016	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1221	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1232	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1242	mg/L	0.00001	0.0006	<0.00001	-	<0.00001	<0.002
	Arochlor 1248	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1254	mg/L	0.00001	0.00003	<0.00001	-	<0.00001	<0.002
	Arochlor 1260	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
Organochlorine Pesticides	4,4-DDE	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	a-BHC	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Aldrin	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	b-BHC	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Chlordane (cis)	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Chlordane (trans)	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	d-BHC	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	DDD	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	DDT	mg/L	0.000001	0.00001	<0.000001	-	<0.000001	<0.0002
	Dieldrin	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Endosulfan I	mg/L	0.000002		<0.000002	-	<0.000002	<0.0002
	Endosulfan II	mg/L	0.000002		<0.000002	-	<0.000002	<0.0002
	Endosulfan sulphate	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Endrin	mg/L	0.000001	0.00002	<0.000001	-	<0.000001	<0.0002
	Endrin aldehyde	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	g-BHC (Lindane)	mg/L	0.000001	0.0002	<0.000001	-	<0.000001	<0.0002
	Heptachlor	mg/L	0.000001	0.00009	<0.000001	-	<0.000001	<0.0002
	Heptachlor epoxide	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Methoxychlor	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
Organophosphorous Pesticides	Azinophos methyl	mg/L	0.00002	0.00002	<0.00002	-	<0.00002	<0.0002
	Bromophos-ethyl	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Chlorpyrifos	mg/L	0.000009	0.00001	<0.000009	-	<0.000009	<0.0002
	Chlorpyrifos-methyl	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Diazinon	mg/L	0.00001	0.00001	<0.00001	-	<0.00001	<0.0002
	Dichlorvos	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Dimethoate	mg/L	0.00015	0.00015	<0.00015	-	<0.00015	<0.0002
	Ethion	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Fenitrothion	mg/L	0.0002	0.0002	<0.0002	-	<0.0002	<0.0002
	Malathion	mg/L	0.00005	0.00005	<0.00005	-	<0.00005	<0.0002
	Methyl parathion	mg/L	0.0002		<0.0002	-	<0.0002	-
	Ronnel	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
Pesticides	Parathion	mg/L	0.000004	0.000004	<0.000004	-	<0.000004	<0.0002

Notes:

a. Criteria for cadmium, chromium, lead, nickel and zinc were hardness adjusted for a hardness of 72 mg/kg of CaCO3

* Where criteria was not available, either a lower or unknown reliabiility criteria was applied, or the laboratory PQL was used as an initial screen

Appendix C

Unexpected Finds Form

Unexpected Find Form

Unexpected Find No.:

Date:

Location:

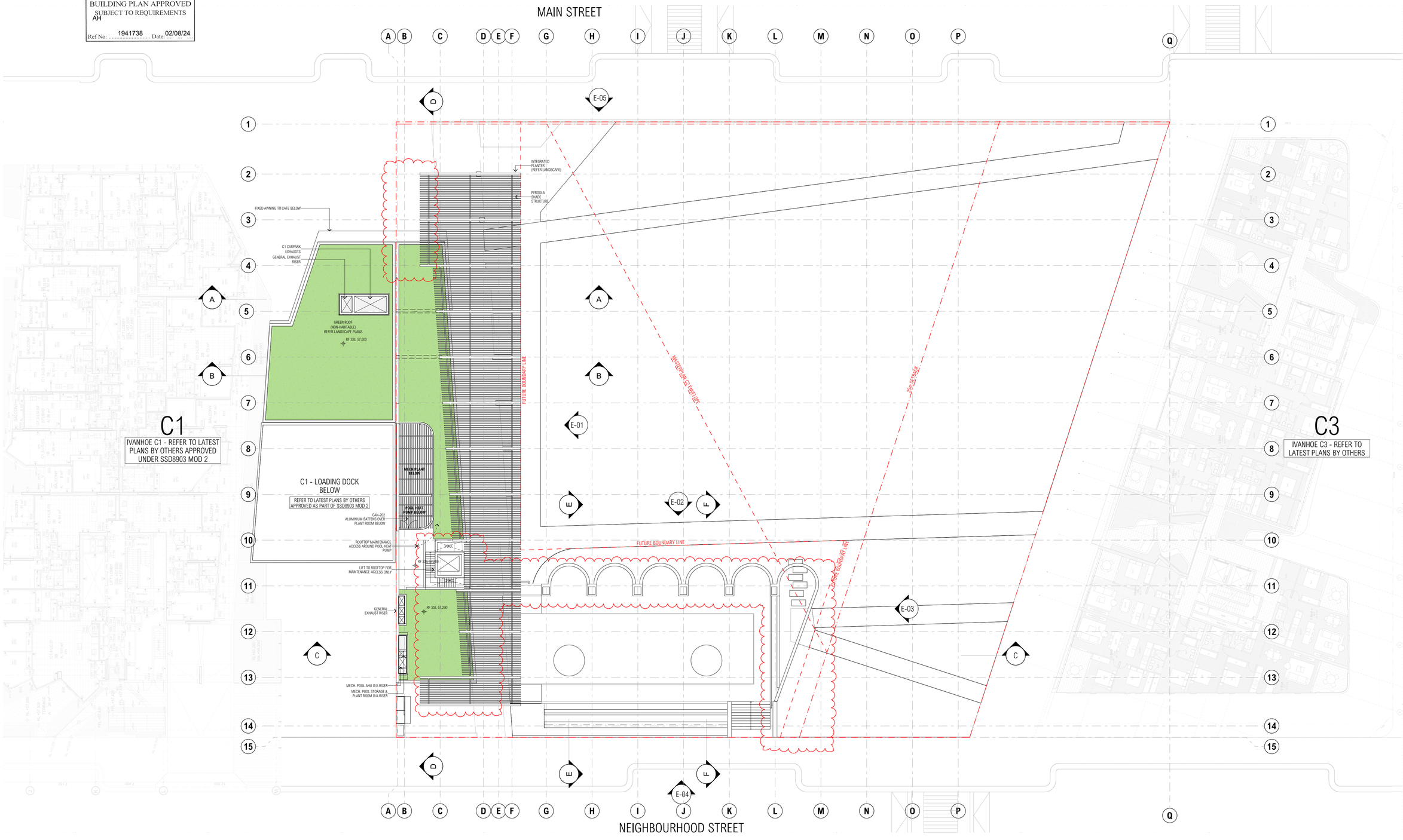
Actions

Item	Action Taken	Action Taken By
Unexpected find encountered	Affected area closed off by barrier tape	Contractor
	Notify the Principal's Representative	Site Manager
	Notify Environmental Consultant / Occupational Hygienist	Principal's Representative

Information for the Environmental Consultant to be completed by the Contractor's Site Manager

Description of the Unexpected Find	
Does the Unexpected Find potentially involve asbestos	Yes No

Accredited Supplier to SYDNEY WATER
BUILDING PLAN APPROVED
SUBJECT TO REQUIREMENTS
AH
Ref No: 1941738 Date: 02/08/24



ARCHITECT

CHROFI

3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

CHOI ROPIHA FIGHERA P/L ACN 144 714 885 ATF CHOI ROPIHA FIGHERA UNIT TRUST T/A CHROFI
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATION, REPORT AND DRAWINGS. DO NOT SCALE DRAWINGS. DIMENSIONS GOVERN. VERIFY ALL DIMENSIONS ON SITE BEFORE CONSTRUCTION. COPYRIGHT OF THIS DRAWING IS VESTED IN CHROFI.

CLIENT

FRASERS PROPERTY

LANDSCAPE ARCHITECT

MCGREGOR COXALL

REV	DATE	ISSUE
01	23/04/21	CONCEPT DESIGN ISSUE
02	30/04/21	ISSUE FOR COORDINATION
03	14/05/21	DRAFT DA ISSUE 1
04	21/05/21	DRAFT DA ISSUE 2
05	31/05/21	DRAFT DA ISSUE 3
06	23/06/21	DA ISSUE 4
07	10/07/21	DA ISSUE 5
08	04/08/21	DA ISSUE 6
09	02/02/22	DA ISSUE 7
10	21/02/22	DA ISSUE 8
11	26/08/22	DA ISSUE 9
12	23/06/23	S4.55 ISSUE

PROJECT

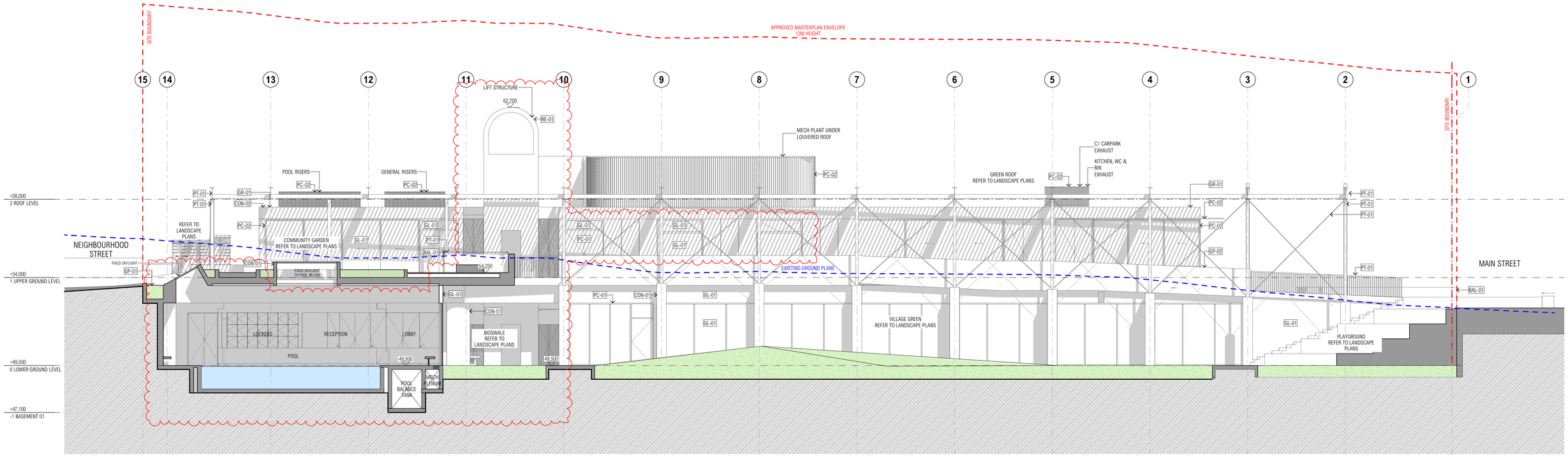
Ivanhoe Village Green & Community Centre
Ivanhoe Precinct - Midtown MacPark

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	29/06/23	LH	HR	1:200	A1	N

DRAWING TITLE

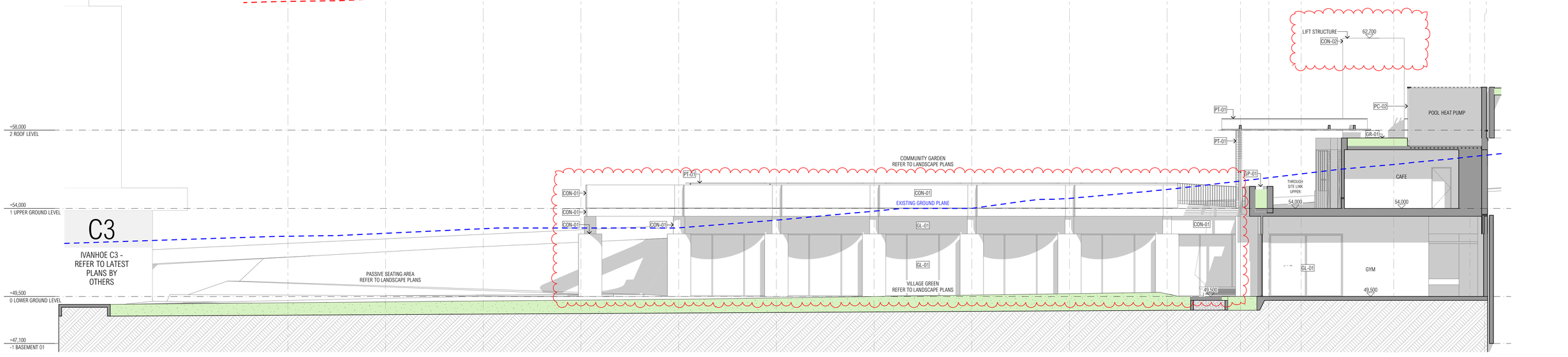
ROOF PLAN

DRAWING NUMBER	REVISION
A-A-104	12



ELEVATION 1 1:100

Accredited Supplier to SYDNEY WATER
BUILDING PLAN APPROVED
SUBJECT TO REQUIREMENTS
AH
Ref No: 1941738 Date: 02/08/24



ELEVATION 2 1:100

BAL-01 STEEL BALUSTRADE	GP-01 GREEN PLANTER
CON-01 CONCRETE	GR-01 GREEN ROOF
CON-02 CONCRETE - COLOURED	PC-01 POWDERCOATED ALUMINIUM - LIGHT GREY
GL-01 VISION GLASS	PC-02 POWDERCOATED ALUMINIUM - GREEN
PT-01 PAINTED STEEL - WHITE	
PT-02 PAINTED STEEL - GREEN	
RE-01 RENDERED MASONRY WALL - GREEN	
TB-01 TIMBER BENCH	

ARCHITECT
CHROFI
3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

CHOI ROPHIA FIGHERA P/L ACN 144 714 885 ATF CHOI ROPHIA FIGHERA UNIT TRUST T/A CHROFI. THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATION, REPORT AND DRAWINGS. DO NOT SCALE DRAWINGS. DIMENSIONS GOVERN. VERIFY ALL DIMENSIONS ON SITE BEFORE CONSTRUCTION. COPYRIGHT OF THIS DRAWING IS VESTED IN CHROFI.

CLIENT
FRASERS PROPERTY

LANDSCAPE ARCHITECT
MCGREGOR COXALL

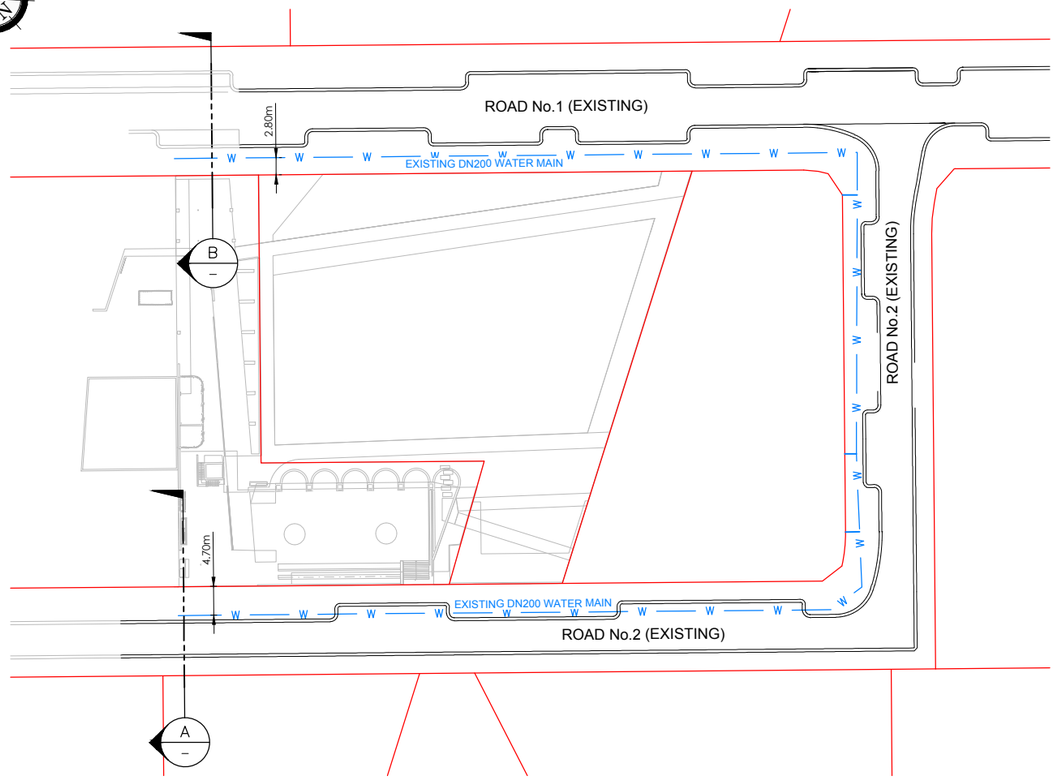
REV	DATE	ISSUE
01	23/04/21	CONCEPT DESIGN ISSUE
02	30/04/21	ISSUE FOR COORDINATION
03	14/05/21	DRAFT DA ISSUE 1
04	21/05/21	DRAFT DA ISSUE 2
05	31/05/21	DRAFT DA ISSUE 3
06	23/06/21	DA ISSUE 4
07	10/07/21	DA ISSUE 5
08	04/08/21	DA ISSUE 6
09	02/02/22	DA ISSUE 7
10	21/02/22	DA ISSUE 8
11	26/08/22	DA ISSUE 9
12	23/06/23	S4.55 ISSUE

PROJECT
Ivanhoe Village Green & Community Centre
Ivanhoe Precinct - Midtown MacPark

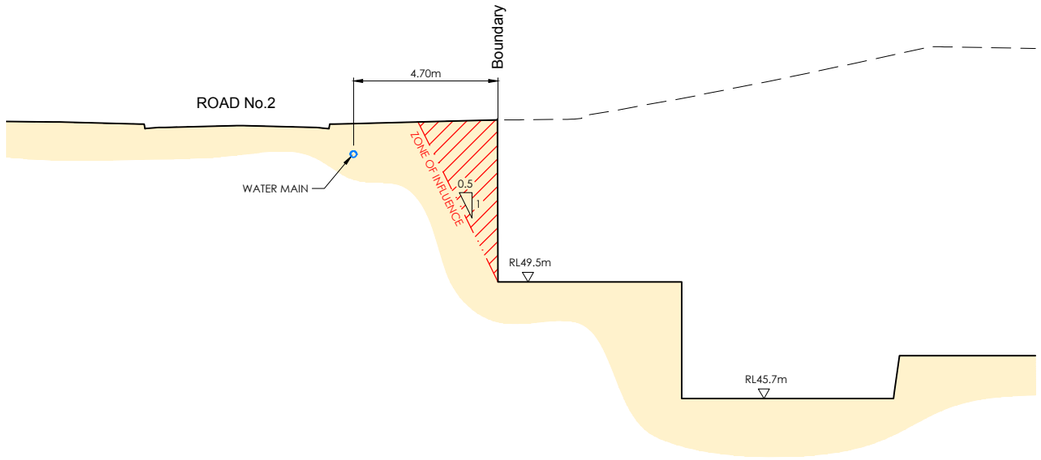
PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	29/06/23	LH	HR	1:100	A1	

DRAWING TITLE
ELEVATIONS 1

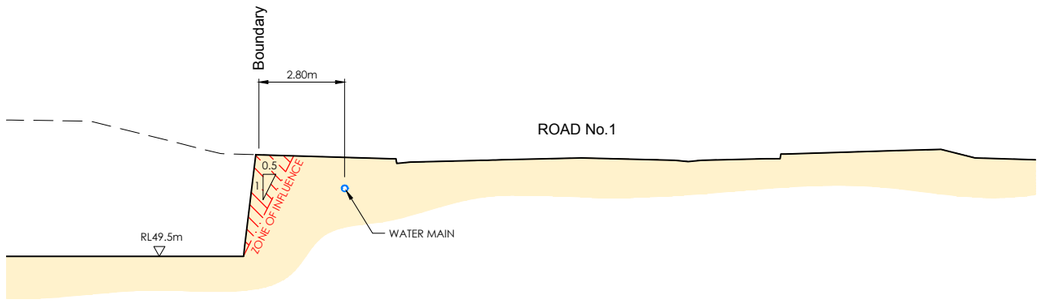
DRAWING NUMBER	REVISION
A-A-201	12



PLAN
SCALE 1:500



SECTION A
SCALE 1:100



SECTION B
SCALE 1:100

Accredited Supplier to SYDNEY WATER
BUILDING PLAN APPROVED
SUBJECT TO REQUIREMENTS
AH
Ref No: 1941738 Date: 02/08/24

ver.	date	comment	drawn	pm	level information	scale (A1 original size)	notes
B	26.07.24	BASEMENT EXCAVATION AMENDED	JD	BM	DATUM: N/A CONTOUR INTERVAL: N/A	A1 1:500 0 12.5 25.0m A3 1:1000	A1 1:100 0 2.5 5.0m A3 1:200

drawing title:
BUILDING C2
ZONE OF INFLUENCE

location: MACQUARIE PARK
council: RYDE COUNCIL
dwg ref: 300001-ESK-269
client: FRASERS PROPERTY

adw johnson
central coast office ph: (02) 4305 4300
hunter office ph: (02) 4978 5100
sydney office ph: (02) 8046 7411
www.adwjohnson.com.au

working beyond expectations

Plotted By: Jeremy Dick Plot Date: 26/07/24 8:07:03AM Cad File: S:\300001\DRAWINGS\GENERAL\300001-ESK-269[B].DWG
This plan includes coloured information. If you have a black and white copy you do not have all of the information. This note is coloured RED.
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SYDNEY WATER
BUILDING PLAN APPROVED -
SUBJECT TO REQUIREMENTS

Sydney Water Tap in ™ Ref No: 1941738

e-Developer Case No:

Property Location

Ivanhoe Estate Building C2

Street Name: Mahogany Avenue

Suburb: Macquarie Park

Building/Structure Description: Mixed use development

Building Plan No: 2041 A-A104/201 Rev.12 23/06/23
Engineers Plan No: 300001-ESK-269 Ver.B 26.07.24

Proposed building/structure is APPROVED to construct OVER/ADJACENT TO a Sydney Water asset, subject to the following requirements:

1. The foundations/piers are to be founded below the zone of influence
2. ~~No part of the building/structure or its foundations to be less than a minimum …… metre, horizontal distance from the outside edge of the asset.~~
3. ~~No part of the swimming pool or its foundations to be less than a minimum …… metre, horizontal distance from the outside edge of the asset to the outer edge of the pool.~~
4. ~~No part of the above-ground building/structure to be less than 1m (for MH on mains up to DN300)/600mm(for MS, Lampholes, RP on mains up to DN300) horizontal distance from outside edge of any Sydney Water structure.~~
5. ~~No part of the below ground building/ structure/foundations to be less than 600/900mm horizontal distance from outside edge of any Sydney Water Structure.~~
6. ~~No part of any swimming pool (excluding coping) is to be less than 2m horizontal distance from outside edge of any Sydney Water structure.~~
7. Foundations/piers are constructed in accordance with Engineers detail plans (stated above) as submitted to Sydney Water.
8. All foundations/piers are to be founded to below the zone of influence or to solid rock.
9. ~~Indemnity letter to be signed by owner/s of property and returned to Water Servicing Coordinator prior to issue of building plan approval.~~
10. ~~Concrete encase approximately …… metres of asset. Concrete encasement to be carried out by an Accredited Constructor of Minor Works (Sewer) / Constructor and a Minor Works Agreement signed prior to commencement of works.~~
11. ~~Concrete encasement must extend a minimum of 1m past the external walls of the building/structure.~~
12. ~~Minimum of …… mm vertical clearance between top of concrete encasement to underside of concrete slab.~~
13. ~~Property connection point (junction) to be inserted under Minor Works Agreement.~~
14. ~~All works are to be completed in accordance with Case No. ……~~

SPECIAL REQUIREMENTS

(a) Piering inspection is required. Additional fee may apply. Contact us Monday – Friday between 8.00am and 4.00pm on (02) 9853 0200 to arrange inspection. Please allow 24hrs notice for inspection otherwise an additional fee may apply.

(b) Piers to be constructed in accordance with engineers details supplied.

NOTE:

Above requirements must be inspected/supervised by a WSC to enable the issue of a satisfactory compliance letter.

APPROVED BY

WSC Company Name: Rose Atkins Rimmer Infrastructure

Name of Key Personnel: Alex Haggett

Signature of Key Personnel: …… Date: 02/08/2024

An application fee will be charged as per standard schedule of charges. Additional charges may also be incurred.

CASE INFORMATION

Application Number	**217427**
Application Type	Section 73 - Development
Associated Cases	189977, 192226
Agent Contact	Libby Clarke
Agent Contact Phone	0298 530 299
Agent Reference	41/24958/C2

DEVELOPER SAME AS THE APPLICANT?

Is the developer the same as the applicant?
(•) Yes ( ) No

DEVELOPER INFORMATION

Search Type	Search for a developer		
Name	Frasers Property Ivanhoe Pty Ltd	ABN	23619909922
Address	1 Ivanhoe Place, Macquarie Park 2113	Phone	

HYDRA DATA AUTO POPULATION

Hydra Download Number	2408081142	Auto-Populate

LEAD ADDRESS

Section Number		Street Number	9
Street Name	MAHOGANY AVE	Comment	
Suburb	Macquarie Park	Comment	
Cross Street			
LGA	Ryde	Comment	
UBD Edition	Sydney UBD Edition 41		
UBD Map	193	UDB Reference	P4
Plan Number(s)	DP1297146 ?	Lot Number(s)	121

DEVELOPMENT LOCATIONS

Property Number	Lot or Portion Number	Section Number	Plan Type and Number	Lot Area Sq m	Street Number	Street Name	Suburb	Lead Address
6358938	121		DP1297146	2165.1	9	MAHOGANY AVE	Macquarie Park	(•)

Total Calculated Area (Sq M)	2165.1	Comment	
Total Number of Lot/Portion Nos flagged for Development	1	Comment	

PROPERTY USE

Lot Status	Developed

Current Property Type	Delete	Comment
VACANT LAND	☐	

Add Current Property Type

Describe Current and Proposed Development:
- excavation and earthworks
- construction of a community facilitates building (Building C2)
- construction of Village Green public open space
- utilities, services infrastructure and public domain areas.

PROPOSED DEVELOPMENT

Development Type	Special
Development sub type	Community Centre
Stage Number	1 of 1
Stage Name	
Subdivision required?	(•) Yes ( ) No
Total Dwellings	0
Total Lots (incl. Residue Lots)	13
Total Residue Lots	
No. of Lots (Excl. Residue/Reserve/Road etc)	13
Total Lot Area (Excl. Residue/Reserve/Road etc)	2170.0
Attach Subdivision Plan	select 217427_Plans 1.zip
Attach Development Plan	select 217427_Plans 2.zip
Attach Additional Application Information Form	select 217427 Additional Information.zip
Is this Anticipated requirements	( ) Yes (•) No

CONSENT INFORMATION

Consent Authority	Dept of Planning and Infrastructure
Development Consent Number	SSD-15822622
Consent Date	14/11/2023
Attach Consent Document	select 217427_SSD.zip
Attach Stormwater Analysis	select
Total Impervious Surface Area	

RELIGIOUS ASSEMBLIES/RECREATIONAL FACILITIES/COMMUNITY CENTRE

Maximum number of patrons	Day
Average number of patrons	Day
Weekly Pattern of usage and peak period of patronage:	

EXPECTED REQUIREMENTS FOR THE PROPOSED DEVELOPMENT

Water

Maximum demand	61.00000 Kl/Day
Average demand	58.40000 Kl/Day
Peak demand	68.80000 L/Sec

Recycled Water

Maximum demand	Kl/Day
Average demand	0.00000 Kl/Day
Peak demand	L/Sec

Waste Water

Maximum discharge	4.20000 Kl/Day
Average discharge	2.20000 Kl/Day
Peak simultaneous discharge	10.50000 L/Sec

Irrigation Systems

Maximum demand	L/Day
Average demand	L/Day
Peak demand	L/Sec
Automatic Timer	☐
Proposed Pattern of Usage:	

Process Water

Maximum demand	L/Day
Average demand	L/Day
Peak demand	L/Sec
Proposed Pattern of Usage:	

Other Requirements

Air-conditioning make-up water	L/Sec
Proposed meter size	mm
Any other relevant information affecting usage:	

Fire Fighting Requirements

Fire Hose Reel	Number
Fire Hydrant	L/Sec
Fire Sprinkler	L/Sec
Wall Drencher	L/Sec

Regulated Design Record

Project Address:	Herring Road, Macquarie Park, NSW 2113
Project Title:	Building C1.4 MIDTOWN ESTATE
Consent No: SSD 8903	Body Corporate Reg No:
Drawing Title: BASEMENT 3 GA PLAN EAST	Drawing No: CD-A 1001.3

Rev	Date	Description	DP Full Name	Reg No
1	16.05.22	CC6	GREGORY CRONE	DEP0002439
2	23.11.22	REGULATED DESIGN	GREGORY CRONE	DEP0002439
3	22.05.23	REGULATED DESIGN	GREGORY CRONE	DEP0002439
4	10.11.23	REGULATED DESIGN	GREGORY CRONE	DEP0002439
5	28.03.24	REGULATED DESIGN	GREGORY CRONE	DEP0002439

GENERAL NOTES - 10 SERIES

1. REFER ARCHITECTURAL DRAWING NOTES PAGE (A 0102) FOR FURTHER NOTATION.
2. FOR ALL EXISTING SITE LEVELS REFER TO THE PROJECT SURVEY. ALL SETOUT WORK TO BE UNDERTAKEN BY A REGISTER SURVEYOR. THIS INCLUDES BUILDING SLAB EDGES, STRUCTURE AND WORKS ADJACENT TO THE SITE BOUNDARY.
3. COMPLY WITH ALL DEVELOPMENT CONSENT CONDITIONS & CURRENT BCA REQS.
4. UNO SERVICES PENETRATIONS IN SERVICES CUPBOARDS TO BE RATED AT SLAB JUNCTIONS I.E CUPBOARD DOORS ARE NOT FIRE RATED.
5. ALL INWARD OPENING DOORS TO ROOMS CONTAINING A TOILET PAN TO USE 'LIFT-OFF' DOOR HINGES. 'OVERCUT' DOOR TO ALLOW REMOVAL.
6. UNO ALL EGRESS DOORS (INCL UNIT ENTRY DOORS & DOORS TO COMMON STAIRS) TO ACHIEVE FRL -/60/30 & TO BE SELF CLOSING. LIFT SHAFT DOORS TO ACHIEVE FRL -/60/- (AS1735.11). EGRESS GATES TO COMPLY WITH BCA SECTION D.
7. WHEEL STOP AS PER AS 2890.1:2004
8. ALL TERRACES, DECKS, BALCONIES AND THE LIKE TO HAVE FALLS IN STRUCTURAL SLAB (NOT SCREEDS). FALLS TO HYDR ENG'S & MEMBRANE MANF'S REQS. UNO ALL BALCONY DRAINAGE CAST IN SLAB AND ALL DOWNPIPES CONCEALED.
9. WHERE PLASTERBOARD (PB) IS NOTED AS A FACING & THE WALL IS IN A 'WET AREA' (BATHROOM, ENSUITE, KITCHEN ETC) USE WET AREA FIBRE BOARD (FCW) FACING INSTEAD.
10. ANY WALL TYPE THAT IS OMITTED OR NOT CONSISTENT IS TO BE RESOLVED BY THE CONTRACTOR TO ENSURE THAT IT MEETS ALL REQUIREMENTS UNDER THE CONTRACT.
11. ALL U-VALUES FOR WINDOW/DOORS TO BE IN ACCORDANCE WITH U-VALUE REQUIREMENTS AS PER BASIX SUMMARY REPORT
12. PHYSICAL BARRIERS (E.G. WIRE MESH) ARE PROVIDED AT THE TOP OF STORAGE CAGES TO PREVENT ANY STORAGE WITHIN 500MM OF SPRINKLER HEADS. PHYSICAL BARRIERS ARE PREFERRED OVER MANAGEMENT IN USE PROCEDURES OR LINE INDICATORS ON THE WALLS. BUILDING MANAGEMENT TO ENSURE THIS COMPLIANCE FOR FIRE ENGINEERING.
13. SIGNAGE REQUIREMENTS FOR THE FIRE CONTROL ROOM, TOWNHOUSE & RESIDENTIAL CORRIDORS AND ROOF TO SUIT THE SIGNAGE CONSULTANTS DRAWINGS AND FIRE ENG. REPORT.

NOTES - ACCESSIBILITY

1. REFER TO DA CONSENT CONDITIONS AND THE LATEST REVIEW BY MGAC FOR ACCESS REQUIREMENTS
2. WHERE REQUIRED ENSURE ALL REQ'S FOR SILVER LEVEL LIVABLE HOUSING DESIGN GUIDE & ADAPTABLE APARTMENTS ARE ALLOWED FOR, PARTICULARLY IN KITCHENS & BATHROOMS. THIS INCLUDES, BUT IS NOT LIMITED TO, WALL STRENGTHENING FOR FUTURE GRAB RAILS, EXTRA CAPPED SERVICES, & CONTINUOUS FLOORING WHERE RELOCATION AND/OR REMOVAL OF JOINERY AND KITCHEN BENCHES ARE REQUIRED. ALL UNITS IN C1.1 & C1.3 TO ACHIEVE SILVER LEVEL LHDG COMPLIANCE.
3. WHERE NOTED 'ACCESSIBLE' ON PLAN, UNIT MUST COMPLY WITH ALL REQ'S. FOR ACCESSIBLE SOLE-OCCUPANCY UNITS IN AS1428.1 IN INITIAL CONSTRUCTED STATE.
4. ACCESSIBILITY PROVISIONS AS REQD BY BCA/ AS1428.1 ARE NOT SHOWN IN THEIR ENTIRETY WITHIN THESE DOCUMENTS. ITEMS NEEDING TO BE PROVIDED INCLUDE (BUT NOT LIMITED TO) TGSI, HANDRAILS, DOOR HARDWARE ETC.
5. SPECIFICATIONS AND INSTALLATION OF HANDRAILS & TGSI AS PER AS1428.1:2021

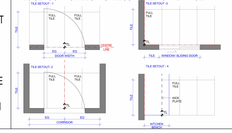
LEGEND

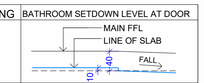
- SITE TERRAIN - REFER TO LANDSCAPE & CIVIL ENGINEER'S REQUIREMENTS
- TL — TILE SETOUT POINT. FOR BATHROOM & LAUNDRY TILE SET OUT, REFER TO SERIES 43 AND 44 FOR DETAILS

CG	COLUMN/CORNER GUARD	MA	MANSAFE ANCHOR POINT
WS	WHEELSTOP		
TGSI	TACTILES		
HR	HANDRAIL		
MB	MAILBOX		DENOTES ROUTE OF STEP FREE ACCESS TOWARD VERA LIVING APARTMENTS TO COMPLY WITH AS1428.1
MG	MECHANICAL GRILLE		
DP	DOWNPIPE		
OF	OVERFLOW		
RWO	RAINWATER OUTLET		

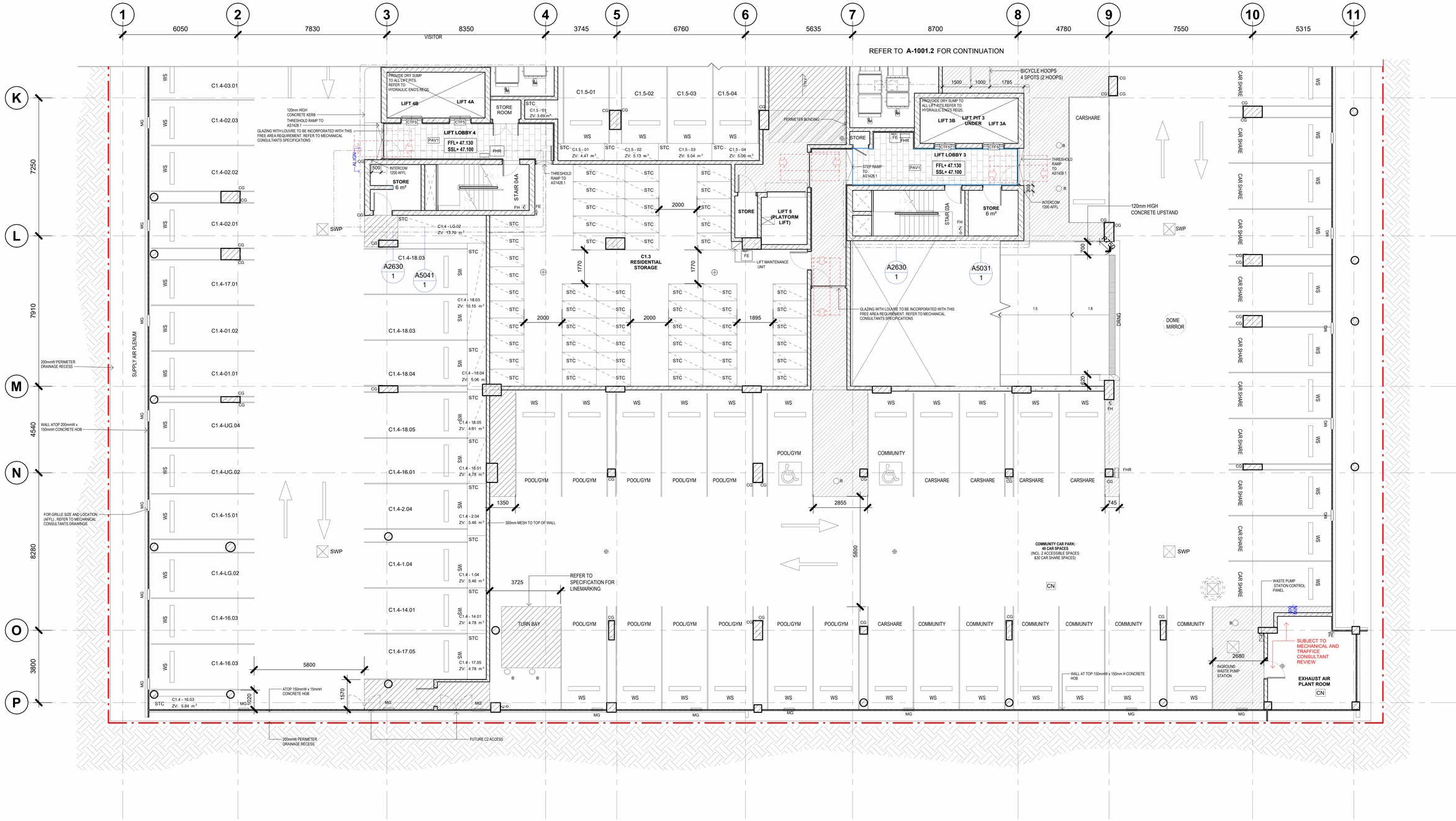
TILE SETOUT

AS A MINIMUM, TILES TO EXTEND TO KICKPLATES AND UNDER DISHWASHER AND FRIDGE SPACE.
WALL & FLOOR TILE JOINTS TO LINE UP
TILE SETOUT AS BELOW UNLESS NOTED OTHERWISE :



BUILDING	BATHROOM SETDOWN LEVEL AT DOOR
C1.1 C1.3	
C1.2 C1.4 C1.5	

REFER TO BATHROOM TYPE 44 SERIES FOR CHANGE OF LEVEL IN SHOWER AREAS AND DETAIL 2/1940.1



DOCUMENTATION ARCHITECT
CRONE ARCHITECTS
Crone Partners Pty Ltd ABN: 80 095 989 272
Level 18, 680 George Street,Sydney, NSW 2000, Australia
Ph: +61 2 8295 5300 E: info@crone.com.au
Nominated Architect: Gregory Crone (NSW Reg No. 3929)

ORIGINAL ARCHITECT
Candalepas Associates (NSW Reg.No 5773)

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CLIENT
Frasers Propety Ivanhoe Pty Limited

HEAD CONTRACTOR / BUILDING PRACTITIONER
RICHARD CROOKES CONSTRUCTIONS
Richard Crookes Constructions Pty Ltd ABN 33 001 975 266
Contractor License 47646C
Level 3, 4 Broadcast Way, Artarmon, NSW 2064 Australia
T +61 2 9902 4700 E reception@richardcrookes.com.au

CONSULTANTS

PRIVATE CERTIFYING AUTHORITY (PCA)
McKenzie Group Consulting
L6, 189 Kent St, Sydney, NSW 2000 T 02 8298 6800

STRUCTURAL ENG.
Van der Meer(NSW) Pty Ltd
L6, 39 Chandos St, North Sydney NSW 2065 T 02 9436 0433

CIVIL ENG.
ADW Johnson Pty Ltd
L35, 100 Barangaroo Ave, Sydney NSW 2000 T 02 8046 7411

FACADE ENG.
Ironbridge Engineering
L4, 17 Randle St, Surry Hills NSW 2010 T 02 9188 4494

GEOTECHNICAL ENG.
Douglas Partners
96 Hermitage Rd, West Ryde, NSW 2114 T 02 9809 0666

SERVICES - MECHANICAL
Whitton & Andrews Air Conditioning
U.5-6/16 Narabang Way, Belrose NSW 2085 T 02 9986 1199

SERVICES - ELECTRICAL/ COMS / SECURITY
Aadler Pty Ltd
L3, 31 Grose St, Parramatta, NSW 2150 T 02 8007 6895

SERVICES - HYDRAULIC
Ilias Design Group
6-10 Tooronga Toe, Beverley Hills, NSW 2209 T 02 9554 4188

FIRE ENG.
Affinity Fire Engineering
S.6.06/ 6AGlen Street, Milsons Point, NSW 2061 T 02 9194 0590

FIRE SERVICES
Innovative Fire Services
U.13/20-22 St Albans Rd, Kingsgrove, NSW 2208 T 02 9502 2900

BCA / PASSIVE FIRE
BCA Logic
PO Box Q1440, QVB, NSW 1230 T 02 9411 5360

ACCESS
Morris Goding Accessibility Consulting (NSW)
S.6/ L1, 56 Bowman St, Pyrmont, NSW 2009 T 02 9692 9322

WATERPROOFING
Waterproofing Integrity
50C Slough Business Park, 2 Slough Ave, Silverwater, NSW 2128

ESD (SECTION J/ BASIX / NatHERS / GBCA)
WSP Australia
L27, 680 George St, Sydney, NSW 2000 T 02 9272 5100

VERTICAL TRANSPORT (PASSENGER / GOODS)
Otis Elevator Company T 02 8338 2700
Harwel Lifts T 02 6558 9977

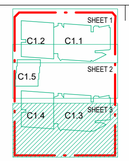
ACOUSTIC ENG.
Acoustic Logic
9 Sarah St, Mascot, NSW 2020 T 02 8338 9888

TRAFFIC ENG.
Aecm Group
L17, 1 Castlereagh St, Sydney, NSW 2000 T 02 9083 6601

LANDSCAPE
Scape Design
S.5/15 The Corso Manly, NSW 2095 T 02 99760756

NOTES

DISCLAIMER:
All dimensions and setouts to be verified prior to commencement, omissions or discrepancies to be notified to the architect. Do not scale from drawings. The Architect shall not be liable for any loss or claims from or in respect any errors existing or resulting from data howsoever transferred from the computer system of the Architect to systems of the Client or other Consultants. Recipient of the data shall be responsible for checking accuracy and completeness of data received. Any use of the electronic data in part or whole shall be at the users risk. The CAD files and their contents are representative and cannot be relied upon beyond the information provided in the PDF drawing.



Rev	Date	By	Revision Notes
B	16/05/2022	CRN	FOR CONSTRUCTION
C	13/10/2022	CRN	FOR REVIEW
D	21/10/2022	CRN	FOR REVIEW
E	24/10/2022	CRN	FOR CONSTRUCTION
F	01/11/2022	CRN	FOR CONSTRUCTION
G	14/11/2022	CRN	FOR CONSTRUCTION
H	23/11/2022	CRN	FOR CONSTRUCTION
I	22/05/2023	CRN	FOR CONSTRUCTION - REGULATED DESIGN - VERA
J	18/01/2024	CRN	AS BUILT
K	15/02/2024	CRN	AS BUILT

PROJECT INFORMATION:
CM3987
Building C1.4 MIDTOWN ESTATE
Herring Road, Macquarie Park, NSW 2113

0 1 2 3 4 5 m
SCALE 1: 100 @A1
NORTH

DRAWING TITLE
10 PROPOSED GA PLANS
BASEMENT 3 GA PLAN EAST

SHEET STATUS: **AS BUILT**
DRAWING NUMBER: **CD-A 1001.3**
CHECKED BY: **CRN**
REV: **K**
A1

FILE LOCATION: Autodesk Docs://CM3987 Ivanhoe - R23/CM3987_IVA_CRN_Bldg-1_CC_R23.rvt
23/04/2024 11:32:46 AM

Regulated Design Record

Project Address:	Herring Road, Macquarie Park, NSW 2113
Project Title:	Building C1.4 MIDTOWN ESTATE
Consent No: SSD 8903	Body Corporate Reg No:
Drawing Title: BASEMENT 3 GA PLAN CENTRE	Drawing No: CD-A 1001.2

Rev	Date	Description	DP Full Name	Reg No
1	16.05.22	CC6	GREGORY CRONE	DEP0002439
2	23.11.22	REGULATED DESIGN	GREGORY CRONE	DEP0002439
3	22.05.23	REGULATED DESIGN	GREGORY CRONE	DEP0002439
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5	28.03.24	REGULATED DESIGN	GREGORY CRONE	DEP0002439

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8. ALL TERRACES, DECKS, BALCONIES AND THE LIKE TO HAVE FALLS IN STRUCTURAL SLAB (NOT SCREEDS). FALLS TO HYDR ENG'S & MEMBRANE MANF'S REQS. UNO ALL BALCONY DRAINAGE CAST IN SLAB AND ALL DOWNPIPES CONCEALED.
9. WHERE PLASTERBOARD (PB) IS NOTED AS A FACING & THE WALL IS IN A 'WET AREA' (BATHROOM, ENSUITE, KITCHEN ETC) USE WET AREA FIBRE BOARD (FCW) FACING INSTEAD.
10. ANY WALL TYPE THAT IS OMITTED OR NOT CONSISTENT IS TO BE RESOLVED BY THE CONTRACTOR TO ENSURE THAT IT MEETS ALL REQUIREMENTS UNDER THE CONTRACT.
11. ALL U-VALUES FOR WINDOW/DOORS TO BE IN ACCORDANCE WITH U-VALUE REQUIREMENTS AS PER BASIX SUMMARY REPORT
12. PHYSICAL BARRIERS (E.G. WIRE MESH) ARE PROVIDED AT THE TOP OF STORAGE CAGES TO PREVENT ANY STORAGE WITHIN 500MM OF SPRINKLER HEADS. PHYSICAL BARRIERS ARE PREFERRED OVER MANAGEMENT IN USE PROCEDURES OR LINE INDICATORS ON THE WALLS. BUILDING MANAGEMENT TO ENSURE THIS COMPLIANCE FOR FIRE ENGINEERING.
13. SIGNAGE REQUIREMENTS FOR THE FIRE CONTROL ROOM, TOWNHOUSE & RESIDENTIAL CORRIDORS AND ROOF TO SUIT THE SIGNAGE CONSULTANT'S DRAWINGS AND FIRE ENG. REPORT.

NOTES - ACCESSIBILITY

1. REFER TO DA CONSENT CONDITIONS AND THE LATEST REVIEW BY MGAC FOR ACCESS REQUIREMENTS
2. WHERE REQUIRED ENSURE ALL REQ'S FOR SILVER LEVEL LIVABLE HOUSING DESIGN GUIDE & ADAPTABLE APARTMENTS ARE ALLOWED FOR, PARTICULARLY IN KITCHENS & BATHROOMS. THIS INCLUDES, BUT IS NOT LIMITED TO, WALL STRENGTHENING FOR FUTURE GRAB RAILS, EXTRA CAPPED SERVICES, & CONTINUOUS FLOORING WHERE RELOCATION AND/OR REMOVAL OF JOINERY AND KITCHEN BENCHES ARE REQUIRED. ALL UNITS IN C1.1 & C1.3 TO ACHIEVE SILVER LEVEL LHDG COMPLIANCE.
3. WHERE NOTED 'ACCESSIBLE' ON PLAN, UNIT MUST COMPLY WITH ALL REQ'S. FOR ACCESSIBLE SOLE-OCCUPANCY UNITS IN AS1428.1 IN INITIAL CONSTRUCTED STATE.
4. ACCESSIBILITY PROVISIONS AS REQD BY BCA/ AS1428.1 ARE NOT SHOWN IN THEIR ENTIRETY WITHIN THESE DOCUMENTS. ITEMS NEEDING TO BE PROVIDED INCLUDE (BUT NOT LIMITED TO) TGSI, HANDRAILS, DOOR HARDWARE ETC.
5. SPECIFICATIONS AND INSTALLATION OF HANDRAILS & TGSI AS PER AS1428.1:2021

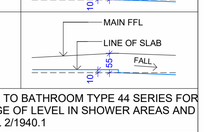
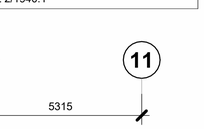
LEGEND

- CG COLUMN/CORNER GUARD
- WS WHEELSTOP
- TGSI TACTILES
- HR HANDRAIL
- MB MAILBOX
- MG MECHANICAL GRILLE
- DP DOWNPIPE
- OF OVERFLOW
- RWO RAINWATER OUTLET
- MA MANSAFE ANCHOR POINT
- TERRAIN - REFER TO LANDSCAPE & CIVIL ENGINEER'S REQUIREMENTS
- TL TILE SETOUT POINT. FOR BATHROOM & LAUNDRY TILE SET OUT, REFER TO SERIES 43 AND 44 FOR DETAILS
- DENOTES ROUTE OF STEP FREE ACCESS TOWARD VERA LIVING APARTMENTS TO COMPLY WITH AS1428.1

TILE SETOUT

AS A MINIMUM, TILES TO EXTEND TO KICKPLATES AND UNDER DISHWASHER AND FRIDGE SPACE.
WALL & FLOOR TILE JOINTS TO LINE UP
TILE SETOUT AS BELOW UNLESS NOTED OTHERWISE :



BUILDING	BATHROOM SETDOWN LEVEL AT DOOR
C1.1 C1.3	
C1.2 C1.4 C1.5	

REFER TO BATHROOM TYPE 44 SERIES FOR CHANGE OF LEVEL IN SHOWER AREAS AND DETAIL 2/1940.1

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ORIGINAL ARCHITECT
Candalepas Associates (NSW Reg.No 5773)

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CIVIL ENG.
ADW Johnson Pty Ltd
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FACADE ENG.
Ironbridge Engineering
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GEOTECHNICAL ENG.
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96 Hermitage Rd, West Ryde, NSW 2114 T 02 9809 0666

SERVICES - MECHANICAL
Whitton & Andrews Air Conditioning
U.5-6/16 Narabang Way, Belrose NSW 2085 T 02 9986 1199

SERVICES - ELECTRICAL/ COMS / SECURITY
Aadler Pty Ltd
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SERVICES - HYDRAULIC
Ilias Design Group
6-10 Tooronga Toe, Beverley Hills, NSW 2209 T 02 9554 4188

FIRE ENG.
Affinity Fire Engineering
S.6.06/ 6AGlen Street, Milsons Point, NSW 2061 T 02 9194 0590

FIRE SERVICES
Innovative Fire Services
U.13/20-22 St Albans Rd, Kingsgrove, NSW 2208 T 02 9502 2900

BCA / PASSIVE FIRE
BCA Logic
PO Box Q1440, QVB, NSW 1230 T 02 9411 5360

ACCESS
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S.6/ L1, 56 Bowman St, Pyrmont, NSW 2009 T 02 9692 9322

WATERPROOFING
Waterproofing Integrity
50C Slough Business Park, 2 Slough Ave, Silverwater, NSW 2128

ESD (SECTION J/ BASIX / NatHERS / GBCA)
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L27, 680 George St, Sydney, NSW 2000 T 02 9272 5100

VERTICAL TRANSPORT (PASSENGER / GOODS)
Otis Elevator Company T 02 8338 2700
Harwel Lifts T 02 6558 9977

ACOUSTIC ENG.
Acoustic Logic
9 Sarah St, Mascot, NSW 2020 T 02 8338 9888

TRAFFIC ENG.
Axom Group
L17, 1 Castlereagh St, Sydney, NSW 2000 T 02 9083 6601

LANDSCAPE
Scape Design
S.5/15 The Corso Manly, NSW 2095 T 02 99760756

NOTES

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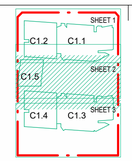

Rev	Date	By	Revision Notes
A	11/05/2022	CRN	FOR CONSTRUCTION
B	16/05/2022	CRN	FOR CONSTRUCTION
C	21/10/2022	CRN	FOR REVIEW
D	24/10/2022	CRN	FOR CONSTRUCTION
E	01/11/2022	CRN	FOR CONSTRUCTION
F	23/11/2022	CRN	FOR CONSTRUCTION
G	22/05/2023	CRN	FOR CONSTRUCTION - REGULATED DESIGN - VERA
H	18/01/2024	CRN	AS BUILT
I	15/02/2024	CRN	AS BUILT

PROJECT INFORMATION:

CM3987

Building C1.4
MIDTOWN ESTATE

Herring Road, Macquarie Park, NSW 2113

0 1 2 3 4 5 m

SCALE 1: 100 @A1

NORTH

DRAWING TITLE

10 PROPOSED GA PLANS
BASEMENT 3 GA PLAN CENTRE

SHEET STATUS: **AS BUILT**

CHECKED BY: **CRN**

DRAWING NUMBER: **CD-A 1001.2**

REV: **I**

A1

FILE LOCATION: Autodesk Docs://CM3987 Ivanhoe - R23/CM3987_IVA_CRN_Bldg-I_CC_R23.rvt
23/04/2024 11:32:34 AM

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Dewatering Management Plan

Stage 2 - Midtown
Herring Road, Macquarie Park

Prepared for
Frasers Property Ivanhoe Pty Ltd

Project 86043.06
May 2022

Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

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Revision 0	1	0	Chris Koukoutaris, Frasers Property Ivanhoe Pty Ltd

The undersigned, on behalf of Douglas Partners Pty Ltd, confirm that this document and all attached drawings, logs and test results have been checked and reviewed for errors, omissions and inaccuracies.

	Signature	Date
Author		4 May 2022
Reviewer	pp 	4 May 2022

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Appendix D:	Groundwater Monitoring Reports
Appendix E:	Results of Permeability Tests
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Report on Dewatering Management Plan
Stage 2 - Midtown
Herring Road, Macquarie Park

1. Introduction

This report presents a dewatering management plan (DMP) prepared for Stage 2 of the Ivanhoe Estate development, also known as “Midtown” at Herring Road, Macquarie Park. The DMP was commissioned in an email dated 11 March 2022 by Chris Koukoutaris of Frasers Property Ivanhoe Pty Ltd and was undertaken in accordance with Douglas Partners' proposal 86043.06.P.008.Rev0 dated 11 March 2022.

It is understood that the proposed development at the site includes the development of three buildings, known as the C2, C3 and C4 buildings.

The aim of the DMP is to assess groundwater conditions at the site, in order to provide information to support the DA submission under the SSDA process, and to support an application for a Water Access Licence (WAL) with NRAR.

This plan includes:

- Information on baseline groundwater conditions;
- Analysis of inflow for the consolidated basements of the 3 buildings forming the Stage 2 works;
- Assessment of impacts relevant to water and soils from dewatering, including impacts on water quality and hydrology; and
- Proposed management, monitoring and remedial works during bulk excavation, to ensure that inflows and discharge do not exceed anticipated levels.

2. Proposed Development

The proposed development at the site consists of three development sites, the C2, C3 and C4 sites. The location of these sites with respect to the greater Ivanhoe site are shown in Drawing 801, in Appendix B.

The proposed developments at the sites, and the key architectural drawings, from a geotechnical perspective, that have been used in the preparation of this DMP, are summarised in Table 1.

Table 1: Summary of Proposed Stage 2 Developments and Key Architectural Drawings

Site	Proposed Work	Key Drawings
C2	Village Green and Community Centre. Low rise building with sunken, landscaped area and	Basement Plan A – Drawing A-CD-101, Rev A, dated 23/2/22 by Chrofi

Site	Proposed Work	Key Drawings
	excavation zones for swimming pool and plant rooms.	Lower Ground Plan A – Drawing-A-CD-103, Rev A, dated 23/2/22 by Chrofi
C3	High rise, mixed-use building, with three level basement.	Basement 3 – Drawing A-110-B03, Rev DA-2, dated 7/2/22 by Studio Johnson
C4	High rise, residential building, with three-level basement.	Basement 3 Plan – Drawing A-DA-2050, Rev 2, dated 17/12/21 by Cox Architecture

These drawings have been reproduced in Appendix C of this DMP.

Based on the above drawings, the proposed development is understood to require:

- For the C2 site, ground levels of approximately RL 49.5 are proposed for the Village Green, and ground floor level of the buildings. Typical floor levels of the partial basement are RL 47.1 to RL 48.1, with small areas of deeper basements (RL 45.7) for service rooms. The basement floor levels at RL 47.1 match up with the (upslope) basement levels of the neighbouring (Stage 1) C1 site development. Access between the basement areas of these adjoining buildings is proposed;
- For the C3 and C4 sites, basement floor levels of RL 40.0 and RL 37.9, respectively; and
- The extent of the proposed basements is shown, superimposed on Drawing 801 in Appendix B.

This DMP is based on the following approach to basement dewatering management:

- The adoption of dewatered excavations in the short and long-term for all the basements within the Stage 2 areas;
- The treatment and disposal to stormwater of any groundwater inflow to the basements, with stormwater disposal to flow directly into Shrimpton's Creek; and
- Excavation for the C2 basement is proposed in late 2022, and subsequent excavation of the C3 basement is proposed in late 2023.

3. Site Description

The greater Midtown site is in Macquarie Park near the corner of Epping Road and Herring Road, within the Ryde Local Government Area. The site occupies an area of approximately 8.2 hectares. The approximate location of the Stage 2 site relative to the greater Midtown area, is shown in Figure 1, and in Drawing 801, in Appendix B.

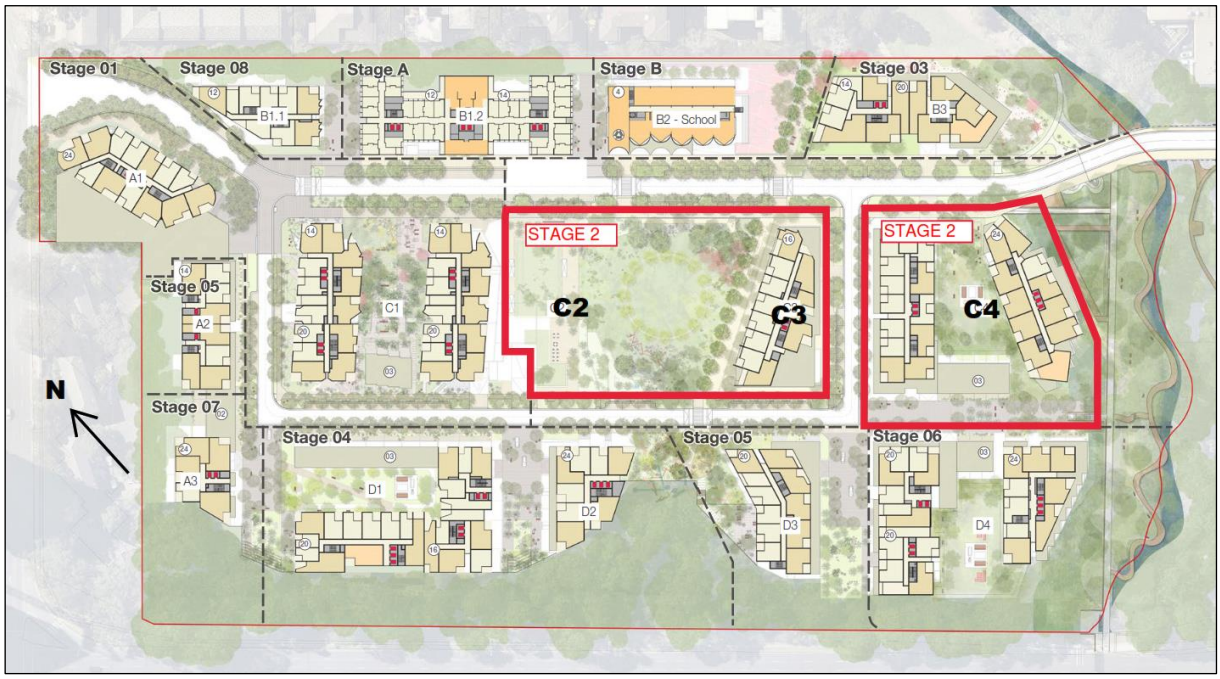

Figure 1: Location of the Stage 2 development areas (red), relative to the greater Midtown site (provided by Client).

Topographically, the Midtown site is located on a sideslope, with ground surface levels falling from approximately RL 71 near Herring Road, to approximately RL 42 at Shrimpton's Creek, at the south-eastern boundary.

Ground surface levels within the Stage 2 area typically fall from approximately RL 54 in the C2 area to RL 44 in the C4 area, towards Shrimpton's Creek. Local variation is also present due to temporary earthworks supporting other works at the site, including a sedimentation basin.

Reference to the Flood Impact Assessment by BMT Commercial Australia Pty Ltd dated 30 June 2021 indicates a baseline water level of RL 41.2 at Shrimpton's Creek and estimated peak flood levels adjacent to the Stage 2 Development area of RL 44.4 to RL 44.7 (based on storms with a 5% to 1% annual exceedance probability, respectively), rising to RL 46.14 for a probable maximum flood.

4. Background Information

4.1 Previous Reporting

Multiple geotechnical investigations and groundwater monitoring observations have been undertaken at the site by DP. The baseline data informing this DMP includes the information in key documents given in Table 2.

Table 2: Key Background Reports at Midtown informing the Dewatering Management Plan

Report	Reference and Revision	Relevance
Preliminary Geotechnical Investigation of Ivanhoe Estate	86043.01.R.001.Rev1, dated 30 July 2018	Geotechnical investigation of the greater Midtown site, including bores and standpipes in the vicinity of the Stage 2 works.
Geotechnical Investigation of C2 Site	86043.06.R.001.Rev1, dated 4 August 2021	Geotechnical investigation of the C2 site within the Stage 2 area
Geotechnical Investigation of C3 Site	86043.06.R.002.Rev2, dated 4 August 2021	Geotechnical investigation of the C3 site within the Stage 2 area
Geotechnical Investigation of C4 Site	86046.06.R.003.Rev2, Dated 4 August 2021	Geotechnical investigation of the C4 site, within the Stage 2 area
Groundwater Monitoring	86043.01.R.005.Rev0 dated 30 July 2018	Groundwater monitoring of 6 bores throughout the Greater Midtown site, from November 2017 to June 2018.
Groundwater Monitoring	86043.06.R.006.Rev0 dated 4 May 2022	Groundwater monitoring of bores in the Stage 2 area from May 2021 to April 2022

The field work methods and detailed results of geotechnical investigation are provided in the relevant geotechnical reports, and reference is provided to those reports where relevant. Broadly speaking, the boreholes were drilled by auger and rotary drilling methods in the soils, then by NMLC coring in the underlying bedrock. Standpipes were installed with a gravel-packed slotted screen length, separated from inflow through overlying strata by a bentonite layer.

The locations of deep boreholes and standpipes given in the above reports are shown in Drawing 801, in Appendix B. As shown in that drawing, at the time of preparation of this report most of the groundwater monitoring standpipes have subsequently been destroyed or buried by site operations or earthworks.

The following extracts from the above reports have been appended to this report:

- Groundwater monitoring reports, and additional groundwater measurement summaries, including summaries of standpipe installation records, given in the geotechnical investigation reports have been reproduced in Appendix D of this report; and
- Permeability tests at standpipe locations are reproduced in Appendix E, based on the use of falling / rising head tests to estimate the hydraulic conductivity (k) using the Hvorslev (1951) method. The testing targeted sandstone units by installing intake screens within boreholes/wells over the area of interest.

The results of the above investigation and monitoring, including interpreted sections based on consolidated data from the various monitoring and investigation reports, are discussed further in the development of the Geotechnical and Hydrogeological Model outlined in Section 6 of this report.

4.2 Regional Mapping

Reference to the Soils Landscape Series mapping indicates that the Midtown site is largely underlain by the residual Lucas Heights soil landscape, and by the erosional Glenorie soils towards Herring Road. The Stage 2 area is mapped as residual Lucas Heights soil landscape.

Reference to the Geological mapping indicates that the Midtown site is underlain by Ashfield Shale towards Herring Road, and by the (lower unit of) Hawkesbury Sandstone in areas of lower elevation. The transitional Mittagong Formation may be present between these two units. A dyke has been identified approximately 2 km north-west of the site, oriented parallel to and near Epping Road, and potentially extending to or near the Midtown site.

The results of the various site investigations in the Stage 2 area are considered to be relatively consistent with the published mapping, with the investigation typically identifying shallow fill and residual soils, underlain by Hawkesbury Sandstone. Alluvial soils are present locally, near Shrimpton's Creek. No dyke materials were identified in the (vertical) bores.

Additional mapping for the site is considered, and discussed with specific reference to dewatering impact considerations, in Section 9 of this report.

5. Supplementary Field Work and Laboratory Testing

Groundwater sampling was carried out in general accordance with DP's standard operating procedures for the purpose of chemical laboratory testing.

Groundwater samples were collected using a low flow peristaltic pump via the micro-purge (minimal drawdown) method. The sampling method was as follows:

- Measuring of the static water level using an electronic interface probe and recording the thickness of any light aqueous phase liquid (LNAPL). It is noted that no LNAPL was encountered during the sampling;
- Decontaminating the interface probe and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water;
- Lowering the well-dedicated tubing into the well then clamping at a level approximately mid-water column;
- Setting the pump at the lowest rate possible to minimise drawdown of the water column;
- Measuring the physical parameters by continuously passing the purged water through a flow cell; and
- Following stabilisation of the field parameters, collection of samples in laboratory-prepared bottles minimising headspace within the sample bottle and capping immediately.

The general groundwater sample handling and management procedures comprised:

- Collection of 10% replicate samples for QC purposes;

- Labelling of sample containers with individual and unique identification details, including project number and sample location;
- Placing the sample jars into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

Sampling was completed from groundwater wells 109A, 111 and 118A. Sample volumes were limited at Bore 118A due to the limited depth of water in the standpipe, and the test scope was adjusted accordingly. Field work results including physical parameters were recorded on field sheets which are included in Appendix F.

The results of laboratory analysis are summarised in Table 1F in Appendix F:

The laboratory certificate of analysis together with the chain of custody and sample receipt information is provided in Appendix F.

6. Geotechnical and Hydrogeological Model

6.1 General Stratigraphy and Groundwater Levels

The geotechnical conditions identified by the investigation indicate a relatively shallow soil profile in the Stage 2 area, consisting of some fill, underlain by residual soil then by Hawkesbury Sandstone. Some alluvial soils were present beyond the Stage 2 area, closer to Shrimpton's Creek, though it is noted that the sandstone was still shallow in these areas. The geotechnical model layers at the site, based on the results of geotechnical investigation, are summarised in Table 3.

Table 3: Summary of Geotechnical Model Units in Stage 2 Area

Unit	Summary	Typical Description
1	Fill	Variable fill, including gravelly sand and apparently re-worked natural clay soils, to typical depths of 0.5 m to 1.5 m, but likely to be deeper in areas of stockpiles, earthworks and services.
2a	Alluvial Soil	Soft to firm, sandy clay, identified at Bore 10 only, beyond the eastern corner of the site, to a depth of 2.1 m.
2b	Residual Soil	Firm to very stiff sandy clay and clayey sand, with trace iron-indurated bands, often grading to hard clay and dense clayey sand (extremely weathered sandstone), absent at some locations.
3a	Sandstone – Variable	Typically very low to low strength, but with extremely weathered (soil strength) bands, medium and high strength iron-cemented bands, highly weathered, typically fractured to highly fractured sandstone.
3b	Sandstone – Low and Medium Strength	Typically medium strength, but low strength or with thick beds of low strength sandstone at some bores, and some high strength bands, highly to slightly weathered, fractured and slightly fractured sandstone.

Unit	Summary	Typical Description
3c	Sandstone – Medium and High Strength	Typically high strength, but with some thick beds of medium or medium to high strength sandstone and some very high strength bands, moderately weathered to fresh, slightly fractured to unbroken, with some fractured zones. This unit is mostly distinguished from Unit 3d by weathering.
3d	Sandstone – High Strength	Typically high strength with some very high strength bands, fresh, slightly fractured to unbroken.

The groundwater measurements at the various standpipes at the site, throughout the monitoring periods, indicate that groundwater levels are within the sandstone bedrock in the Stage 2 area, largely within Unit 3c, but occasionally in Units 3a and 3b.

The permeability of the rock mass, and therefore the flow into the excavation, is expected to be governed by the permeability and continuity of the defects within the rock. The above units are largely based on the strength of the rock and fracture spacing observed in the rock cores, and therefore are also expected to correspond to changes in permeability, with permeability decreasing from Unit 3a, to 3b, to 3c then 3d.

Interpreted geotechnical long sections through the Stage 2 area, produced for the purpose of this DMP, are included in Drawings 802 to 803. These interpreted sections show:

- A summary graphic log for the boreholes, showing the general stratigraphy with depth;
- The slotted screen length at standpipe locations, and summary water levels showing measured levels, and/or range of monitored levels at standpipe locations;
- The interpreted water table along these sections, excluding measurements that appear to represent isolated fluctuations (eg high levels shortly after drilling, with no apparent weather influence); and
- The interpreted geotechnical boundaries for the sandstone units outlined above, where those units intersect the interpreted groundwater table. The overlying soil units can be readily identified from the graphic log, are above the groundwater table and have not been labelled in the sections.

As can be seen from the sections, the groundwater table falls from approximately RL 46 at the upslope side of the Stage 2 site, near the C1 excavation for Stage 1 of the works, falling to the south and south-east towards Shrimpton's Creek, at approximately RL 41.2. Shrimpton's Creek appears to be the receiving water for the existing groundwater flow through the site. Groundwater in the depth range affected by the proposed dewatered excavation, is largely within Unit 3c sandstone. Some of the more fractured rock of Units 3a and 3b are intercepted at the eastern end of the site, however, as can be seen in Long Section B-B (Drawing 803 in Appendix B).

Groundwater level fluctuations of approximately 0.5 m to 1.0 m were typically observed at monitoring points during the monitoring period, though occasionally higher. Greater fluctuations are likely to occur over the longer term in response to climate and weather variations, and due to human influences onsite or upslope. The water levels shown in the sections are generally at the higher end of the monitored readings, for the subject bores.

6.2 Hydrogeological Characterisation

The results of the permeability tests (by falling / rising head, or 'slug' tests), as given in Appendix D of this report, were considered in conjunction with the effective screen length, material description, Rock Quality Designation (RQD) and average defect spacing, as given in the original bore logs in the investigation reports. Increasing defects in rock masses will lead to increases in permeability. A visual assessment from the borehole photos along the screen interval (as given in the investigation reports) was also completed, to check calculated permeabilities against the general rock condition. The results of the review are summarised in Table 4.

Table 4: Summary of Hydrogeological Data at Midtown

Bore	Screen Start (RL,m)	Screen Finish (RL,m)	Screened Unit	Rock Strength	Rock Weathering	Average Fracture Spacing (m)	RQD	Estimated k (m/s)
118A	46	43.9	3A	VL/LS	HW	0.35	55	7.7E-08
104A	40.3	38.3	3C	HS	MW	0.1	70	4.2E-06
106	42	38.5	3C	HS	SW/FR	>1.0	98	9.7E-08
106*	42	38.5	3C	HS	SW/FR	>1.1	99	1.5E-08
109A	41.1	37.6	3C	HS	SW/MW	0.75	93	2.8E-07
111A	40.8	37.3	3C	MS/HS	MW/SW	0.5	90	3.8E-07
115	38.9	35.4	3C	HS	MW/SW	0.4	90	1.9E-06
107	36	32.5	3D	HS	FR	1	94	1.7E-06
109	35.8	32.3	3D	HS	FR	>1	100	1.3E-07
111	37.5	34	3D	MS/HS	FR	1	95	1.7E-07
113	36.1	32.6	3D	HS	FR	>1	100	9.7E-07
114	39	32.4	3D	HS	FR	0.75	95	5.4E-07

*Note: Rising head tests

The hydraulic conductivity values in Table 4 were then plotted against RL to interpret appropriate parameters for the inflow assessment for each unit, as shown in Figure 3.

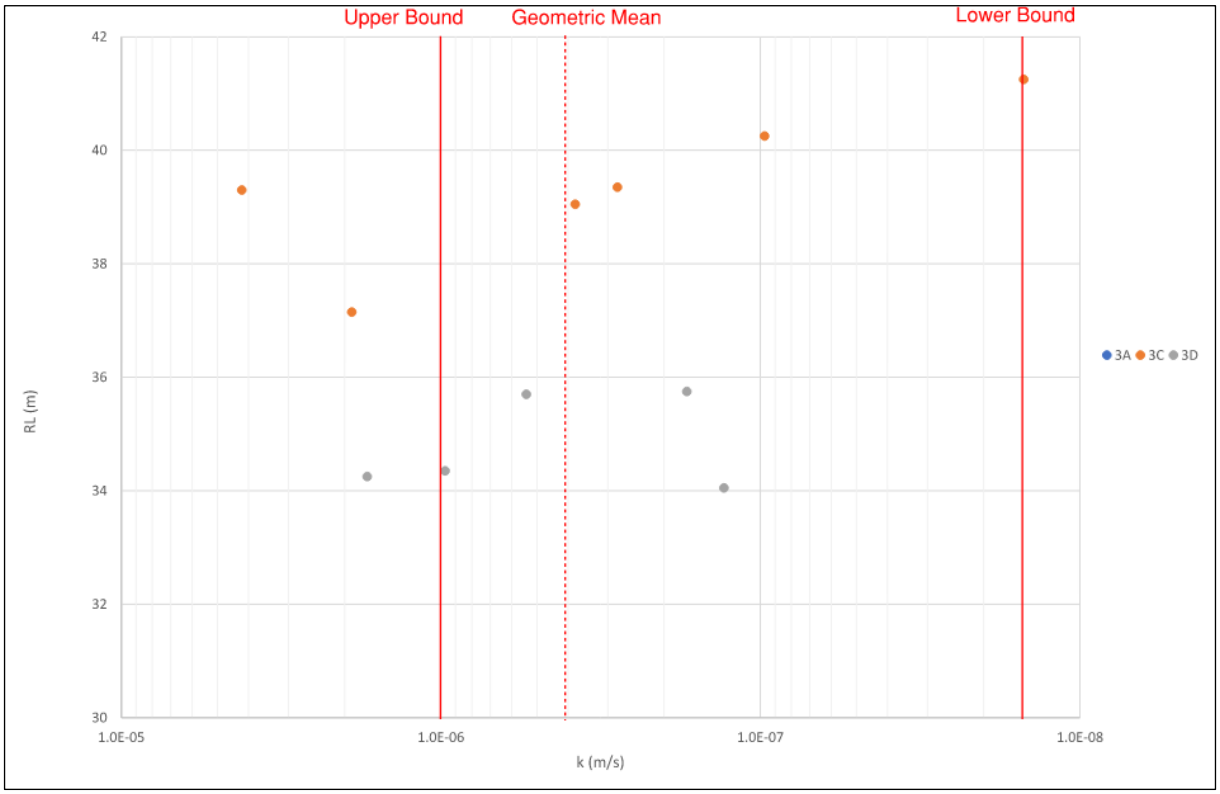

Figure 2: Hydraulic Conductivity vs RL using Midtown data (x axis log scale)

It is noted in Figure 3 that there is no noticeable variation when comparing the permeability of the in-situ testing for the 3c and 3d units, which are the primary units which will contribute to seepage and groundwater inflows. Testing on the 3a unit was in a similar order to the other sandstone units, while inconclusive testing occurred in the 3b unit. Given this, it was deemed suitable to adopt a bulk rock horizontal hydraulic conductivity (k_h) for the inflow and drawdown assessment. This was calculated by taking the geometric mean of all hydraulic conductivities for borehole screens located below the long-term water table, and represents an average permeability on a large rock mass scale. Table 5 summarises the adopted (hydraulic) conductivity values, with 'lines of best fit' indicated in Figure 3. Note that the x axis on Figure 2 is a log scale.

Table 5: Adopted hydraulic permeability for inflow assessment

Unit	Bound	k_h (m/s)	k_h (m/d)	k_v/k_h
3a, 3b, 3c and 3d	Upper	1.0E-6	0.0864	0.5
	Geometric Mean	4.0E-7	0.0346	0.5
	Lower	1.5E-8	0.0013	0.5
Fill / Residual Soil	Adopted all cases	1.0E-8	0.000864	0.5

A porosity of 0.1 was adopted for sandstone, and 0.5 for the soil unit.

7. Groundwater Modelling

7.1 Methodology

Groundwater modelling was undertaken to assess the potential inflow rates into the proposed basement during construction. The drawdown or cone of depression, likely to be induced by the excavation was also assessed.

A 2-dimensional (2D) numerical groundwater model was developed. The modelling was carried out using 2D finite element hydrogeological software SEEP/W (a component of GeoStudio 2019 R2, Version 10.1.1.18972) developed by GEOSLOPE International Ltd. Both steady-state and transient flow conditions were modelled in the analyses.

The resulting SEEP/W outputs (in m3/s/m run) are based on a two dimensional model, which assumes the basement excavations are much longer than their width. In order to convert these predictions to more realistic values for a finite basement, the following expression proposed by Kavvadas et al (1992) was used to adjust the results to allow for the actual length to width ratio of the proposed basement.

$$\frac{qo}{q} = 0.7 + 0.3\left(1 - \frac{B}{L}\right)$$

where: qo is the predicted 'realistic' inflow rate
q is the inflow rate from 2D modelling
B is the width of the excavation
L is the length of the excavation

7.2 Model Geometry

For the purpose of the analysis, DP selected one cross-section in the west to east direction, intersecting the C1, C3, and C4 basements footprint through the centre. The ground surrounding the proposed development was simulated as being a multi-layered numerical model to represent the subsurface conditions surrounding the site. The C2 basement was excluded from the inflow assessment, as there is very limited interception of the groundwater table (<0.5 m) in a corner of the basement, and the inflows are expected to be orders of magnitude less than the inflows to C3 and C4 (ie effectively negligible for the consolidated basement inflows).

The geological units were subdivided into layers corresponding to the main soil and rock units for the numerical model, as outlined and characterised in Section 6.2. The boundaries of the model were extended approximately 50 m from the western end of C1 basement and 20 m from the eastern end of C4 excavation. This is slightly less than the actual distance to Shrimpton's Creek from the C4 basement area (approximately 25 m), but is considered reasonable for the purpose of this assessment.

The geological units were simulated by assigning multiple materials with different hydraulic conductivities (permeabilities) to the model layers. Details of the layering are provided in Figure 3. All layers were assigned as SEEP/W saturated/unsaturated materials.

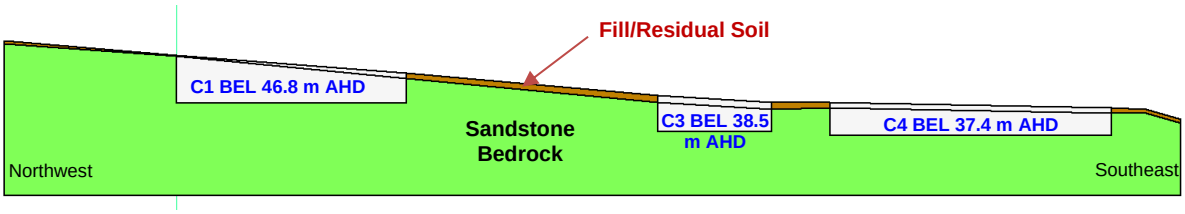

Figure 3: Model Geometry

The calculated reduction factors due to each basement shape and alignment, were obtained from the following geometries and applied to the Seep/W analysis outputs:

- C3: approximately 33 m width (average) parallel to the flow direction and 70 m length perpendicular to the flow direction, a reduction factor of 0.85 was applied.
- C4: approximately 70 m (average) width parallel to the flow direction and 82 m length perpendicular to the flow direction, a reduction factor of 0.75 was applied.

These reduction factors were used to obtain the inflow estimates in ML/year.

7.3 Basement Shoring Walls

As noted in Section 2 of this report, it is understood that a drained basement shoring excavation support scheme is proposed.

The bulk excavation levels for C1, C3, and C4 were assumed at RLs 46.8, 38.5, and 37.4 m AHD, respectively. These levels correspond to a depth of approximately 0.3 m below basement floor levels.

7.4 Groundwater Modelling Simulations

A Base Case Analysis was based on the geometric mean for sandstone bedrock permeability value. The analysis was run under transient and steady-state conditions and comprised the following:

Table 6: Groundwater Modelling Runs

Run	Scenario and Boundary Conditions
Run 1- C3 Excavation Dewatering	This considered a transient scenario to estimate the inflow and drawdown due to C3 basement excavation and construction (an assumed construction dewatering period of up to 1 year) while C1 excavation is already completed. The groundwater level at C1 was set to RL 46.8 (i.e., C1 BEL) as northwestern end boundary condition and at RL 41.2 (Shrimpton Creek) on the southeastern end of the model.
Run 2- C4 Excavation Dewatering	This considered a transient scenario to estimate the inflow and drawdown due to C4 basement excavation and construction (an assumed construction dewatering period of up to 1 year) while C1 and C3 excavations are already completed.

Run	Scenario and Boundary Conditions
	The groundwater level at C3 was set to RL 38.5 (i.e., C3 BEL) as northwestern end boundary condition and about RL 41.2 (Shrimpton Creek) on the southeastern end of the model.
Run 3 – Steady-State Analysis	This considered a long term steady-state scenario assuming the three drained basements of C1, C3 and C4 completely excavated to estimate the long term inflow and drawdown likely to happen as a result of the drained basements after the basements are constructed. The constant head 'far-end' boundary conditions were calibrated similar to Run 2-C4.

In excavation stages, the duration of the basement excavation works has been assumed to be effectively instantaneous, ie all excavation below the groundwater table is assumed to occur in one step, and not progressively over days or weeks. This results in concentrated short-term inflows after excavation, but does not affect long term volumes.

Following the base case runs, sensitivity analyses were undertaken using the upper bound and lower bound values for sandstone bedrock permeability given in Section 6.2, with no other changes to the model.

7.5 Groundwater Modelling Results

The inflow rates represent the estimated total rate of groundwater flowing into the excavations and the volume (per unit time) requiring extraction via the dewatering system in order to dewater the basement excavation during construction.

Simulated results of the runs for the short term (during construction) and in the long term (basements left as drained) for the base case are summarised in Table 7 to Table 9, with the inflow volumes adjusted to consider the dimensions of the basement (refer discussion in Section 7.1).

Table 7: Predictive Model Simulated Inflow Results - Run 1- C3 Excavation Dewatering

Elapsed Time	Inflow Rate – Base Case			
	m^3 / sec / m run	L / min	m^3 / day	Average ML / year
7 days	1.7×10^{-6}	8.8	12.7	2.7
14 days	1.2×10^{-6}	6.4	9.2	
30 days	9.8×10^{-7}	5.2	7.5	
60 days	9.2×10^{-7}	4.9	7.0	
90 days	9.1×10^{-7}	4.8	6.9	
180 days	9.0×10^{-7}	4.8	6.9	
270 days	9.0×10^{-7}	4.8	6.9	

Elapsed Time	Inflow Rate – Base Case			
	m^3 / sec / m run	L / min	m^3 / day	Average ML / year
1 year	9.0×10^{-7}	4.8	6.9	

Table 8: Predictive Model Simulated Inflow Results - Run 2 - C4 Excavation Dewatering

Elapsed Time	Inflow Rate – Base Case			
	m^3 / sec / m run	L / min	m^3 / day	Average ML / year
7 days	1.4 x 10-6	9.0	13.0	4.5
14 days	1.3 x 10-6	8.5	12.3	
30 days	1.3 x 10-6	8.5	12.2	
60 days	1.3 x 10-6	8.5	12.2	
90 days	1.3 x 10-6	8.5	12.2	
180 days	1.3 x 10-6	8.5	12.2	
270 days	1.3 x 10-6	8.5	12.2	
1 year	1.3 x 10-6	8.5	12.2	

Table 9: Predictive Model Simulated Inflow Results for Long Term - Run 3 – Steady-State

Basement ID	Inflow Rate – Base Case			
	m^3 / sec / m run	L / min	m^3 / day	Average ML / year
C3	5.1 x 10-7	2.7	3.9	1.5
C4	1.3 x 10-6	8.5	12.2	4.5

Sensitivity analysis results, based on the upper bound and lower bound permeabilities results given in Table 10 below.

Table 10: Sensitivity Analyses - Predictive Model Simulated 2D Inflow Results

Average Inflow Rate (ML/Year)			
Case	Basement ID	Upper Bound	Lower Bound
Average Inflow Rate during Excavation (ML/year)	C3	8.4	0.3
	C4	12.3	0.3
Long-term	C3	4.0	0.1
	C4	12.2	0.2

The following comments are given on the analysis:

- Average inflows of about 3 ML/year and 5 ML/year are expected during the basement excavation and first year of dewatering for C3 and C4; respectively
- Long-term inflows of about 2ML/year and 5 ML/year are expected for C3 and C4, respectively; **or 7 ML/year for the consolidated basements of the Stage 2 area, in the long-term.**
- Sensitivity estimates of inflow indicate long term flows of less than 1 ML/year to up to 17 ML/year for the consolidated basements of the Stage 2 areas and based on the expected construction sequence. Given the available information and availability of management options (refer Section 10), it is anticipated that if the higher inflow levels are encountered during excavation, management options will be put in place to manage them.

The inflow rate presented above is a prediction only and may vary significantly to the rate presented. The actual flow rate will only be known once the excavation is completed, and the inflow can be observed and measured. Appropriate planning should be in place to monitor and compensate for possible variations in the actual inflow rate, as discussed in Section 10.

7.6 Drawdown Estimates

The impact on the water table from dewatering of the C3 and C4 basements was estimated by subtracting the steady-state groundwater level after excavation from the initial groundwater level prior to basement excavation. The drawdown at various distances away from the basement excavation in the upstream and downstream side of the excavation in the long term for base case analysis are summarised in Table 11. Note that mounding effects are not anticipated, given the dewatered basements proposed.

Table 11: Groundwater Table Drawdown

Location	Location	Initial Water Level (RL m AHD)	Final Water Level (RL m AHD)	Drawdown (m)
Upslope (Upgradient)	Immediately Adjacent to Basement	45.0	38.5	6.5
	20 m from Basement	45.5	41.4	4.1
	50 m from Basement	46.2	44.0	2.2
Downslope (Downgradient)	Immediately Adjacent to Basement	41.7	37.4	4.3
	10 m from Basement	41.5	39.9	1.6
	20 m from Basement (Shrimptons Creek)	41.2	41.2	0.0*

Note: *The lack of drawdown at Shrimpton's Creek is reflective of the boundary conditions. Given that any groundwater take is to be treated and disposed of to Shrimpton's Creek, this is considered reasonable.

The simulation results show that drawdown of 2.2 m is anticipated 50 m upslope of the basement (still within the Midtown site), and 1.6 m is anticipated 10 m downslope of the basement. Drawdown at

Shrimpton's Creek (0 m) is determined by the boundary condition, and is considered reasonable given the return of groundwater take to Shrimpton's Creek, in the area adjacent to the Midtown area.

This analysis also indicates that some drawdown may occur around the (local) C2 excavation. Given the nominal depth into the existing groundwater at that location, this further reinforces the negligible inflows to the C2 basement, compared to the C3 and C4 basements.

8. Groundwater Quality

One round of the groundwater monitoring was completed as part of the current works from the wells within or near the Stage 2 development. Results were compared against the adopted groundwater quality criteria to provide an indication on the likely requirement for treatment of groundwater prior to disposal.

Groundwater results and the adopted screening criteria (ANZG 2018) are shown in Table 1F in Appendix F. It should be noted that the disposal criteria may vary depending on the receiving water body and / or the requirements of relevant authorities. The adopted criteria for 95% species protection for freshwater groundwater was selected based on the groundwater conditions at the site.

The results of the groundwater quality monitoring indicate that groundwater chemical concentrations are within the adopted screening criteria for all analytes tested with the exception of metals that exceeded the adopted criteria (more specifically, chromium, copper, iron, lead and zinc). Elevated iron concentrations can also be associated with discolouring of the water and may have aesthetic concerns. These elevated concentrations, particularly in sample 118 are likely associated with the high levels of total suspended solids (TSS) detected in the groundwater which would also need to be addressed. It is noted that although sample 118 had elevated suspended solids, the anion and cation concentrations were consistent with the results from the other groundwater wells. As such, the results from sample 118 are considered to be representative of the groundwater rather than surface water or perched water, although the high TSS may be influenced by sediment and not be representative of groundwater inflow.

Groundwater will require treatment and quality monitoring prior to disposal to stormwater (ie Shrimptons Creek) and noting that, based on the current results, the required quality levels should be able to be achieved through conventional industry practices. Site specific dewatering criteria from the relevant authorities would need to be confirmed prior to any groundwater disposal and ongoing monitoring undertaken as outlined in Section 10.

9. Impact Assessment

9.1 Aquifer Interference Policy

The Water Management Act (2000) includes the concept of ensuring "no more than minimal harm" for granting water access licences and approvals, and the NSW Aquifer Interference Policy (AIP, 2012) requires assessment of the potential impact of dewatering relative to the minimal impact considerations it defines (in Table 1 or Table 2 of that document), as they relate to water-dependent assets.

The NSW Aquifer Interference Policy (AIP) indicates that the term “aquifer” is commonly understood to mean a groundwater system that is sufficiently permeable to allow water to move within it, and which can yield productive volumes of groundwater. A groundwater system is defined as any type of saturated geological formation that can yield low or high volumes of water. However, for the purpose of the AIP, the term aquifer has the same meaning as groundwater system and includes low yielding and saline systems.

The site is underlain by fill and residual and shallow rock that is typically slightly fractured. The rock profile on the site is of relatively low permeability with low yield, and is considered to be a “less productive groundwater source” as outlined in the AIP.

Table 1 in Section 3.2.1 of the AIP outlines minimal impact considerations. The AIP indicates that *“if predicted impacts are less than the Level 1 minimal impact considerations, then these impacts will be considered as acceptable”*. The following minimal impact considerations are outlined for less productive porous and fractured rock groundwater sources:

- less than or equal to 10% cumulative variation in water table 40 m from any high priority groundwater dependant ecosystem, high priority culturally significant site, *and* less than a 2 m decline at any water supply work; *and*; a cumulative pressure head decline of not more than 2 m at any water supply work; and
- any change in groundwater quality should not lower the beneficial use category of the groundwater source beyond 40 m from the activity.

The minimal consideration impacts relate to impacts on groundwater dependant ecosystems and groundwater users. The proposed excavation on the site is considered to comply with the AIP minimal consideration requirements for the following reasons;

- There are no registered groundwater users within 500 m of the site (ref Figure 4), and DP is not aware of any water sharing agreements in the area;
- DP is not aware of any groundwater dependant ecosystems in close proximity of the site. There is a moderate potential GDE more than 100 m from the site to the south at ELS Hall Park. Lane Cove River is situated 1 km from the site to the north east (ref Figure 5). These locations are considered to be too distant from the basements to be influenced by the dewatering activities, particularly given the proposed return of groundwater to Shrimpton’s Creek;
- The site and adjacent soils are outside of areas of coastal Acid Sulphate Soil mapping, and elevations are above the level of known acid sulphate soils. Therefore no change in soil or water quality due to drawdown in acid sulphate soils is anticipated;
- Groundwater testing indicates that measures to make the groundwater take suitable for disposal to stormwater (ie Shrimptons Creek), are likely to be achievable using conventional groundwater treatment methods; and
- The take of water can be easily measured during the construction period and in the long term.

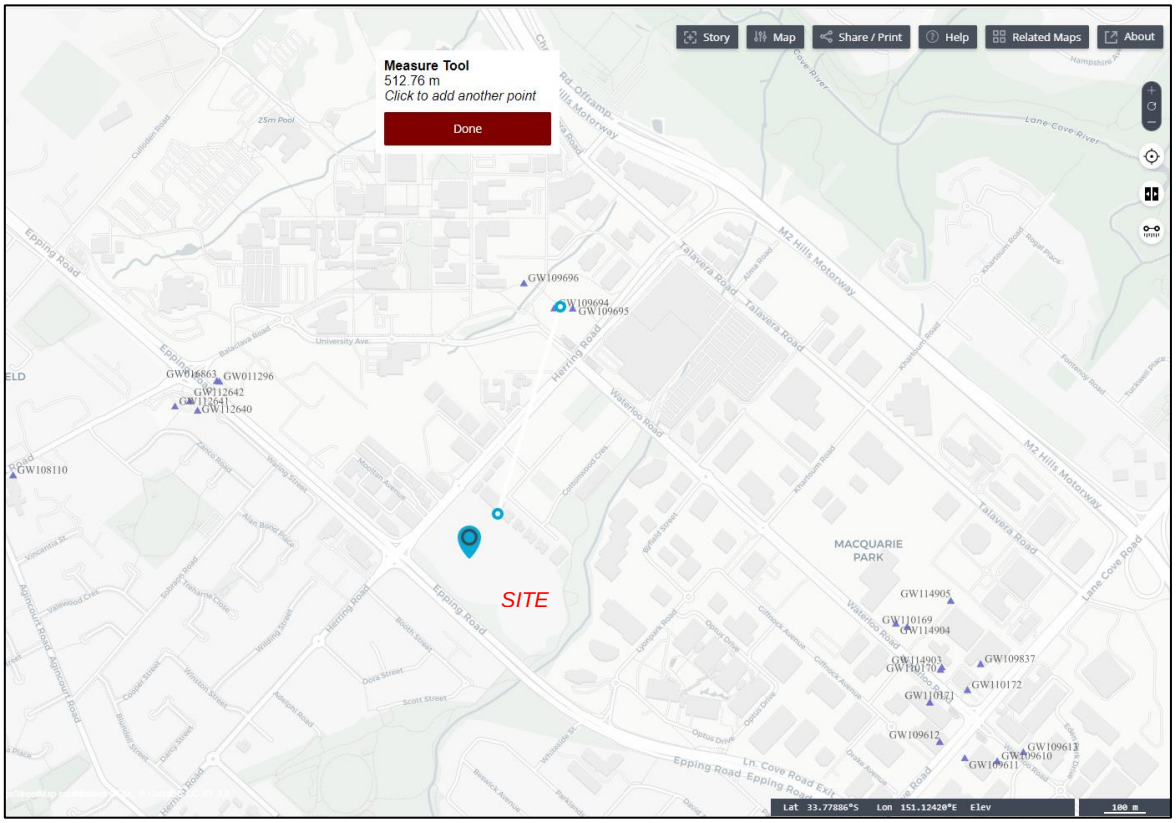

Figure 4: Map of NSW Registered Groundwater Wells (Purple Triangles)



Figure 5: Map of Groundwater Dependent Ecosystems (GDEs) Near the Site (Bureau of Meteorology (BoM): GDE Atlas online, viewed 28 April 2022.)

9.2 Summary of Assessment of Effects on Neighbouring Properties

The potential effects of dewatering on neighbouring properties and groundwater dependent ecosystems, building on the information already outlined above, is summarised in Table 12.

Table 12: Assessment of Potential Effects of Dewatering on Neighbouring Properties

Item	Comment
Proximity of Groundwater Dependent Ecosystems (GDEs)	No known groundwater dependent ecosystems in close proximity to the site. ELS Hall Park and Lane Cove River are more than 100 m and 1 km away from the site, respectively (see Figure 5)
Water Supply Losses by neighbouring groundwater users	A review of registered bores within a 500 m radius of the surrounding site was undertaken. The search identified no groundwater wells within the search area (see Figure 4). Seep/W analysis indicates drawdown of approximately 2 m at 50 m from the basement, which is still within the Midtown site.
Potential Subsidence of neighbouring structures	It is considered that the local lowering of the water levels within the rock will have no significant impact to the surrounding properties or structures. No settlement is anticipated due to groundwater drawdown in rock.
Mounding of water upgradient of structure	Significant mounding of groundwater is not expected. A drained basement would eliminate potential mounding.

10. Groundwater Management, Monitoring and Reporting

10.1 Approvals and Licensing

The proposed drained basement will be subject to DA approval. A separate approval for a water supply works is not required for a state significant development, provided approval for a drained basement is granted in the DA.

The following will then also be required:

- A water access license (WAL), nominating the subject development as the water supply work. This will need to be obtained from the Natural Resources Access Regulator (NRAR); and
- An allocation/entitlement sufficient for the proposed take. This may be obtained from a controlled allocation, or trading on the market.

Reference to the Water Sharing Plan for the Greater Metropolitan Region Groundwater Sources 2011 (accessed 2 May 2022), indicates that the site is within the Sydney Basin Central Groundwater Source.

The analysis indicates that an entitlement of 7 ML/year (ie 7 shares of entitlement) appears to be a reasonable target based on the available permeability data, and the proposed timing of the works, with excavation of the C3 and C4 basement in separate water years. Additional entitlements up to the anticipated upper bound of 17 ML/year may potentially allow greater flexibility during construction,

reduce delays, remediation and mitigation actions requirements, provided that the groundwater impacts remain within acceptable levels in both the short term and steady state condition, as measured by the monitoring program. Excess shares may then be sold on the market. Retaining a target of 7 ML/year increases the chance of remediation and control of inflow during construction being suitable for long-term targets, that may allow some or all long-term dewatering to fall within an exemption, particularly if the Stage 2 area is subdivided in the future. As noted previously these are estimates only and variation must be expected. Actual inflows will only be known at the time of excavation and dewatering.

10.2 Compliance and Mitigation Strategy

Additional measures to ensure compliance and mitigate against excessive impacts may be required if inflow volumes or groundwater impacts are found to be greater than expected.

10.2.1 Shoring and Bulk Excavation

The investigation results indicate that groundwater levels will be within sandstone, although areas of more fractured rock (eg in Units 3a and 3b) may require grouting or cut-off walls (eg by use of a secant-pile wall, or by over-excavation, installation of temporary drainage to manage short-term inflows, and installation of a more localised cut-off wall), to reduce inflows through the rock.

The design of shoring, including cut-off walls or grouting around the basement should consider the design flood levels at Shrimpton's Creek, which may result in higher than usual hydrostatic loads on these structures in the design flood event.

The flood levels indicated by the flood impact study suggest that infiltration of surface water may occur into the basement during a flood event, unless the basement retention is designed to be tanked above the sandstone and to withstand the full hydrostatic pressure. If the soils are saturated during the storm event, infiltration into the underlying bedrock may result in temporary higher inflows to the basement during these events.

It would be costly to continue to install cut-off walls to significant depth in the sandstone, particularly as shoring walls are not likely to be required once consistently medium strength rock with no adverse defects is encountered (typically Unit 3c).

For excavation below the shoring, where excessive inflows occur along particular defects, grouting or similar of the defects of concern should be considered to manage flows to acceptable levels. It is noted that these methods can be expensive and time consuming and may result in the redirection of flow rather than immediate reduction in inflow. These remediation measures should be designed and installed in accordance with the required design life, noting that temporary measures may be required to manage inflows for construction of more permanent inflow management.

Ongoing monitoring should be undertaken as excavation proceeds to allow identification of when groundwater impacts or inflows are excessive relative to the expected inflows. Excavation progress may need to be halted until the remedial actions are taken and found to be effective.

10.2.2 Detailed Excavation

The inflow arising from local excavations in sandstone below the basement floor levels will depend on local features within the rock. Grouting may be required to manage inflows, but if excessive inflow occurs, consideration could also be given to tanking local, deep structures where the structure can readily resist uplift loads (eg lift pits). For many local excavations, inflows may only be short-term (eg excavations for footings).

10.2.3 Groundwater Treatment and Disposal

The treatment and disposal of groundwater inflows to Shrimptons Creek is an important control on the impacts of the proposed dewatering. Current quality testing indicates that conventional water treatment measures can be used to manage water quality in this respect. As groundwater quality and treatment may change over time, the treatment provisions should be reviewed and revised, as required to meet the quality requirements for disposal to Shrimpton's Creek.

10.2.4 Separation of Stormwater and Groundwater Inflows

Stormwater should be effectively separated from groundwater inflows as soon as is practicable in the excavation area, to limit error in measurement of groundwater inflows and for effective treatment of groundwater. Such separation may be impractical, at least prior to the completion of excavation.

10.3 Monitoring and Reporting

Monitoring and reporting will be required to ensure that the impact of the drained basement is consistent with expectations, and that dewatering activities meet the requirements of the approvals and licenses.

Monitoring requirements are summarised in Table 13.

Table 13: Summary of Monitoring Requirements during Excavation

ID	Item	Monitoring	Requirements	Reporting*
1	Groundwater Drawdown	By monitoring of water levels in standpipes at least 3 locations around the outside of the proposed basement levels. Given the scale of the site, and potential access limitations, additional bores are likely to be required to effectively monitor drawdown. In event of damage or obstruction, replacement required within a week.	Replacement strategy. Daily records. Trigger values based on drawdown model, depend on location of monitoring wells (will depend on other site works and accessibility).	Reporting frequency based on excavation progress.
2	Groundwater Quality Sampling and Testing	Sampling and testing of water from wells and excavation, or the point of discharge. Contaminant and physical properties tested to be nominated by	pH and turbidity to be measured daily for the first week and then weekly.	

ID	Item	Monitoring	Requirements	Reporting*
		the authority accepting water but to include: Heavy Metals and PAH pH & conductivity Suspended Solids Turbidity Dissolved Oxygen Levels	Two rounds of groundwater sampling and testing initially. Subject to relatively uniform results groundwater testing to be carried out monthly or as otherwise agreed with the authority accepting the water.	
3	Groundwater inflow (or disposal) rates	Groundwater inflow to be measured in collection tanks of a pre-determined size or using a calibrated flow meter connected to the dewatering system. Excavation depths to be recorded with inflow records, until bulk excavation levels have been reached.	Daily, or once collection point is filled (whichever is more frequent), during excavation and for the first two weeks following excavation then daily. Trigger values based on approvals & entitlements	Weekly
4	Quantity of water disposed off-site (includes rainwater)	Calibrated Flowmeter connected to any pump-out system	Automatically	Weekly (Annual reporting to NRAR, but earlier if exceedance is expected)
5	(Optional) Rain Gauge measurement	In the event of high rainfall during excavation prior to construction of the basement structure and stormwater control, daily rain gauge measurements may be prudent to improve assessment of groundwater inflows from the available measurements	Daily, if recorded	As per inflow/disposal rates

Note: * Internal reporting to Principal, only. Reporting to NRAR will generally be on an annual basis for groundwater inflow (per "water year"), or as required by 'trigger levels'.

A detailed groundwater management and monitoring plan should be prepared prior to commencement of work on site to identify the trigger values for the above monitoring, with due consideration of available monitoring points, entitlements and license conditions (eg metering). The expected impacts outlined in this report would provide the baseline for development of these triggers. Reporting responsibilities, including responsibilities for reporting to NRAR should form part of the monitoring plan, noting that exceedance of the expected impacts must be promptly reported to NRAR.

A long-term management plan will also need to be incorporated into the final building management strategy, to ensure that appropriate monitoring continues for the life of the building. This is expected to

include monthly water quality measurement of limited quality parameters, and monthly meter readings of discharge, with reporting to NRAR.

While not the subject of the current DA, it is anticipated that the three sites will be separated into lots in the future. As such action may allow some or all of the sites to fall under exemptions to Water Access Licences, it is suggested that the records for items 2-4 in Table 13 also be separately recorded and reported, if practical, to provide useful information to support future exemptions.

11. References

Kavvadas, M., Giolas, A., & Papacharalambous, G., 1992: Drainage of Supported

Excavations. Geotechnical & Geological Engineering, Vol. 10, pp. 141-157. Technical Note.

12. Limitations

Douglas Partners (DP) has prepared this report for this project at Stage 2, Midtown in accordance with DP's proposal dated 11 March 2022 and acceptance received from Chris Koukoutaris dated 11 March 2022. The work was carried out under the Consultancy Services Agreement dated 26 April 2021 This report is provided for the exclusive use of Frasers Ivanhoe Pty Ltd for this project only and for the purposes as described in the report. It should not be used by or relied upon for other projects or purposes on the same or other site or by a third party. Any party so relying upon this report beyond its exclusive use and purpose as stated above, and without the express written consent of DP, does so entirely at its own risk and without recourse to DP for any loss or damage. In preparing this report DP has necessarily relied upon information provided by the client and/or their agents.

The results provided in the report are indicative of the sub-surface conditions on the site only at the specific sampling and/or testing locations, and then only to the depths investigated and at the time the work was carried out. Sub-surface conditions can change abruptly due to variable geological processes and also as a result of human influences. Such changes may occur after DP's field testing has been completed.

DP's advice is based upon the conditions encountered during investigations. The accuracy of the advice provided by DP in this report may be affected by undetected variations in ground conditions across the site between and beyond the sampling and/or testing locations. The advice may also be limited by budget constraints imposed by others or by site accessibility.

The assessment of atypical safety hazards arising from this advice is restricted to the geotechnical and groundwater components set out in this report and based on known project conditions and stated design advice and assumptions. While some recommendations for safe controls may be provided, detailed 'safety in design' assessment is outside the current scope of this report and requires additional project data and assessment.

This report must be read in conjunction with all of the attached and should be kept in its entirety without separation of individual pages or sections. DP cannot be held responsible for interpretations or

conclusions made by others unless they are supported by an expressed statement, interpretation, outcome or conclusion stated in this report.

This report, or sections from this report, should not be used as part of a specification for a project, without review and agreement by DP. This is because this report has been written as advice and opinion rather than instructions for construction.

Douglas Partners Pty Ltd

Appendix A

About This Report

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

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Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
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- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

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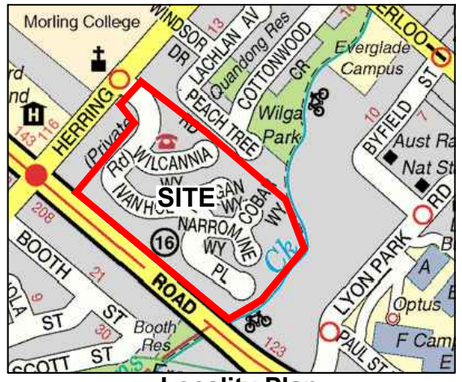
Appendix B

Drawings





Locality Plan

NOTE:
1: Base image from MetroMap (Dated 09.02.2022)

0 10 20 30 40 60 80 100 150 200m

1:2000 @ A3

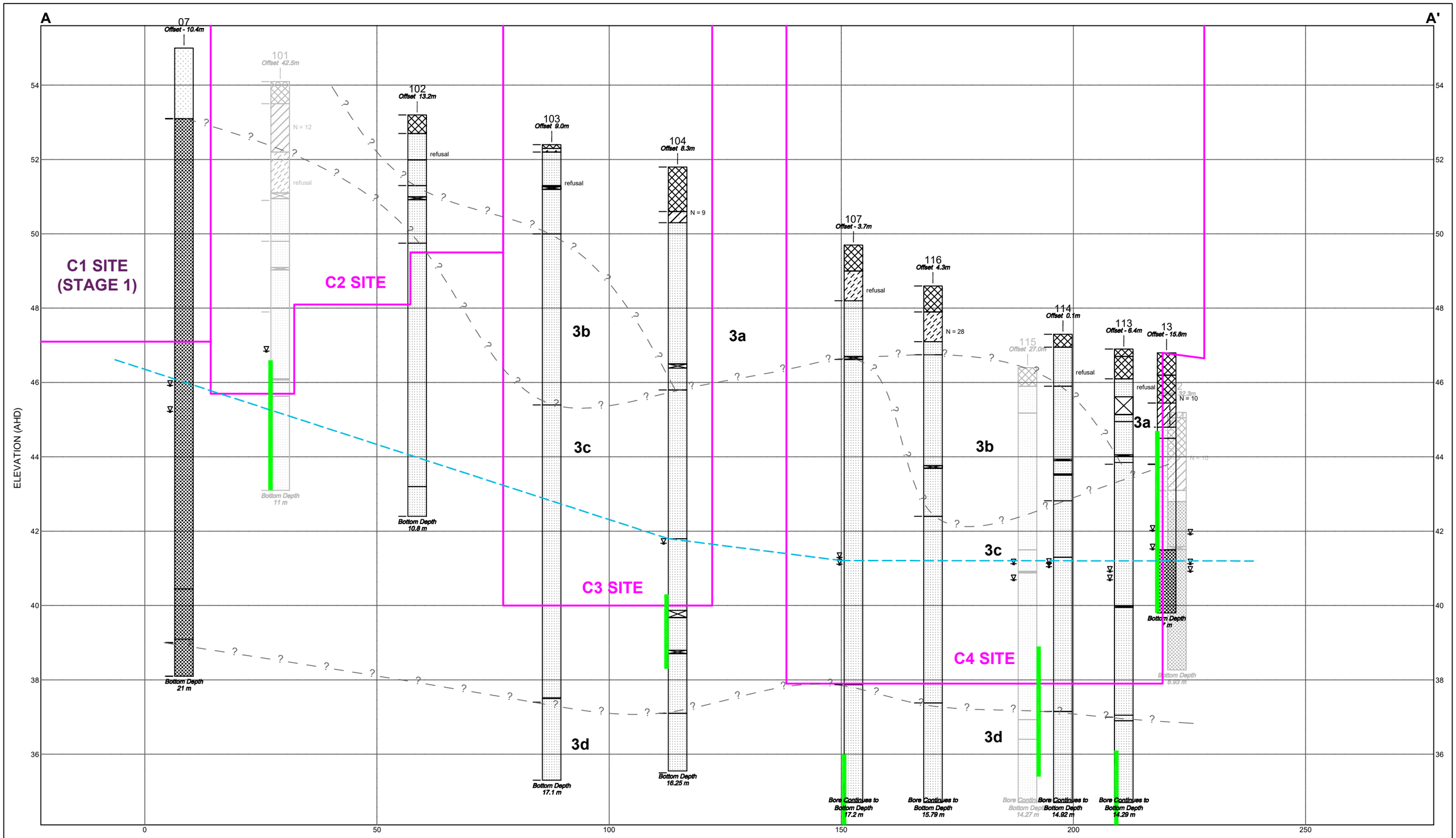
LEGEND

- Borehole Location
- Previous Cored Bore location
- Standpipe Location (Current)
- Standpipe Location (Destroyed)
- Greater Midtown Site Boundary
- Stage 2 Midtown Site Boundary
- C2 Site - Approximate Proposed Building Footprint
- C3 Site - Approximate Proposed Basement Footprint
- C4 Site - Approximate Proposed Basement Footprint
- Interpreted Sections (See Drawings 802 and 803)

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Frasers Property Ivanhoe		TITLE: **Test Location Plan** **Proposed Residential Development** **Ivanhoe Estate, Macquarie Park**
OFFICE: Sydney	DRAWN BY: MG	
SCALE: 1:2000 @ A3	DATE: 13.04.2022	

PROJECT No:	86043.06
DRAWING No:	801
REVISION:	0



LEGEND

- Core Loss
- Clayey Sand
- Concrete
- Filling
- Sandstone
- Sandstone coarse grained
- Sandstone fine grained
- Sandy Clay
- Silty Clay
- Topsoil

NOTES:

1. Subsurface conditions are accurate at the borehole locations only. Variations in subsurface conditions may occur between borehole locations. Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.
3. Horizontal and vertical scales are not equal.
4. Greyed out bore have not been included in the interpreted boundaries, but are near the section and included for comparison

TESTS / OTHER

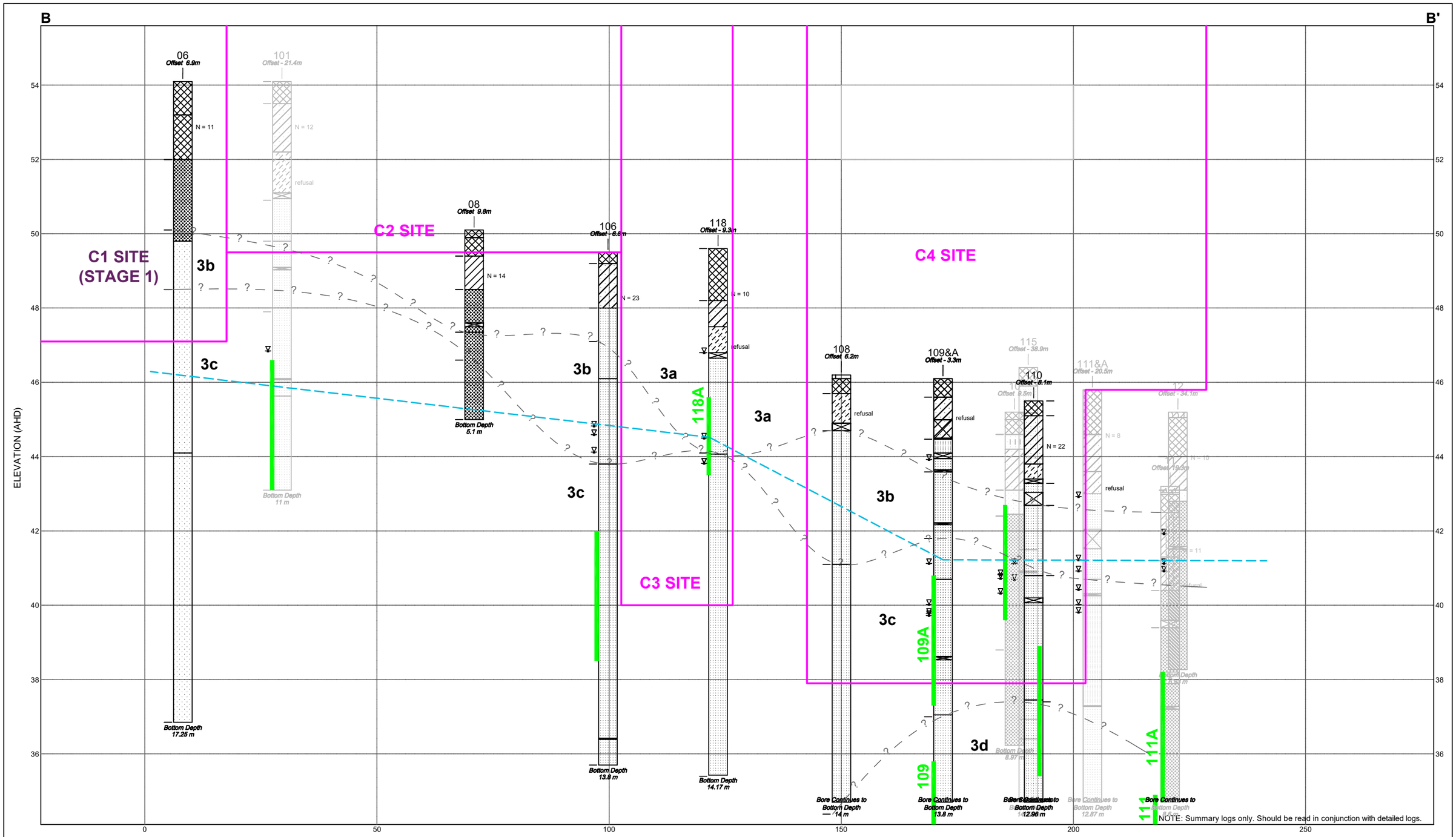
- N - Standard penetration test value
- ▽ - Water level
- Interpreted water table
- Standpipe Screen Length
- Approximate Basement/Design floor Level
- Interpreted Geotechnical Unit Boundary
- 3d - Interpreted Geotechnical Unit (only Sandstone labelled)

Horizontal Scale (metres) 0 16

Vertical Exaggeration = 8.0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Frasers Property Ivanhoe Pty Ltd		TITLE: **Interpreted Geotechnical Long Section A-A'**	PROJECT No: 86043.06
OFFICE: Sydney	DRAWN BY: SCP	**Proposed Stage 2 Development**	DRAWING No: 802
SCALE: 1:800 (H) 1:100 (V) @ A3	DATE: 29.04.2022	**Midtown, Maquarie Park**	REVISION: 0



NOTE: Summary logs only. Should be read in conjunction with detailed logs.

LEGEND

Core Loss	Concrete	Sandstone fine grained	Subbase
Bricks	Filling	Sandy Clay	Topsoil
Clay	Sandstone	Silty Clay	
Clayey Sand	Sandstone coarse grained	Silty Sand	

NOTES:

1. Subsurface conditions are accurate at the borehole locations only.
   Variations in subsurface conditions may occur between borehole locations.
   Interpreted strata boundaries are approximate and should be used as a guide only.
2. Summary logs only and should be read in conjunction with detailed logs.
3. Horizontal and vertical scales are not equal.
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TESTS / OTHER

- N - Standard penetration test value
- ▽ - Water level
- Interpreted water table
- Standpipe Screen Length
- Approximate Basement/Design Floor Level/Boundary
- Interpreted Geotechnical Unit Boundary
- 3d - Interpreted Geotechnical Unit (only Sandstone labelled)

0 16

Horizontal Scale (metres)

Vertical Exaggeration = 8.0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Frasers Property Ivanhoe Pty Ltd		TITLE: Interpreted Geotechnical Long Section B-B'	PROJECT No: 86043.06
OFFICE: Sydney	DRAWN BY: SCP	Proposed Stage 2 Development	DRAWING No: 803
SCALE: 1:800 (H) 1:100 (V) @ A3	DATE: 29.04.2022	Midtown, Maquarie Park	REVISION: 0

Appendix C

Key Architectural Drawings



STUDIO JOHNSTON
L1/268A DEVONSHIRE ST
SURRY HILLS NSW 2010
PH: 02 9211 2700
ABN: 63111324353

Client
Frasers Property Australia

REV	DESCRIPTION	DRAWN	DATE
DA-2	DA Documentation	PL/AP	7/2/22

ALL LEVELS TO AUSTRALIAN HEIGHT DATUM.

IT IS THE CONTRACTORS RESPONSIBILITY TO CONFIRM ALL MEASUREMENTS ON SITE PRIOR TO COMMENCEMENT OF WORK. DRAWINGS SHOULD NOT BE SCALED. WRITTEN DIMENSIONS ONLY SHOULD BE TAKEN FROM DRAWINGS. ALL DIMENSIONING IS TO SUBSTRATE BRICKWORK / BLOCKWORK UNLESS OTHERWISE NOTED.

DESIGN AND DRAWINGS REMAIN COPYRIGHT OF STUDIO JOHNSTON
NOT TO BE USED FOR CONSTRUCTION

Project
C3 Midtown MacPark

Title
Basement 3

Job No.	2101
Scale	1:100 @ A1
Date	7/2/22
Drawn/Checked	PL/AP/ CJ

Dwg No. **A-110-B03** Rev. **DA-2**

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Rev	Description	By	Date
1	For Development Application	AL	03.08.2021
2	For Development Application	AL	28.01.2022

BASEMENT BICYCLE & STORAGE SCHEDULE

Storage Type	Quantity
BASEMENT 1	
Social - 1 Bed (Vertical bicycle storage)	78
Social - 2 Bed (Horizontal bicycle storage)	62
Social - 2 Bed (Vertical bicycle storage)	16
Social - Studio (Vertical bicycle storage)	23
Social - Visitor Bicycle Parking Spaces (Hoops)	4
BASEMENT 2	
Market - 1 Bed (Vertical bicycle storage)	78
Market - 2 Bed (Horizontal bicycle storage)	24
Market - 3 Bed (Horizontal bicycle storage)	10
Market - 4 Bed (Horizontal bicycle storage)	4
Market - Visitor bicycle parking spaces (Hoops)	6
Social - 1 Bed (Vertical bicycle storage)	19
Social - 2 Bed (Horizontal bicycle storage)	17
Social - Studio (Vertical bicycle storage)	1
BASEMENT 3	
Market - 1 Bed (Vertical bicycle storage)	55
Market - 2 Bed (Horizontal bicycle storage)	24
Market - 2 Bed (Vertical bicycle storage)	44
Market - 3 Bed (Horizontal bicycle storage)	33
Total	498

PARKING SCHEDULE

PARKING TYPE	Quantity
BASEMENT 1	
5400x2400 Social Accessible (Angle)	10
5400x2400 Social Residential (Angle)	81
5400x2400 Social Residential (Parallel)	5
5400x2400 Social Visitor (Angle)	9
5400x2400 Social Visitor (Parallel)	2
Shared Space	5
	112
BASEMENT 2	
5400x2400 Market Accessible (Angle)	8
5400x2400 Market Residential (Angle)	97
5400x2400 Market Residential (Parallel)	6
5400x2400 Market Visitor (Angle)	7
5400x2400 Social Residential (Angle)	11
Shared Space	4
	133
BASEMENT 3	
5400x2400 Market Accessible (Angle)	6
5400x2400 Market Residential (Angle)	135
5400x2400 Market Residential (Parallel)	12
5400x2400 Market Visitor (Angle)	7
Shared Space	3
	163
Grand Total (Car spaces)	396
Shared Spaces	12
Car Wash Bays	2

Basement 1
Area 5555m²
Total spaces inc. Shared spaces 112
Efficiency 49 m²/ space

Basement 2
Area 5555m²
Total spaces inc. Shared spaces 133
Efficiency 41 m²/space

Basement 3
Area 5555m²
Total spaces inc. Shared spaces 163
Efficiency 34 m²/space

Total Basement area: 16665m²
Total Efficiency rate: 40.8m²/space

Legend
Deep Soil

Cox Architecture

Level 6, 155 Clarence Street,
Sydney, NSW 2000, Australia
T + 61 2 9267 9599
F + 61 2 9264 5844

www.coxarchitecture.com.au

Nominated Architects
Joe Agius no. 6491
Russell Lee no. 6367

Client
FRASERS PROPERTY

Project No.
220148.00

Project
MIDTOWN - LOT C4

EPPING ROAD, MACQUARIE PARK, NSW

Drawing Title
BASEMENT 3 PLAN

Document Control Status:
NOT FOR CONSTRUCTION
DEVELOPMENT APPLICATION

Project Architect: AL	**Drawn:** IC / DP
Design Associates: FM / RB	**Scale:** 1 : 200 @ A1
Project Director: RJ	**Date:** 17.12.2021
Drawing Number: A-DA-2050	**Revision:** 2

PLOT STAMP DATE: 17/03/2022 6:23:17 PM

DA ISSUE

Scale 1:200
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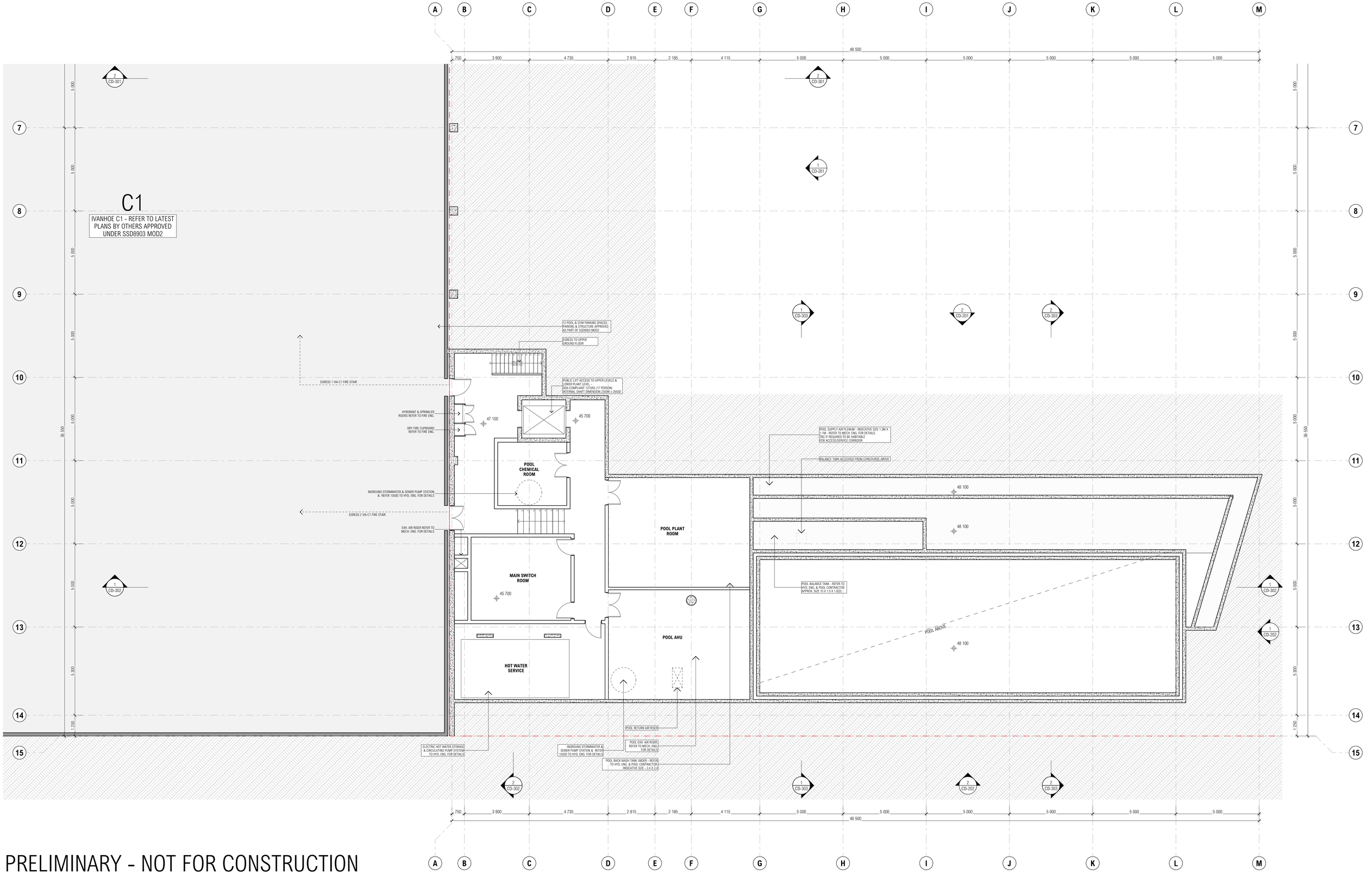


PRELIMINARY - NOT FOR CONSTRUCTION

ARCHITECT

CHROFI

3/1 THE CORSO MANLY NSW 2095 AUSTRALIA
T +61 2 8096 8500 E info@chrofi.com

CHOI ROPIHA FIGHERA P/L ACN 144 714 885 ATF CHOI ROPIHA FIGHERA UNIT TRUST T/A CHROFI ABN 22 365 257 187 NOMINATED ARCHITECT JOHN CHOI 8706 TAI ROPIHA 6568 STEVEN FIGHERA 6609
THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATION, REPORT AND DRAWINGS. DO NOT SCALE DRAWINGS. DIMENSIONS GOVERN. VERIFY ALL DIMENSIONS ON SITE BEFORE CONSTRUCTION. COPYRIGHT OF THIS DRAWING IS VESTED IN CHROFI.

CLIENT

FRASERS PROPERTY

LANDSCAPE ARCHITECT

MCGREGOR COXALL

REV	DATE	ISSUE
A	23/2/22	PRELIMINARY GA ISSUE

REV	DATE	ISSUE

PROJECT

IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE

1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	23/2/22	LH	HR	1:100	A1	

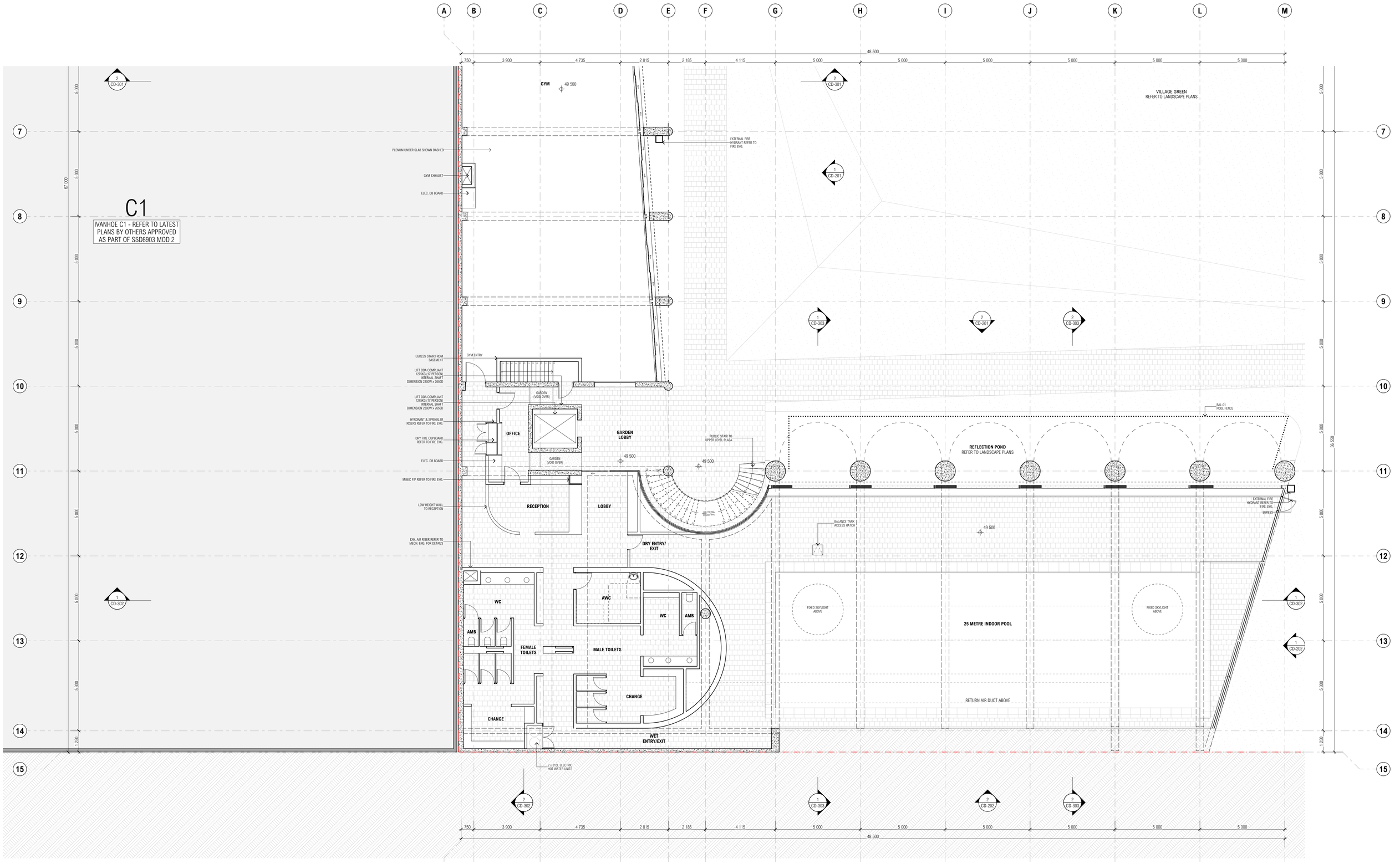
DRAWING TITLE

BASEMENT PLAN A

DRAWING NUMBER	REVISION
A-CD-101	A

C1

IVANHOE C1 - REFER TO LATEST PLANS BY OTHERS APPROVED AS PART OF SSD8903 MOD 2



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REV	DATE	ISSUE
A	23/2/22	PRELIMINARY GA ISSUE

REV	DATE	ISSUE

PROJECT

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1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	23/2/22	LH	HR	1:100	A1	

DRAWING TITLE

LOWER GROUND PLAN A

DRAWING NUMBER	REVISION
A-CD-103	A

Appendix D

Groundwater Monitoring Reports

Douglas Partners Pty Ltd
ABN 75 053 980 117
www.douglaspartners.com.au
96 Hermitage Road
West Ryde NSW 2114
PO Box 472
West Ryde NSW 1685
Phone (02) 9809 0666
Fax (02) 9809 4095

Frasers Property Ivanhoe Pty Ltd
Level 2, 1C Homebush Bay Drive
Rhodes NSW 2138

Project 86043.01
30 July 2018
R.005.Rev0
SCP:cm

Attention: Mr Chris Koukoutaris

Email: Chris.Koukoutaris@fraserspropery.com.au

Dear Chris Koukoutaris

Groundwater Monitoring
Proposed Residential Development
Ivanhoe Estate, Macquarie Park

This letter provides a summary of groundwater monitoring results at Ivanhoe Estate for the period 14 November 2017 to 22 June 2018, and brief comments.

Douglas Partners Pty Ltd (DP) installed six groundwater monitors (data-loggers) in monitoring wells at Bores 01, 05, 07, 10, 12 and 13 in November 2017, during geotechnical investigations at the site. The bore locations are shown in the attached Drawing GW1, and reference should be made to DP Report 86043.01.R.001.Rev1 for the detailed methods and results of the geotechnical investigation, and details of standpipe construction. The standpipes were purged of groundwater prior to the installation of groundwater monitors.

During the monitoring period, the dataloggers were inspected on a regular basis for intermediate uploads and maintenance. The dataloggers were generally removed from the boreholes on 22 June 2018, except at Bore 05, where the datalogger was removed in early March 2018 due to demolition works in the area. Surface damage to the standpipe was also observed at Bore 01 during the site visit of March 2018, with more severe damage noted in June 2018.

The attached figures show the water levels at well locations from 14 November 2017 to 22 June 2018, together with daily rainfall measurements from the Bureau of Meteorology. Rainfall measurements are those measured at Macquarie Park (Willandra Village) from 1 November 2017 to 30 June 2018.

The results of groundwater levels are summarised in the following table.

Table 1: Summary of Groundwater Monitoring Measurements

Bore	Ground Surface Level (RL)	Range of Groundwater Depths (m)	Range of Groundwater Levels (RL)	Typical Groundwater Levels (RL)	Comment
01	67.5	17.3 - 18.2	49.3 - 50.2	49.3 - 50.0	Outlier readings in June 2018
05	59.2	12.5 - 12.9	46.3 - 46.7	46.3 - 46.7	
07	59.1	13.2 - 13.9	45.2 - 45.8	45.2 - 45.8	
10	45.2	4.4 - 4.9	40.3 - 40.8	40.3 - 40.8	
12	45.2	3.3 - 4.3	40.8 - 41.8	40.8 - 41.2	Responsive to rainfall events
13	46.8	4.8 - 5.3	41.2 - 42.0	41.2 - 42.0	

The following comments are made with regards to the groundwater readings obtained at the site:

- Groundwater levels at the site generally fell slightly during the course of the monitoring period, with typical fluctuations of 0.5 m to 1.0 m.
- Groundwater levels generally showed no significant response to rainfall events, with the exception of groundwater levels at Bore 12.
- At Bore 01, unusual readings were obtained in June 2018 following rainfall. It is considered likely that this is due to the surficial damage observed at the standpipe, with dislodgement of the standpipe cover possibly resulting in surface water inflow to the standpipe.
- At Bore 12, elevated groundwater readings followed some rainfall events, with water levels rising by up to 0.6 m, then rapidly dissipating to more typical groundwater levels. The standpipe construction at this location includes a bentonite seal down to sandstone. Presuming that the seal has performed adequately, the cause of the elevated water levels may be due to local ground conditions (eg groundwater infiltration through joints or bedding planes in the sandstone) and its proximity to the creek and/or the adjacent stormwater drains.
- Reference to the borehole logs in DP Report 86043.01.R.001.Rev1 indicates that the above groundwater levels correspond to levels within the sandstone bedrock.

The limitations of the associated geotechnical investigation report, DP Report 86043.01.R.001.Rev1 apply to this letter report.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd

Sally Peacock
Geotechnical Engineer

Reviewed by

Bruce McPherson
Principal

Attachments: About this Report
Drawing GW1
Figures 1 to 6

About this Report

Douglas Partners

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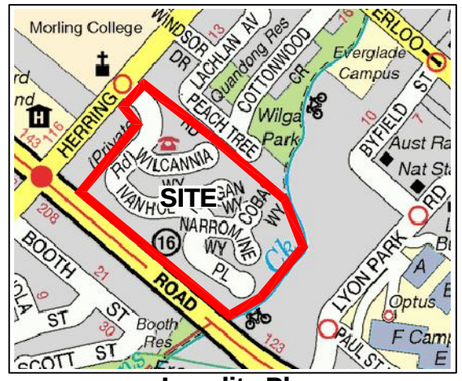

Locality Plan

NOTE:
1: Base image from Nearmap.com (Dated 19.10.2017)
2: Test locations are approximate only and are shown with reference to existing features.

LEGEND

- Cored bore location
- Shallow bore location
- Standpipe location
- Site boundary

Douglas Partners Geotechnics / Environment / Groundwater	CLIENT: Frasers Property Ivanhoe	TITLE: **Test Location Plan**	PROJECT No: 86043.01
	OFFICE: Sydney / DRAWN BY: PSCH	**Proposed Residential Development**	DRAWING No: GW1
	SCALE: 1:2000 @ A3 / DATE: 04.07.2018	**Ivanhoe Estate, MACQUARIE PARK**	REVISION: 0

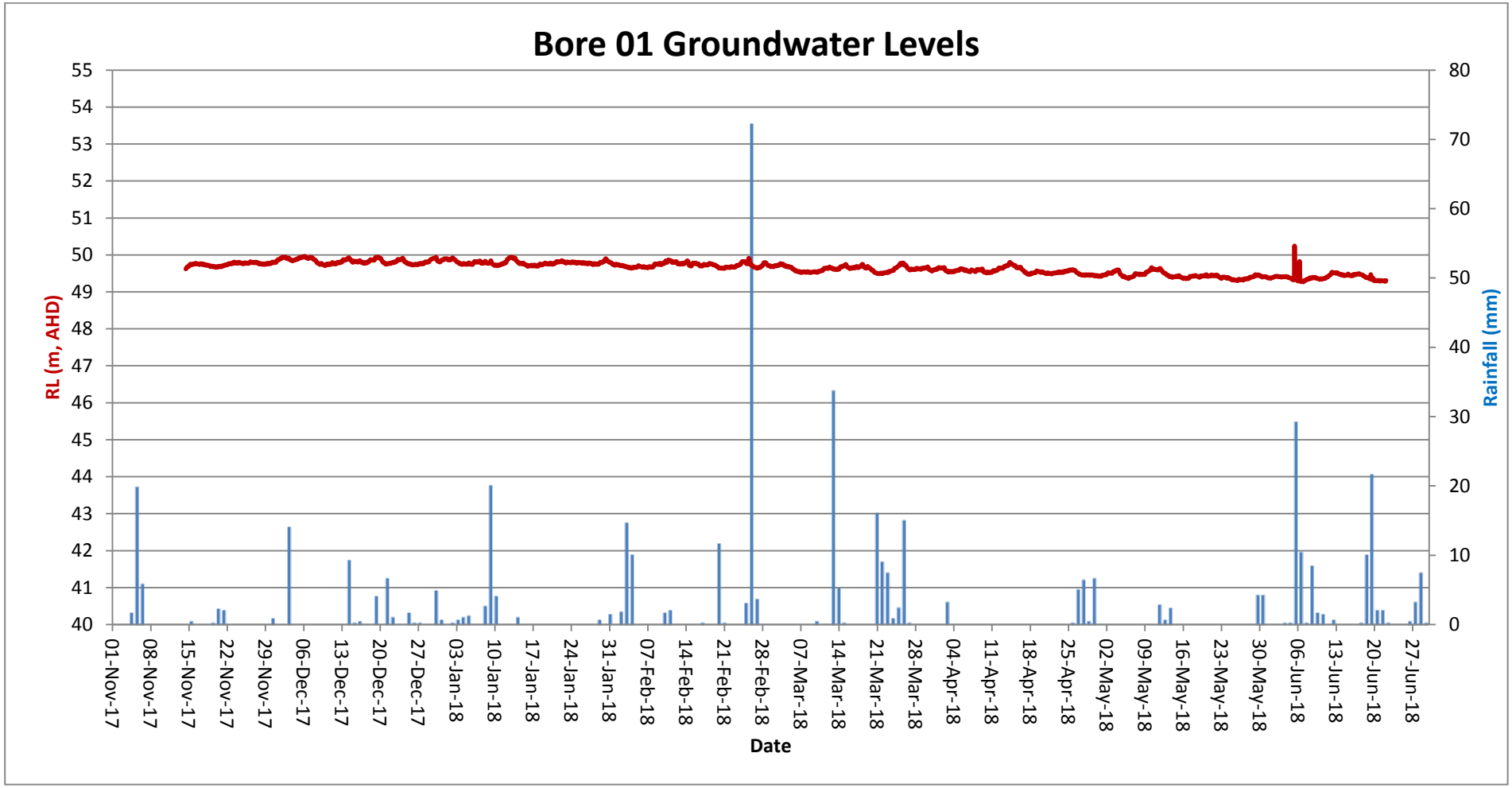

Figure 1: Groundwater Monitoring Results at Bore 01

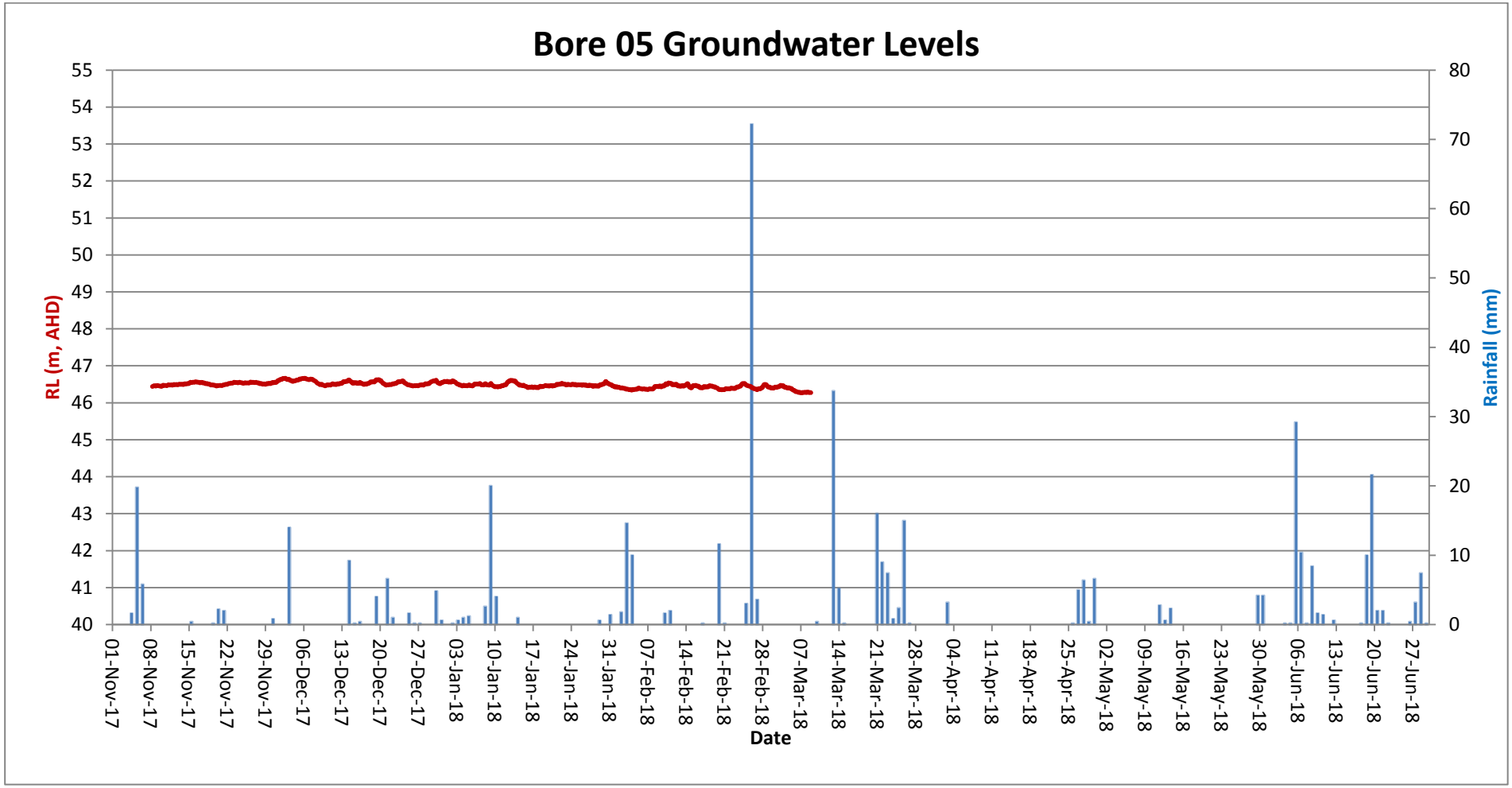

Figure 2: Groundwater Monitoring Results at Bore 05

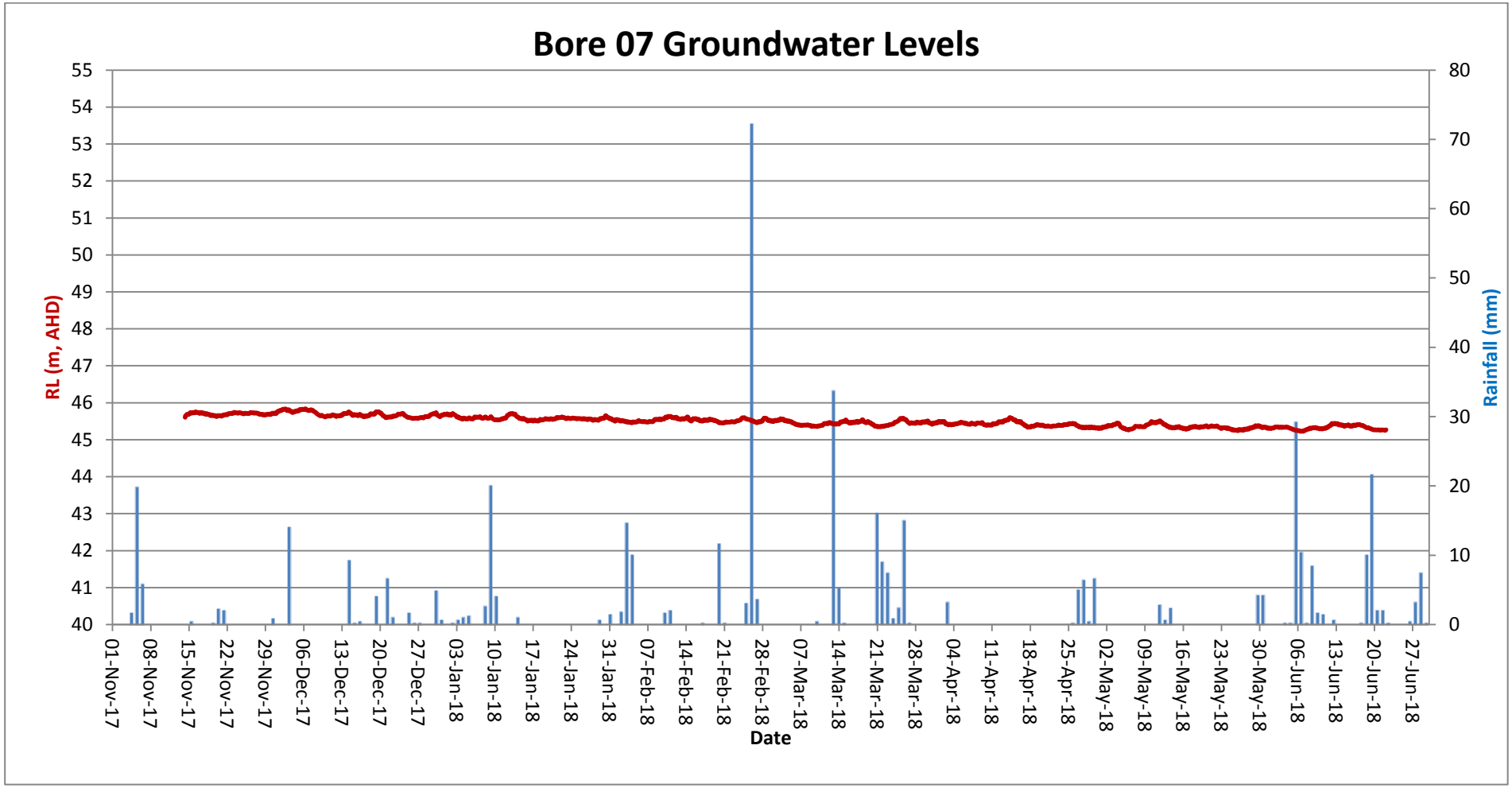

Figure 3: Groundwater Monitoring Results at Bore 07

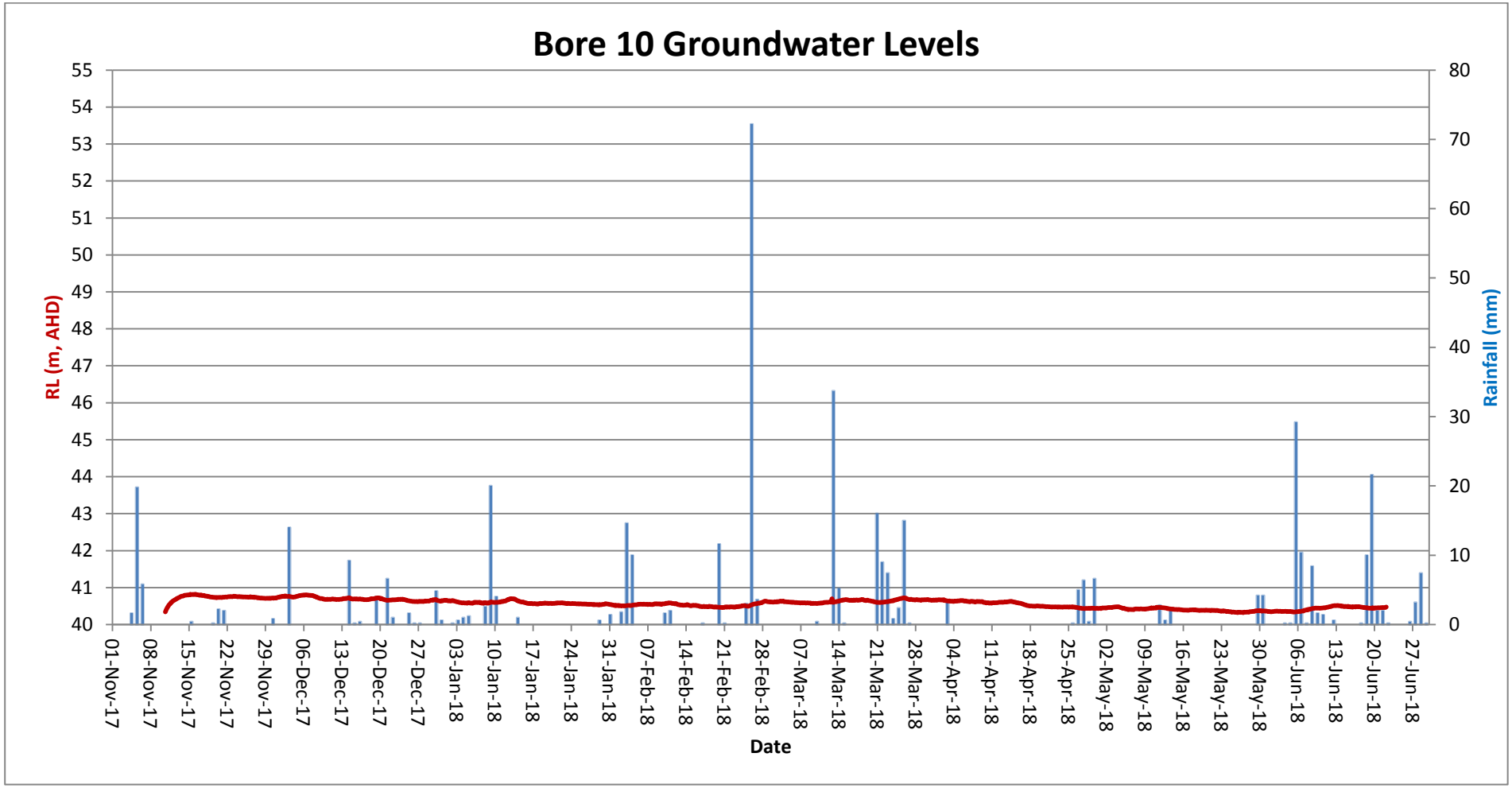

Figure 4: Groundwater Monitoring Results at Bore 10

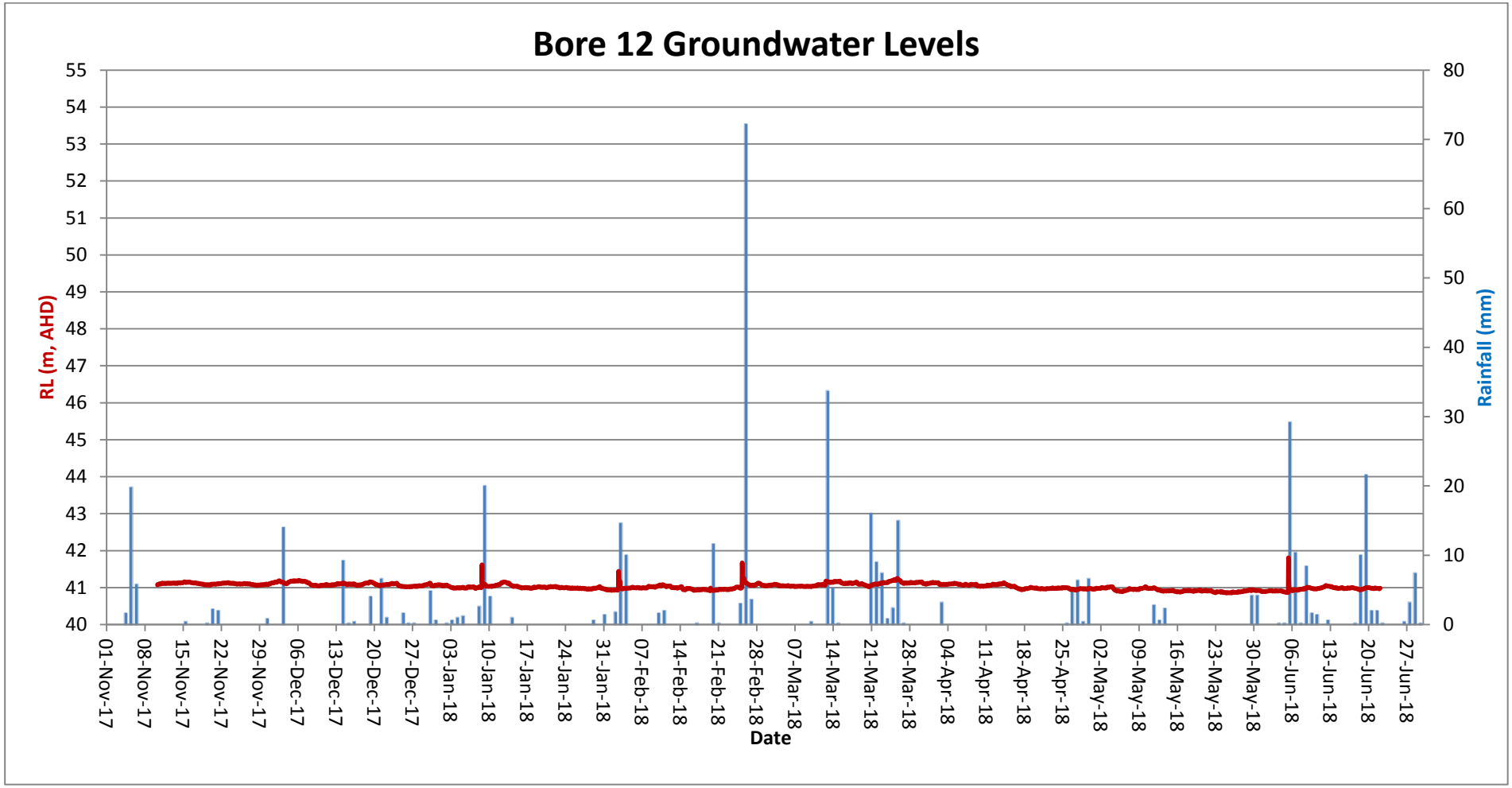

Figure 5: Groundwater Monitoring Results at Bore 12

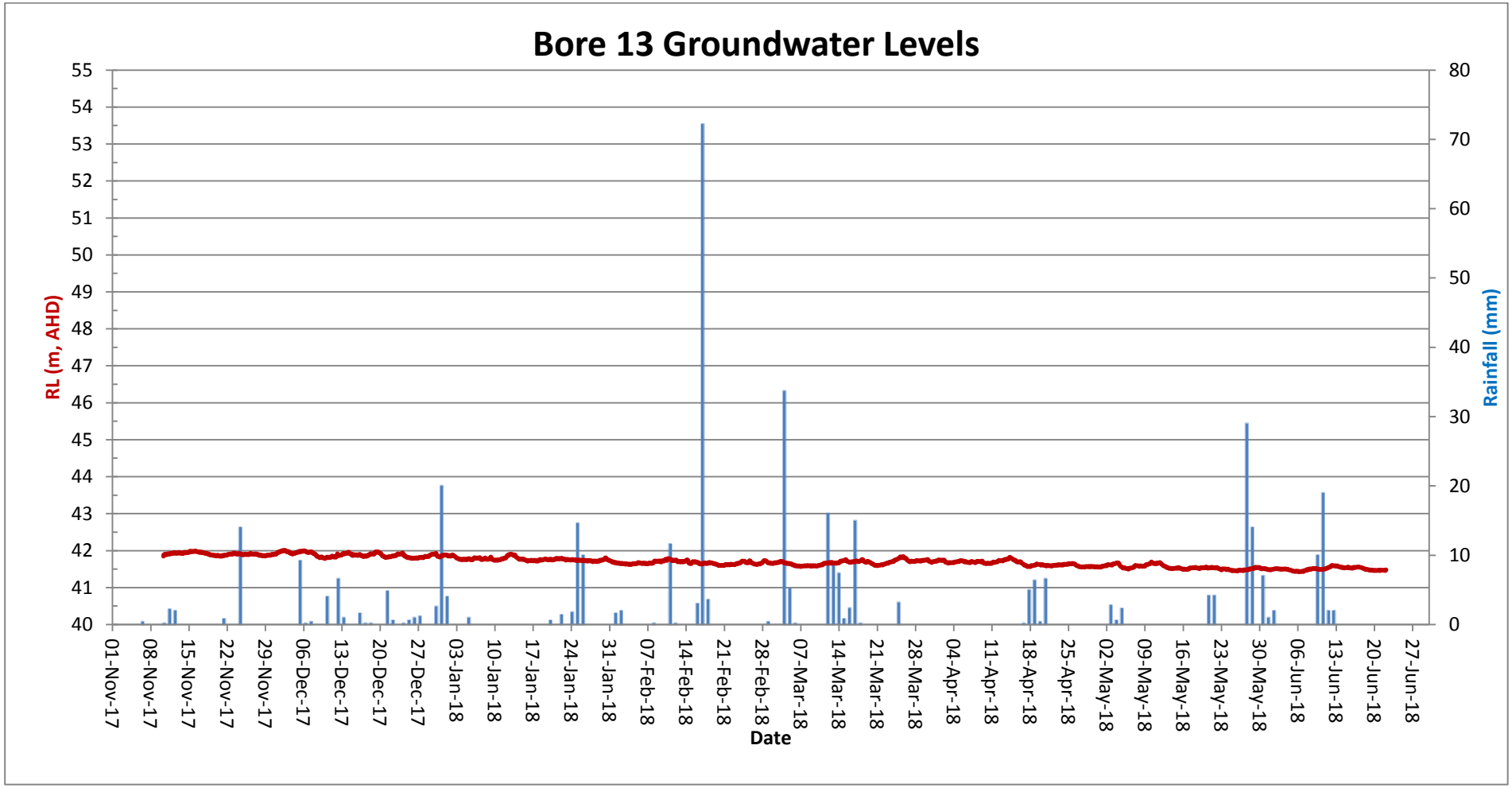

Figure 6: Groundwater Monitoring Results at Bore 13

Appendix D - Summary of Groundwater Measurements - Midtown, Macquarie Park

Groundwater level measurements at standpipes in the vicinity of the Stage 2 development area of the Midtown site are summarised in Table D1, below, together with reference to the reports which provide the relevant logs. Standpipe construction details are summarised in Table D2.

Table D1 – Summary of Groundwater Measurements – Stage 2 Midtown, Macquarie Park

Test Location	Ground Surface RL	Depth to Water (m)	Water Level (RL)	Comment	Gravel Interval (m)	Status	Original Report(s)
07	59.1	13.2-13.9	45.2-45.8	Monitoring Period November 2017-June 2018	1.2-21.0	Destroyed	86043.01.R.005.Rev0; 86043.01.R.001.Rev1
10	45.2	4.4-4.9	40.3-40.8	Monitoring Period November 2017-June 2018	2.6-5.6	Missing	86043.01.R.005.Rev0; 86043.01.R.001.Rev1
12	45.2	3.3-4.3	40.8-41.8	Monitoring Period November 2017-June 2018; Responsive to rainfall events	2.3-6.93	Missing	86043.01.R.005.Rev0; 86043.01.R.001.Rev1
13	46.8	4.8-5.3	41.2-42.0	Monitoring Period November 2017-June 2018	1.8-7.0	Missing	86043.01.R.005.Rev0; 86043.01.R.001.Rev1
101	54.1	7.28	46.8	11/05/2021	7.5-11.0	Intact	86043.06.R.001
103	52.4	-	-	No reading obtained before destruction	11.5-15.0	Destroyed	86043.06.R.002
104A	51.7	10.15	41.55	28/05/21	11.5-13.5	Intact	86043.06.R.002
106	49.5	4.93-4.98	44.5-44.6	11&28/05/2021	7.5-11.0	Intact	86043.06.R.002
107	49.7	8.43-8.61	41.1-41.3	28/04/2021 (8.61m), 28/5/21 (8.43m)	13.7-17.2	Intact	86043.06.R.003
109	46.1	6.34-6.4	39.7-39.8	28/04/2021 (6.4m), 28/5/21 (6.34m)	10.3-13.8	Intact	86043.06.R.003
109A	46.1	2.2-6.1	40.0-43.9	17/5/21 (2.2m), 28/5/21 (6.1m); Nested well	5.0-8.5	Intact	86043.06.R.003
111	45.8	4.9-6.0	39.8-40.9	28/4/21 (6.0m), 17/5/21 (4.9m), 27/5/21 (5.95m)	8.3-11.8	Intact	86043.06.R.003
111A	45.8	2.9-5.54	40.3-42.9	17/5/21 (2.9m), 27/5/21 (5.54m); Nested well	5.0-8.5	Intact	86043.06.R.003
113	46.9	6.23-6.0	40.7-40.9	28/04/2021 (6.23m), 27/5/21 (6.0m)	10.8-14.29	Intact	86043.06.R.003

Continued on next page

Table D1 – Summary of Groundwater Measurements – Stage 2 Midtown, Macquarie Park (continued)

Test Location	Ground Surface RL	Depth to Water (m)	Water Level (RL)	Comment	Gravel Interval (m)	Status	Original Report(s)
114	47.3	6.28-6.19	41.0-41.1	28/04/2021 (6.28m), 28/5/21 (6.19m)	8.3-14.92	Intact	86043.06.R.003
114A	47.3	4.06	43.2	28/5/21; Nested well	1.5-4.5	Intact	86043.06.R.003
115	46.4	5.3-5.73	40.7-41.1	17/5/21 (5.3m), 27/5/21 (5.73m);	7.5-11.0	Intact	86043.06.R.003
118A	50.0	5.38	44.6	28/5/21	4.0-6.1	Intact	86043.06.R.002

Table D2 – Summary of Well Construction – Stage 2 Midtown, Macquarie Park

Bore	101	103	104A	106	107	109	109A
Ground Level	54.1	52.4	51.7	49.5	49.7	46.1	46.1
Backfill	0-7.0	0-11.0	0-10.5	0-7.0	0-13.2	0-9.5	0-4.5
Bento	7.0-7.5	11.0-11.5	10.5-11.5	7.0-7.5	13.2-13.7	9.5-10.3	4.5-5.0
Gravel	7.5-11.0	11.5-15.0	11.5-13.5	7.5-11.0	13.7-17.2	10.3-13.8	5.0-8.5
Blank PVC	0-8.0	0-12.0	0-12.0	0-8.0	0-14.2	0-10.8	0-5.5
Slotted PVC	8.0-11.0	12.0-15.0	12.0-13.5	8.0-11.0	14.2-17.2	10.8-13.8	5.5-8.5

Bore	111	111A	113	114	114A	115	118A
Ground Level	45.8	45.8	46.9	47.3	47.3	46.4	50
Backfill	0-7.5	0-4.5	0-10.3	0-7.8	0-0.5	0-7.0	0-3.0
Bento	7.5-8.3	4.5-5.0	10.3-10.8	7.8-8.3	0.5-1.5	7.0-7.5	3.0-4.0
Gravel	8.3-11.8	5.0-8.5	10.8-14.29	8.3-14.92	1.5-4.5	7.5-11.0	4.0-6.1
Blank PVC	0-8.8	0-5.5	0-11.29	0-8.92	0-2.0	0-8.0	0.0-4.5
Slotted PVC	8.8-11.8	5.5-8.5	11.29-14.29	14.92-8.92	2.0-4.5	8.0-11.0	4.5-6.1

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Frasers Property Ivanhoe Pty Ltd
Level 2, 1C Homebush Bay Drive
Rhodes NSW 2138

Project 86043.06
4 May 2022
R.006.Rev0
SCP

Attention: Mr Chris Koukoutaris

Email: Chris.Koukoutaris@fraserspropery.com.au

Dear Chris

Groundwater Monitoring
Stage 2 - Midtown
Herring Road, Macquarie Park

1. Introduction

This letter provides a summary of groundwater monitoring results following investigation of Stage 2 of Ivanhoe Estate for the period 28 May 2021 to 20 April 2022, and brief comments.

The groundwater monitoring follows previous groundwater monitoring at the Greater Ivanhoe Estate area, encompassing the Stage 2 area, and undertaken from 14 November 2017 to 22 June 2018. The results of that monitoring were previously reported in DP memo 86043.01.R.005.Rev0, dated 30 July 2018. Attempts to re-locate those standpipes in March and April 2021 were unsuccessful, and given the site works that had occurred at that time, those standpipes are presumed to be destroyed.

2. Groundwater Monitoring

Douglas Partners Pty Ltd (DP) installed four groundwater monitors (data-loggers) in monitoring wells at Bores 106, 111A and 114 on 28 May 2021, and Bore 118A on 3 June 2021, following geotechnical investigation at the site. A further two groundwater monitors (data-loggers) were installed at Bores 109A and 111 on 21 March 2022.

The bore locations are shown in the attached Drawing 101, and reference should be made to DP Reports 86043.06.R.001 to R.003 for the detailed methods and results of the geotechnical investigation, and details of standpipe construction. The standpipes were purged of groundwater following the completion of drilling.

During the monitoring period, the dataloggers were periodically inspected for intermediate uploads and maintenance. Unfortunately, several of the data-loggers were buried or destroyed during site works following installation. While repeated attempts were made to re-locate the standpipes, and to excavate materials that obstructed or buried standpipes, the data-loggers (and final monitoring data) were

generally lost. Only the data-logger at Bore 118A remained operational for the full intended monitoring period.

The attached figures show the measurements of water levels at well locations from 17 June 2021 to 20 April 2022, where available from data-logger records, together with daily rainfall measurements from the Bureau of Meteorology. Rainfall measurements are those measured at Macquarie Park (Willandra Village) for the relevant time interval.

The results are summarised in the following Table 1.

Table 1: Summary of Groundwater Monitoring Measurements at Data-logger Locations

Bore	Ground Surface Level (RL)	Manual Measured groundwater depths (m)*	Monitoring Period	Range of Groundwater Depths (m)*	Range of Groundwater Levels (RL)*	Comment
106	49.5	4.9 (11/5/21 – after drilling) 5.0 (28/5/21)	28 May 2021-31 August 2021	4.7 – 5.4	44.2 – 44.8	Buried/destroyed after August 2021
109A	46.1	*2.2 (17/5//21 – after drilling)* 6.1 (28/5/21) 5.0 (21/3/22)	-	5.0 – 6.1	40.0 – 41.1	Buried/destroyed after 21 March 2022 prior to first datalogger upload
111	45.8	6.0 (28/4/21 – after drilling) 4.9 (17/5/21) 6.0 (27/5/21) 4.6 (21/3/22)	-	4.6 – 6.0	39.8 – 41.2	Buried/destroyed after 21 March 2022 prior to first datalogger upload
111A	45.8	*2.9 (17/5/21 – after drilling)* 5.5 (27/5/21)	28 May 2021 – 31 August 2021	5.4 – 5.8	40.0 – 40.4	Buried/destroyed after August 2021
114	47.3	6.3 (28/4/21 – after drilling) 6.2 (28/5/21)		6.2 – 6.3	41.0 – 41.1	Buried/destroyed after 28 May 2021, prior to first datalogger upload
118A	50.0	5.4 (28/5/21 – after drilling)	3 June 2021 – 20 April 2022	5.1 – 5.8**	44.2 – 45.0**	Datalogger retrieved on 20 April 2022

Note: *Manual measurements of groundwater depth exclude manual check measurements during the monitoring period. Values given in italics show readings that are considered to be inconsistent with subsequent data While standpipes were purged and allowed to recharge prior to measurement, the italicised results are considered to be influenced by the drilling process, and the readings have been excluded from the other groundwater depth and level summary columns.

**At BH118A a brief water pressure increase during high rainfall on 22/2/22, and low water level from sampling on 21/3/22 were excluded from the ranges, due to suspected surface infiltration and artificial influences, respectively.

Additional manual measurements of groundwater at additional standpipes during the Stage 2 investigation (April to May 2021), but not subject to further monitoring, have been previously reported in the relevant geotechnical investigation reports – DP Reports 86043.06.R.001 to 003, dated August 2021.

3. Comment on Groundwater Results

The following comments are made with regards to the groundwater readings obtained at the site:

- Groundwater levels at the site apparently fell slightly during the monitoring period to September 2021 at Bores 106 and 111A (after which no further monitoring data was obtained) and to December 2021 at Bore 118A, where monitoring continued. At Bore 118A, groundwater levels subsequently rose to RL 45.0, showing a 0.9 m variation in groundwater levels during the monitoring period. This is likely due to the wet conditions experienced during those months, with monthly climate summaries for Sydney by the Bureau of Meteorology noting that rainfall was generally above average in December 2021 and January 2022, and well above average in February 2022 and March 2022. The highest water levels at the end of the monitoring period were still within 0.5 m of the early monitoring readings;
- While monitoring at Bores 109A and 111 were unsuccessful due to destroyed or buried standpipes, the manual readings taken at these locations suggest similar variations in groundwater levels (of 1.1 m to 1.4 m) between May 2021 and March 2022; and
- Reference to the relevant borehole logs in DP Reports 86043.06.R.001 to 003 indicates that the above groundwater levels are all within the sandstone bedrock.

The limitations of the associated geotechnical investigation reports, DP Report 86043.01.R.001 to 003 apply to this letter report.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully
Douglas Partners Pty Ltd

Reviewed by

Sally Peacock
Senior Associate

pp **Scott Easton**
Principal

Attachments: About this Report
Drawing GW1
Figures 1 to 3

About this Report

Douglas Partners

Introduction

These notes have been provided to amplify DP's report in regard to classification methods, field procedures and the comments section. Not all are necessarily relevant to all reports.

DP's reports are based on information gained from limited subsurface excavations and sampling, supplemented by knowledge of local geology and experience. For this reason, they must be regarded as interpretive rather than factual documents, limited to some extent by the scope of information on which they rely.

Copyright

This report is the property of Douglas Partners Pty Ltd. The report may only be used for the purpose for which it was commissioned and in accordance with the Conditions of Engagement for the commission supplied at the time of proposal. Unauthorised use of this report in any form whatsoever is prohibited.

Borehole and Test Pit Logs

The borehole and test pit logs presented in this report are an engineering and/or geological interpretation of the subsurface conditions, and their reliability will depend to some extent on frequency of sampling and the method of drilling or excavation. Ideally, continuous undisturbed sampling or core drilling will provide the most reliable assessment, but this is not always practicable or possible to justify on economic grounds. In any case the boreholes and test pits represent only a very small sample of the total subsurface profile.

Interpretation of the information and its application to design and construction should therefore take into account the spacing of boreholes or pits, the frequency of sampling, and the possibility of other than 'straight line' variations between the test locations.

Groundwater

Where groundwater levels are measured in boreholes there are several potential problems, namely:

- In low permeability soils groundwater may enter the hole very slowly or perhaps not at all during the time the hole is left open;
- A localised, perched water table may lead to an erroneous indication of the true water table;
- Water table levels will vary from time to time with seasons or recent weather changes. They may not be the same at the time of construction as are indicated in the report; and
- The use of water or mud as a drilling fluid will mask any groundwater inflow. Water has to be blown out of the hole and drilling mud must first be washed out of the hole if water measurements are to be made.

More reliable measurements can be made by installing standpipes which are read at intervals over several days, or perhaps weeks for low permeability soils. Piezometers, sealed in a particular stratum, may be advisable in low permeability soils or where there may be interference from a perched water table.

Reports

The report has been prepared by qualified personnel, is based on the information obtained from field and laboratory testing, and has been undertaken to current engineering standards of interpretation and analysis. Where the report has been prepared for a specific design proposal, the information and interpretation may not be relevant if the design proposal is changed. If this happens, DP will be pleased to review the report and the sufficiency of the investigation work.

Every care is taken with the report as it relates to interpretation of subsurface conditions, discussion of geotechnical and environmental aspects, and recommendations or suggestions for design and construction. However, DP cannot always anticipate or assume responsibility for:

- Unexpected variations in ground conditions. The potential for this will depend partly on borehole or pit spacing and sampling frequency;
- Changes in policy or interpretations of policy by statutory authorities; or
- The actions of contractors responding to commercial pressures.

If these occur, DP will be pleased to assist with investigations or advice to resolve the matter.

About this Report

Site Anomalies

In the event that conditions encountered on site during construction appear to vary from those which were expected from the information contained in the report, DP requests that it be immediately notified. Most problems are much more readily resolved when conditions are exposed rather than at some later stage, well after the event.

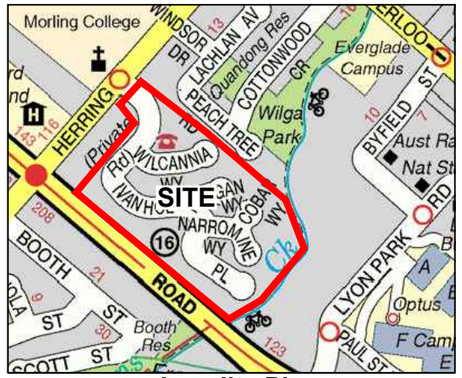
Information for Contractual Purposes

Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate to prepare a specially edited document. DP would be pleased to assist in this regard and/or to make additional report copies available for contract purposes at a nominal charge.

Site Inspection

The company will always be pleased to provide engineering inspection services for geotechnical and environmental aspects of work to which this report is related. This could range from a site visit to confirm that conditions exposed are as expected, to full time engineering presence on site.





Locality Plan

LEGEND

- Borehole Location
- Previous Cored Bore location
- Standpipe Location (Current)
- Standpipe Location (Destroyed)
- Site Boundary

NOTE:
1: Base image from MetroMap (Dated 09.02.2022)

0 10 20 30 40 60 80 100 150 200m

1:2000 @ A3

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Frasers Property Ivanhoe		TITLE: **Standpipe Location Plan**	PROJECT No: 86043.06
OFFICE: Sydney	DRAWN BY: MG	**Proposed Residential Development**	DRAWING No: GW1
SCALE: 1:2000 @ A3	DATE: 28.04.2022	**Ivanhoe Estate, Macquarie Park**	REVISION: 0

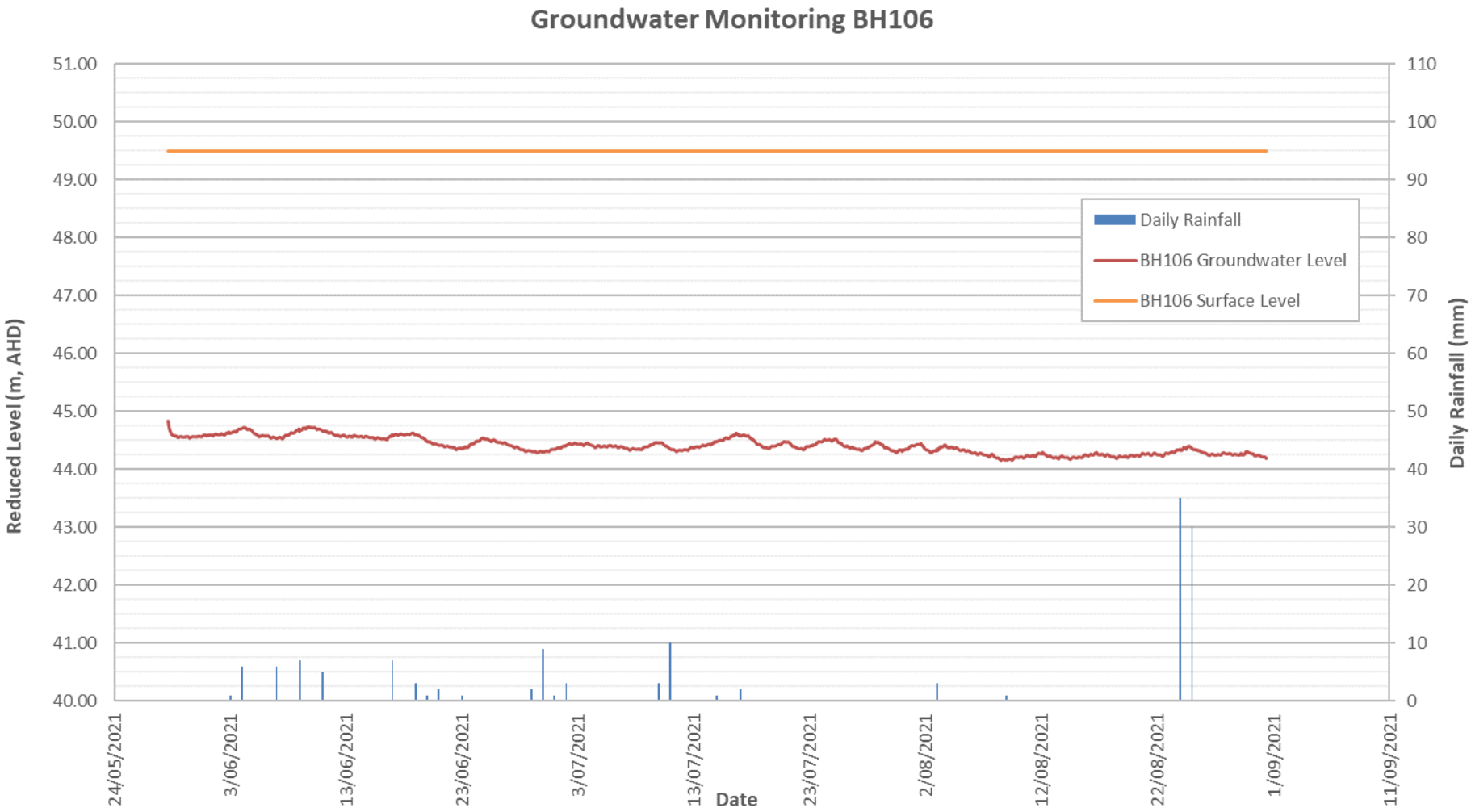


Figure 1: Groundwater Monitoring Results at Bore 106

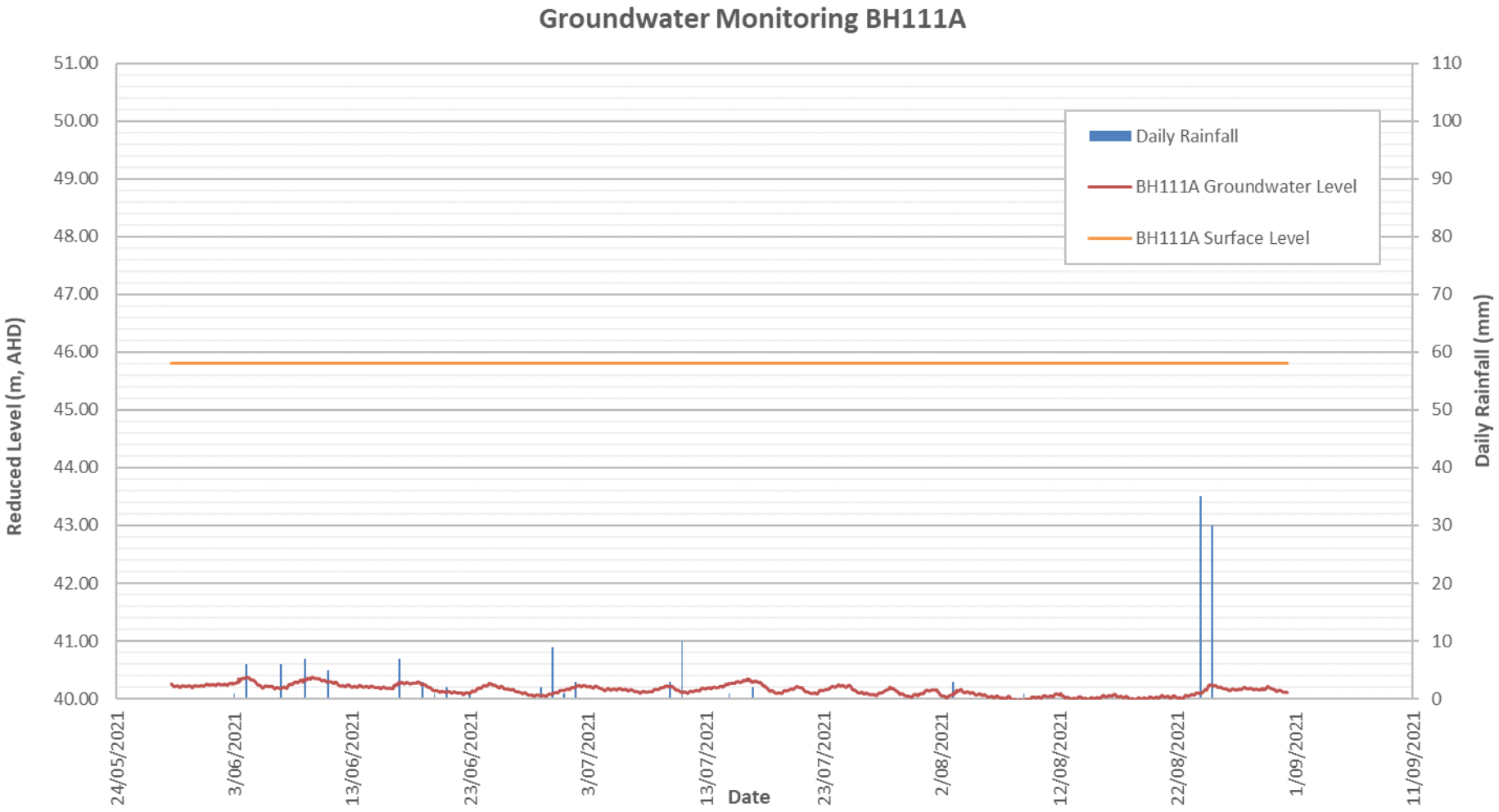


Figure 2: Groundwater Monitoring Results at Bore 111A

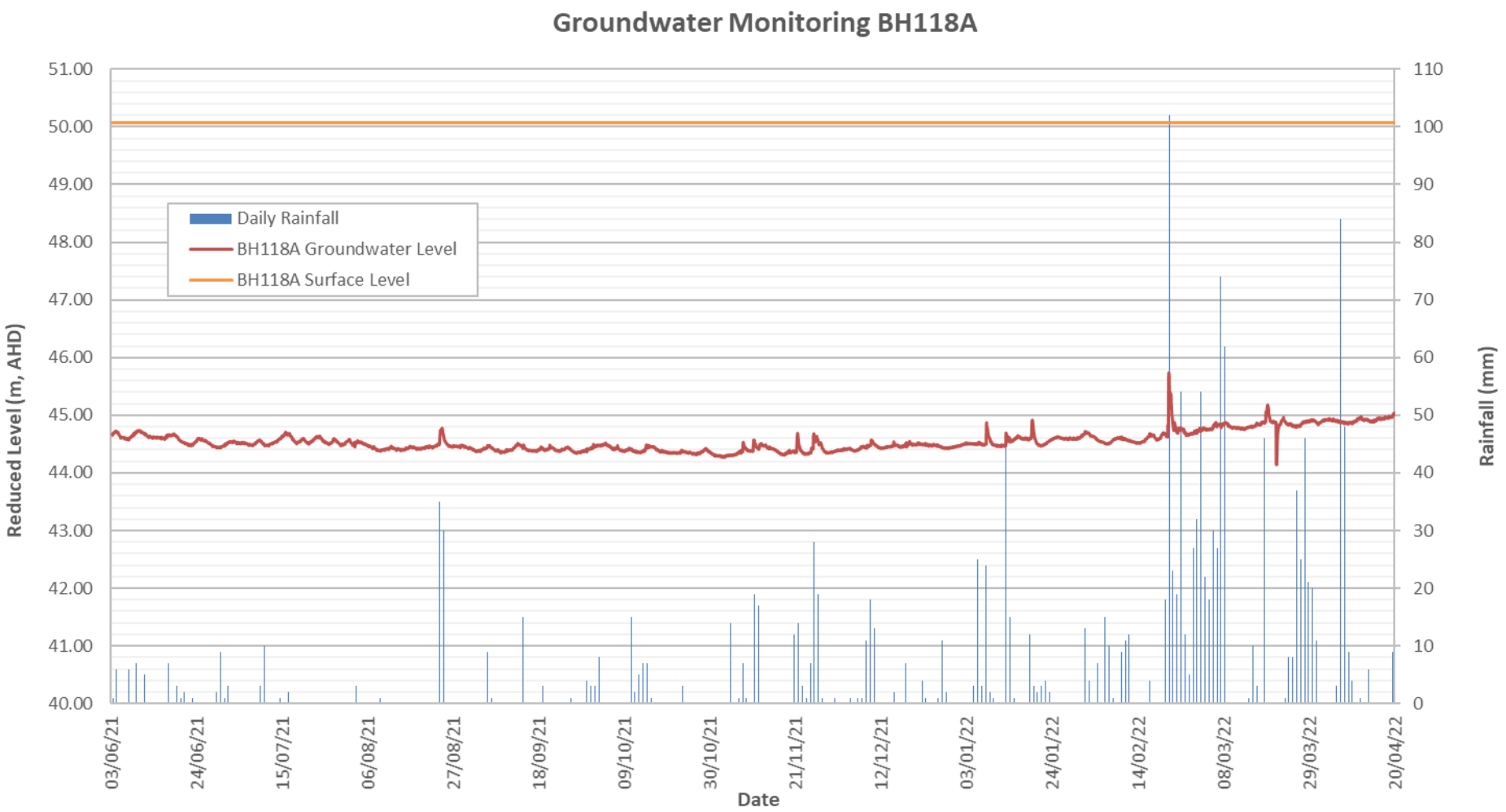


Figure 3: Groundwater Monitoring Results at Bore 118A

Appendix E

Results of Permeability Tests

Douglas Partners
Geotechnics / Environment / Groundwater

Douglas Partners Pty Ltd
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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	28-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

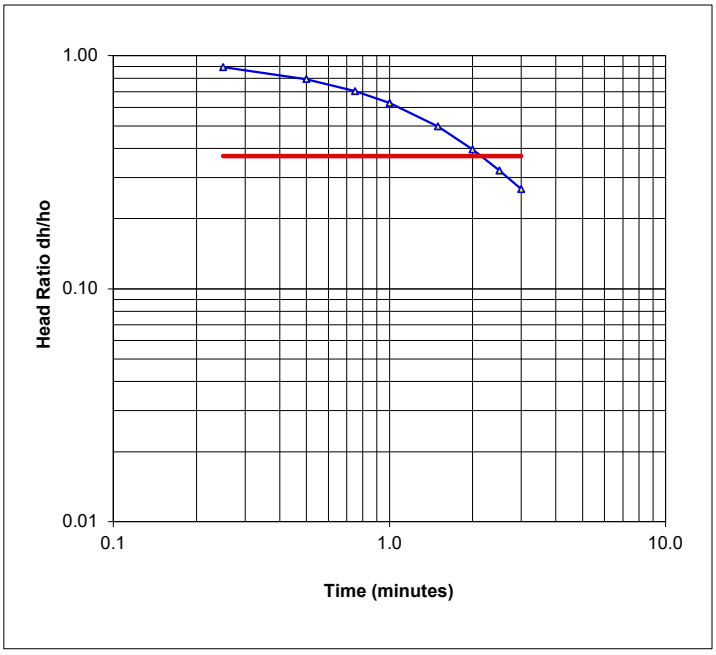
Description:	Unit 3C	**Test No.**	BH104A	
Material type:	Sandstone	Easting:	325637.8	m
		Northing	6260346.9	m
		Surface Level:	51.8	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	10.15	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	1.7	m
Length of well screen (Le)	2	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.0	1.70	8.45	1.000
0.3	2.61	7.54	0.892
0.5	3.45	6.70	0.793
0.8	4.2	5.95	0.704
1.0	4.85	5.30	0.627
1.5	5.95	4.20	0.497
2.0	6.8	3.35	0.396
2.5	7.43	2.72	0.322
3.0	7.89	2.26	0.267



To = 2.3 mins
138 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$

where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**4.2E-06**	m/sec	4.2E-04 cm/sec
	=	**1.504**	cm/hour	

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ABN 75 053 980 117
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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	28-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

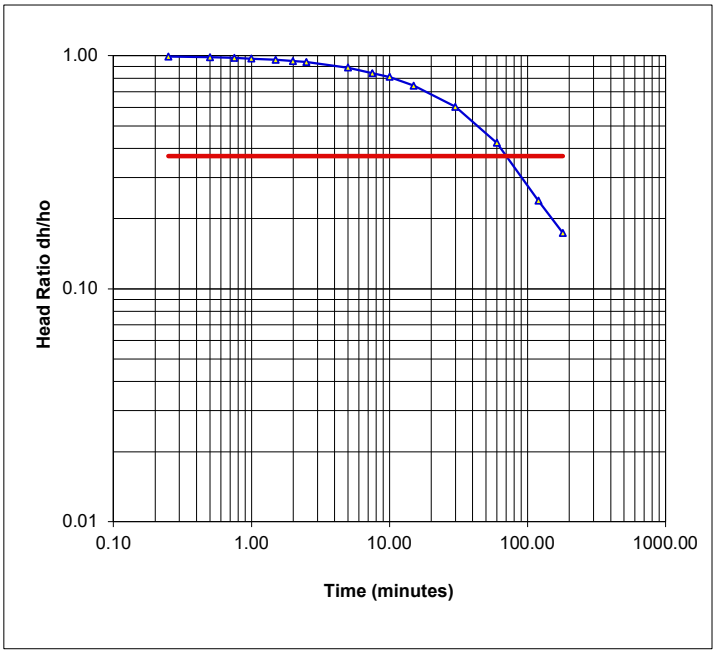
Description:	Unit 3C	**Test No.**	BH106	
Material type:	Sandstone	Easting:	325661.8	m
		Northing	6260395.3	m
		Surface Level:	49.4	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	4.98	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0.37	m
Length of well screen (Le)	3.5	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.00	0.37	4.61	1.000
0.25	0.41	4.57	0.991
0.50	0.44	4.54	0.985
0.75	0.47	4.51	0.978
1.00	0.5	4.48	0.972
1.50	0.55	4.43	0.961
2.00	0.61	4.37	0.948
2.50	0.65	4.33	0.939
5.00	0.88	4.10	0.889
7.5	1.1	3.88	0.842
10	1.24	3.74	0.811
15	1.55	3.43	0.744
30	2.20	2.78	0.603
60	3.03	1.95	0.423
120	3.88	1.10	0.239
180	4.18	0.80	0.174



To = 65 mins
3900 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$ where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**9.7E-08**	m/sec	9.7E-06 cm/sec
	=	**0.035**	cm/hour	

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Geotechnics / Environment / Groundwater

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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	28-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

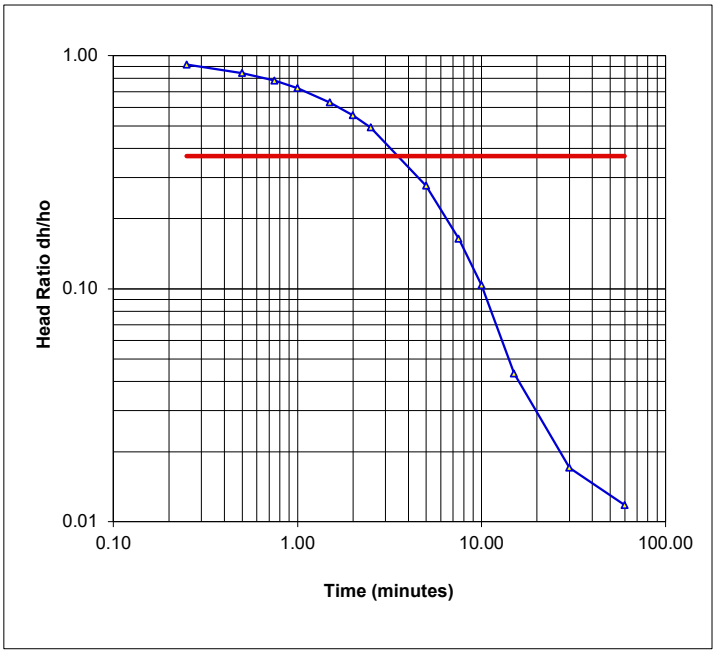
Description:	Unit 3D	**Test No.**	BH107	
Material type:	Sandstone	Easting:	325658.7	m
		Northing	6260313.1	m
		Surface Level:	49.7	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	8.43	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0.81	m
Length of well screen (Le)	3.5	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.00	0.81	7.62	1.000
0.25	1.46	6.97	0.915
0.50	2.01	6.42	0.843
0.75	2.47	5.96	0.782
1.00	2.9	5.53	0.726
1.50	3.63	4.80	0.630
2.00	4.2	4.23	0.555
2.50	4.68	3.75	0.492
5.00	6.32	2.11	0.277
7.5	7.18	1.25	0.164
10	7.64	0.79	0.104
15	8.1	0.33	0.043
30	8.30	0.13	0.017
60	8.34	0.09	0.012



To = 3.67 mins
220.2 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$

where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**1.7E-06**	m/sec	1.7E-04 cm/sec
	=	**0.620**	cm/hour	

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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	28-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

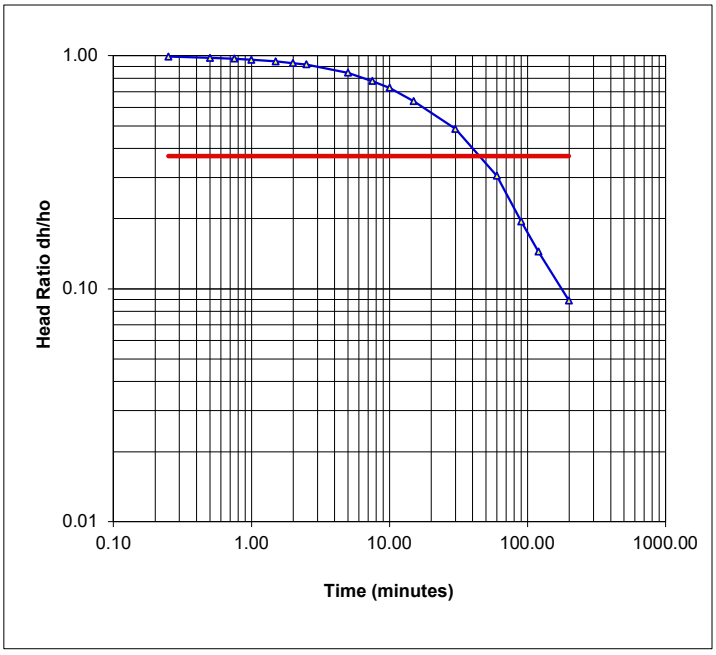
Description:	Unit 3D	**Test No.**	BH109	
Material type:	Sandstone	Easting:	325716	m
		Northing	6260351.1	m
		Surface Level:	46.1	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	6.34	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0.38	m
Length of well screen (Le)	3.5	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.00	0.38	5.96	1.000
0.25	0.44	5.90	0.990
0.50	0.5	5.84	0.980
0.75	0.55	5.79	0.971
1.00	0.61	5.73	0.961
1.50	0.7	5.64	0.946
2.00	0.8	5.54	0.930
2.50	0.87	5.47	0.918
5.00	1.3	5.04	0.846
7.5	1.7	4.64	0.779
10	2	4.34	0.728
15	2.54	3.80	0.638
30	3.45	2.89	0.485
60	4.52	1.82	0.305
90	5.18	1.16	0.195
120	5.48	0.86	0.144
200	5.81	0.53	0.089



To = 47.8 mins
2868 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$

where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**1.3E-07**	m/sec	1.3E-05 cm/sec
	=	**0.048**	cm/hour	

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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	28-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

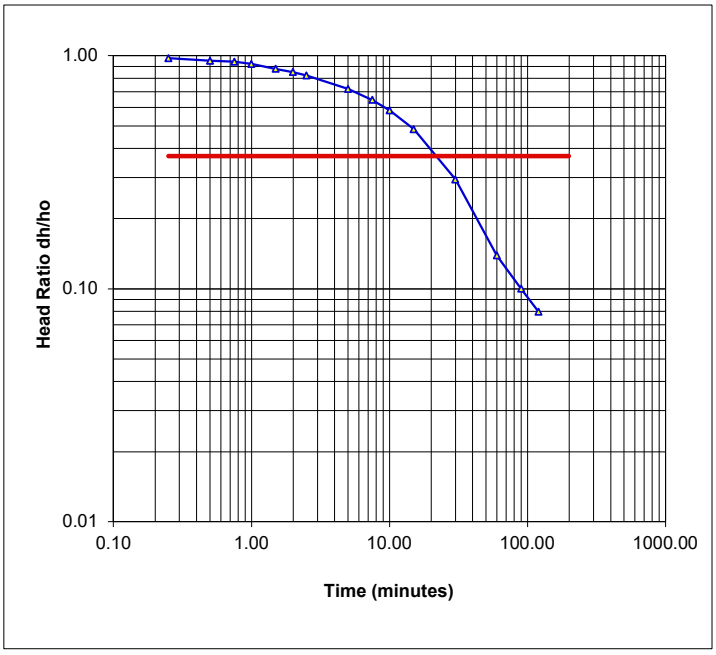
Description:	Unit 3C	**Test No.**	BH109A	
Material type:	Sandstone	Easting:	325716	m
		Northing	6260351.1	m
		Surface Level:	46.1	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	6.1	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0.7	m
Length of well screen (Le)	3.5	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.00	0.70	5.40	1.000
0.25	0.83	5.27	0.976
0.50	0.96	5.14	0.952
0.75	1.01	5.09	0.943
1.00	1.12	4.98	0.922
1.50	1.36	4.74	0.878
2.00	1.51	4.59	0.850
2.50	1.66	4.44	0.822
5.00	2.21	3.89	0.720
7.5	2.61	3.49	0.646
10	2.95	3.15	0.583
15	3.49	2.61	0.483
30	4.51	1.59	0.294
60	5.35	0.75	0.139
90	5.56	0.54	0.100
120	5.67	0.43	0.080
200			



To = 22.7 mins
1362 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$

where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**2.8E-07**	m/sec	2.8E-05 cm/sec
	=	**0.100**	cm/hour	

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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	27-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

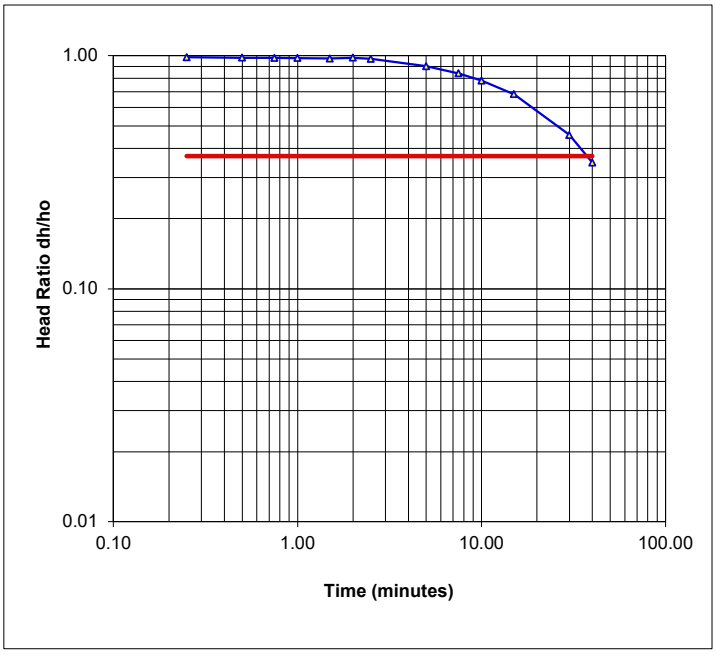
Description:	Unit 3D	**Test No.**	BH111	
Material type:	Sandstone	Easting:	325729.6	m
		Northing	6260317.2	m
		Surface Level:	45.8	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	5.95	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0.63	m
Length of well screen (Le)	3.5	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.00	0.63	5.32	1.000
0.25	0.71	5.24	0.985
0.50	0.73	5.22	0.981
0.75	0.74	5.21	0.979
1.00	0.75	5.20	0.977
1.50	0.77	5.18	0.974
2.00	0.73	5.22	0.981
2.50	0.79	5.16	0.970
5.00	1.15	4.80	0.902
7.5	1.48	4.47	0.840
10	1.79	4.16	0.782
15	2.31	3.64	0.684
30	3.52	2.43	0.457
40	4.1	1.85	0.348



To = 37.7 mins
2262 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$

where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**1.7E-07**	m/sec	1.7E-05 cm/sec
	=	**0.060**	cm/hour	

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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	27-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

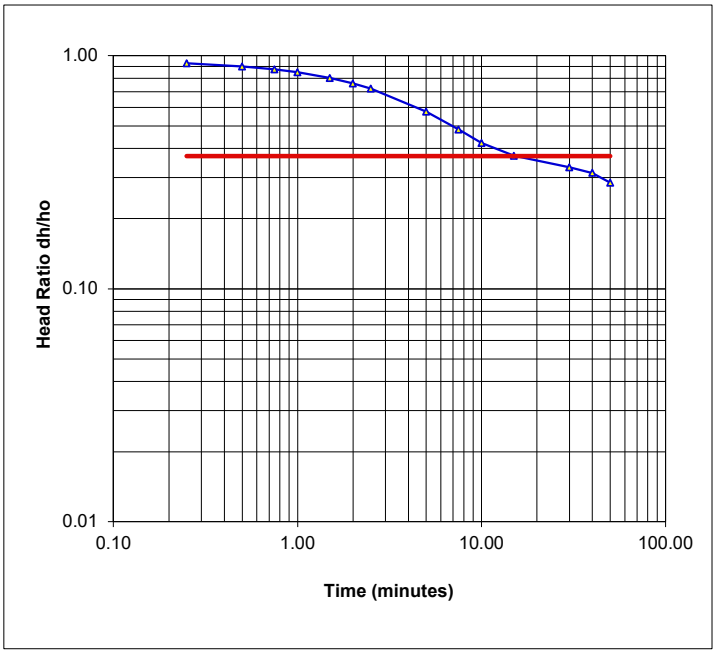
Description:	Unit 3D	**Test No.**	BH111A	
Material type:	Sandstone	Easting:	325729.6	m
		Northing	6260317.2	m
		Surface Level:	45.8	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	5.54	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0	m
Length of well screen (Le)	3.5	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.00	0.00	5.54	1.000
0.25	0.4	5.14	0.928
0.50	0.56	4.98	0.899
0.75	0.7	4.84	0.874
1.00	0.84	4.70	0.848
1.50	1.1	4.44	0.801
2.00	1.33	4.21	0.760
2.50	1.54	4.00	0.722
5.00	2.35	3.19	0.576
7.5	2.87	2.67	0.482
10	3.2	2.34	0.422
15	3.48	2.06	0.372
30	3.70	1.84	0.332
40	3.8	1.74	0.314
50	3.96	1.58	0.285



To = 16.7 mins
1002 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$ where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**3.8E-07**	m/sec	3.8E-05 cm/sec
	=	**0.136**	cm/hour	

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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	27-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

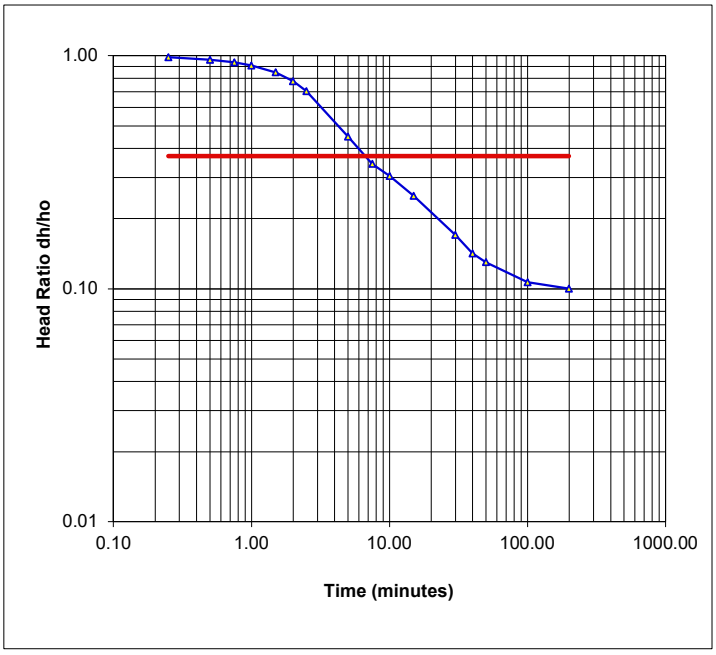
Description:	Unit 3D	**Test No.**	BH113	
Material type:	Sandstone	Easting:	325701.1	m
		Northing	6260273.1	m
		Surface Level:	46.9	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	6	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0	m
Length of well screen (Le)	3.5	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.00	0.00	6.00	1.000
0.25	0.1	5.90	0.983
0.50	0.24	5.76	0.960
0.75	0.38	5.62	0.937
1.00	0.55	5.45	0.908
1.50	0.91	5.09	0.848
2.00	1.34	4.66	0.777
2.50	1.77	4.23	0.705
5.00	3.3	2.70	0.450
7.5	3.94	2.06	0.343
10	4.17	1.83	0.305
15	4.5	1.50	0.250
30	4.98	1.02	0.170
40	5.15	0.85	0.142
50	5.22	0.78	0.130
100	5.36	0.64	0.107
200	5.4	0.60	0.100



To = 6.6 mins
396 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$

where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**9.6E-07**	m/sec	9.6E-05 cm/sec
	=	**0.345**	cm/hour	

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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	28-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

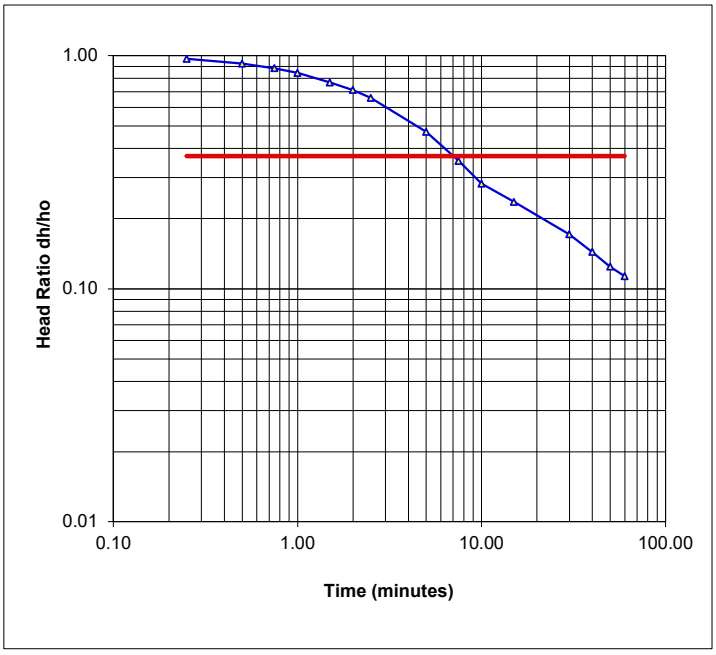
Description:	Unit 3D	**Test No.**	BH114	
Material type:	Sandstone	Easting:	325695.41	m
		Northing	6260286.6	m
		Surface Level:	47.3	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	6.19	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0	m
Length of well screen (Le)	6.6	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.00	0.00	6.19	1.000
0.25	0.2	5.99	0.968
0.50	0.46	5.73	0.926
0.75	0.72	5.47	0.884
1.00	0.97	5.22	0.843
1.50	1.44	4.75	0.767
2.00	1.78	4.41	0.712
2.50	2.11	4.08	0.659
5.00	3.27	2.92	0.472
7.5	4	2.19	0.354
10	4.44	1.75	0.283
15	4.73	1.46	0.236
30	5.13	1.06	0.171
40	5.3	0.89	0.144
50	5.42	0.77	0.124
60	5.49	0.70	0.113



To = 7.1 mins
426 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$

where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**5.4E-07**	m/sec	5.4E-05 cm/sec
	=	**0.195**	cm/hour	

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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	27-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

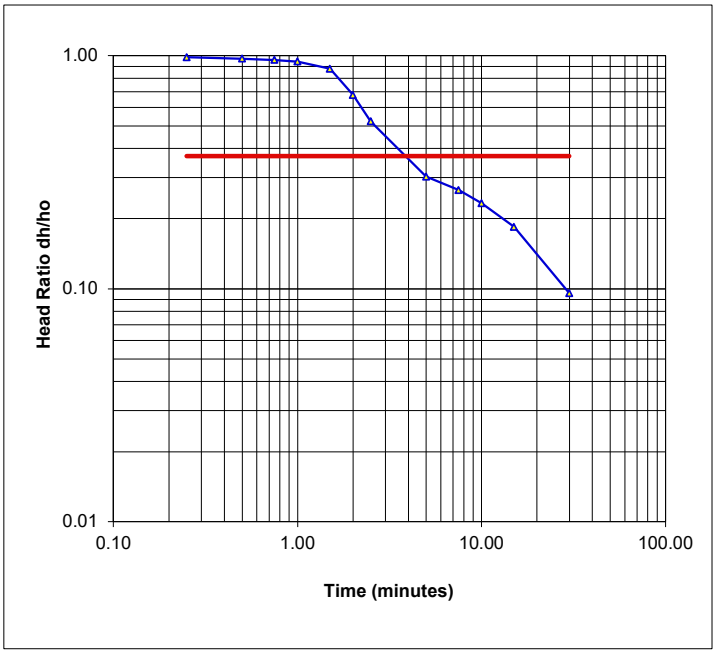
Description:	Unit 3C	**Test No.**	BH115	
Material type:	Sandstone	Easting:	325707.2	m
		Northing	6260312	m
		Surface Level:	46.4	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	5.73	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0.41	m
Length of well screen (Le)	3.5	m			

Test Results

Time (min)	Depth (m)	Change in Head: δH (m)	δH/Ho
0.00	0.41	5.32	1.000
0.25	0.49	5.24	0.985
0.50	0.56	5.17	0.972
0.75	0.63	5.10	0.959
1.00	0.71	5.02	0.944
1.50	1.05	4.68	0.880
2.00	2.12	3.61	0.679
2.50	2.95	2.78	0.523
5.00	4.12	1.61	0.303
7.5	4.32	1.41	0.265
10	4.49	1.24	0.233
15	4.75	0.98	0.184
30	5.22	0.51	0.096



To = 3.3 mins
198 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$ where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**1.9E-06**	m/sec	1.9E-04 cm/sec
	=	**0.690**	cm/hour	

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Permeability Testing - Falling Head Test Report

Client:	Frasers Property Ivanhoe	Project No:	86043.06
Project:	Stage 2 - Midtown	Date:	27-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

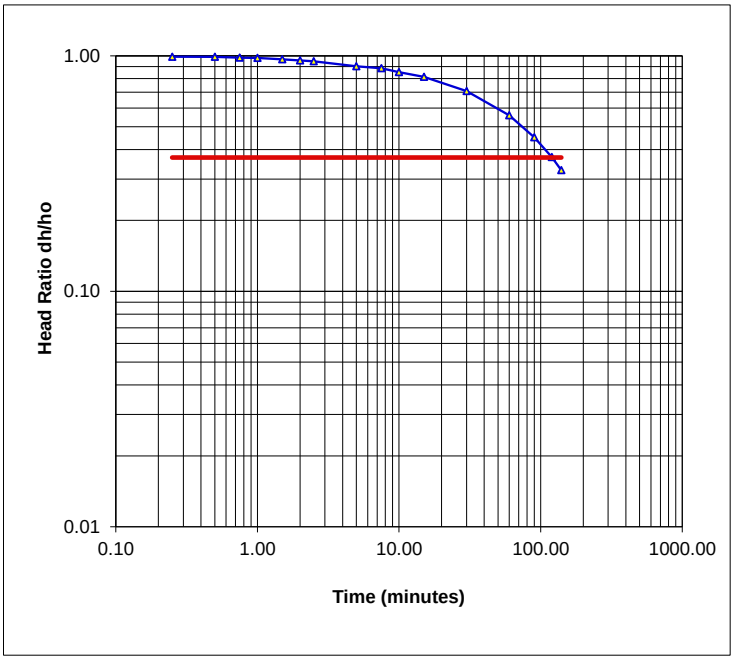
Description:	Unit 3A	**Test No.**	BH118A	
Material type:	Sandstone	Easting:	325675	m
		Northing	6260378	m
		Surface Level:	46.4	m AHD

Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	5.38	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	0.45	m
Length of well screen (Le)	2.1	m			

Test Results

Time (min)	Depth (m)	Change in Head: dH (m)	dH/Ho
0.00	0.45	4.93	1.000
0.25	0.49	4.89	0.992
0.50	0.5	4.88	0.990
0.75	0.53	4.85	0.984
1.00	0.55	4.83	0.980
1.50	0.62	4.76	0.966
2.00	0.67	4.71	0.955
2.50	0.71	4.67	0.947
5.00	0.93	4.45	0.903
7.5	1.01	4.37	0.886
10	1.17	4.21	0.854
15	1.37	4.01	0.813
30	1.89	3.49	0.708
60	2.62	2.76	0.560
90	3.16	2.22	0.450
120	3.55	1.83	0.371
140	3.77	1.61	0.327



To = 120 mins
7200 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$

where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**7.7E-08**	m/sec	7.7E-06 cm/sec
	=	**0.028**	cm/hour	

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Permeability Testing - Rising Head Test Report

Client:	Frasers Property Ivanhoe Pty Ltd	Project No:	86043.06
Project:	Midtown in Macquarie Park	Test date:	11-May-21
Location:	C3 Development Area	Tested by:	TM

Test Location

Description:	Standpipe in borehole	**Test No.**	BH106	
Material type:	Sandstone	Easting:	325658.4	m
		Northing	6260394.7	m
		Surface Level:	49.5	m AHD

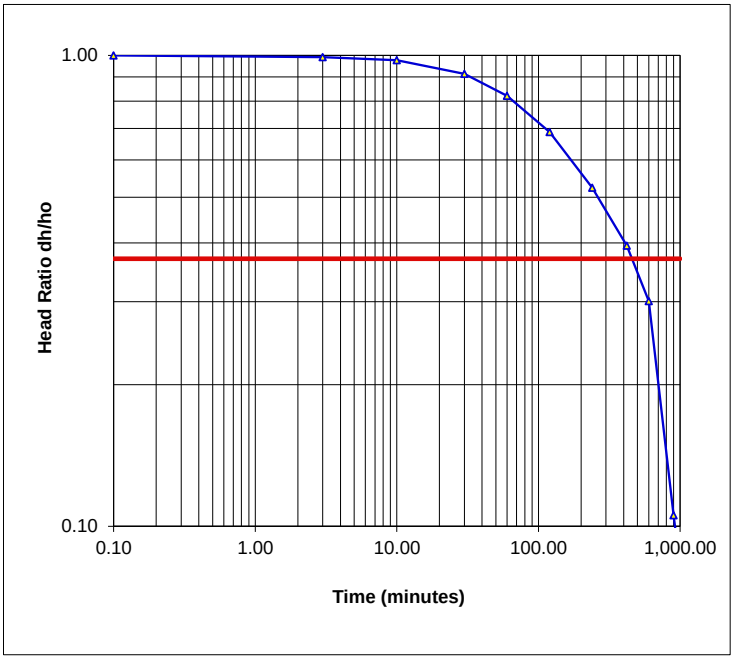
Details of Well Installation

Well casing diameter (2r)	50	mm	Depth to water before test	4.93	m
Well screen diameter (2R)	100	mm	Depth to water at start of test	7.49	m
Length of well screen (Le)	3.5	m			

Comments:

Test Results

Time (min)	Depth (m)	Change in Head dH (m)	dH/Ho
0	7.49	2.56	1.000
3.0	7.47	2.54	0.992
10	7.43	2.50	0.977
30	7.27	2.34	0.914
60	7.03	2.10	0.820
120	6.69	1.76	0.688
240	6.27	1.34	0.523
420	5.94	1.01	0.395
600	5.7	0.77	0.301
900	5.2	0.27	0.105
1000	5.14	0.21	0.082



To = 430 mins
25800 secs

Theory: Falling Head Permeability calculated using equation by Hvorslev

$k = [r^2 \ln(Le/R)]/2Le\ To$

where r = radius of casing
R = radius of well screen
Le = length of well screen
To = time taken to rise or fall to 37% of initial change

Hydraulic Conductivity	**k =**	**1.5E-08**	m/sec
	=	**0.005**	cm/hour

Appendix F

Laboratory Testing

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 291444

Client Details

Client	Douglas Partners Pty Ltd
Attention	Sally Peacock
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86043.06, Macquarie Park**
Number of Samples	4 Water
Date samples received	21/03/2022
Date completed instructions received	21/03/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	28/03/2022
Date of Issue	28/03/2022

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Results Approved By
Diego Bigolin, Inorganics Supervisor
Dragana Tomas, Senior Chemist
Hannah Nguyen, Metals Supervisor
Josh Williams, Organics and LC Supervisor
Liam Timmins, Chemist
Nick Sarlamis, Assistant Operation Manager

Authorised By



Nancy Zhang, Laboratory Manager

VOCs in water				
Our Reference		291444-1	291444-2	291444-3
Your Reference	UNITS	109A	111	118A
Date Sampled		21/03/2022	21/03/2022	21/03/2022
Type of sample		Water	Water	Water
Date extracted	-	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022
Dichlorodifluoromethane	µg/L	<10	<10	<10
Chloromethane	µg/L	<10	<10	<10
Vinyl Chloride	µg/L	<10	<10	<10
Bromomethane	µg/L	<10	<10	<10
Chloroethane	µg/L	<10	<10	<10
Trichlorofluoromethane	µg/L	<10	<10	<10
1,1-Dichloroethene	µg/L	<1	<1	<1
Trans-1,2-dichloroethene	µg/L	<1	<1	<1
1,1-dichloroethane	µg/L	<1	<1	<1
Cis-1,2-dichloroethene	µg/L	<1	<1	<1
Bromochloromethane	µg/L	<1	<1	<1
Chloroform	µg/L	<1	<1	<1
2,2-dichloropropane	µg/L	<1	<1	<1
1,2-dichloroethane	µg/L	<1	<1	<1
1,1,1-trichloroethane	µg/L	<1	<1	<1
1,1-dichloropropene	µg/L	<1	<1	<1
Cyclohexane	µg/L	<1	<1	<1
Carbon tetrachloride	µg/L	<1	<1	<1
Benzene	µg/L	<1	<1	<1
Dibromomethane	µg/L	<1	<1	<1
1,2-dichloropropane	µg/L	<1	<1	<1
Trichloroethene	µg/L	<1	<1	<1
Bromodichloromethane	µg/L	<1	<1	<1
trans-1,3-dichloropropene	µg/L	<1	<1	<1
cis-1,3-dichloropropene	µg/L	<1	<1	<1
1,1,2-trichloroethane	µg/L	<1	<1	<1
Toluene	µg/L	<1	<1	<1
1,3-dichloropropane	µg/L	<1	<1	<1
Dibromochloromethane	µg/L	<1	<1	<1
1,2-dibromoethane	µg/L	<1	<1	<1
Tetrachloroethene	µg/L	<1	<1	<1
1,1,1,2-tetrachloroethane	µg/L	<1	<1	<1
Chlorobenzene	µg/L	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1

VOCs in water				
Our Reference		291444-1	291444-2	291444-3
Your Reference	UNITS	109A	111	118A
Date Sampled		21/03/2022	21/03/2022	21/03/2022
Type of sample		Water	Water	Water
Bromoform	µg/L	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2
Styrene	µg/L	<1	<1	<1
1,1,2,2-tetrachloroethane	µg/L	<1	<1	<1
o-xylene	µg/L	<1	<1	<1
1,2,3-trichloropropane	µg/L	<1	<1	<1
Isopropylbenzene	µg/L	<1	<1	<1
Bromobenzene	µg/L	<1	<1	<1
n-propyl benzene	µg/L	<1	<1	<1
2-chlorotoluene	µg/L	<1	<1	<1
4-chlorotoluene	µg/L	<1	<1	<1
1,3,5-trimethyl benzene	µg/L	<1	<1	<1
Tert-butyl benzene	µg/L	<1	<1	<1
1,2,4-trimethyl benzene	µg/L	<1	<1	<1
1,3-dichlorobenzene	µg/L	<1	<1	<1
Sec-butyl benzene	µg/L	<1	<1	<1
1,4-dichlorobenzene	µg/L	<1	<1	<1
4-isopropyl toluene	µg/L	<1	<1	<1
1,2-dichlorobenzene	µg/L	<1	<1	<1
n-butyl benzene	µg/L	<1	<1	<1
1,2-dibromo-3-chloropropane	µg/L	<1	<1	<1
1,2,4-trichlorobenzene	µg/L	<1	<1	<1
Hexachlorobutadiene	µg/L	<1	<1	<1
1,2,3-trichlorobenzene	µg/L	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	100	100
Surrogate toluene-d8	%	96	97	96
Surrogate 4-BFB	%	99	102	100

vTRH(C6-C10)/BTEXN in Water					
Our Reference		291444-1	291444-2	291444-3	291444-4
Your Reference	UNITS	109A	111	118A	BD1/20220321
Date Sampled		21/03/2022	21/03/2022	21/03/2022	21/03/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	22/03/2022	22/03/2022	22/03/2022	22/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022	23/03/2022
TRH C_6 - C_9	µg/L	<10	<10	<10	<10
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10
Benzene	µg/L	<1	<1	<1	<1
Toluene	µg/L	<1	<1	<1	<1
Ethylbenzene	µg/L	<1	<1	<1	<1
m+p-xylene	µg/L	<2	<2	<2	<2
o-xylene	µg/L	<1	<1	<1	<1
Naphthalene	µg/L	<1	<1	<1	<1
Surrogate Dibromofluoromethane	%	100	100	100	99
Surrogate toluene-d8	%	96	97	96	95
Surrogate 4-BFB	%	99	102	100	100

svTRH (C10-C40) in Water					
Our Reference		291444-1	291444-2	291444-3	291444-4
Your Reference	UNITS	109A	111	118A	BD1/20220321
Date Sampled		21/03/2022	21/03/2022	21/03/2022	21/03/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022	25/03/2022
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	<100	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16}	µg/L	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	µg/L	<50	<50	<50	<50
TRH >C_{16} - C_{34}	µg/L	<100	<100	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	<50	<50	<50
Surrogate o-Terphenyl	%	91	88	108	98

PAHs in Water - Low Level					
Our Reference		291444-1	291444-2	291444-3	291444-4
Your Reference	UNITS	109A	111	118A	BD1/20220321
Date Sampled		21/03/2022	21/03/2022	21/03/2022	21/03/2022
Type of sample		Water	Water	Water	Water
Date extracted	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022	25/03/2022
Naphthalene	µg/L	<0.2	<0.2	<0.2	<0.2
Acenaphthylene	µg/L	<0.1	<0.1	<0.1	<0.1
Acenaphthene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluorene	µg/L	<0.1	<0.1	<0.1	<0.1
Phenanthrene	µg/L	<0.1	<0.1	<0.1	<0.1
Anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Fluoranthene	µg/L	<0.1	<0.1	<0.1	<0.1
Pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Chrysene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	µg/L	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Indeno(1,2,3-c,d)pyrene	µg/L	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	µg/L	<0.1	<0.1	<0.1	<0.1
Benzo(a)pyrene TEQ	µg/L	<0.5	<0.5	<0.5	<0.5
Total +ve PAH's	µg/L	<0.1	<0.1	<0.1	<0.1
Surrogate p-Terphenyl-d14	%	89	79	64	93

OCPs in Water - Trace Level			
Our Reference	UNITS	291444-1	291444-2
Your Reference		109A	111
Date Sampled		21/03/2022	21/03/2022
Type of sample		Water	Water
Date extracted	-	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022
alpha-BHC	µg/L	<0.001	<0.001
HCB	µg/L	<0.001	<0.001
beta-BHC	µg/L	<0.001	<0.001
gamma-BHC	µg/L	<0.001	<0.001
Heptachlor	µg/L	<0.001	<0.001
delta-BHC	µg/L	<0.001	<0.001
Aldrin	µg/L	<0.001	<0.001
Heptachlor Epoxide	µg/L	<0.001	<0.001
gamma-Chlordane	µg/L	<0.001	<0.001
alpha-Chlordane	µg/L	<0.001	<0.001
Endosulfan I	µg/L	<0.002	<0.002
pp-DDE	µg/L	<0.001	<0.001
Dieldrin	µg/L	<0.001	<0.001
Endrin	µg/L	<0.001	<0.001
Endosulfan II	µg/L	<0.002	<0.002
pp-DDD	µg/L	<0.001	<0.001
Endrin Aldehyde	µg/L	<0.001	<0.001
pp-DDT	µg/L	<0.001	<0.001
Endosulfan Sulphate	µg/L	<0.001	<0.001
Methoxychlor	µg/L	<0.001	<0.001
Surrogate TCMX	%	78	86

OP in water Trace ANZECCF/ADWG			
Our Reference		291444-1	291444-2
Your Reference	UNITS	109A	111
Date Sampled		21/03/2022	21/03/2022
Type of sample		Water	Water
Date extracted	-	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022
Dichlorovos	µg/L	<0.2	<0.2
Dimethoate	µg/L	<0.15	<0.15
Diazinon	µg/L	<0.01	<0.01
Chlorpyriphos-methyl	µg/L	<0.2	<0.2
Methyl Parathion	µg/L	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2
Malathion	µg/L	<0.05	<0.05
Chlorpyriphos	µg/L	<0.009	<0.009
Parathion	µg/L	<0.004	<0.004
Bromophos ethyl	µg/L	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.02	<0.02
Surrogate TCMX	%	78	76

PCBs in Water - Trace Level			
Our Reference		291444-1	291444-2
Your Reference	UNITS	109A	111
Date Sampled		21/03/2022	21/03/2022
Type of sample		Water	Water
Date extracted	-	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022
Aroclor 1016	µg/L	<0.01	<0.01
Aroclor 1221	µg/L	<0.01	<0.01
Aroclor 1232	µg/L	<0.01	<0.01
Aroclor 1242	µg/L	<0.01	<0.01
Aroclor 1248	µg/L	<0.01	<0.01
Aroclor 1254	µg/L	<0.01	<0.01
Aroclor 1260	µg/L	<0.01	<0.01
Surrogate TCMX	%	78	76

Organochlorine Pesticides in Water		
Our Reference		291444-3
Your Reference	UNITS	118A
Date Sampled		21/03/2022
Type of sample		Water
Date extracted	-	24/03/2022
Date analysed	-	24/03/2022
alpha-BHC	µg/L	<0.2
HCB	µg/L	<0.2
beta-BHC	µg/L	<0.2
gamma-BHC	µg/L	<0.2
Heptachlor	µg/L	<0.2
delta-BHC	µg/L	<0.2
Aldrin	µg/L	<0.2
Heptachlor Epoxide	µg/L	<0.2
gamma-Chlordane	µg/L	<0.2
alpha-Chlordane	µg/L	<0.2
Endosulfan I	µg/L	<0.2
pp-DDE	µg/L	<0.2
Dieldrin	µg/L	<0.2
Endrin	µg/L	<0.2
Endosulfan II	µg/L	<0.2
pp-DDD	µg/L	<0.2
Endrin Aldehyde	µg/L	<0.2
pp-DDT	µg/L	<0.2
Endosulfan Sulphate	µg/L	<0.2
Methoxychlor	µg/L	<0.2
Surrogate TCMX	%	65

OP Pesticides in Water		
Our Reference		291444-3
Your Reference	UNITS	118A
Date Sampled		21/03/2022
Type of sample		Water
Date extracted	-	24/03/2022
Date analysed	-	24/03/2022
Dichlorvos	µg/L	<0.2
Dimethoate	µg/L	<0.2
Diazinon	µg/L	<0.2
Chlorpyriphos-methyl	µg/L	<0.2
Ronnel	µg/L	<0.2
Fenitrothion	µg/L	<0.2
Malathion	µg/L	<0.2
Chlorpyriphos	µg/L	<0.2
Parathion	µg/L	<0.2
Bromophos ethyl	µg/L	<0.2
Ethion	µg/L	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.2
Surrogate TCMX	%	65

PCBs in Water		
Our Reference		291444-3
Your Reference	UNITS	118A
Date Sampled		21/03/2022
Type of sample		Water
Date extracted	-	24/03/2022
Date analysed	-	24/03/2022
Aroclor 1016	µg/L	<2
Aroclor 1221	µg/L	<2
Aroclor 1232	µg/L	<2
Aroclor 1242	µg/L	<2
Aroclor 1248	µg/L	<2
Aroclor 1254	µg/L	<2
Aroclor 1260	µg/L	<2
Surrogate TCMX	%	65

HM in water - dissolved					
Our Reference		291444-1	291444-2	291444-3	291444-4
Your Reference	UNITS	109A	111	118A	BD1/20220321
Date Sampled		21/03/2022	21/03/2022	21/03/2022	21/03/2022
Type of sample		Water	Water	Water	Water
Date prepared	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022	24/03/2022
Arsenic-Dissolved	µg/L	<1	<1	<1	<1
Cadmium-Dissolved	µg/L	<0.1	<0.1	<0.1	<0.1
Chromium-Dissolved	µg/L	<1	<1	<1	<1
Copper-Dissolved	µg/L	2	<1	35	2
Lead-Dissolved	µg/L	4	<1	<1	4
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	2	2	3	2
Zinc-Dissolved	µg/L	16	26	22	16
Iron-Dissolved	µg/L	220	730	1,300	250

HM in water - total				
Our Reference		291444-1	291444-2	291444-3
Your Reference	UNITS	109A	111	118A
Date Sampled		21/03/2022	21/03/2022	21/03/2022
Type of sample		Water	Water	Water
Date prepared	-	24/03/2022	24/03/2022	24/03/2022
Date analysed	-	24/03/2022	24/03/2022	24/03/2022
Arsenic-Total	µg/L	<1	<1	6
Cadmium-Total	µg/L	<0.1	<0.1	0.2
Chromium-Total	µg/L	1	4	58
Copper-Total	µg/L	3	6	69
Lead-Total	µg/L	5	6	70
Mercury-Total	µg/L	<0.05	<0.05	0.08
Nickel-Total	µg/L	3	4	19
Zinc-Total	µg/L	19	48	230
Iron-Total	µg/L	500	2,700	44,000

Ion Balance				
Our Reference		291444-1	291444-2	291444-3
Your Reference	UNITS	109A	111	118A
Date Sampled		21/03/2022	21/03/2022	21/03/2022
Type of sample		Water	Water	Water
Date prepared	-	21/03/2022	21/03/2022	21/03/2022
Date analysed	-	21/03/2022	21/03/2022	21/03/2022
Calcium - Dissolved	mg/L	6.0	27	28
Potassium - Dissolved	mg/L	0.7	1	3
Sodium - Dissolved	mg/L	93	74	67
Magnesium - Dissolved	mg/L	7.9	5.0	2
Hardness	mgCaCO 3 /L	47	88	80
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	<5	<5	<5
Bicarbonate Alkalinity as $CaCO_3$	mg/L	<5	65	120
Carbonate Alkalinity as $CaCO_3$	mg/L	<5	<5	<5
Total Alkalinity as $CaCO_3$	mg/L	<5	65	120
Sulphate, SO4	mg/L	170	64	95
Chloride, Cl	mg/L	120	110	48
Ionic Balance	%	-15	-5.0	-11

Miscellaneous Inorganics				
Our Reference	UNITS	291444-1	291444-2	291444-3
Your Reference		109A	111	118A
Date Sampled		21/03/2022	21/03/2022	21/03/2022
Type of sample		Water	Water	Water
Date prepared	-	23/03/2022	23/03/2022	23/03/2022
Date analysed	-	23/03/2022	23/03/2022	23/03/2022
Total Suspended Solids	mg/L	76	300	95,000
Total Dissolved Solids (grav)	mg/L	300	320	420
Oil & Grease (LLE)	mg/L	<5	<5	[NA]
Ferric Iron (by calculation)	mg/L	<0.05	0.21	<0.05
Ferrous Iron	mg/L	0.24	0.52	1.3

Method ID	Methodology Summary
Inorg-003	Oil & Grease - determine gravimetrically following extraction with Hexane, in accordance with APHA latest edition, 5520-B.
Inorg-006	Alkalinity - determined titrimetrically in accordance with APHA latest edition, 2320-B.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C.
Inorg-019	Suspended Solids - determined gravimetricially by filtration of the sample. The samples are dried at 104+/-5°C.
Inorg-040	The concentrations of the major ions (mg/L) are converted to milliequivalents and summed. The ionic balance should be within +/- 15% ie total anions = total cations +/-15%.
Inorg-076	Ferrous Iron is determined colourimetrically by discrete analyser. Waters samples are filtered on receipt prior to analysis.
Inorg-081	Anions - a range of Anions are determined by Ion Chromatography, in accordance with APHA latest edition, 4110-B. Waters samples are filtered on receipt prior to analysis. Alternatively determined by colourimetry/turbidity using Discrete Analyser.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS.
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS/GC-MSMS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013.
Org-023	Water samples are analysed directly by purge and trap GC-MS.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing by purge and trap GC-MS. Water samples are analysed directly by purge and trap GC-MS. F1 = (C6-C10)-BTEX as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater.

QUALITY CONTROL: VOCs in water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			22/03/2022	[NT]	[NT]	[NT]	[NT]	22/03/2022	[NT]
Date analysed	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
Dichlorodifluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Vinyl Chloride	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromomethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichlorofluoromethane	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-Dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trans-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Cis-1,2-dichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chloroform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	100	[NT]
2,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	92	[NT]
1,1,1-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	88	[NT]
1,1-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Cyclohexane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Carbon tetrachloride	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromomethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Trichloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	83	[NT]
Bromodichloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	80	[NT]
trans-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
cis-1,3-dichloropropene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2-trichloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibromochloromethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	72	[NT]
1,2-dibromoethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tetrachloroethene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	91	[NT]
1,1,1,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromoform	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Styrene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,1,2,2-tetrachloroethane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]

QUALITY CONTROL: VOCs in water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Isopropylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Bromobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-propyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
2-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-chlorotoluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3,5-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Tert-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trimethyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,3-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Sec-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,4-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
4-isopropyl toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
n-butyl benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2-dibromo-3-chloropropane	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,4-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Hexachlorobutadiene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
1,2,3-trichlorobenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate toluene-d8	%		Org-023	96	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			22/03/2022	[NT]	[NT]	[NT]	[NT]	22/03/2022	[NT]
Date analysed	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	91	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	[NT]	[NT]	[NT]	[NT]	91	[NT]
Benzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	87	[NT]
Toluene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	86	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	93	[NT]
m+p-xylene	µg/L	2	Org-023	<2	[NT]	[NT]	[NT]	[NT]	95	[NT]
o-xylene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	90	[NT]
Naphthalene	µg/L	1	Org-023	<1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	104	[NT]
Surrogate toluene-d8	%		Org-023	96	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate 4-BFB	%		Org-023	99	[NT]	[NT]	[NT]	[NT]	96	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	109	[NT]
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	[NT]	[NT]	[NT]	[NT]	101	[NT]
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	100	[NT]
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	[NT]	[NT]	[NT]	[NT]	109	[NT]
Surrogate o-Terphenyl	%		Org-020	121	[NT]	[NT]	[NT]	[NT]	98	[NT]

QUALITY CONTROL: PAHs in Water - Low Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	25/03/2022	[NT]
Naphthalene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	113	[NT]
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	113	[NT]
Fluorene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	109	[NT]
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	124	[NT]
Anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	114	[NT]
Pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	117	[NT]
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	85	[NT]
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	124	[NT]
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	91	[NT]	[NT]	[NT]	[NT]	93	[NT]

QUALITY CONTROL: OCPs in Water - Trace Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
alpha-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	102	[NT]
HCB	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	113	[NT]
gamma-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	102	[NT]
delta-BHC	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	107	[NT]
Heptachlor Epoxide	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	111	[NT]
gamma-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	106	[NT]
Dieldrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	116	[NT]
Endrin	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	64	[NT]
Endosulfan II	µg/L	0.002	Org-022/025	<0.002	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	108	[NT]
Endrin Aldehyde	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	108	[NT]
Endosulfan Sulphate	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methoxychlor	µg/L	0.001	Org-022/025	<0.001	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	86	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: OP in water Trace ANZECCF/ADWG						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Dichlorovos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	75	[NT]
Dimethoate	µg/L	0.15	Org-022/025	<0.15	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.01	Org-022/025	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Methyl Parathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	113	[NT]
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	83	[NT]
Malathion	µg/L	0.05	Org-022/025	<0.05	[NT]	[NT]	[NT]	[NT]	113	[NT]
Chlorpyriphos	µg/L	0.009	Org-022/025	<0.009	[NT]	[NT]	[NT]	[NT]	113	[NT]
Parathion	µg/L	0.004	Org-022/025	<0.004	[NT]	[NT]	[NT]	[NT]	96	[NT]
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	91	[NT]
Azinphos-methyl (Guthion)	µg/L	0.02	Org-022/025	<0.02	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	86	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: PCBs in Water - Trace Level						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			25/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Aroclor 1016	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	108	[NT]
Aroclor 1260	µg/L	0.01	Org-021	<0.01	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	86	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: Organochlorine Pesticides in Water					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
alpha-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	102	[NT]
HCB	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	114	[NT]
gamma-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Heptachlor	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	103	[NT]
delta-BHC	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aldrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	109	[NT]
Heptachlor Epoxide	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
gamma-Chlordane	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	107	[NT]
Dieldrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	114	[NT]
Endrin	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	62	[NT]
Endosulfan II	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDD	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	108	[NT]
Endrin Aldehyde	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	108	[NT]
Methoxychlor	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	86	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: OP Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Dichlorvos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	91	[NT]
Dimethoate	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Diazinon	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	85	[NT]
Malathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	110	[NT]
Chlorpyriphos	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	112	[NT]
Parathion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	93	[NT]
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	92	[NT]
Azinphos-methyl (Guthion)	µg/L	0.2	Org-022/025	<0.2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	86	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W3	[NT]
Date extracted	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Date analysed	-			24/03/2022	[NT]	[NT]	[NT]	[NT]	24/03/2022	[NT]
Aroclor 1016	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	108	[NT]
Aroclor 1260	µg/L	2	Org-021	<2	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Surrogate TCMX	%		Org-021	86	[NT]	[NT]	[NT]	[NT]	89	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			24/03/2022	1	24/03/2022	24/03/2022		24/03/2022	[NT]
Date analysed	-			24/03/2022	1	24/03/2022	24/03/2022		24/03/2022	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	97	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	<0.1	<0.1	0	99	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	<1	0	97	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	2	2	0	98	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	4	4	0	100	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	[NT]		114	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	2	2	0	99	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	16	16	0	98	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	1	220	230	4	97	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date prepared	-			24/03/2022	1	24/03/2022	24/03/2022		24/03/2022	[NT]
Date analysed	-			24/03/2022	1	24/03/2022	24/03/2022		24/03/2022	[NT]
Arsenic-Total	µg/L	1	Metals-022	<1	1	<1	[NT]		98	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	<0.1	[NT]		99	[NT]
Chromium-Total	µg/L	1	Metals-022	<1	1	1	[NT]		98	[NT]
Copper-Total	µg/L	1	Metals-022	<1	1	3	[NT]		98	[NT]
Lead-Total	µg/L	1	Metals-022	<1	1	5	[NT]		104	[NT]
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	114	[NT]
Nickel-Total	µg/L	1	Metals-022	<1	1	3	[NT]		99	[NT]
Zinc-Total	µg/L	1	Metals-022	<1	1	19	[NT]		97	[NT]
Iron-Total	µg/L	10	Metals-022	<10	1	500	[NT]		101	[NT]

QUALITY CONTROL: Ion Balance						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	291444-2
Date prepared	-			21/03/2022	1	21/03/2022	21/03/2022		21/03/2022	21/03/2022
Date analysed	-			21/03/2022	1	21/03/2022	21/03/2022		21/03/2022	21/03/2022
Calcium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	6.0	6.0	0	90	86
Potassium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	0.7	0.6	15	92	92
Sodium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	93	90	3	105	79
Magnesium - Dissolved	mg/L	0.5	Metals-020	<0.5	1	7.9	7.8	1	88	87
Hardness	mgCaCO 3 /L	3		<3	1	47	47	0	[NT]	[NT]
Hydroxide Alkalinity (OH^-) as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Bicarbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Carbonate Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		[NT]	[NT]
Total Alkalinity as $CaCO_3$	mg/L	5	Inorg-006	<5	1	<5	[NT]		100	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	170	180	6	98	#
Chloride, Cl	mg/L	1	Inorg-081	<1	1	120	120	0	102	#
Ionic Balance	%		Inorg-040	[NT]	1	-15	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
Date analysed	-			23/03/2022	[NT]	[NT]	[NT]	[NT]	23/03/2022	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	<5	[NT]	[NT]	[NT]	[NT]	87	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	[NT]	[NT]	[NT]	[NT]	101	[NT]
Oil & Grease (LLE)	mg/L	5	Inorg-003	<5	[NT]	[NT]	[NT]	[NT]	97	[NT]
Ferric Iron (by calculation)	mg/L	0.05		<0.05	[NT]	[NT]	[NT]	[NT]	[NT]	[NT]
Ferrous Iron	mg/L	0.05	Inorg-076	<0.05	[NT]	[NT]	[NT]	[NT]	106	[NT]

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

ION_BALANCE:# Percent recovery is not applicable due to the high concentration of the analyte/s in the sample/s. However an acceptable recovery was obtained for the LCS.

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CHAIN OF CUSTODY DESPATCH SHEET

Project No:	86043.06	**Suburb:**	Macquarie Park	**To:**	*Envirolab Services*
Project Manager:	Sally Peacock	**Order Number:**		**Sampler:** AN	*12 Ashley St, Chatswood NSW 2067*
Email:	Sally.Peacock@douglaspartners.com.au			**Attn:**	*Sample Receipt*
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day			**Contact:**	*(02) 9910 6200 samplereceipt@envirolab.com.au*
Prior Storage:	☑ Fridge ☐ Freezer ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No ☐ Yes (If YES, then handle, transport and store in accordance with FPM HAZID)		

Lab ID	Sample ID: Location / Other ID	Depth From	Depth To	Date Sampled	Sample Type: S - soil W - water	Container Type: G - glass P - plastic	Analytes: Combo 8L	Combo 4L	VOC	Oil and Grease	Anions and Cations (Major)	Ferrous Iron and Ferric Iron	Hardness	Total Metals	TSS and TDS			Notes/ Preservation/ Additional Requirements
1	109A	-	-	18/03/22	w	g/p	✓		✓	✓	✓	✓	✓	✓	✓			Phenols not required
2	111	-	-	18/03/22	w	g/p	✓		✓	✓	✓	✓	✓	✓	✓			Phenols not required
3	118A	-	-	18/03/22	w	g/p	✓		✓	[illegible]	✓	✓	✓	✓	✓			Phenols not required
4	BD1/20220318			18/03/22	w	g/p		✓										108A may not have enough sample for low levels – please do std. or TSS/TDS.

Metals to analyse:	HM8 (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn)	**LAB RECEIPT**	291644
Number of samples in container:	**Transported to laboratory by:** Dropped Off by DP	**Lab Ref. No:**	
Send results to:	Douglas Partners Pty Ltd	**Received by:**	Eu Suchne
Address:	96 Hermitage Road, West Ryde NSW 2114 **Phone:** (02) 9809 0666	**Date & Time:**	21/3/22 1555
Relinquished by:	Angus Nelson **Date:** 18/03/2022 **Signed:**	**Signed:**	

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Douglas Partners Pty Ltd
Attention	Sally Peacock

Sample Login Details

Your reference	86043.06, Macquarie Park
Envirolab Reference	291444
Date Sample Received	21/03/2022
Date Instructions Received	21/03/2022
Date Results Expected to be Reported	28/03/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	4 Water
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	17
Cooling Method	Ice
Sampling Date Provided	YES

Comments

118A - not enough for Oil & Grease

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	VOCs in water	vTRH(C6-C10)/BTEXN in Water	svTRH (C10-C40) in Water	PAHs in Water - Low Level	OCPs in Water - Trace Level	OP in water Trace ANZECCF/ADWG	PCBs in Water - Trace Level	Organochlorine Pesticides in Water	OP Pesticides in Water	PCBs in Water	HM in water - dissolved	HM in water - total	Calcium - Dissolved	Potassium - Dissolved	Sodium - Dissolved	Magnesium - Dissolved	Hardness	Hydroxide Alkalinity (OH-) as CaCO3	Bicarbonate Alkalinity as CaCO3	Carbonate Alkalinity as CaCO3	Total Alkalinity as CaCO3	Sulphate, SO4	Chloride, Cl	Ionic Balance	Total Suspended Solids	Total Dissolved Solids(grav)	Oil & Grease (LLE)	Ferric Iron (by calculation)	Ferrous Iron
109A	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
111	✓	✓	✓	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
118A	✓	✓	✓	✓				✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BD1/20220321		✓	✓	✓							✓																			

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.

Requests for longer term sample storage must be received in writing.

Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.

TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

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Groundwater (GW) Field Sheet

Project and Bore Installation Details						
Project Name / Site Location	MACQUARIE PARK, Ivanhoe Estate.				Project Number	86043.06
Well Construction Details	Well ID	118A	Drilling Method	~~Hand~~	Hole Diameter (m)~	~~0.075~~
	Well Depth (m bgl)		Screened (m bgl)	~~[redacted]~~	Stick Up (m)	
Survey Information	Easting		Northing		Elevation RL	
GW Level During Drilling		m bgl				
Contaminants/Comments						

Well Development Details					
Date / Time / Weather Conditions				Purged By	
Purge Method / Equipment					
Product observed / Thickness		mm	Confirmed with Bailer? (Y / N)		
GW Level (pre-purge)		m bgl	Observed Well Depth		m bgl
Height of Water Column (H)		m bgl	Estimated Bore Volume*		L
GW Level (post-purge)		m bgl	Total Volume Purged**		L
Appearance/Comments					

Sampling Details					
Date / Time / Weather Conditions	21/3/22 11:00 AM Overcast			Sampled By	LT/AN
Sampling Method / Equipment	Peristaltic pump, WQM, ~~interface meter~~, bailer & line 12V battery.				
WQM Model	TPS FL900		WQM Calibration Date	21/3/22	
Product observed / Thickness	0	mm	Confirmed with Bailer? (Y / N)	Yes	
GW Level (pre-micropurge)	5.07	m bgl	Observed Well Depth	5.90	m bgl
Height of Water Column	0.83	m bgl	Estimated Bore Volume*	~5	L
GW Level (post sample)	5.90 (DRY)	m bgl	Total Volume of Micro-Purged	2-3 DRY	L

Water Quality Parameters

Time	Cumulative Volume (L)	Temp (°C)	DO (mg/L)#	EC (µS or mS/cm)	pH	Redox (mV)	Turbidity^
Stabilisation Target (3 readings)		0.2	+/- 10%	+/- 5%	+/- 0.1	+/- 10 mV	+/- 10%
11:31	0.5	24.9	0.78	476	5.31	98	—
11:32	0.75	23.1	0.79	483	5.32	96	—
11:33	1.00	21.4	0.66	480	5.34	90	—
11:34	1.25	21.2	0.61	484	5.34	89	—
11:35	1.50	20.9	0.58	435	5.37	87	—
11:36	1.75	20.8	0.48	427	5.39	87	—
11:37	2.00	20.8	0.45	468	5.49	86	1249 —
Notes:	# Considered stabilised if three DO values are less than 0.5 mg/L			^ Considered stabilised if three Turbidity values are less than 5 NTU			

Sample Details						
Sampling Depth (rationale)	5.5-5.8	m bgl,	middle of column / bottom.			
Sample Observations (e.g. colour, sediment, sheen, odour)	silty, pale brown					
Sample ID	118A					
QAQC Samples	Replicate	—	Triplicate	—	Other	—
Sample Containers Quantity / Preservation / Filtration	Amber glass (Small)	2	Plastic	1	PFAS (no teflon)	—
	Metals (F/UF) (HNO3)	2	Phenols/COD/NH3 (H2SO4)	1	Vials (HCl)	4
	Ferrous/Ferric Iron (HCl)	1	Cyanides/Chromium (NaOH)	—	Other	—
Comments	not alot of water					

*Estimated Well Volume = H * F	Std. Drilling Diameter (m)~	NMLC (0.075)	HQ (0.096)	PQ (0.1226)	SFA (0.125)	HFA (0.194)
**Purge Target: min. 3 well volumes	Factor (F):	2.8	3.7	5.2	5.4	11.1

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Groundwater (GW) Field Sheet

Project and Bore Installation Details						
Project Name / Site Location	MACQUARIE PARK, Ivanhoe Estate				Project Number	86043.06
Well Construction Details	Well ID	111	Drilling Method	NMLC	Hole Diameter (m)~	0.075
	Well Depth (m bgl)		Screened (m bgl)	8.8-11.8	Stick Up (m)	0
Survey Information	Easting		Northing		Elevation RL	
GW Level During Drilling		m bgl				
Contaminants/Comments						

Well Development Details					
Date / Time / Weather Conditions				Purged By	
Purge Method / Equipment					
Product observed / Thickness		mm	Confirmed with Bailer? (Y / N)		
GW Level (pre-purge)		m bgl	Observed Well Depth		m bgl
Height of Water Column (H)		m bgl	Estimated Bore Volume*		L
GW Level (post-purge)		m bgl	Total Volume Purged**		L
Appearance/Comments					

Sampling Details					
Date / Time / Weather Conditions	21/3/22 1:00pm sunny, partly cloudy			Sampled By	LT/AN
Sampling Method / Equipment	Peristaltic pump, WQM, bailer + line, 12V battery, water chlorate				
WQM Model	TPS FCT90		WQM Calibration Date	21/3/22	
Product observed / Thickness	0	mm	Confirmed with Bailer? (Y / N)	Y	
GW Level (pre-micropurge)	4.56	m bgl	Observed Well Depth	11.25	m bgl
Height of Water Column	6.69	m bgl	Estimated Bore Volume*	~ ~~19~~	L
GW Level (post sample)	6.45	m bgl	Total Volume of Micro-Purged	4-5	L

Water Quality Parameters

Time	Cumulative Volume (L)	Temp (°C)	DO (mg/L)#	EC (µS or mS/cm)	pH	Redox (mV)	Turbidity^
Stabilisation Target (3 readings)		0.2	+/- 10%	+/- 5%	+/- 0.1	+/- 10 mV	+/- 10%
1:24pm		26.6	2.07	602	5.31	133	
1:25pm		23.1	1.87	621	5.44	126	
1:26pm		21.2	1.64	633	5.48	123	
1:27pm		20.8	1.57	628	5.45	119	
1:28pm		20.6	1.45	627	5.44	117	
1:29pm		20.5	1.38	626	5.46	116	~~[illegible]~~
1:30pm							
1:31pm							
1:32pm							
1:33pm							
1:34pm							
1:35pm							
1:36pm							
1:37pm							
1:38pm							

Notes: # Considered stabilised if three DO values are less than 0.5 mg/L ^ Considered stabilised if three Turbidity values are less than 5 NTU

Sample Details							
Sampling Depth (rationale)	8	m bgl,	middle of column.				
Sample Observations (e.g. colour, sediment, sheen, odour)	clear						
Sample ID	111						
QAQC Samples	Replicate	—	Triplicate	—	Other	—	
Sample Containers Quantity / Preservation / Filtration	Amber glass	2	Plastic	2	PFAS (no teflon)	—	
	Metals (F/UF) (HNO3)	2	Phenols/COD/NH3 (H2SO4)	1	Vials (HCl)	4	
	Ferrous/Ferric Iron (HCl)	1	Cyanides/Chromium (NaOH)	—	Other	—	
Comments							

*Estimated Well Volume = H * F	Std. Drilling Diameter (m)~	NMLC (0.075)	HQ (0.096)	PQ (0.1226)	SFA (0.125)	HFA (0.194)
**Purge Target: min. 3 well volumes	Factor (F):	2.8	3.7	5.2	5.4	11.1

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Groundwater (GW) Field Sheet

Project and Bore Installation Details						
Project Name / Site Location					Project Number	
Well Construction Details	Well ID	109A	Drilling Method	Rotary	Hole Diameter (m)~	0.119
	Well Depth (m bgl)	8.5	Screened (m bgl)	5.5-8.5	Stick Up (m)	0
Survey Information	Easting		Northing		Elevation RL	
GW Level During Drilling		m bgl				
Contaminants/Comments						

Well Development Details					
Date / Time / Weather Conditions				Purged By	
Purge Method / Equipment					
Product observed / Thickness		mm	Confirmed with Bailer? (Y / N)		
GW Level (pre-purge)		m bgl	Observed Well Depth		m bgl
Height of Water Column (H)		m bgl	Estimated Bore Volume*		L
GW Level (post-purge)		m bgl	Total Volume Purged**		L
Appearance/Comments					

Sampling Details					
Date / Time / Weather Conditions	21/3/2022 12pm Overcast			Sampled By	LT/AM
Sampling Method / Equipment	WQM, Peristaltic pump, bailer and line, water whistle				
WQM Model	TPS FLT-90		WQM Calibration Date		
Product observed / Thickness	0	mm	Confirmed with Bailer? (Y / N)		
GW Level (pre-micropurge)	4.96	m bgl	Observed Well Depth	8.20	m bgl
Height of Water Column	3.24	m bgl	Estimated Bore Volume*	~16	L
GW Level (post sample)	6.33	m bgl	Total Volume of Micro-Purged	9-10	L

12V battery

Water Quality Parameters

Time	Cumulative Volume (L)	Temp (°C)	DO (mg/L)#	EC (µS or mS/cm)	pH	Redox (mV)	Turbidity^
Stabilisation Target (3 readings)		0.2	+/- 10%	+/- 5%	+/- 0.1	+/- 10 mV	+/- 10%
12:14pm		26.0	1.79	612	7.39	114	
12:15pm		22.4	1.27	834	7.51	116	
12:16pm		21.8	1.00	642	7.61	109	
12:17pm		21.7	0.91	641	7.69	106	
12:18pm		21.0	0.83	645	7.71	105	
12:19pm		20.9	0.69	645	6.50	104	
12:20pm		20.8	0.67	652	6.68	102	
12:21pm		20.7	0.56	646	6.74	104	306
12:22pm		20.6	0.55	651	7.24	101	257
12:23pm		20.5	0.55	651	7.30	101	305
12:24pm		20.5	0.50	633	7.92	99	267
12:25pm		20.5	0.46	616	8.10	98	251
12:26pm		20.5	0.43	596	8.14	97	235

Notes: # Considered stabilised if three DO values are less than 0.5 mg/L ^ Considered stabilised if three Turbidity values are less than 5 NTU

Sample Details							
Sampling Depth (rationale)	6.5-7	m bgl,	mid col.				
Sample Observations (e.g. colour, sediment, sheen, odour)	clear						
Sample ID	109A						
QAQC Samples	Replicate	BD1/20220321	Triplicate		Other		
Sample Containers Quantity / Preservation / Filtration	Amber glass	2	Plastic	2	PFAS (no teflon)	—	
	Metals (F/UF) (HNO3)	2	Phenols/COD/NH3 (H2SO4)	1	Vials (HCl)	4	
	Ferrous/Ferric Iron (HCl)	1	Cyanides/Chromium (NaOH)	—	Other		
Comments							

*Estimated Well Volume = H * F	Std. Drilling Diameter (m)~	NMLC (0.075)	HQ (0.096)	PQ (0.1226)	SFA (0.125)	HFA (0.194)
**Purge Target: min. 3 well volumes	Factor (F):	2.8	3.7	5.2	5.4	11.1

				Sample ID	109A	BD1/20220321	111	118A
				LocCode	109A	109A	111	118A
				WellCode				
				Sample Date	21/03/2022	21/03/2022	21/03/2022	21/03/2022
				Lab_Report_Number	291444	291444	291444	291444
				Matrix_Type	WATER	WATER	WATER	WATER
				ANZG (2018) Freshwater 95% LOSP Toxicant DGVs*				
Chem_Group	**ChemName**	**Units**	**PQL**					
Ion Balance	Carbonate Alkalinity as CaCO3	mg/L	5		<5	-	<5	<5
PAHs in Water - Low Level	Benzo(a)pyrene TEQ	µg/L	0.5		<0.5	<0.5	<0.5	<0.5
	Benzo(b,j+k)fluoranthene	µg/L	0.2		<0.2	<0.2	<0.2	<0.2
	Total +ve PAHs	µg/L	0.1		<0.1	<0.1	<0.1	<0.1
Inorganics	Alkalinity (Hydroxide) as CaCO3	mg/L	5		<5	-	<5	<5
	Alkalinity (total) as CaCO3	mg/L	5		<5	-	65	120
	Alkalinity (Bicarbonate as CaCO3)	mg/L	5		<5	-	65	120
	Chloride	mg/L	1		120	-	110	48
	Ferrous Iron	mg/L	0.05		0.24	-	0.52	1.3
	Ionic Balance	%			-15	-	-5	-11
	Sodium (Filtered)	mg/L	0.5		93	-	74	67
	Sulphate	mg/L	1		170	-	64	95
	TDS	mg/L	5		300	-	320	420
	TSS	mg/L	5		76	-	300	95,000
Metals	Arsenic	mg/L	0.001	0.024	<0.001	-	<0.001	0.006
	Arsenic (Filtered)	mg/L	0.001	0.024	<0.001	<0.001	<0.001	<0.001
	Cadmium	mg/L	0.0001	0.0004	<0.0001	-	<0.0001	0.0002
	Cadmium (Filtered)	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
	Calcium (Filtered)	mg/L	0.5		6	-	27	28
	Chromium (III+VI)	mg/L	0.001	0.0068	0.001	-	0.004	0.058
	Chromium (III+VI) (Filtered)	mg/L	0.001	0.0068	<0.001	<0.001	<0.001	<0.001
	Copper	mg/L	0.001	0.0014	0.003	-	0.006	0.069
	Copper (Filtered)	mg/L	0.001	0.0014	0.002	0.002	<0.001	0.035
	Ferric Iron	mg/L	0.05		<0.05	-	0.21	<0.05
	Iron	mg/L	0.01		0.5	-	2.7	44
	Iron (Filtered)	mg/L	0.01		0.22	0.25	0.73	1.3
	Lead	mg/L	0.001	0.0103	0.005	-	0.006	0.07
	Lead (Filtered)	mg/L	0.001	0.0103	0.004	0.004	<0.001	<0.001
	Magnesium (Filtered)	mg/L	0.5		7.9	-	5	2
	Mercury	mg/L	0.00005	0.0006	<0.00005	-	<0.00005	0.00008
	Mercury (Filtered)	mg/L	0.00005	0.0006	<0.00005	<0.00005	<0.00005	<0.00005
	Nickel	mg/L	0.001	0.0232	0.003	-	0.004	0.019
	Nickel (Filtered)	mg/L	0.001	0.0232	0.002	0.002	0.002	0.003
	Potassium (Filtered)	mg/L	0.5		0.7	-	1	3
	Zinc	mg/L	0.001	0.0168	0.019	-	0.048	0.23
	Zinc (Filtered)	mg/L	0.001	0.0168	0.016	0.016	0.026	0.022
TPH	C10-C16	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C16-C34	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	C34-C40	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	Oil and Grease	mg/L	5		<5	-	<5	-
	F2-NAPHTHALENE	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C6 - C9	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
	C10 - C14	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C15 - C28	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	C29-C36	mg/L	0.1		<0.1	<0.1	<0.1	<0.1
	+C10 - C36 (Sum of total)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C10 - C40 (Sum of total)	mg/L	0.05		<0.05	<0.05	<0.05	<0.05
	C6-C10 less BTEX (F1)	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
	C6-C10	mg/L	0.01		<0.01	<0.01	<0.01	<0.01
BTEX	Benzene	mg/L	0.001	0.95	<0.001	<0.001	<0.001	<0.001
	Ethylbenzene	mg/L	0.001	0.08	<0.001	<0.001	<0.001	<0.001
	Toluene	mg/L	0.001	0.18	<0.001	<0.001	<0.001	<0.001
	Xylene (m & p)	mg/L	0.002		<0.002	<0.002	<0.002	<0.002
	Xylene (o)	mg/L	0.001	0.35	<0.001	<0.001	<0.001	<0.001
MAH	1,2,4-trimethylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,3,5-trimethylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Isopropylbenzene	mg/L	0.001	0.03	<0.001	-	<0.001	<0.001
	n-butylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	n-propylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	p-isopropyltoluene	mg/L	0.001		<0.001	-	<0.001	<0.001
	sec-butylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Styrene	mg/L	0.001		<0.001	-	<0.001	<0.001
	tert-butylbenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
Chlorinated Hydrocarbons	1,1,1,2-tetrachloroethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,1,1-trichloroethane	mg/L	0.001	0.27	<0.001	-	<0.001	<0.001
	1,1,2,2-tetrachloroethane	mg/L	0.001	0.4	<0.001	-	<0.001	<0.001
	1,1,2-trichloroethane	mg/L	0.001	6.5	<0.001	-	<0.001	<0.001
	1,1-dichloroethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,1-dichloroethene	mg/L	0.001	0.7	<0.001	-	<0.001	<0.001
	1,1-dichloropropene	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,2,3-trichloropropane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,2-dibromo-3-chloropropane	mg/L	0.001		<0.001	-	<0.001	<0.001
	1,2-dichloroethane	mg/L	0.001	1.9	<0.001	-	<0.001	<0.001
	1,2-dichloropropane	mg/L	0.001	0.9	<0.001	-	<0.001	<0.001
	1,3-dichloropropane	mg/L	0.001	1.1	<0.001	-	<0.001	<0.001
	2,2-dichloropropane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromochloromethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromodichloromethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromoform	mg/L	0.001		<0.001	-	<0.001	<0.001
	Carbon tetrachloride	mg/L	0.001	0.24	<0.001	-	<0.001	<0.001
	Chlorodibromomethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Chloroethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	Chloroform	mg/L	0.001	0.77	<0.001	-	<0.001	<0.001
	Chloromethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	cis-1,2-dichloroethene	mg/L	0.001		<0.001	-	<0.001	<0.001

				Sample ID	109A	BD1/20220321	111	118A
				LocCode	109A	109A	111	118A
				WellCode				
				Sample Date	21/03/2022	21/03/2022	21/03/2022	21/03/2022
				Lab_Report_Number	291444	291444	291444	291444
				Matrix_Type	WATER	WATER	WATER	WATER
				ANZG (2018) Freshwater 95% LOSP Toxicant DGVs*				
Chem_Group	**ChemName**	**Units**	**PQL**					
	cis-1,3-dichloropropene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Dibromomethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Hexachlorobutadiene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Trichloroethene	mg/L	0.001	0.33	<0.001	-	<0.001	<0.001
	Tetrachloroethene	mg/L	0.001	0.07	<0.001	-	<0.001	<0.001
	trans-1,2-dichloroethene	mg/L	0.001		<0.001	-	<0.001	<0.001
	trans-1,3-dichloropropene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Vinyl chloride	mg/L	0.01	0.1	<0.01	-	<0.01	<0.01
Halogenated Hydrocarbons	1,2-dibromoethane	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromomethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	Dichlorodifluoromethane	mg/L	0.01		<0.01	-	<0.01	<0.01
	Trichlorofluoromethane	mg/L	0.01		<0.01	-	<0.01	<0.01
Halogenated Benzenes	1,2,3-trichlorobenzene	mg/L	0.001	0.01	<0.001	-	<0.001	<0.001
	1,2,4-trichlorobenzene	mg/L	0.001	0.17	<0.001	-	<0.001	<0.001
	1,2-dichlorobenzene	mg/L	0.001	0.16	<0.001	-	<0.001	<0.001
	1,3-dichlorobenzene	mg/L	0.001	0.26	<0.001	-	<0.001	<0.001
	1,4-dichlorobenzene	mg/L	0.001	0.06	<0.001	-	<0.001	<0.001
	2-chlorotoluene	mg/L	0.001		<0.001	-	<0.001	<0.001
	4-chlorotoluene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Bromobenzene	mg/L	0.001		<0.001	-	<0.001	<0.001
	Chlorobenzene	mg/L	0.001	0.055	<0.001	-	<0.001	<0.001
	Hexachlorobenzene	mg/L	0.000001	0.0001	<0.000001	-	<0.000001	<0.0002
Solvents	Cyclohexane	mg/L	0.001		<0.001	-	<0.001	<0.001
PAH/Phenols	Acenaphthene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Acenaphthylene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Anthracene	mg/L	0.0001	0.0004	<0.0001	<0.0001	<0.0001	<0.0001
	Benz(a)anthracene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(a) pyrene	mg/L	0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
	Benzo(g,h,i)perylene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Chrysene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Dibenz(a,h)anthracene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Fluoranthene	mg/L	0.0001	0.0014	<0.0001	<0.0001	<0.0001	<0.0001
	Fluorene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Indeno(1,2,3-c,d)pyrene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
	Naphthalene	mg/L	0.0002	0.016	<0.0002	<0.0002	<0.0002	<0.0002
	Phenanthrene	mg/L	0.0001	0.002	<0.0001	<0.0001	<0.0001	<0.0001
	Pyrene	mg/L	0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Polychlorinated Biphenyls	Arochlor 1016	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1221	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1232	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1242	mg/L	0.00001	0.0006	<0.00001	-	<0.00001	<0.002
	Arochlor 1248	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
	Arochlor 1254	mg/L	0.00001	0.00003	<0.00001	-	<0.00001	<0.002
	Arochlor 1260	mg/L	0.00001		<0.00001	-	<0.00001	<0.002
Organochlorine Pesticides	4,4-DDE	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	a-BHC	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Aldrin	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	b-BHC	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Chlordane (cis)	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Chlordane (trans)	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	d-BHC	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	DDD	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	DDT	mg/L	0.000001	0.00001	<0.000001	-	<0.000001	<0.0002
	Dieldrin	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Endosulfan I	mg/L	0.000002		<0.000002	-	<0.000002	<0.0002
	Endosulfan II	mg/L	0.000002		<0.000002	-	<0.000002	<0.0002
	Endosulfan sulphate	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Endrin	mg/L	0.000001	0.00002	<0.000001	-	<0.000001	<0.0002
	Endrin aldehyde	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	g-BHC (Lindane)	mg/L	0.000001	0.0002	<0.000001	-	<0.000001	<0.0002
	Heptachlor	mg/L	0.000001	0.00009	<0.000001	-	<0.000001	<0.0002
	Heptachlor epoxide	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
	Methoxychlor	mg/L	0.000001		<0.000001	-	<0.000001	<0.0002
Organophosphorous Pesticides	Azinophos methyl	mg/L	0.00002	0.00002	<0.00002	-	<0.00002	<0.0002
	Bromophos-ethyl	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Chlorpyrifos	mg/L	0.000009	0.00001	<0.000009	-	<0.000009	<0.0002
	Chlorpyrifos-methyl	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Diazinon	mg/L	0.00001	0.00001	<0.00001	-	<0.00001	<0.0002
	Dichlorvos	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Dimethoate	mg/L	0.00015	0.00015	<0.00015	-	<0.00015	<0.0002
	Ethion	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
	Fenitrothion	mg/L	0.0002	0.0002	<0.0002	-	<0.0002	<0.0002
	Malathion	mg/L	0.00005	0.00005	<0.00005	-	<0.00005	<0.0002
	Methyl parathion	mg/L	0.0002		<0.0002	-	<0.0002	-
	Ronnel	mg/L	0.0002		<0.0002	-	<0.0002	<0.0002
Pesticides	Parathion	mg/L	0.000004	0.000004	<0.000004	-	<0.000004	<0.0002

Notes:

a. Criteria for cadmium, chromium, lead, nickel and zinc were hardness adjusted for a hardness of 72 mg/kg of CaCO3

* Where criteria was not available, either a lower or unknown reliabiility criteria was applied, or the laboratory PQL was used as an initial screen

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TPS FLT90 CALIBRATION RECORD

Serial Number: 474853

DP Identification No. WQM NO. 2

Project: MACQUARIE PARK, Ivanhoe

Project Number: 86043.06

PARAMETER	STANDARD	PRE CALIBRATION READING		POST CALIBRATION READING	
Temperature	* ~~23.0~~ - 24.0	25.0	degrees C	24.0	degrees C
pH	10.02	9.94	pH units	10.03	pH units
	7.01	7.13	pH units	7.00	pH units
	4	3.92	pH units	4.00	pH units
Conductivity	0.0** uS/cm	—	µS/cm	—	µS/cm
	2.76 mS/cm	2.67	mS/cm	2.759	mS/cm
	12.88 mS/cm	13.04	mS/cm	12.65	mS/cm
TDS	0.0** ppm	—	ppm	—	ppm
	36.0 ppk	—	ppk	—	ppk
Dissolved Oxygen	0.0% sat	—	ppm		
		-1.3	%	102.9	%
	100.0**% sat	—	ppm		
			%		%
Turbidity	0*** NTU	—	NTU	—	NTU
	90 NTU	90.3	NTU	90.0	NTU
ORP #	240 mV		mV	-	mV

Calibrated by: LT

Date: 7/3/22

* use NATA certified reference thermometer from soils clean lab
** air
*** distilled water
# factory calibrated – do a bump test

NOTES:

Form Updated 1 September 2017

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Our Ref: L.A11141.002.MidtownStg2_FIA.docx

30 June 2021

Liz Yao
Frasers Property Australia
Level 2, 1C Homebush Bay Drive
Rhodes NSW 2138

Dear Liz

RE: MIDTOWN STAGE 2 DEVELOPMENT FLOOD IMPACT ASSESSMENT AND FRAMEWORK FOR FLOOD EMERGENCY RESPONSE

Introduction

This letter presents a Flood Impact Assessment (FIA) of the proposed Midtown Stage 2 development within the Ivanhoe Estate at Macquarie Park, Sydney undertaken to support the Development Application (DA) submission for this State Significant Development (SSD). This FIA addresses the flooding-related conditions outlined in the Secretary's Environmental Assessment Requirements (SEARs).

SEARs Conditions

The flooding-related SEARs conditions relevant to the proposed development are outlined below:

- *The EIS must:*
  - *Identify any flood risk on-site having regard to adopted studies for the development site, consideration of any relevant provisions of the NSW Floodplain Development Manual and the potential effects of climate change, sea level rise and an increase in rainfall intensity.*
  - *Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions to mitigate flood risk where required.*
  - *Identifies required management measures and design solutions, including water sensitive urban design and detention, to minimise the impacts of flooding on the proposed development.*
- *The EIS must also address the following flood related issues:*
  - *Finished Floor Levels (FFLs) shall be set at levels that comply with Council's freeboard requirements defined in DCP-2014-8.2 Stormwater Management Technical Manual.*
  - *Basement ramps shall raise up to PMF levels, at each location, before descending to the basements, to fully flood proof every basement.*
  - *No gaps/openings connected to any basement are allowed below the PMF level at each location.*
  - *Fences located in overland flow paths shall allow flows to pass through.*

Previous Master Plan Assessment and Findings

In 2017, BMT completed a flood impact assessment for Frasers Property Australia to support the proposed Ivanhoe Estate Master Plan (Reference: *L.S20319.03.Flood Impact Assessment for Ivanhoe Estate Masterplan.pdf*). This assessment considered the following Master Plan development components of the Ivanhoe Estate:

- buildings (residential flat buildings comprising private, social and affordable housing, seniors house comprising residential care facilities and self-contained dwellings, a new school, child care centres and minor retail development);
- public open space and roads; and
- community uses.

The above components were incorporated into a 2D hydraulic flood model (refer hereafter as the "Ivanhoe Flood Model") and assessed against existing catchment conditions to establish the change in flood regime due to the Master Plan development.

In all modelled design events, flood conditions outside of Shrimptons Creek and within the Ivanhoe Estate were typified by shallow inundation (low depths) and low velocities (<0.2m/s). These areas are referred to as "Local Drainage" under the NSW Government's 'Floodplain Development Manual' (2005).

Outside of the local drainage areas, the flood impact assessment found negligible differences in design flood conditions in the areas adjacent to Shrimptons Creek. Hence impacts on: emergency planning and evacuation, social and economic cost to the community and erosion, siltation, riparian vegetation and bank stability were not predicted to be altered due to the proposed Ivanhoe Estate Master Plan development.

Midtown Stage 2 Development Updates

The assessment herein focuses on the Midtown Stage 2 development within the Ivanhoe Estate. Subsequent to the Master Plan flood impact assessment referenced previously, the Midtown Stage 2 development seeks consent for the detailed design and construction of Blocks C2, C3 and C4. The latest architectural drawings have been provided and are listed below:

- Midtown Stage 2 – Block C2 Village Green and Community Centre by CHROFI, issued 22/6/2021.
- Midtown Stage 2 – Block C3 Residential and Retail by Fox Johnston, issued 11/6/2021.
- Midtown Stage 2 – Block C4 Residential and Social by Cox Architecture, issued 25/6/2021.

Updates to the Ivanhoe Flood Model for Stage 2

BMT have reviewed the architectural drawings for each block illustrating the proposed building footprint and public domain, as shown in Figure 1, Figure 2 and Figure 3 for Block C2, C3 and C4, respectively. Detailed building footprints (compared to those considered at the Master Plan stage) along with the surface roughness for post-development conditions were incorporated into the Ivanhoe Flood Model for this subsequent flood impact assessment.

BMT were also provided with an updated Digital Elevation Model (DEM) for the site for pre-development (ADWJohnson, issued 5/5/2021) and post-development (ADWJohnson, issued 10/6/2021) conditions. Both datasets have been used to update the Ivanhoe Flood Model, with the post-development DEM providing definition of the proposed internal roads within the Ivanhoe Estate and the earthworks along the western bank of Shrimptons Creek (introduced as part of the Ivanhoe Estate development).

This updated version of the Ivanhoe Flood Model is hereafter referred to as the "Ivanhoe Stage 2 Flood Model".

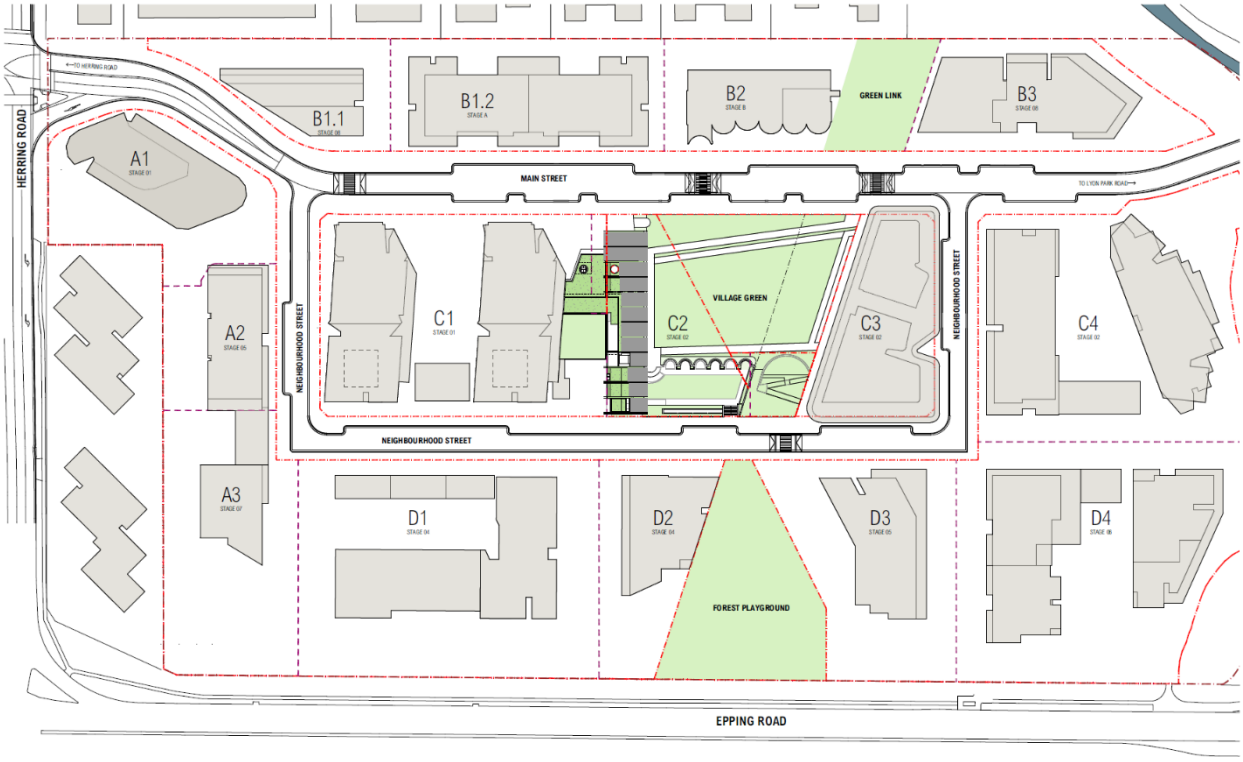


Figure 1 Midtown Stage 2 – Block C2 Village Green and Community Centre (CHROFI, Drawing Number A-A-002 Rev 02 issued 22/6/2021)

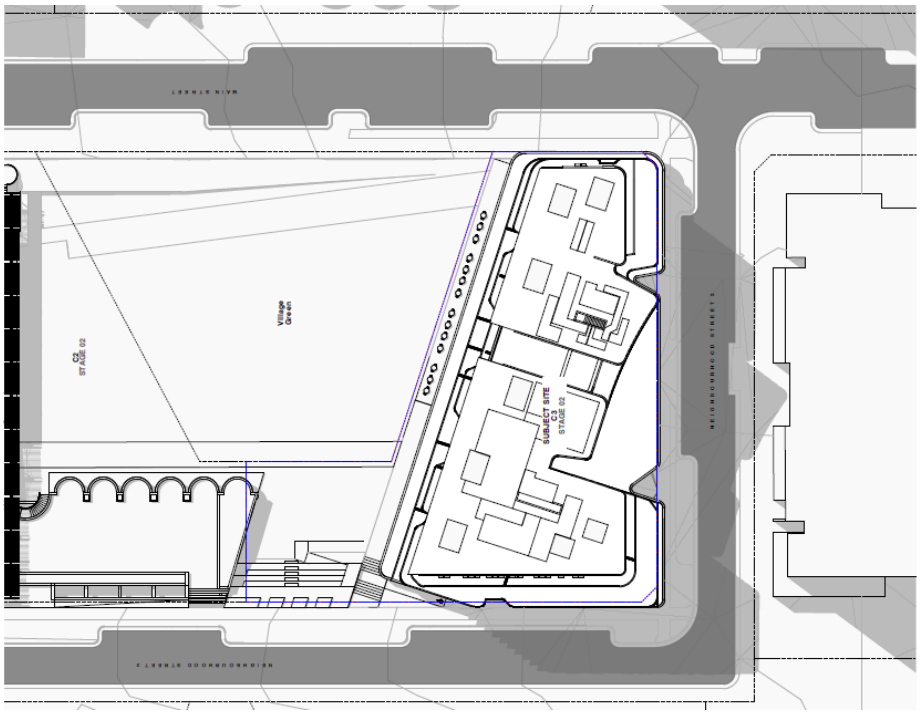


Figure 2 Midtown Stage 2 – Block C3 Residential and Retail (Fox Johnston, Drawing Number A-A-100-P3 Rev 003 issued 11/6/2021)

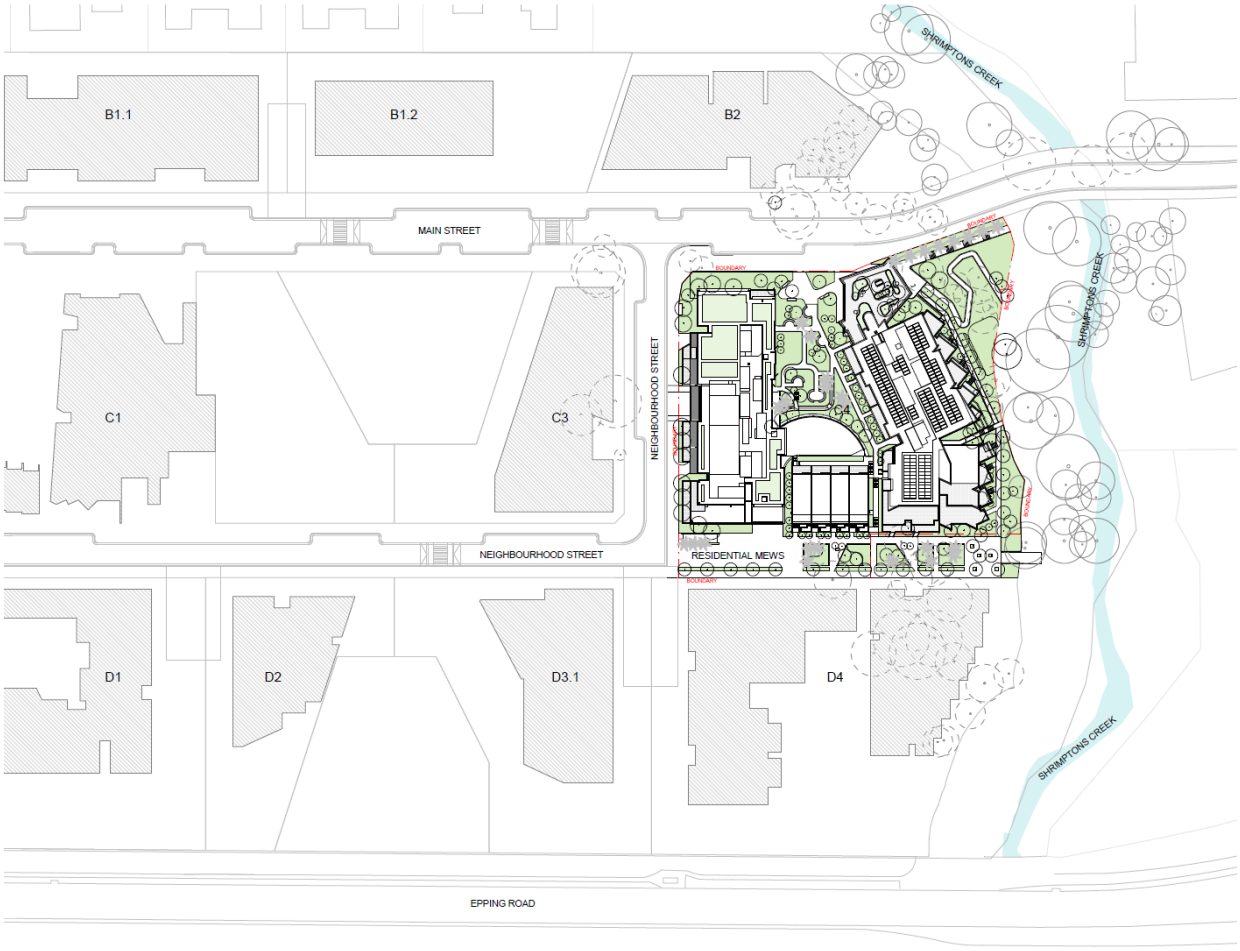


Figure 3 Midtown Stage 2 – Block C4 Residential and Social (Cox Architecture, Drawing Number A-DA-1100 Rev D issued 25/6/2021)

Flood Impact Assessment Results

The flood impact assessment was undertaken based on the Ivanhoe Stage 2 Flood Model for the following design flood events:

- 5% AEP (Annual Exceedance Probability) 2 hour critical storm for blocked[1] and unblocked scenarios;
- 1% AEP 2 hour critical storm for blocked and unblocked scenarios;
- 1% AEP plus 10% rainfall increase (climate change)[2] 2 hour critical storm for blocked and unblocked scenarios; and
- Probable Maximum Flood (PMF) 15 minute critical storm for unblocked scenario[3].

Flood impact maps showing the peak flood level comparison between the pre-development and post-development scenarios are provided in Attachment A (note: maps were prepared based on the post-

[1] Drainage blockage methodology as per Macquarie Park Floodplain Risk Management Study and Plan Flood Study Report (Bewsher, 2010).
[2] Climate change assessment consistent with Macquarie Park Floodplain Risk Management Study and Plan Final Report (Bewsher, 2011). The site and adjacent creek are not subject to impacts from sea level rise.
[3] Blockage scenario was not investigated for the PMF in the Macquarie Park Floodplain Risk Management Study and Plan Flood Study Report (Bewsher, 2010).

development peak flood levels minus the pre-development peak flood levels). The results show that under post-development conditions there is minimal change in the mainstream flood levels on Shrimptons Creek up to the 1% AEP design flood event including climate change, with adverse impacts highly localised and limited to within the Shrimptons Creek corridor. Therefore, there are no predicted flood impacts on adjacent properties as a result of the proposed development. The Midtown Stage 2 development extent generally does not encroach onto the 1% AEP Shrimptons Creek mainstream flood extent, even in the climate change scenario.

For the PMF extreme event, adverse flooding impacts are predicted to extend upstream of Epping Road and downstream of the Ivanhoe Estate development. However, it is important to note that this is an extremely rare event with an AEP of 1 in 10,000,000 according to *The Estimation of Probable Maximum Precipitation in Australia: Generalised Short-Duration Method* (Bureau of Meteorology, 2003), and Shrimptons Creek and its adjacent floodplain are already subject to significant inundation depths.

As previously mentioned, runoff within the Ivanhoe Estate including the Midtown Stage 2 development is generally shallow overland flow outside of the Shrimptons Creek corridor and considered as “Local Drainage”. As the internal stormwater drainage and design terrain surrounding the Ivanhoe Estate have not been finalised (other than the grading of the internal roads and the earthworks along the western bank of Shrimptons Creek), the assessment herein is limited to assessing impacts primarily on Shrimptons Creek mainstream flooding and not local catchment flooding.

Finished Floor and Basement Entry Levels

Finished Floor Levels (FFLs) for the Midtown Stage 2 development have been assessed in reference to the City of Ryde’s freeboard requirements defined in *Part 8.2 Stormwater Management Technical Manual* of the City of Ryde Development Control Plan (DCP) 2014. The requirements are outlined in Table 1, with Figure 4 also referred to in categorising the site in accordance with the flood risk and overland flow precincts. Given that the site adjacent to the Shrimptons Creek corridor may experience medium to high risk flooding, the 0.5 m freeboard for habitable floor level and 0.3 m freeboard for non-habitable floor level would be applicable for the proposed development.

The buildings on Block C4, which are located at the lowest elevation of the site (compared to Blocks C2 and C3) and nearest to Shrimptons Creek, have proposed minimum FFLs of 47.0 mAHD. Compared to the peak flood levels listed in Table 2, a freeboard in excess of 0.5 m has been achieved for all events up to the PMF event.

The lowest threshold for a basement entry into the underground car park at Block C4 is proposed at 47.7 mAHD. This is above the Shrimptons Creek PMF level of 46.14 mAHD as per Table 2. Hence, the floodwaters from Shrimpton Creek will be prevented from ingressing the basement in all events up to and including the PMF.

Table 1 Freeboard Requirements based on City of Ryde DCP (2014)

Drainage System/ Overland Flow	Residential			Industrial/ Commercial	
	Land Level [b]	Habitable Floor Level	Non-Habitable Level [c]	Land Level [b]	Floor Level
Surface Drainage/ adjoining ground level [a]	-	.15m	-	-	.15m
Public drainage infrastructure, creeks and open channels	0.5m	0.5m	0.1m	0.3m	0.3m
Flooding and Overland Flow (Overland Flow Precincts and Low Risk)	N/A	0.3m	0.15m	N/A	0.3m
Flooding and Overland Flow (Medium Risk and greater)	N/A	0.5m	0.3m	N/A	-
Onsite Detention [d]	N/A	0.2m	0.1m	N/A	0.2m
Road Drainage Minor Systems (Gutter and pipe flow)		0.15m below top of grate			
Road Drainage		Refer to Figure 2-1.			
Detention Basins [4]		The top water level shall be designed to be 0.5m below top of embankment (100yr ARI)			

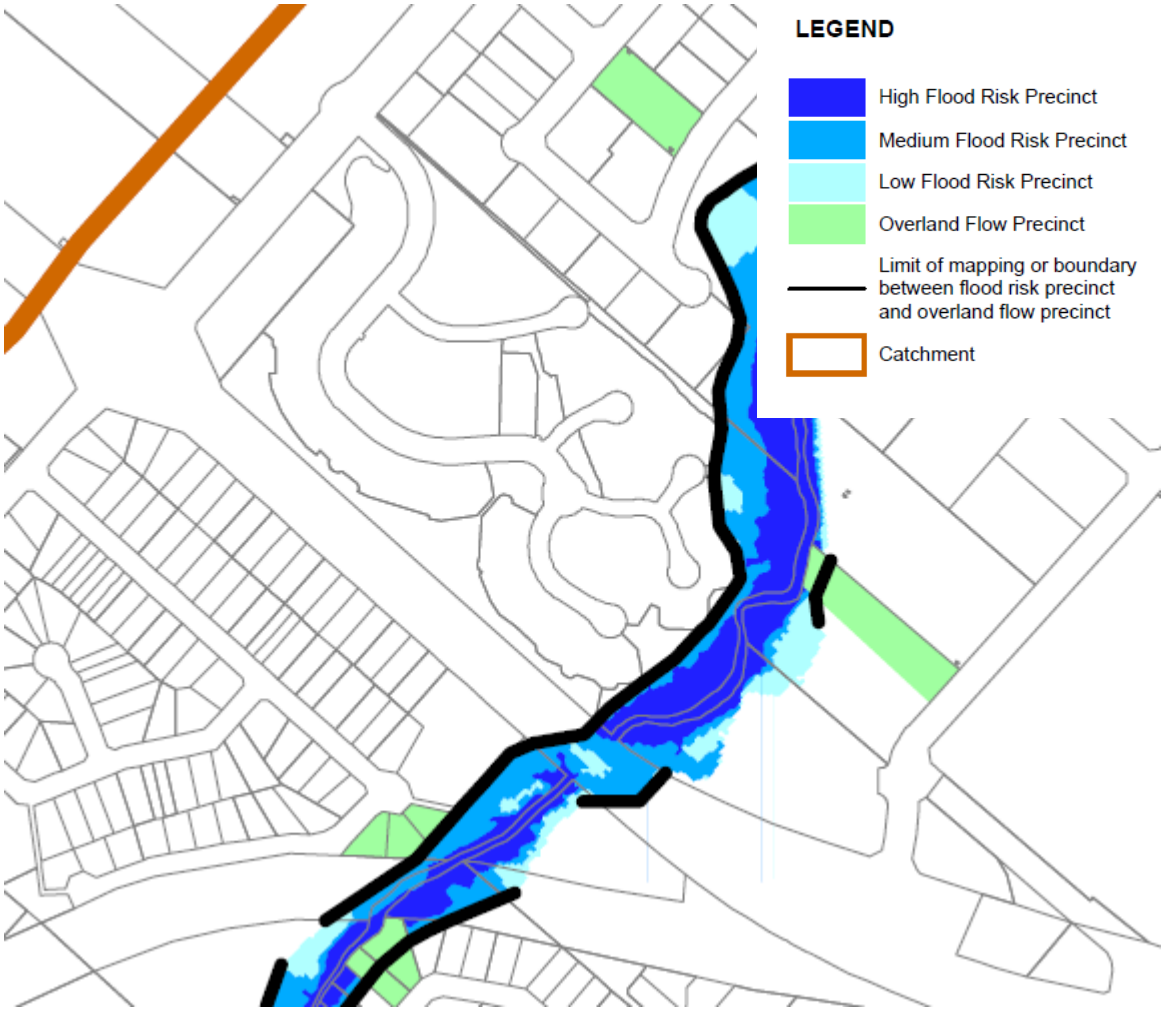


Figure 4 Flood Risk and Overland Flow Precincts based on Macquarie Park Floodplain Risk Management Study and Plan Final Report (Bewsher, 2011)

Table 2 Shrimptons Creek Peak Flood Levels adjacent to Midtown Stage 2 Development[4]

Design Storm (AEP)	Peak Flood Levels (mAHD)
5%	44.42
1%	44.48
1% with climate change	44.68
PMF	46.14

[4] Peak flood levels based on the critical of the blocked and unblocked scenarios.

Framework for Flood Emergency Response

A Flood Emergency Response Plan (FERP) is required to ensure occupants of the development site are aware of the flood risk within and adjacent to the site, and to identify measures that can be employed to safely manage the flood risk before, during and after flood events. There are a number of items that require consideration in a FERP, including:

- An appreciation for the nature of the development and on-site flood risk;
- Flood warning, evacuation and evasion procedures;
- Actions that need to be undertaken before, during and after an event;
- An event timeline indicating the time available to undertake the required actions;
- Triggers to commence actions identified;
- Roles and responsibilities and training requirements for key on-site personnel (e.g. site manager, evacuation marshals etc.);
- Flood preparedness and awareness procedures for occupants, visitors and/or end-users of the development;
- Communication requirements.

The following sections outline flood emergency response considerations and a preliminary framework for the preparation of a Flood Emergency Response Plan (FERP) for the proposed development demonstrating that a flood emergency can be safely managed on the site. However, the information documented in this report only represents a preliminary framework for flood emergency management and should be further refined and developed during the detailed design stage of the development process. Therefore, a detailed final FERP would be prepared prior to the occupation of the Midtown Stage 2 development.

Flood Response

The proposed finished levels and basement entry thresholds for the Midtown Stage 2 development place occupants and vehicles above mainstream Shrimptons Creek flood levels plus freeboard for all events up to and including the PMF. Accordingly, it is recommended that a ‘shelter in place’ flood emergency response be adopted, whereby occupants remain inside the buildings on-site until floodwaters recede. Nevertheless, in the event of another emergency requiring evacuation from the development during Shrimpton Creek flooding, rising road egress shall be provided from the site to Herring Road in all events up to and including the PMF.

Where occupants or visitors are located on-site but in an area below the PMF level (e.g. lower lying areas outside the buildings), they should move to the closest building and make their way indoors (i.e. to an area above the PMF) as soon as a flood alarm/sensor is activated or ideally prior to this point (for example, following observations of significant depths of water in Shrimptons Creek).

Rate of Rise and Timeline

Figure 5 plots the 1% AEP and PMF levels within Shrimptons Creek over time, showing the rate of rise and recession of floodwaters. The flood modelling results indicate that in extreme events such as the PMF, mainstream floodwaters in the creek can increase rapidly and would inundate the lower floodplain adjacent to the development site within 30 minutes of the onset of rain. Due to the limited warning time, the shelter

in place strategy proposed in the preceding section is recommended as the warning time is not considered sufficient to allow for evacuation of occupants from the site, the duration of flooding is predicted to be relatively short (i.e. about 3 hours or less for the 1% AEP and PMF events as shown in Figure 5) and safe refuge can be provided within buildings on-site.

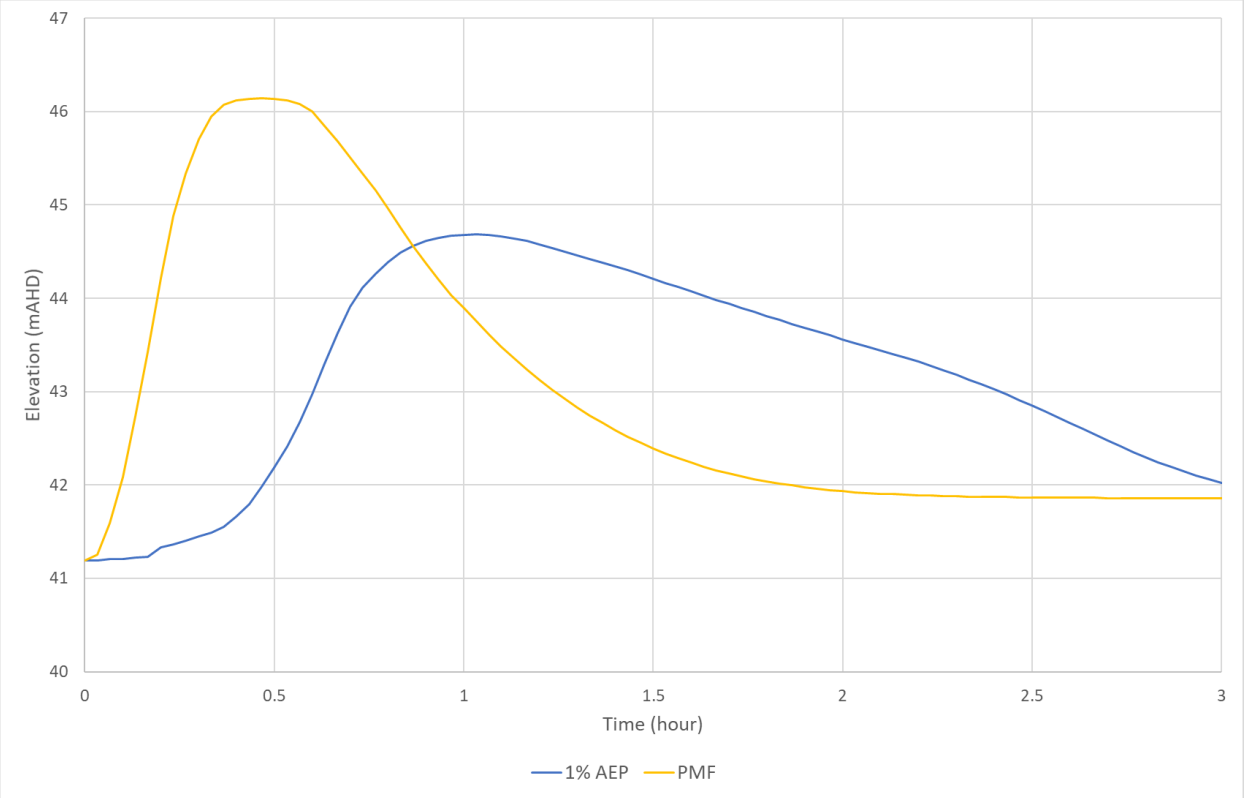


Figure 5 Shrimptons Creek Water Level Rise over Time

Flood Warning Triggers

A warning of a flood event is required to alert occupants and any other people on the site that an extreme flood may inundate the site. In order to maximise the available warning time, it is recommended that the property management monitor the Bureau of Meteorology (BoM) severe weather forecasts for warnings of flash flooding or severe weather (refer http://www.bom.gov.au/weather-services/severe-weather-knowledge-centre/warnings.shtml). This will allow management to be aware of the potential for an extreme event to occur and to prepare accordingly in the event of flooding eventuating. A subscription to the BoM warning service to receive updates and warnings of anticipated heavy rainfall events is recommended.

Roles and Responsibilities

Positions and responsibilities that are to be assigned to on-site personnel for managing flood response should be defined within a FERP. A chief flood warden or head warden will need to be nominated to manage the evacuation of the site during a flood. Individual building wardens will also need to be nominated for the individual building structures to manage the emergency response of local sites. There will also need to be involvement from first aid officers and other responsible staff on-site.

Communication

It is recommended that multiple communication platforms are maintained on the site (such as internet, mobile phone, or radio) so that if one communication platform fails there is redundancy. These platforms can be used to monitor for emergency warnings as well as to maintain effective communication with friends, family and emergency services during a flood event.

Within the site, the emergency siren and PA system that is installed for fire emergencies is also likely suitable for communicating with occupants during other emergencies such as a flood emergency. These emergency warning and communication systems are to be located above the PMF level.

Conclusions and Recommendations

The Flood Impact Assessment undertaken herein for the Midtown Stage 2 development found that there is minimal impacts on the Shrimptons Creek mainstream flood levels predicted to result from the proposed development for events up to and including the 1% AEP design flood with climate change (10% rainfall increase). The proposed development extent generally does not encroach onto the 1% AEP Shrimptons Creek mainstream flood extent, even in the climate change scenario.

Outside of the Shrimptons Creek corridor, runoff within the Ivanhoe Estate (including the Midtown Stage 2 development) is generally shallow overland flow and considered as “Local Drainage”. It should be noted that as the internal stormwater drainage and design terrain surrounding the Ivanhoe Estate have not been finalised (other than the grading of the internal roads and the earthworks along the western bank of Shrimptons Creek), the assessment herein is limited to assessing impacts primarily on Shrimptons Creek mainstream flooding and not local catchment flooding. It is assumed that the detailed design of the development (e.g. stormwater management plan, drainage design) will address and mitigate any local drainage impacts.

For Block C4 within the Midtown Stage 2 development, which has buildings located at the lowest elevation of the site (compared to Blocks C2 and C3) and is located nearest to Shrimptons Creek, the FFLs comply with the freeboard requirements outlined in the City of Ryde DCP (2014). The FFLs for the development should also be checked against the local drainage/overland flow freeboard requirements once the internal stormwater drainage and design terrain are finalised.

The basement ramp threshold leading into the underground car park at Block C4 is proposed above the PMF Shrimptons Creek flood levels. Hence, the floodwaters from Shrimpton Creek will be prevented from ingressing the basement in all events up to and including the PMF.

Other conditions outlined in the SEARs shall also be adhered to:

- No gaps/openings connected to any basement shall be below the PMF level at each location.
- Fences located in overland flow paths shall allow flows to pass through.

Flood emergency response considerations and a framework for the preparation of a Flood Emergency Response Plan are also provided for the proposed development to demonstrate that any residual flood risk to occupants of the site can be managed safely. However, the information documented in this report only represents a preliminary framework for emergency management to be further refined in the detailed design stage of the development process.

I trust that this letter addresses the flooding-related conditions outlined in the SEARs for the Midtown Stage 2 development. Should you have any further questions regarding this assessment, please do not hesitate to contact myself.

Yours Faithfully

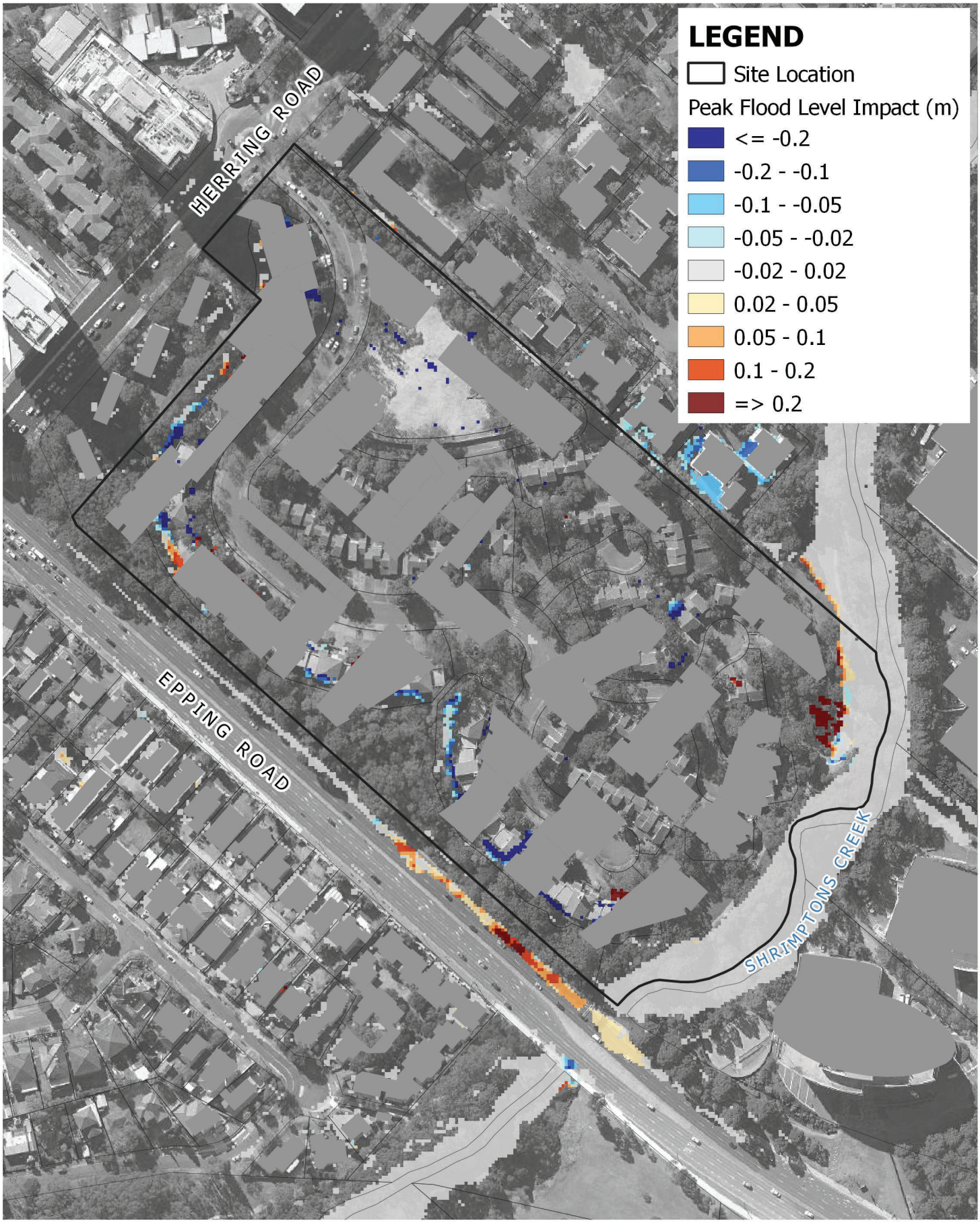


Nathan Cheah
Associate Principal Engineer
BMT

Attachments:

- *Attachment A: Flood Impact Maps*

Attachment A - Flood Impact Maps



Title:

Peak Flood Level Impact
5% AEP Event - No Blockage Scenario

Figure: 1

Rev: A

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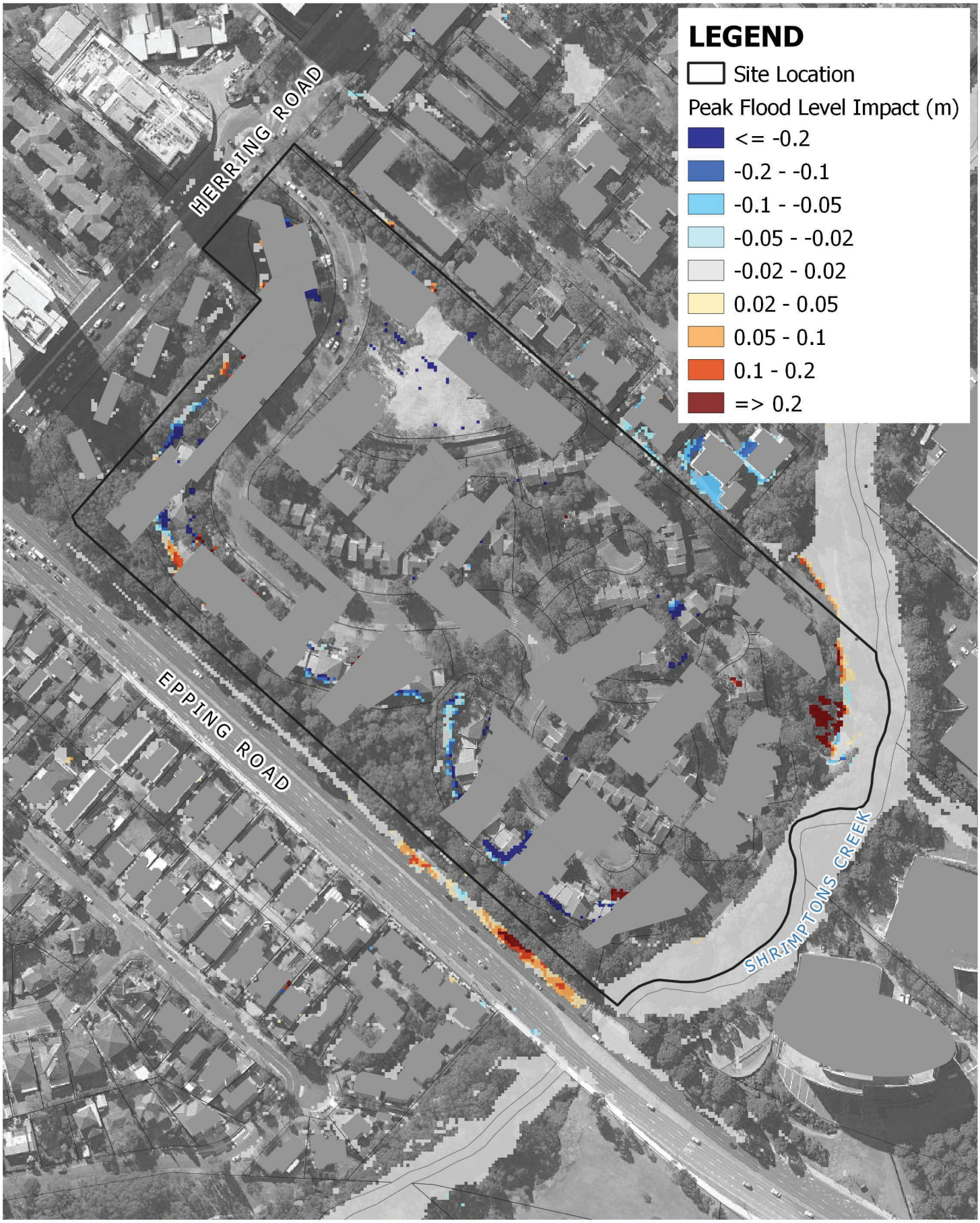

Title:

Peak Flood Level Impact
5% AEP Event - Blockage Scenario

Figure: 2

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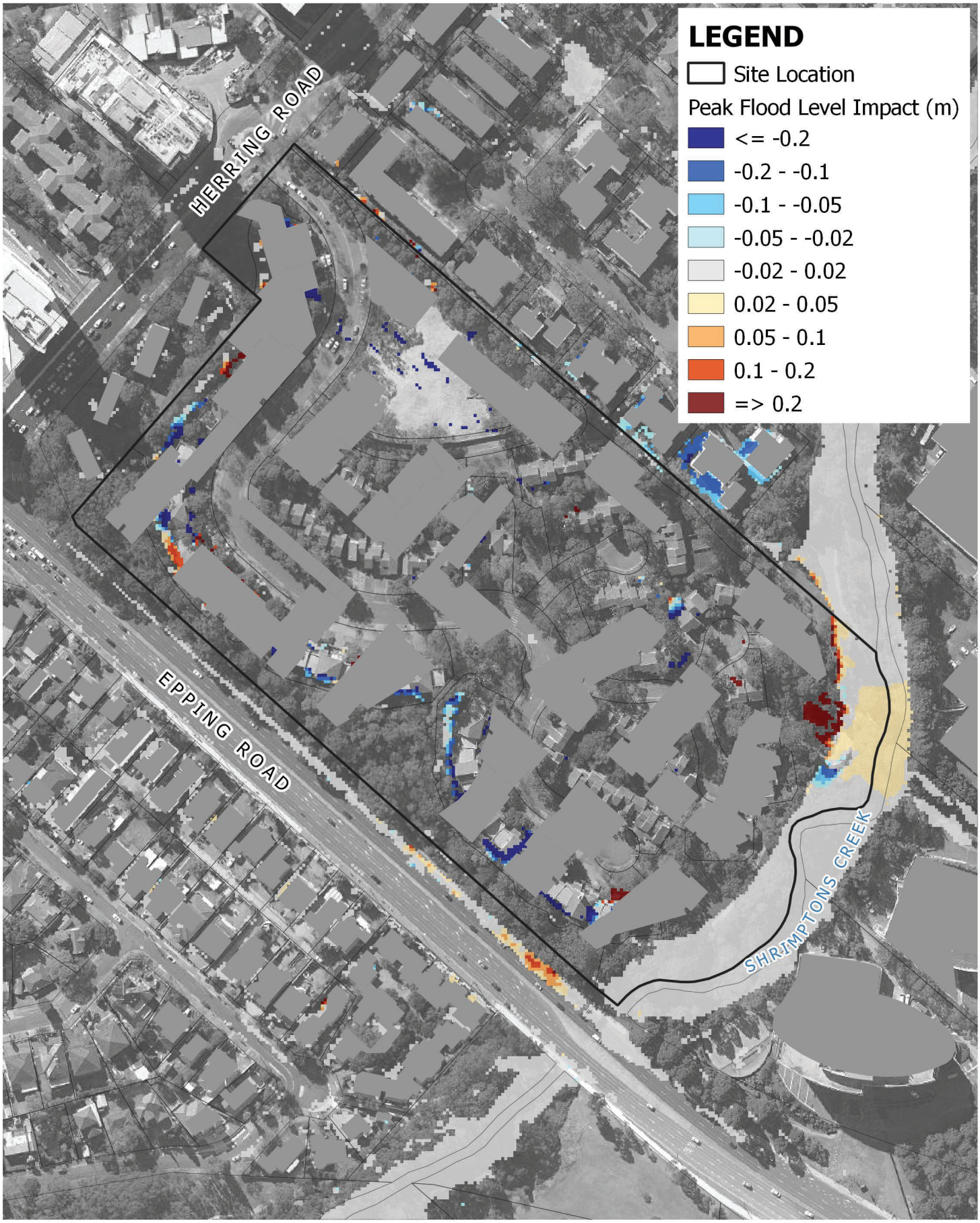

Title:

Peak Flood Level Impact
1% AEP Event - No Blockage Scenario

Figure: 3

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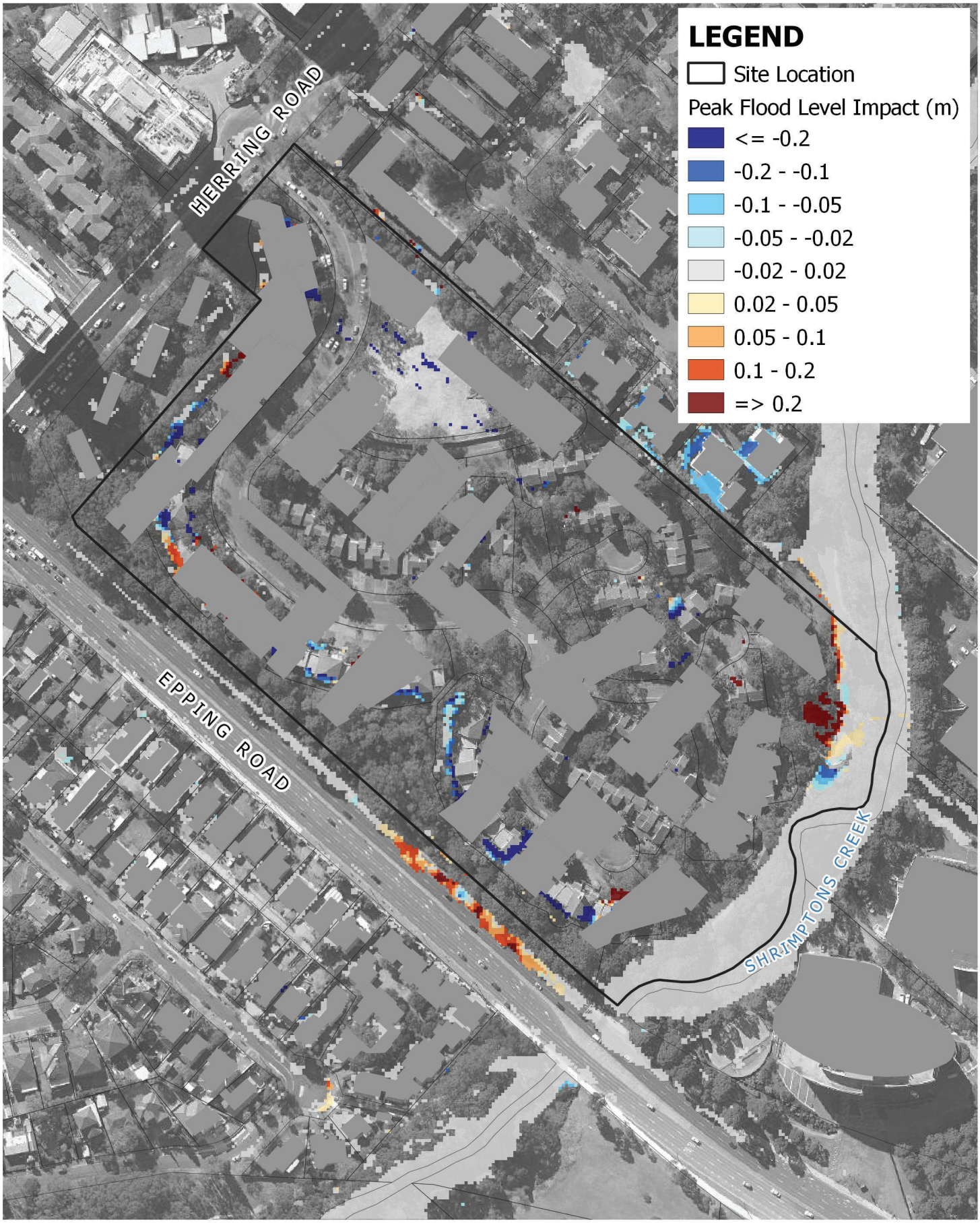

Title:

Peak Flood Level Impact
1% AEP Event - Blockage Scenario

Figure: 4

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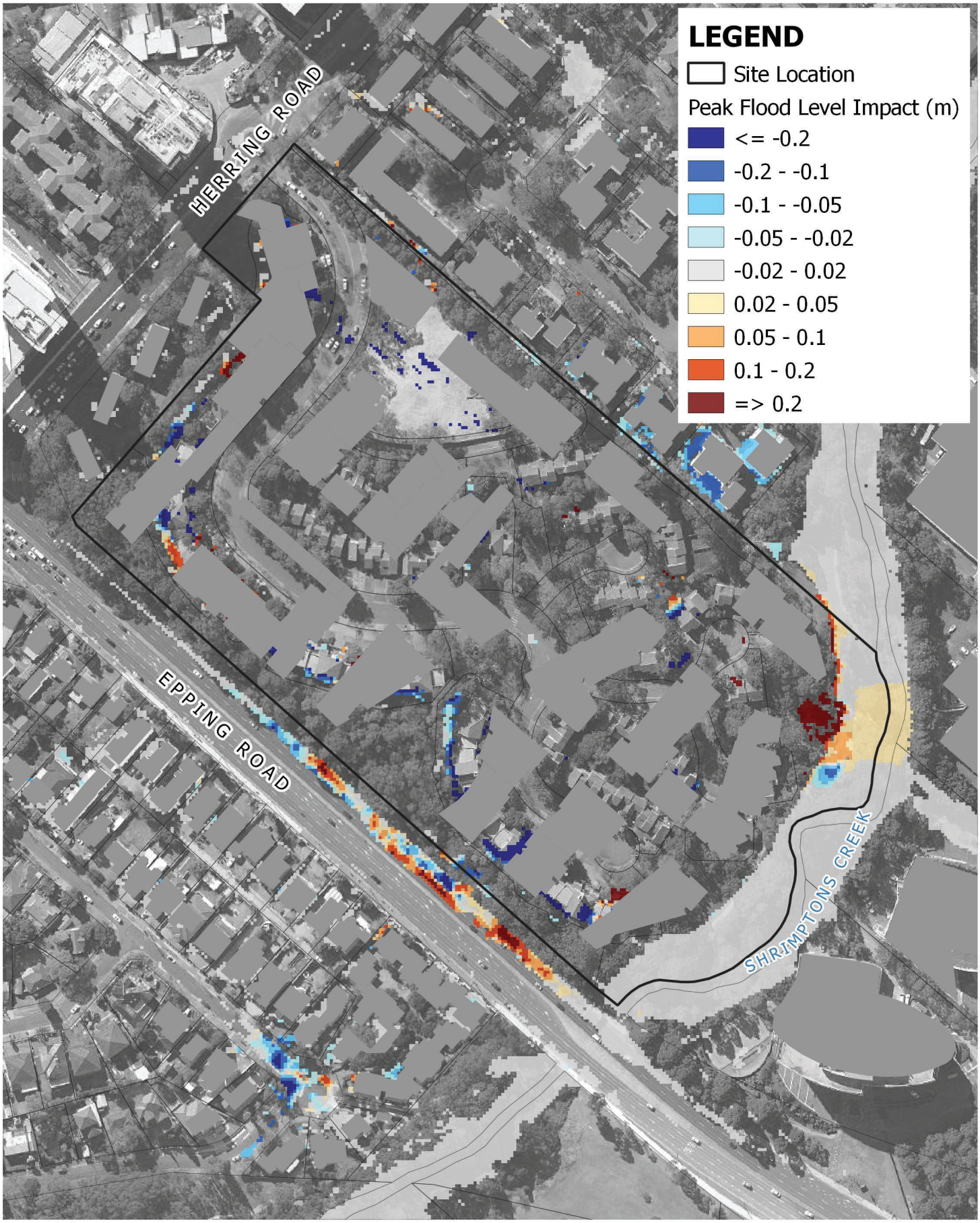

Title:

Peak Flood Level Impact
1% AEP with Climate Change - No Blockage Scenario

Figure: 5

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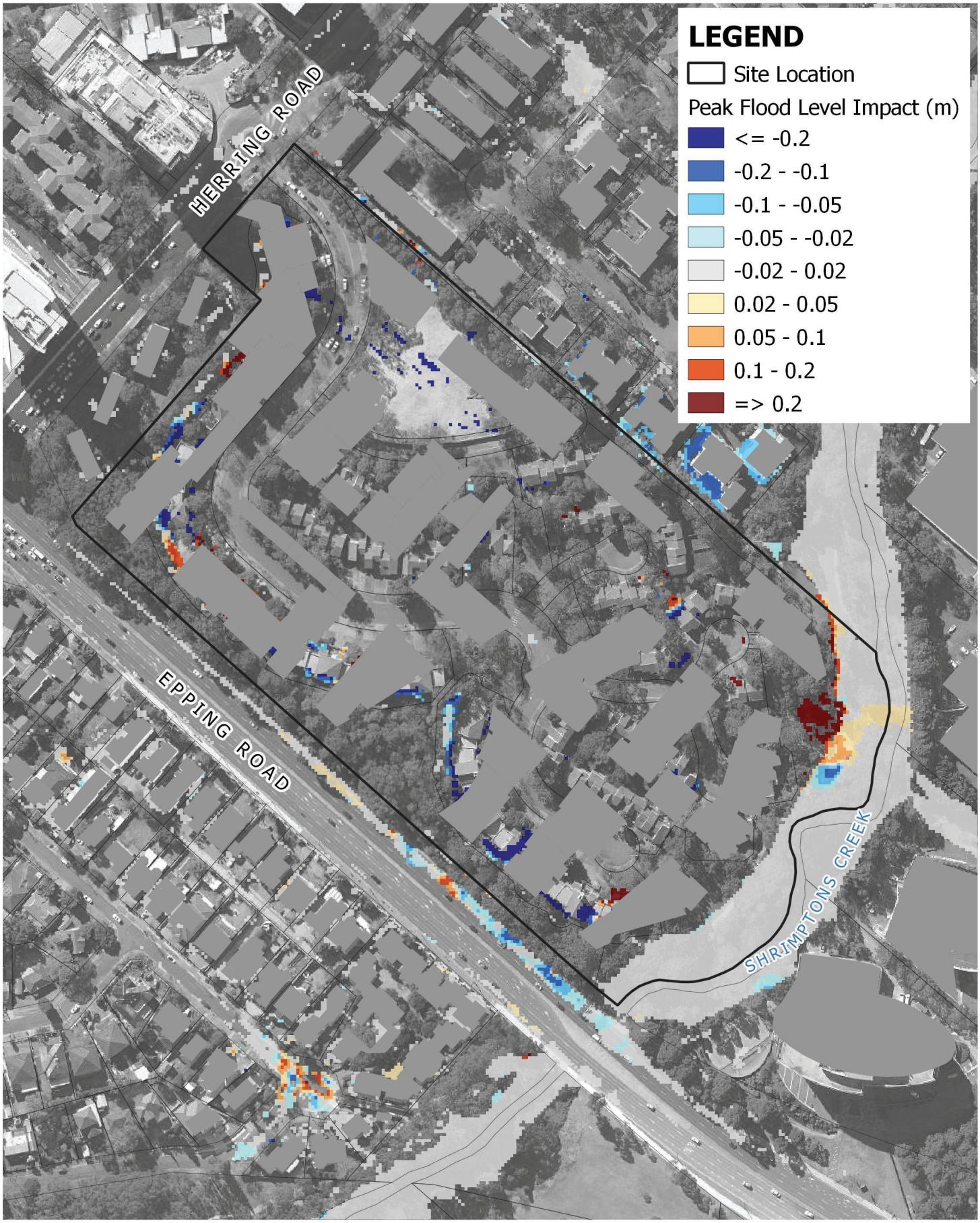

Title:

Peak Flood Level Impact
1% AEP with Climate Change - Blockage Scenario

Figure: 6

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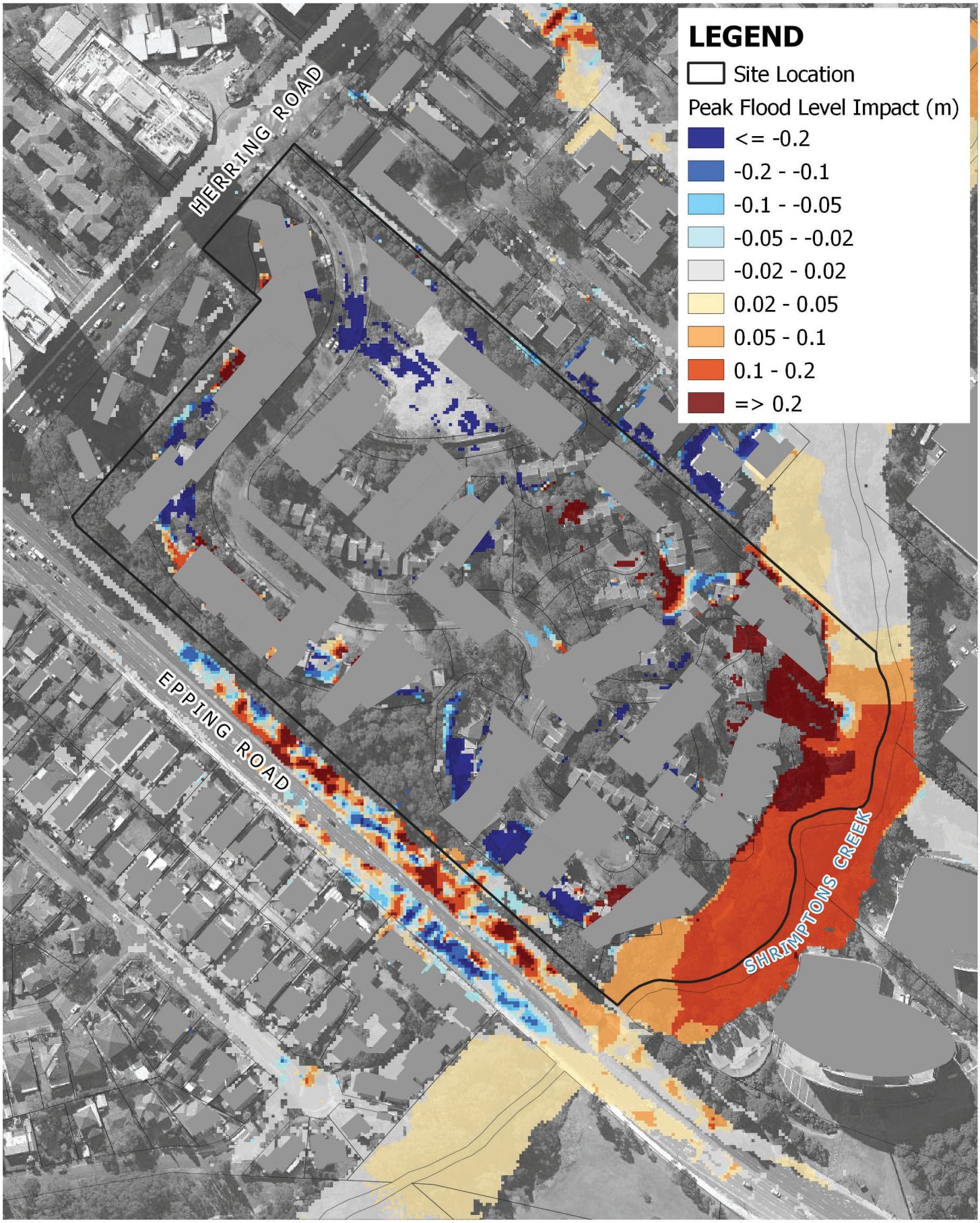

Title:

Peak Flood Level Impact
PMF Event

Figure: 7

Rev: A

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Ref: BMY/LF 300001(8)

10th July 2024

Grindley
PO Box 6246
PYMBLE NSW 2073

Attention: Maria Pennisi

Dear Maria,

MIDTOWN MAC PARK – BUILDING C2 FLOOD LETTER

With reference to condition B79 of SSD 15822622, we hereby certify that the C2 building site is located wholly above the 1% AEP and PMF flood levels and therefore the requirements of condition B79 are not applicable to project.

Should you have any queries, please do not hesitate to contact the undersigned.

Yours faithfully,



Ben Myles
Senior Civil Engineer
MIEAust CPENG NER
ADW Johnson Pty Ltd
Central Coast

ADW JOHNSON PTY LIMITED
ABN 62 129 445 398

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www.adwiohnson.com.au

From: Ben Myles
Sent: Wednesday, 10 July 2024 8:18 AM
To: Maria Pennisi <mpennisi@grindley.com.au>
Cc: Jeff Jackson <JJackson@grindley.com.au>; Michael Jones <mjones@grindley.com.au>; Peter Wilson <pwilson@grindley.com.au>; Rod Booth <Rod.Booth@dsc.com.au>; slava.mikheenkov@vandermeer.com.au; Angus Lim <angusl@adwjohnson.com.au>
Subject: RE: CC1 - ADWJ Scope for CC1

Maria,

See below commentary re the remaining conditions:

- B79 – the lot is not flood affected. We can provide a letter to this effect
- B80 – not relevant for CC1 as that drainage connection is not being made
- B81 – not relevant as we do not discharge directly to the creek
- B82 – also not relevant as our connection points are located within private property and not council's road reserve.

Regards,

Ben Myles
Senior Civil Engineer
MIEAust CPEng NER
Central Coast Office
02 4305 4300
0431 018 741
Email : benm@adwjohnson.com.au
Website: www.adwjohnson.com.au

ADW Johnson Pty Limited

Hunter	**7/335 Hillsborough Road, Warners Bay NSW 2282**	**Ph. 02 4978 5100**
Central Coast	**5 Pioneer Avenue, Tuggerah NSW 2259**	
Sydney	**Level 35 One International Towers, 100 Barangaroo Avenue, Sydney NSW 2000**	**Ph. 02 4305 4300**
		Ph. 02 8046 7411

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MIDTOWN S2

C2 Community Centre

Lot C2 Epping Road, Macquarie Park

DA Sustainability Report

05.08.2021 V.3

David Barker, Principal
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INTEGRAL GROUP

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ACKNOWLEDGEMENT OF COUNTRY

This project acknowledges the Gadigal People of the Eora Nation as the traditional owners of land at the site. It acknowledge their elders, past, present and emerging.

1. INTRODUCTION

1.1 PROJECT DESCRIPTION

The Ivanhoe Estate precinct has been rezoned by the Department of Planning and Environment as part of the Macquarie University Station Priority Precinct. Currently owned by NSW Land and Housing Corporation, its redevelopment is part of the NSW Government Communities Plus program, which seeks to deliver new communities where social housing blends with private and affordable housing, with good access to transport, employment, improved community facilities and open space.

The Midtown Precinct at Macquarie Park is set to become an exemplar master planned community and the benchmark for 21st century integrated communities; characterised by attractive and vibrant lifestyle offerings as well as diverse social, economic and housing opportunities.

Midtown is located a short walk away from both Macquarie university and Macquarie shopping centre. Macquarie is renowned for being an Innovation District and is the second largest business district in NSW, home to various top 100 ASX listed companies.

The Midtown precinct will add to this growing area offering a fully resolved master planned community with an activated Village Green which will be framed with retail offerings, community uses and an extensive network of, walkways and cycleway linkages to nearby Shrimptons creek. The entire Midtown precinct when complete, will accommodate over 3,300 market, social and affordable dwellings.

The **C2** site envisions to become the heart of the Midtown Precinct. The central communal area will consist of the 3,300 sqm Village Green, a 1,122 sqm pool and gym on the lower ground and additional 500 sqm allocated to community space to the upper floor which looks to service residents with an active flexible space adjacent to the School and Aged Care facility with space for an enterprise café.

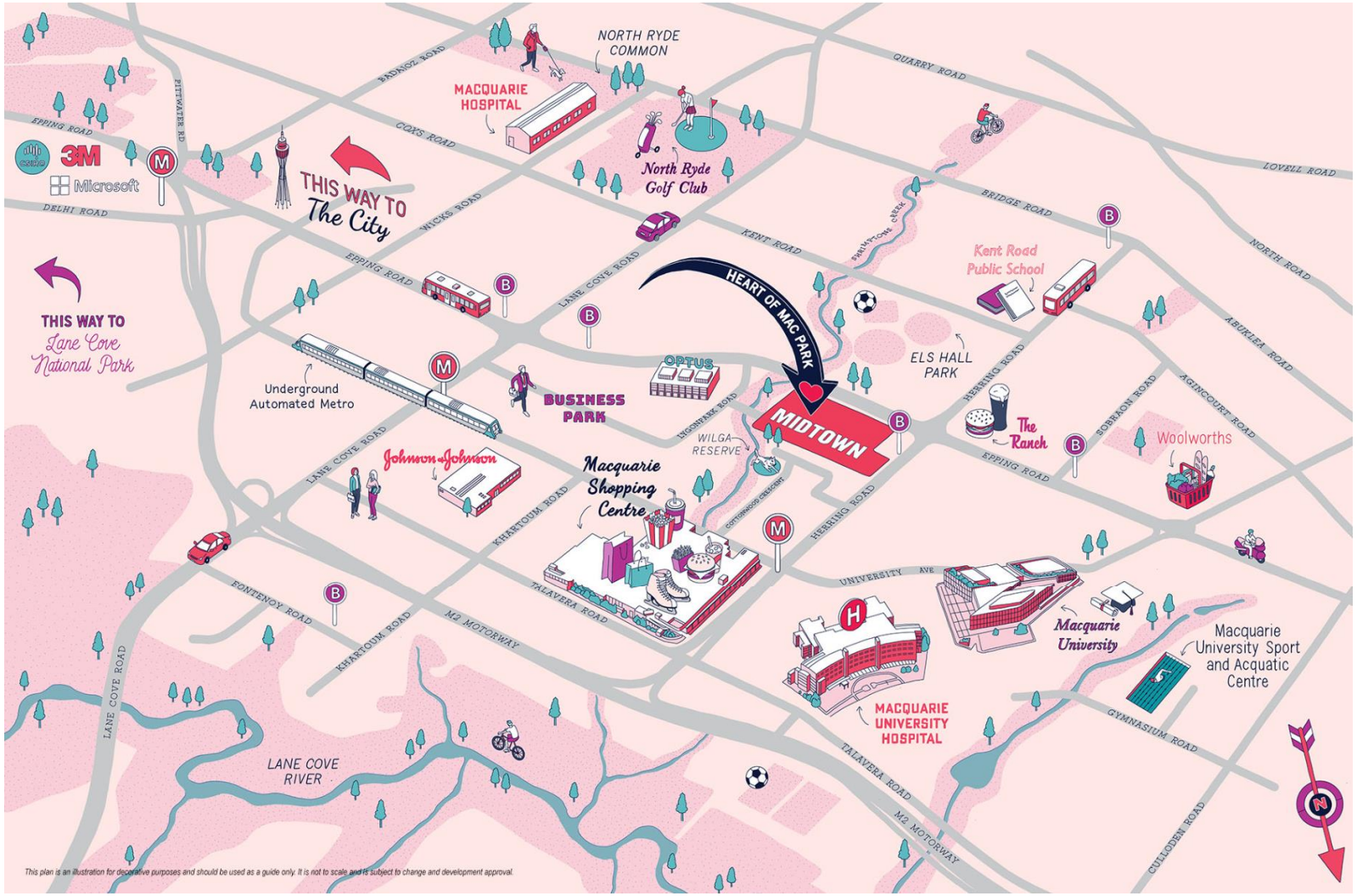


Figure 1 – Midtown map from www.frasersproperty.com.au

2. PERFORMANCE BRIEF

2.1 SEARS REQUIREMENTS

The main purpose of this report is to address SEARs ESD requirements for the project:

- Identify how ESD principles (as defined in clause 7 (4) of Schedule 2 of the regulation) will be incorporated into the design, construction and ongoing operation of the proposed development;
- Demonstrate how the development will achieve the commitments identified in the approved concept plan;
- Demonstrate how future buildings will meet or exceed the relevant industry recognised building sustainability and environmental performance standards, including any green accreditation;
- Demonstrate how the proposal incorporates measures to minimize carbon emissions from both construction/waste materials and in built, embodied design; reflecting the Government's goal of net zero emissions by 2050, and the consumption of resources, water (including through water sensitive design principles and water re-use) and energy.

2.2 APPROVED COMMITMENTS

The precinct is targeting the following sustainability outcomes:

- Sustainability Benchmark #1: 5-star Green Star Design and As-Built v1.3;
- Sustainability Benchmark #2: 6-star Green Star Communities v1.1;
- Sustainability Benchmark #3: Integrated Infrastructure Solution

The repot describes a range of building design and urban infrastructure opportunities for the project to embed the principles of sustainability and give effect to the global, state and local policy relating to amenity, climate change and biodiversity.

It provides a framework with which the project can be made future-proof and responsive to the major challenges that Australian cities are facing.
Sustainability strategies will be presented for the following major components:

- *Architectural design*
- *Building systems design and renewable energy*
- *Materials and procurement*
- *Landscape and site water systems*
- *Offsite opportunities*
- *Transport and mobility.*



Figure 2 – Midtown Artist impression

2. PERFORMANCE BRIEF

2.3 LAND AND HOUSING CORPORATION VISION

NSW Land and Housing Corporation (LAHC) is here to serve the people of New South Wales by developing well-connected communities, preserving our environment, supporting our industries and contributing to a strong economy.

The Department of Planning, Industry and Environment brings together specialists in urban and regional planning, natural resources, industry, environment, Aboriginal and social housing and regional New South Wales.

LAHC shares a common goal to maximise the long-term wellbeing of New South Wales. they do this by protecting and improving:

- Prosperity;
- Environmental sustainability;
- Safety and security;
- Social inclusion and cohesion; and
- Attractiveness as a place for recreation and relaxation.

They strive to be a global leader in the planning and management of resources, environmental and socio-economic security, financial affordability, land use and carbon emissions.

The Department of Planning, industry and Environment cluster is responsible for delivering:

- A strong and liveable New South Wales;
- Maximum community benefit from government land and property;
- Resilient and sustainable environment and energy;
- Sustainable and productive regional industries and communities;
- Sustainable and secure water resources.

2.4 PROJECT OBJECTIVES

The ongoing challenges of increasing urban density, housing affordability and climate change mean we all share the responsibility to improve the liveability of our towns and cities and minimise the impacts of development on our natural environment.

The project will aim to achieve a high level of environmental performance for both the precinct and individual buildings through its design and materials.

By doing this, the project will improve sustainability by reducing water usage and energy costs for residents.

The project will seek to deliver new dwellings with high levels of residential amenity and which also reduce living costs through water and energy efficiency:

- ***To minimize resultant carbon emissions in both the delivery and operation of the building;***
- ***To substantially reduce the water usage in both the delivery and operation of the building;***
- ***To improve building efficiency and reduce operational costs;***
- ***To create a healthy and resilient environment for the community to live and work in, well into the future;***
- ***To demonstrate leadership in sustainable development for social and affordable housing in New South Wales through sustainability measurement tools and policy; and***
- ***To demonstrate effective use of materials to minimise waste in construction and lifestyle.***

Figure 3 – Ratings Frameworks for demonstrating leadership

3. PLANNING AND POLICY CONTEXT

3.1 SUPPORTING POLICY

The site will provide a vehicle for the advancement of the comprehensive sustainability-related policy framework in NSW; considering global, Commonwealth, State and Local government policy.

3.2 GLOBAL & COMMONWEALTH POLICY

UN Sustainable Development Goals | At least seven of the UN Sustainable Development Goals are advanced through sustainability in cities and urban renewal and the site provides a material contribution to each:

- *SDG3 – Good Health and Wellbeing* | Ensuring healthy lives and promoting the well-being for all at all ages is essential to all sustainable development.
- *SDG7 – Affordable & Clean Energy* | Ensure access to affordable, reliable, sustainable and modern energy for all
- *SDG8 – Decent Work & Economic Growth* | Promote inclusive and sustainable economic growth, employment and decent work for all
- *SDG9 – Industry, Innovation & Infrastructure* | Build resilient infrastructure, promote sustainable industrialization and foster innovation
- *SDG11 – Sustainable Cities & Communities* | Make cities inclusive, safe, resilient and sustainable
- *SDG12 – Responsible Consumption & Production* | Ensure sustainable consumption and production patterns
- *SDG13 – Climate Action* | Take urgent action to combat climate change and its impacts
- *SDG15 – Life on Land* | Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss.

Figure 4 – UN SDGs relevant to the project



Commitments under the Paris Agreement | Cities are critical to the global goal to reduce GHG emissions in order to hold average temperature increase to well below 2°C and pursue efforts to keep warming below 1.5°C above pre-industrial levels.

The project can provide an approach to net zero emissions, supporting competitiveness in an emissions-constrained global economy.

Smart Cities Plan | The project includes a range of liveability, housing and affordability measures in support of the Smart Cities Plan and the advancement of the City Performance Indicators.

3.3 NSW STATE GOVERNMENT POLICY

NSW Office of Environment and Heritage | The project will give effect to the NSW climate change framework.

It can provide a pathway to the NSW ambition for net zero emissions by 2050 by showcasing a GHG emissions strategy that includes electrification, on-site energy generation, off-site renewable energy procurement, incentivising fuel switching for transport options and offsetting residual emissions with a robust, future ready negative emissions strategy.

NSW Environmental Protection Agency | The site can be an urban exemplar of the Circular Economy, giving effect to the NSW Circular Economy Policy Statement.

NSW Procurepoint | Supporting and advancing the opportunities for Aboriginal and Torres Strait Islander Australians through the procurement and design approaches to the site.

Transport for NSW | The site can be an exemplar for future mobility, including active mobility, movement and place and vehicle electrification.

NSW State Environment Planning Policy – Affordable Rental Housing | The site can be a benchmark project for the Affordable Rental Housing 2009 of the NSW Government policy.

The policy's intent is to facilitate the increased supply and diversity of affordable rental and social housing in NSW. The ARHSEPP covers housing types including in-fill affordable housing, along with secondary dwellings (granny flats), boarding houses, group homes, social housing and supportive accommodation.

The policy seeks to help facilitate development carried out by LAHC and its developer partners by amending provisions for in-fill affordable housing development and LAHC's self-assessment provisions. These include:

- Increasing the maximum number of dwellings that LAHC can self-assess on a single
- A mixture of private, affordable and social housing in a single development.
- Consider its design guidelines 'Good design for social housing', dated September 2020 and 'Land and Housing Corporation Dwelling Requirements' dated September 2020 when self-assessing development proposals.
- Allowing LAHC to self-assess manor house and multi dwelling housing (terraces
- Expansion of the range of residential accommodation dwelling types that attract a density bonus under the in-fill affordable housing provisions to include, manor houses and multi dwelling houses (terraces).
- Expansion of the areas where the in-fill affordable housing provisions apply to include the Central Coast, Wollongong and Newcastle regions as well as Greater Sydney to better capture 'accessible areas' across the State.
- The requirement for all development under the in-fill affordable housing provisions to deliver a minimum 20 per cent of gross floor area as affordable housing.

4. FRAMING NET ZERO OPERATIONS

4.1 DEFINING NET ZERO

The World Green Building Council defines Net Zero Carbon for operating emissions as "highly efficient with all remaining energy from on-site and/or off-site renewable sources".

Many leading global frameworks have expanded the net zero definition to include embodied emissions, and to be more prescriptive in the nature of off-site renewable energy and negative emissions instruments (offsets).

The Green Building Council of Australia has defined 'climate positive' in preference to 'net zero':

1. Fossil Fuel Free
2. Highly efficient
3. Powered by renewable energy
4. Built with low-carbon materials
5. Offset with nature, i.e. re- and afforestation.

4.2 CERTIFICATION

There are a number of options for certification with Net Zero Emissions:

- Certify with Climate Active, an Australian emissions certification scheme;
- Certify with Green Star, within the framework of the Energy category (in design and as-built);
- Certify with the International Living Futures Institute (available for operations only).

4.3 FOSSIL FUEL FREE

Electrification of all building service is crucial to Net Zero Carbon ambition by eliminating the burning of fossil fuels (gas) for building services which cannot be offset by on-site renewables.

4.4 HIGHLY EFFICIENT

A global best practice benchmark for highly efficient residential dwellings is Passive House; requiring exceptional insulation and building sealing with efficient fresh-air delivery.

A best practice benchmark aligned with NSW planning policy is NatHERS: 7 star average.

4.5 POWERED BY RENEWABLE ENERGY

The project will integrate on-site renewable energy and provide mechanisms for off-site renewable energy procurement.

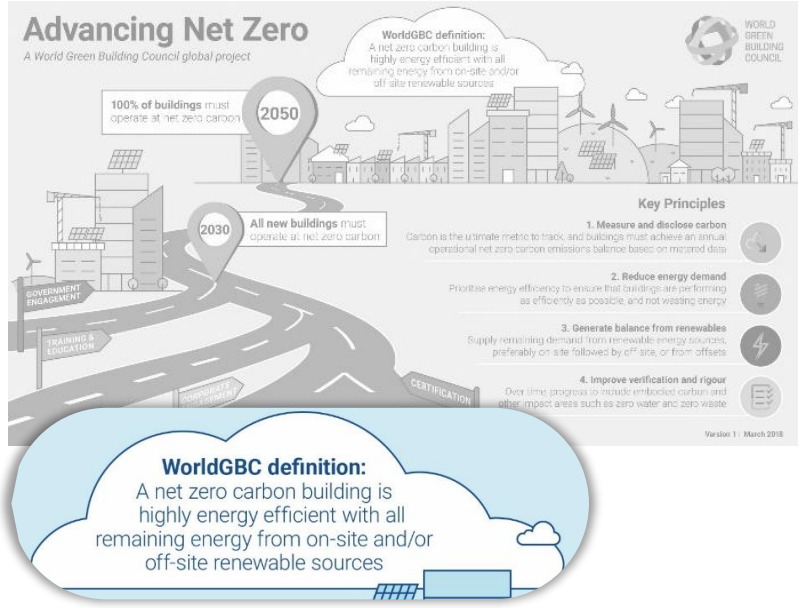
4.6 BUILT WITH LOW-CARBON MATERIALS

The approach to Net Zero Emissions includes consideration of embodied emissions and efforts to reduce the life-cycle impact of greenhouse gasses.

4.7 OFFSET WITH NATURE

All construction projects have some residual emissions – whether as a result of embodied emissions in the materials that are used, refrigerant impacts or residual operating emissions.

To advance to net zero whole-of-life emissions, projects must use off-site negative emissions instruments such as nature-based offset schemes (afforestation or reforestation among others).



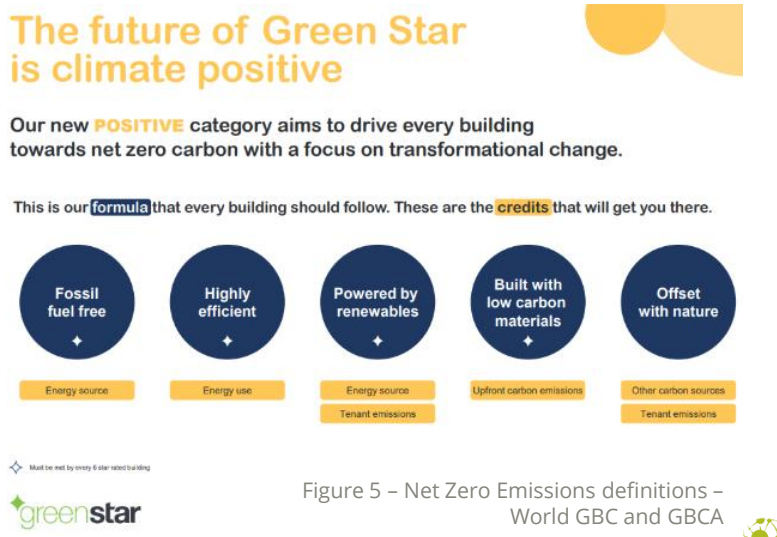


Figure 5 – Net Zero Emissions definitions – World GBC and GBCA

5. DESIGN OPPORTUNITES

5.1 PASSIVE DESIGN

There are a range of passive opportunities to reduce the resource consumption of the building, provide healthy and comfortable spaces for occupants and enable high-efficiency systems.

The Green Star framework provides some guidance for passive design; however the thermal comfort requirements for the project are set by the Nationwide House Energy Rating Scheme (NatHERS) and BASIX. This report identifies a level of performance based on NatHERS requirements.

Certification with the NatHERS will consider the following passive design principles.

- Natural ventilation
- Solar access
- Building fabric
- Shading

5.2 GREEN ROOFS AND WALLS

Roof-top greening will be implemented alongside renewable energy for occupant amenity, building fabric performance and heat island mitigation.

Rainwater harvesting will be implemented precinct-wide for re-use in irrigation and washdown.

5.3 WASTE MANAGEMENT

Smart waste collection to improve separation, recycling and spatial efficiency and organic waste management have been considered.

5.4 EFFICIENT HVAC AND DHW SERVICES

The opportunities that have been explored for efficient building services include:

- Electrification; providing systems that reduce the future reliance of the project on fossil fuels.
- Efficient HVAC and advanced commissioning for heating/cooling with mechanical ventilation to mitigate condensation risk and filter external pollutants.
- Refrigerants in HVAC systems will minimize global warming and ozone-depleting potential.
- Domestic hot water (DHW) systems will efficient, zero fossil-fuels options.
- Occupant education with a building user guide for building occupants to support optimal use of efficient buildings systems.

5.5 LIGHTING & ELECTRICAL SYSTEMS

- Daylight maximization
- Energy efficient fittings.
- Controls such as automated occupancy controls on lighting and ventilation, using motion-sensor technology.

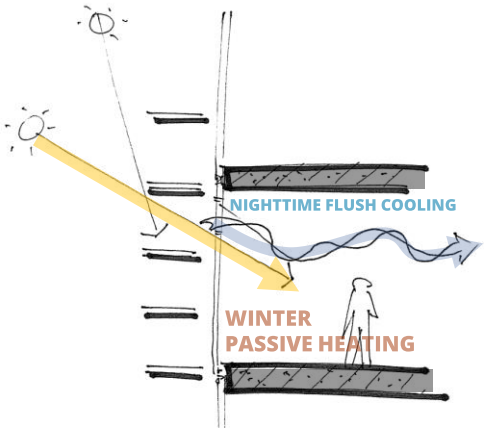


Figure 6 – Passive Design Strategies to create a comfortable environment.

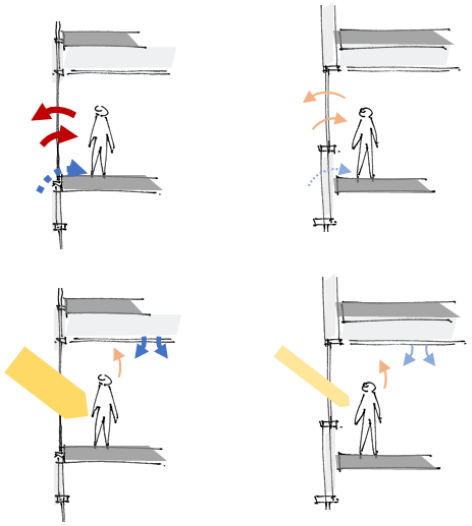


Figure 7 – Efficient Integrated systems on precinct

6. RENEWABLE ENERGY OPPORTUNITIES

6.1 RENEWABLE ENERGY AND STORAGE

On-site renewable energy generation through rooftop PV can provide the most cost-effective mitigation of GHG emissions and create a low-carbon utility grid.

Preliminary analysis indicates a plausible solar arrangement as shown in the opposite plan.

Onsite renewable energy can support shared facilities, or with an embedded network operator can be operated allocated to residents too.

On-site battery storage can support the optimization of on-site solar and also improve the reliability of power for emergency purposes during any loss of power.

Batteries are increasingly important for grid stability and the firming of renewable generation.

The precinct is targeting a 1.5MW PV System covering approximately 50% of site roof space. The balance of roof space will be green roofs and open areas.



Figure 8 – Solar PV

7. MOBILITY AND PUBLIC REALM OPPORTUNITIES

7.1 CLIMATE RISK

Climate risk mitigation related to heat is a necessity in Sydney.

Prolonged periods of time of extreme heat and drought will be more frequent in the future and affect health and wellbeing of the community.

Urban heat island mitigation will be supported with shading, green infrastructure and high SRI surfaces.

7.2 GREEN & BLUE INFRASTRUCTURE

Water sensitive urban design will contribute to measurable improvements to local air and water quality as well as thermal comfort in the public realm.

7.3 ACTIVE TRANSPORT

The approach to mobility will prioritize active transport options:

- Bicycles – end of trip facilities and secure storage
- Pedestrians – public spaces and intersections that are safe and amenable

7.4 FUTURE MOBILITY

The project will also consider the future of mobility:

- Electric vehicles
- Shared vehicles
- Connected & autonomous vehicles
- E-mobility.

Figure 9 – Green and Blue spaces in the public realm for more comfort and biodiversity.

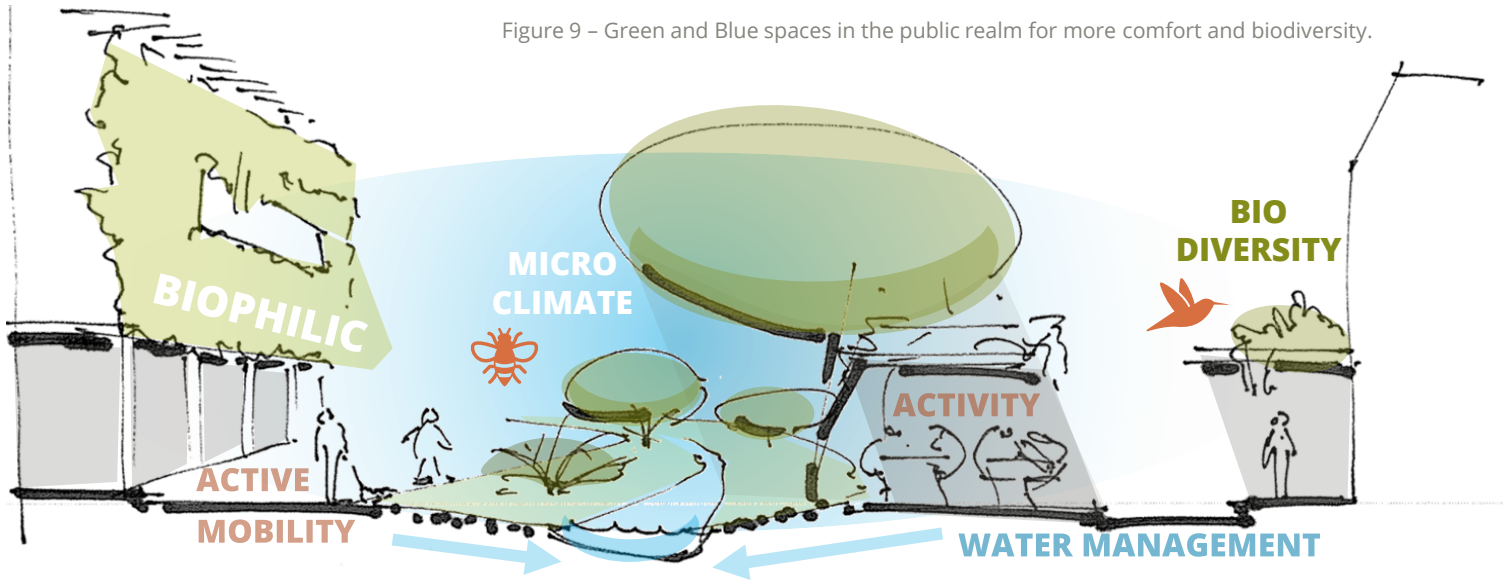


Figure 10 – Active Transport facilities combined with Smart Mobility to future-proof the public domain.



8. SECTION J COMPLIANCE

Section J Energy Efficiency of Volume One of the National Construction Code (NCC) Series 2019 provides minimum performance requirements for the building to incorporate energy efficiency in the building and services design.

The building services for The Proposal must be designed to meet the minimum Deemed To Satisfy provisions of the relevant parts.

Recommendations for compliance have been addressed in our preliminary design analysis. We have assessed the proposal in terms of recommended window to wall ratios, glazing specification and building fabric thermal performance. By doing so we are confident that Section J compliance is achievable.

The project shall continue to address the opposite NCC requirements through the design of construction elements as well as product specification, during design development stages.

8.1 PROJECT DETAILS

BUILDING CLASS

- 9b – Pool, Gym, Community and Multipurpose
- 6 - Cafe

CLIMATE ZONE

- 5 - Warm temperate



8.2 GENERAL REQUIREMENTS

ROOF AND CEILING CONSTRUCTION

- R3.7 for a downward direction of heat flow; and
- Upper surface of the roof must be ≤ 0.45

TOTAL SYSTEM WALL-GLAZING CONSTRUCTION

	Class 9B	Class 6
U-Value	≤ 2.0	≤ 2.0
Solar Admittance	≤ 0.13	≤ 0.13

WALL COMPONENT

	< 80% of system	≥ 80% of system
R-Values	≥ 1.0	≥ 1.4

SPANDREL COMPONENT

	Insulation	Total R-value
Configuration 4: Thermally broken frame, Double glazed low-e clear + 50mm air gap + 3mm aluminium, 0.8mm galvanized steel or zinc back pan.	**R-2.0**	**R-1.11**

SHADING DEVICES

- Able to restrict at least 80% of summer solar light incidence; and
- If adjustable, will automatically respond to solar radiation levels.

FLOOR CONSTRUCTION

- R2.0 for a downward direction of heat flow

THERMAL BRIDGING

- Needs to be calculated for compliance with the required Total System R-values for both wall-glazing and roof construction in accordance with AS/NZS 4859.2

9. GREEN STAR INITIATIVES

The project has committed to achieving a *5-star Green Star Design and As-Built* rating for each separate building, as well as *6-star Green Star Communities* for the whole precinct.

Green Star is a comprehensive environmental rating system for buildings and communities. Green Star separately evaluates the environmental initiatives of design, projects and/or buildings based on several criteria, including energy and water efficiency, indoor environmental quality and resource conservations.

The Green Star environmental rating system for buildings was created for the property industry in order to:

- Establish a common language;
- Set a standard of measurement for green buildings;
- Promote integrated, whole-building design;
- Recognise environmental leadership;
- Identify building life-cycle impacts; and
- Raise awareness of green building benefits.



6 STAR COMMUNITIES RATING TARGETS

Sustainable Site	Maximise the ecological value of site to be close to or exceeding existing (biodiversity, permeable surfaces, urban greening): 1. Protect the existing Turpentine Ironbark Forest 2. Maintain its functional connection to Shrimptons Creek riparian habitat through the site and with fauna crossings at road intersections. 3. Mitigating the urban heat island effect with extensive landscaped public domain, green roofs, low-SRI roofs and solar PV.
	Mitigating the urban heat island effect with extensive landscaped public domain, light coloured roofs, green roofs and solar PV.
	Employ Water Sensitive Urban Design Manage stormwater. Manage urban stormwater with water sensitive urban design including swales and permeable detention basins
Transport & Connectivity	A connected and permeable site to encourage active transport and use of public transport
	At least one bicycle parking space to be provided for each dwelling and at least 200 provided for visitors
	Provision of 50 GoGet spaces
	Electric vehicle ready
	End of trip facilities for non-residential buildings
Community Health & Happiness	To fully quantify and track tangible health and well-being metrics through programs and partnerships including Live Life Get Active and Mission Australia's Strengthening Communities amongst others.
	Public domain that encourages social interaction, has activated street frontages, is adaptable and comfortable, and is pedestrian-oriented
	A minimum 200 volunteer hours on various community activities specifically for Ivanhoe Estate.
Living Costs	Development reduces average living costs for households, and average operating costs for businesses, compared with business as usual
	Whole of life affordability strategy considering: Housing, Utilities, Food and Transit
	The CCAP Precinct report indicates in excess of a 40% reduction in living costs.
Local Economy	Integrate commercial opportunities within precinct, including spaces suitable for small business or home business operations and / or work from- home 1. Community Hub – fitted out with offices and session rooms for the delivery of MA's tenant support programs and also drop-in offices for the delivery of community services 2. Social Enterprise Space – opportunities for social enterprise development in conjunction with the community.
	The Strengthening Communities program will deliver opportunities that MA and MAH can create through the operation of the residential community such as: 1) Landscaping, 2)Common area maintenance, 3) Administration of the Community Hub, and 4) Live Work Dwellings are incorporated in buildings along the main street which will be suitable for small business or home business

9. GREEN STAR | PATHWAY TO GREEN STAR D&AB

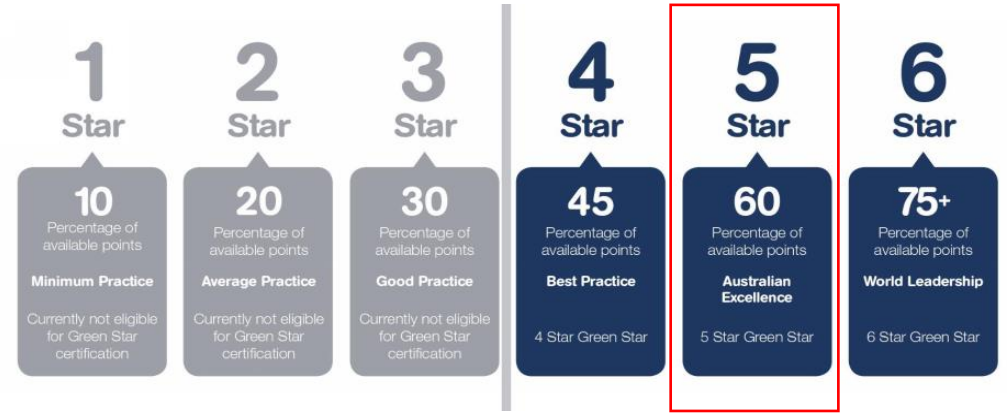
Green Star - Design & As Built Scorecard

Project: Midtwon C2 Frasers Residential Project

Targeted Rating: **5 Star – Australian Excellence**

CATEGORY / CREDIT	POINTS AVAILABLE	POINTS TARGETED
Management	14	11
Indoor Environment Quality	17	12
Energy	17	11
Transport	7	7
Water	6	5
Materials	12	10
Land Use & Ecology	6	4
Emissions	5	4
Innovation	10	5

	AVAILABLE	TARGETED
Core	100	64
Innovation	10	5
Total Score Targeted		**69**



Green Star - Design & As Built Scorecard

5 Star – Australian Excellence

Project:	**Round:**	Please select the round of assessment	
Targeted Rating:			

Core Points Available	Total Score Targeted
100	64

AVAILABLE	TARGETED
100	64
10	5
	69

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9. GREEN STAR | MANAGEMENT

1.1 Accredited Professional
- No special requirements to plan.

2.0, 2.2, 2.1 & 2.4 – Commissioning & Tuning
- Services & Maintainability review during design
- Comprehensive pre commissioning and commissioning
- Commit to tuning process after PC

3.1 - Climate Adaptation Plan
- Develop Climate Adaptation Plan during design
- Include solutions suggested in CAP in the design

4.1 – Building Information
- Develop Operations & Maintenance manual
- Develop building log-book
- Building user information documents

6.1 – Metering and Monitoring
- Common area sub-metering requirements:
    - All floors to be separately metered
    - Metering split by all major usages
- Install automatic monitoring system
- Implement monitoring strategy
- Smart BMS required to provide data hourly/daily/monthly/annually

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Management			**14**	
Green Star Accredited Professional	1.1	Accredited Professional	1	1
Commissioning and Tuning	2.0	Environmental Performance Targets	-	Complies
	2.1	Services and Maintainability Review	1	1
	2.2	Building Commissioning	1	1
	2.3	Building Systems Tuning	1	1
	2.4	Independent Commissioning Agent	1	0
Adaptation and Resilience	3.1	Implementation of a Climate Adaptation Plan	2	2
Building Information	4.1	Building Information	1	1
Commitment to Performance	5.1	Environmental Building Performance	1	0
	5.2	End of Life Waste Performance	1	0
Metering and Monitoring	6.0	Metering	-	Complies
	6.1	Monitoring Systems	1	1
Responsible Construction Practices	7.0	Environmental Management Plan	-	Complies
	7.1	Environmental Management System	1	1
	7.2	High Quality Staff Support	1	1
Operational Waste	8A	Performance Pathway: Specialist Plan	1	1
	8B	Prescriptive Pathway: Facilities	1	0
Total			**14**	**11**

7.0 -, 7.1 & 7.2 – Responsible Construction Practices
- Best Practice EMP is minimum requirement
- Environmental Management System during construction
- High Quality Staff support practices in place: contractor programs & workshops.

8A – Operational Waste – Performance Pathway
- Waste specialist plan
- Waste streams shall be separate by landfill, co-mingled recycling and at least on other waste stream (eg. organics or e-waste).
- Provide dedicated waste storage areas adequately sized as per third-party best practice guidelines, according to waste generation and collection frequency.
- Access to waste storage areas to meet third-party best practice guidelines.

9. GREEN STAR | INDOOR ENVIRONMENT QUALITY

9 – Indoor Air Quality

- **9.1** Ventilation system complies with: minimum distances between air intakes and pollutant sources (eg. exhausts) as per ASHRAE 62.1:2013; design for easy maintenance; cleaning prior to use/occupation
- **9.2A** OA provided at least at 50% higher than AS 1668.2:2012.
- **9.3** Sources of indoor pollutants should be eliminated or exhausted directly to the outside (Eg. printers and kitchen equipment)

10 – Acoustic Comfort

- **10.1 Internal Noise Level** measurement and documentation must be provided by a qualified acoustic consultant. For naturally ventilated buildings, all measurements must be carried out with natural ventilation openings in the open position.
- **10.2 Reverberation** measurements to achieve the 'Recommended Reverbetaion Times' recommended in Table 1 of AS/NZ 2017:2016
- **10.3 Acoustic Separation _ Sound Reduction**
    - Fixed partitions without a door (including glazed) must achieve an Rw of at least 45.
    - All partition types containing a door must achieve an Rw of at least 35.
    - Compliance demonstrated through measurements.

11 – Lighting Comfort

- **11.0 Minimum:** Ensure flicker-free lighting and colour quality as a minimum.
- **11.1.1 Illuminance:** Lighting levels comply with best practice guidelines and glare is eliminated.
- **11.1.2 Localised lighting control:** Ensure that occupants have the ability to control the lighting in their immediate environment.

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Indoor Environment Quality			**17**	
Indoor Air Quality	9.1	Ventilation System Attributes	1	1
	9.2C	Provision of Outdoor Air _ Natural Ventilation	2	1
	9.3	Exhaust or Elimination of Pollutants	1	1
Acoustic Comfort	10.1	Internal Noise Levels	1	1
	10.2	Reverberation	1	1
	10.3C	Acoustic Separation _ Residential Projects	1	1
Lighting Comfort	11.0	Minimum Lighting Comfort	-	Complies
	Illuminance and Glare Reduction	11.1.1B General Illuminance _Residential Spaces 11.1.2A Glare Reduction_Prescriptive Method	1	1
	11.2C	Surface Illuminance _ Residential Spaces prescriptive method	1	0
	11.3	Localised Lighting Control	1	1
Visual Comfort	12.0B	Glare Reduction _Blinds or Screens	-	Complies
	12.1A	Daylight _ Prescriptive Method	2	0
	12.2	Views	1	1
Indoor Pollutants	Adhesives, Sealants and Carpets	13.1.1A Paints, Adhesives and Sealants_Product Certification 13.1.2A Carpets _ Product Certification	1	1
	13.2A	Engineered Wood Products _ Product Certification	1	1
Thermal Comfort	14.1B	Thermal Comfort _Mechanically ventilated spaces	1	1
	14.2	Advanced Thermal Comfort	1	0
Total			**17**	12

9. GREEN STAR | INDOOR ENVIRONMENT QUALITY

12 – Visual Comfort

- **12.0 Glare reduction:**
  - Install blinds/screens for all areas, controlled by occupants, VLT <10%. These must reduce at least 95% of the viewing façade and skylights; **OR**
  - Skylights and 1.5m of floor plane along all viewing facades, to be shaded from direct sunlight during 80% of the nominated hours through the seasons.

- **12.1A Daylight Prescriptive Methodology**: use hand calc to determine zone of compliance (minimum 60%)
- **12.2 Views:** 60% of nominated area has a clear line of sight to high quality internal or external view.

12.2 Views

At least 60% of the nominated areas has a clear line of sight to a high quality internal or external view. All floor areas within 8m from a compliant view can be included in this criterion.

13 – Indoor Pollutants

- Paints, Adhesives, Sealants, Carpets and Engineered Wood Products need to be certified under a recognised Product Certification Schemes or laboratory testing.

14.1B – Thermal Comfort – Mechanically ventilated spaces

Nominated spaces meet specified prescriptive criteria for thermal comfort or the Predicted Mean Vote levels are between -1 and +1.

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Indoor Environment Quality			**17**	
Indoor Air Quality	9.1	Ventilation System Attributes	1	1
	9.2C	Provision of Outdoor Air _ Natural Ventilation	2	1
	9.3	Exhaust or Elimination of Pollutants	1	1
Acoustic Comfort	10.1	Internal Noise Levels	1	1
	10.2	Reverberation	1	1
	10.3C	Acoustic Separation _ Residential Projects	1	1
Lighting Comfort	11.0	Minimum Lighting Comfort	-	Complies
	Illuminance and Glare Reduction	11.1.1B General Illuminance _Residential Spaces 11.1.2A Glare Reduction_Prescriptive Method	1	1
	11.2C	Surface Illuminance _ Residential Spaces prescriptive method	1	0
	11.3	Localised Lighting Control	1	1
Visual Comfort	12.0B	Glare Reduction _Blinds or Screens	-	Complies
	12.1A	Daylight _ Prescriptive Method	2	0
	12.2	Views	1	1
Indoor Pollutants	Adhesives, Sealants and Carpets	13.1.1A Paints, Adhesives and Sealants_Product Certification 13.1.2A Carpets _ Product Certification	1	1
	13.2A	Engineered Wood Products _ Product Certification	1	1
Thermal Comfort	14.1B	Thermal Comfort _Mechanically ventilated spaces	1	1
	14.2	Advanced Thermal Comfort	1	0
Total			**17**	12

9. GREEN STAR | ENERGY

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Energy			**22**	
	15A.0	Conditional Requirement: Prescriptive Pathway	1	-
	15A.1	Building Envelope	1	1
	15A.2	Wall-Glazing Construction and Retail Display Glazing	1	1
	15A.3	Lighting	1	1
	15A.4	Ventilation and Air Conditioning	1	
	15A.5	Domestic Hot Water	1	1
	15A.6	Transition Plan	1	1
	15A.7	Fuel Switching	1	1
	15A.8	On-Site Storage	1	
	15A.9	Vertical Transportation	1	
	15A.10	Off-Site Renewables	5	5
Peak Electricity Demand Reduction	16A	Prescriptive Pathway: On-Site Energy Generation	2	1
Total			**17**	**11**

15A – Greenhouse Gas Emissions – Prescriptive Pathway

15A.0 Conditional
- Exceed Part J1 by 5%.

15A.1 Building Envelope
- Points awarded based on calculated on the basis of improvement in building performance for roofs, ceilings, floors and roof lights .

15A.2 Glazing
- Solar admittance and u-value in excess of the code

15A.3 Lighting
- At least 10% better aggregated illumination power than the code
- Automated lighting controls systems required throughout 95% of the nominated area.

15A.5 Domestic Hot Water
- Powered by renewable energy or waste heat; or
- Primary source is a heat pump with COP > 3.5.

15A.6 Transition Plan
- Commit to the transition away from fossil fuels.

15A.7 Fuel Switching
- No fossil fuels are burned on-site for electricity generation, heating or cooling.
- 15% of energy from on-site renewables.

15B.10 Off-site Renewables
- At least 10 points in this pathway have been achieved, AND
- A supply contract is in place to procure 100% of the building's electricity consumption through off-site renewable electricity solutions.

Minimum time of procurement: 10 years after PC.

16A – Peak Electricity Demand Reduction - Prescriptive Pathway
- On-site renewable energy sources reduces peak electricity demand by at least 15%.
- Peak Electricity demand must be calculated in accordance with AS/NZS 3000:2007, including all building end-use loads except for process loads.

9. GREEN STAR | TRANSPORT

17B – Sustainable Transport – Prescriptive Pathway

17B.1 Access by Public Transport
- Minimum 15% of people within the Greater Capital City Statistical Area can access the site by public transport within 45 min during peak hour.

17B.2 Reduced Car Parking Provision
- A reduction of car parking spaces compared to the local planning allowance. Points are awarded based on the level of the reduction and the site's access to public transport.

17B.3 Low Emission Vehicle Infrastructure

17B.3B Parking for Electric Vehicles
- 5% of parking is dedicated to electric vehicles and charging infrastructure is provided for each space. Charging infrastructure must be easily accessed by the users of dedicated electric vehicle charging spaces. **OR**

17B.3C Parking for Shared vehicles
- For residential projects (at least 80% GFA Class 1 or 2), dedicated and clearly designated car share spaces and vehicles are provided at the rate of 1 per 70 project occupants.

17B.4 Active Transport Facilities
- Bicycle parking and associated facilities are provided to a proportion of the building's regular occupants and visitors.

17B.5 Walkable Neighborhoods
A. Proximity to Amenities
- At least 8 amenities are within 400 m of the project.

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Transport			**10**	
Sustainable Transport	17A	Performance Pathway	0	0
	17B.1	Access by Public Transport	3	3
	17B.2	Reduced Car Parking Provision	1	1
	17B.3A	Low Emission Vehicle Infrastructure _ Parking for fuel-efficient vehicles	1	1
	17B.4	Active Transport Facilities	1	1
	17B.5A	Walkable Neighbourhoods _ Proximity to Amenities	1	1
Total			**7**	**7**

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Water			**12**	
Potable Water	18A	Potable Water - Performance Pathway	12	0
	18B.1	Sanitary Fixture Efficiency	1	1
	18B.2	Rainwater Reuse	1	0
	18B.3	Heat Rejection	2	2
	18B.4	Landscape Irrigation	1	1
	18B.5	Fire Protection System Test Water	1	1
Total			**12**	5

18B – Potable Water - Prescriptive Pathway B

18B.1 Efficient Sanitary Fixtures
All fixtures are within one star of specified WELS ratings:

- Taps: 6 star
- Urinals: 6 Star
- Toilet: 5 Star
- Showers: 3 Star
- Dishwashers: 6 Star

18B.3 Heat rejection
- No water is used for heat rejection. For example, by using natural ventilation.

18B.4 Landscape irrigation
- Drip irrigation, OR moisture sensors are installed; OR No potable water is used for irrigation.

18B.5 Fire Protection System Test Water
- No water is used for fire system testing, **OR** at least 80% of test water is captured and reused

9. GREEN STAR | MATERIALS

19A – Life Cycle Impacts - Performance Pathway

19A.1 + 19A.2 – Comparative Life Cycle Assessment

- A whole of building, whole of life LCA is conducted for the project and a reference building
- Additional Reporting is included

20 - Responsible Building Materials

20.1 – Structural and reinforcing steel

20.1.0 – Responsible Steel Maker:

- The steel making facility has an ISO 14001 Environmental Management System (EMS) in place.
- The steel maker supplying the steel is a member of the World Steel Association (WSA) Climate Action Programme (CAP).

20.1A Responsible Steel Fabricator:

- The steel fabricator must be a member of the ASI's Environmental Sustainability Charter Group

20.2 – Timber

20.2.A – Certified Timber:

- Timber must be certified by a forest certification scheme (FSC, PEFC)

20.3 – Permanent Formwork, Pipes, Flooring, Blinds and Cables

20.3.B – Best Practice Guidelines for PVC:

- A valid audit verification certificate for each of the PVC products specified or used in the project. Show compliance against GBCA's Best Practice Guidelines for PVC.

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Materials			**14**	
Life Cycle Impacts	19A.1	Life Cycle Assessment	6	4
	19A.2	Additional Reporting	4	1
Responsible Building Materials	20.1 A	Structural and Reinforcing Steel _ Responsible Steel Fabricator	-	Complies
	B.2		1	1
	20.2 A	Timber _ Certified Timber	1	1
	20.3 A	Permanent Formwork, Pipes, Flooring, Blinds and Cables _ No PVC	1	1
Sustainable Products	21.1	Product Transparency and Sustainability	3	1
Construction and Demolition Waste	22.0	Reporting Accuracy	-	Complies
	22A	Fixed Benchmark	0	0
	22B	Percentage Benchmark	1	1
Total			**12**	**10**

21.1 Sustainable Products

> 3% Eligible products meet the following pathways for compliance: Reused, Recycled content, EPD, Third party certified, OR Stewardship Programs. A combination of pathways can be used.

22 – Construction and Demolition Waste

22.0 – Reporting Accuracy:

Waste contractors and waste processing facilities servicing the project demonstrate compliance with the Green Star Construction and Demolition Waste Reporting Criteria.

- Either show a Compliance Verification Summary issued by a Suitably Qualified Auditor, or;
- Complete a Disclosure Statement outlining how much of the Green Star Construction and Demolition Waste Reporting Criteria has been implemented.

22B – Percentage Benchmark

Demonstrate that >90% of construction and demolition waste has been diverted from landfill.

9. GREEN STAR | LAND USE & ECOLOGY and EMISSIONS

23.0C Ecological Value Professional report confirming the site does not contain any critically endangered or vulnerable species or communities.

24 – Sustainable Sites

24.0 Previously Developed land
Demonstrate previous condition of the site by reporting that the project site was previously developed.

24.1 Reuse of Land
>75% of the site was previously developed at the time of purchase. Aerial photographs and As-built drawings as evidence.

24.2 Contamination and Hazardous Materials
Site contamination to be remediated in accordance to best practice.

25.1 Heat Island Effect Demonstrate that at least 75% of the whole site area comprises of heat island mitigation solutions. The most applicable for this project are:

- Vegetation
- Green Roof
- Cool roof materials
- Shaded hardscaping

26 – Stormwater

26.1 Peak Stormwater Discharge
Post-development peak Average Recurrence Interval (ARI) event discharge from the site does not exceed pre-development levels.
- Roof collection & use
- Infiltration in soil
- Water retention

26.2 Stormwater Pollution Targets
- Credit 26.1 needs to be achieved in order to target 26.2
- Post-development situation meets pollution reduction targets compared to untreated runoff.
- Shown through modelling or manual calculation.

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Land Use & Ecology				
Ecological Value	23.1	Ecological Value	3	1
Sustainable Sites	24.0	Conditional Requirement	-	Complies
	24.1	Reuse of Land	1	1
	24.2	Contamination and Hazardous Materials	1	1
Heat Island Effect	25.1	Heat Island Effect Reduction	1	1
Total			**6**	**4**

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Emissions			**5**	
Stormwater	26.1	Stormwater Peak Discharge	1	1
	26.2	Stormwater Pollution Targets	1	1
Light Pollution	1.	Light Pollution to Neighbouring Bodies	-	Complies
	2.	Light Pollution to Night Sky	1	1
Microbial Control		Legionella Impacts from Cooling Systems	1	1
Refrigerant Impacts	29.1	Refrigerants Impacts	1	0
Total			**5**	**4**

27 – Light Pollution

27.0 Light Pollution to neighbouring bodies
- All outdoor lighting complies with AS 4282:1997 Control of the obtrusive effects of outdoor lighting.

27.1 Light pollution to night sky
- Control of Upward Light output ratio (ULOR): no external luminaire has a ULOR higher than 5%.

28 – Microbial Control

28B Waterless Heat Rejection Systems
- Any building cooling rejection system do not use or contain water

9. GREEN STAR | INNOVATION

30 – Innovation

Preselected Innovation Credits are;

1. Community Benefits
2. Financial transparency
3. Local procurement 1
4. Local procurement 2
5. Marketing Excellence

CATEGORY / CREDIT	CODE	CREDIT CRITERIA	POINTS AVAILABLE	POINTS TARGETED
Innovation			**10**	
Innovative Technology or Process	30A	Innovative Technology or Process	10	
Market Transformation	30B	Market Transformation		
Improving on Green Star Benchmarks	30C	Improving on Green Star Benchmarks		
Innovation Challenge	30D	Innovation Challenge		5
Global Sustainability	30E	Global Sustainability		
Total			**10**	**5**

AVAILABLE	TARGETED
100	**64**
10	**5**
TOTAL	**69**

10. SUMMARY

The precinct is achieving the planning requirements through a series of strategies, which are captured in the summary matrix below.

PLANNING REQUIREMENT	PRECINCT PROJECT RESPONSE
Identify how ESD principles will be incorporated into the design, construction and ongoing operation of the proposed development	Incorporated through: • Architectural design • Building systems design and renewable energy • Materials and procurement • Landscape and site water systems • Offsite opportunities • Transport and mobility.
Demonstrate how the development will achieve the commitments identified in the approved concept plan:	
• 5-star Green Star Design and As-Built v1.3;	Committed to 5 stars GS D&AB v1.3. Refer to targeted pathway in Section 9
• 6-star Green Star Communities v1.1;	Committed to 6 stars GS Communities v1.1. Refer to Section 9
• Precinct wide averaged Basix 40 Energy target;	Passive design strategies, On-site renewable energy generation, efficient systems
• Precinct wide averaged Basix 45 Water target;	Water efficient fixtures/fittings, rainwater tank and reuse for landscape irrigation
• 6 Stars average NatHERS;	Passive design strategies
• NABERS 5-star water for all commercial components;	Water efficient fixtures/fittings, rainwater tank and reuse for landscape irrigation
• Carbon Neutral in operations;	• Green power procurement • 1.5 MW Solar PV System precinct-wide • Reduction in Embodied carbon • Integrated utilities infrastructure
• Materials sustainability & Waste reduction	Achieved through Green Star certification
• Sustainable transport and mobility	Achieved through Green Star certification
Demonstrate how future buildings will meet or exceed the relevant industry recognised building sustainability and environmental performance standards, including any green accreditation;	Committed to 5 stars Green Star D&AB v1.3 and 6 stars Green Star Communities
Demonstrate how the proposal incorporates measures to minimize carbon emissions from both construction/waste materials and in built, embodied design; reflecting the Government's goal of net zero emissions by 2050, and the consumption of resources, water (including through water sensitive design principles and water re-use) and energy.	• Achieved through commitment to carbon zero operations; • Green Star certifications; and • Integrated utilities infrastructure

11. ANNEXES

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PROJECT CORRESPONDENCE

Date: Tuesday, June 29, 2021
To: Frasers Property
Attention: Liz Yao
From: David Arnott
Project Name: **C2_Midtown Precinct S2**
Project No: 640018.000
Email: liz.yao@fraserspropertyproperty.com.au

Sent	Company	Name	Email
cc	Frasers Property	Hallum Jennings	hallum.jennings@fraserspropertyproperty.com.au
cc	Frasers Property	Robert Cauchi	Robert.Cauchi@fraserspropertyproperty.com.au
cc	CHROFI	Hugo Raggett	hugo@chrofi.com
cc	Integral Group	Melissa Nouel	melissa.nouel@integralgroup.com

RE: Section J – Review of DTS provisions

This correspondence provides an update of Integral Group's preliminary assessment of the Section J DTS provisions for C2 of the Midtown Precinct S2. The compliance of the current design with the provisions of the National Construction Code (NCC) version 2019 is reviewed in this document.

The below advice is limited to Part J1 – Building Fabric. More detail will be included in the final Section J compliance report at the end of the current stage.

Table 1 outlines the documentation provided by CHROFI, which was used as the basis of this assessment.

***Table 1** Reference Documentation*

Drawing Title / Number	*Author*	*Date*	*Issue*
A-A-002 – Site Plan	CHROFI	31/05/21	01
A-A-101 – Basement Plan	CHROFI	31/05/21	05
A-A-102 – Lower Ground Plan	CHROFI	31/05/21	05
A-A-103 – Upper Ground Plan	CHROFI	31/05/21	05
A-A-104 – Roof Plan	CHROFI	31/05/21	05
A-A-201 – Elevations 1	CHROFI	31/05/21	05
A-A-202 – Elevations 2	CHROFI	31/05/21	03
A-A-203 – Elevations 3	CHROFI	31/05/21	03
A-A-301 – Section A & B	CHROFI	31/05/21	05
A-A-302 – Section C & D	CHROFI	31/05/21	05
A-A-303 – Section E	CHROFI	31/05/21	05

Project Location & Classification

Table 2 Project Location & Climate Zone provides a summary of the project location and applicable climate zone as defined within the NCC.

***Table 2** Project Location & Climate Zone*

Address	*Local Government Area*	*Climate Zone*
Ivanhoe Precinct – Midtown, Macquarie Park	Ryde, NSW	Zone 5 – Warm temperate

Table 3 NCC classification & building areas provides a summary of the building classification, as assumed until provided by the relevant consultant, and a summary of building areas as per the architectural documentation.

***Table 3** NCC classification & building areas*

Level	*Space Type(s)*	*NCC Class*
Basement Floor	Basement carpark and Pool Plant areas	Class 7a
Ground Floor	Pool, Gym, Office, Reception and amenities	Class 5 & 9b
First Floor	Community room, Café and support spaces	Class 6 & 9b

Deemed-to-Satisfy requirements

The minimum Deemed-to-Satisfy (DTS) requirements for building fabric are provided below and comments have been included to provide further details on the requirements.

***Table 4** Deemed-to-Satisfy General requirements*

Envelope Components	*DTS Requirements*	*Comments*
J1.3 Roof & Ceiling Construction	- Total R-value **≥ 3.7 m²K/W** (downward direction of heat flow) - Solar absorptance **≤ 0.45** (upper surface).	- Total R-values must account for thermal bridging. - For the solar absorptance requirement only light colours are allowed under DTS.
J1.4 Roof Lights	- Skylight area **< 5%** of the floor area of the room or space served. - Total U-Value **≤ 3.9 W/m²K** - Total system Solar Admittance **≤ 0.29**	- NCC defines the area of a roof light as: *'the area of the roof opening that allows light to enter the building.'* - The roof light shaft index is determined by the geometry of the shaft, following the calculations under NCC2019 Table J1.4 Note 1
J1.5 Walls & Glazing	- Total system U-Value **≤ 2 W/m²K** - Total system Solar Admittance **≤ 0.13** (for all façade aspects) (For specific requirements of glazing components refer to Table 6)	- Wall-glazing construction is calculated as a whole, rather than separately. Achieving compliant values can be difficult with higher glass to façade ratios. - Total U-values must be total system inclusive of framing and any thermal loss.

Envelope Components	DTS Requirements	Comments
	Additionally, for wall components only - Where wall is less than 80% of the area of wall-glazing construction, wall components Total R-Value **≥ R1.0 m²K/W**. (Refer to Table 5 for specific requirements of walls); OR - Where wall is greater than 80% of the area of wall-glazing construction wall components must be a **≥ R1.4 m²K/W**	- Requirements for Wall-glazing construction as a whole are based on the proportion of wall to glazing. If the wall is greater than 80% climate zone specific requirements also apply. - Any areas of spandrel panels (as defined by NCC) must be calculated as per Specification J1.5b. NCC defines spandrel panels as follows: *"[…] means the opaque part of a façade in curtain wall construction which is commonly adjacent to, and integrated with, glazing."*
J1.6 Floors	- Floor without in-slab heating or cooling Total R-value **≥ 2.0** m²K/W (downwards); OR - Floor with in-slab heating or cooling ≥ 3.25 m²K/W (downwards).	- Total R-Value is applicable to all floor types including concrete slab on ground. - Concrete slab on ground calculations required to factor thermal resistance of ground.

Thermal bridges

Total System R-Value and Total System U-Value calculations under NCC 2019 require detailed thermal bridge analysis in accordance with AS/NZS 4859.2. This has a significant impact on construction methods and detailing. If the thermal bridges are not adequately addressed, the product R-Value of the insulation can greatly exceed the DTS Total R-Value requirement. For example, a roof Total System requirement of R3.7 may in-fact require R4.5 insulation, once thermal bridging is considered.

Specific Wall and Glazing requirements

The following tables show the Total System Values for both windows and walls, as well as Total System SHGC for windows. These values have been input into the NCC 2019 facade calculator to assess the compliance of preliminary performance values. Results from the calculator have been included in Appendix B. Note that U-Value is the inverse of R-Value.

Table 5 Preliminary Wall Systems – Project requirements

Wall Reference	Total System R-value [m².K/W]	Total System U-value [W/m².K]	Solar Absorptance
All external walls	1.60	0.625	0.65
All internal walls (which form part of the envelope)	1.60	0.625	

Note: The performance values for all wall constructions have accounted for thermal bridging assuming frame values.

Table 6 Preliminary Glazing Systems – Project requirements

Window Reference	Indication of System Type (for guidance only)	Total System U-value [W/m².K]	Total System SHGC
Lower Ground Floor	Tinted, double glazing in aluminium frames	4.0	0.21
Upper Ground Floor	Tinted, double glazing in aluminium frames	3.8	0.23

Note: Shading from Vertical Blades to the East and West has not been considered in this preliminary assessment. Vertical shading should be capable to block at least 80% of summer solar radiation to be considered under a DTS pathway. This should be demonstrated through modelling or any alternative method.

Roof lights compliance

The skylight areas of the assessed design do not exceed the maximum allowed 5% of the floor area of the room/space served. However the area is almost exactly 5% and therefore any further increase will result in a non-compliant design under DtS provisions.

Summary

Table 4 lists the general DTS provisions applicable to the project. According to this preliminary assessment, the proposed performance values for the glazing and walls show compliance with J1.5 (NCC 2019) as per Calculation Method 2 (Multiple Aspects). The current areas of roof light areas should not be increased.

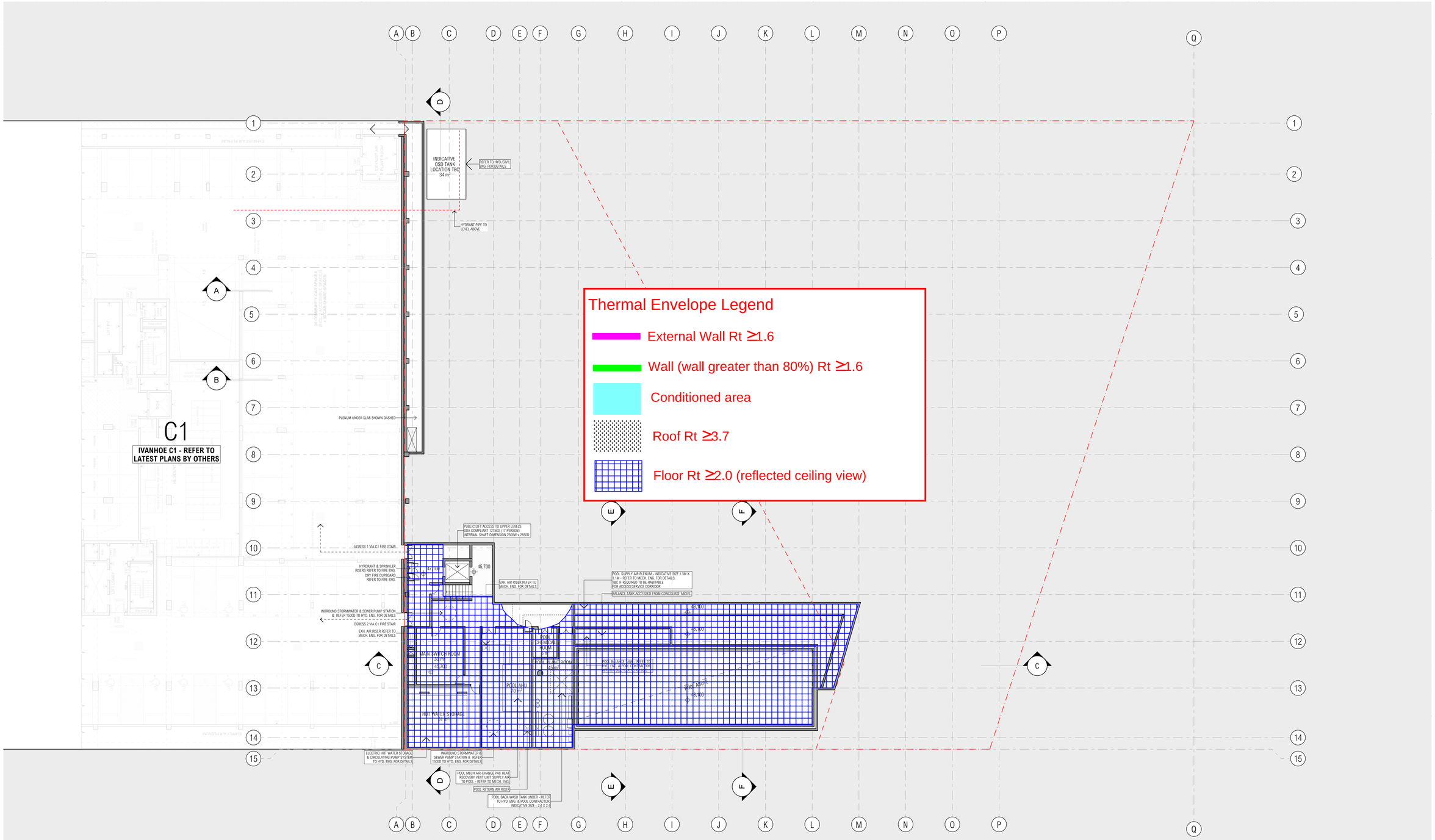
As the design progresses, updates may require verification for compliance at the end of the current stage.

Should you wish to discuss further, please do not hesitate to contact me.

Kind regards,

David Arnott
Associate
INTEGRAL GROUP

Appendix A: Thermal Envelope Mark-ups



ARCHITECT

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CHOI ROPHA FIGHERA P/L ACN 144 714 885 ATF CHOI ROPHA FIGHERA UNIT TRUST T/A CHROFI ABN 22 365 257 167 NOMINATED ARCHITECT JOHN CHOI 8706 TAI ROPHA 6568 STEVEN FIGHERA 6609
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CLIENT

FRASERS PROPERTY

LANDSCAPE ARCHITECT

MCGREGOR COXALL

REV	DATE	ISSUE
01	23/04/2021	CONCEPT DESIGN ISSUE
02	30/04/2021	ISSUE FOR COORDINATION
03	14/05/2021	DRAFT DA ISSUE 1
04	21/05/2021	DRAFT DA ISSUE 2
05	31/05/2021	DRAFT DA ISSUE 3

REV	DATE	ISSUE

PROJECT

Ivanhoe Village Green & Community Centre

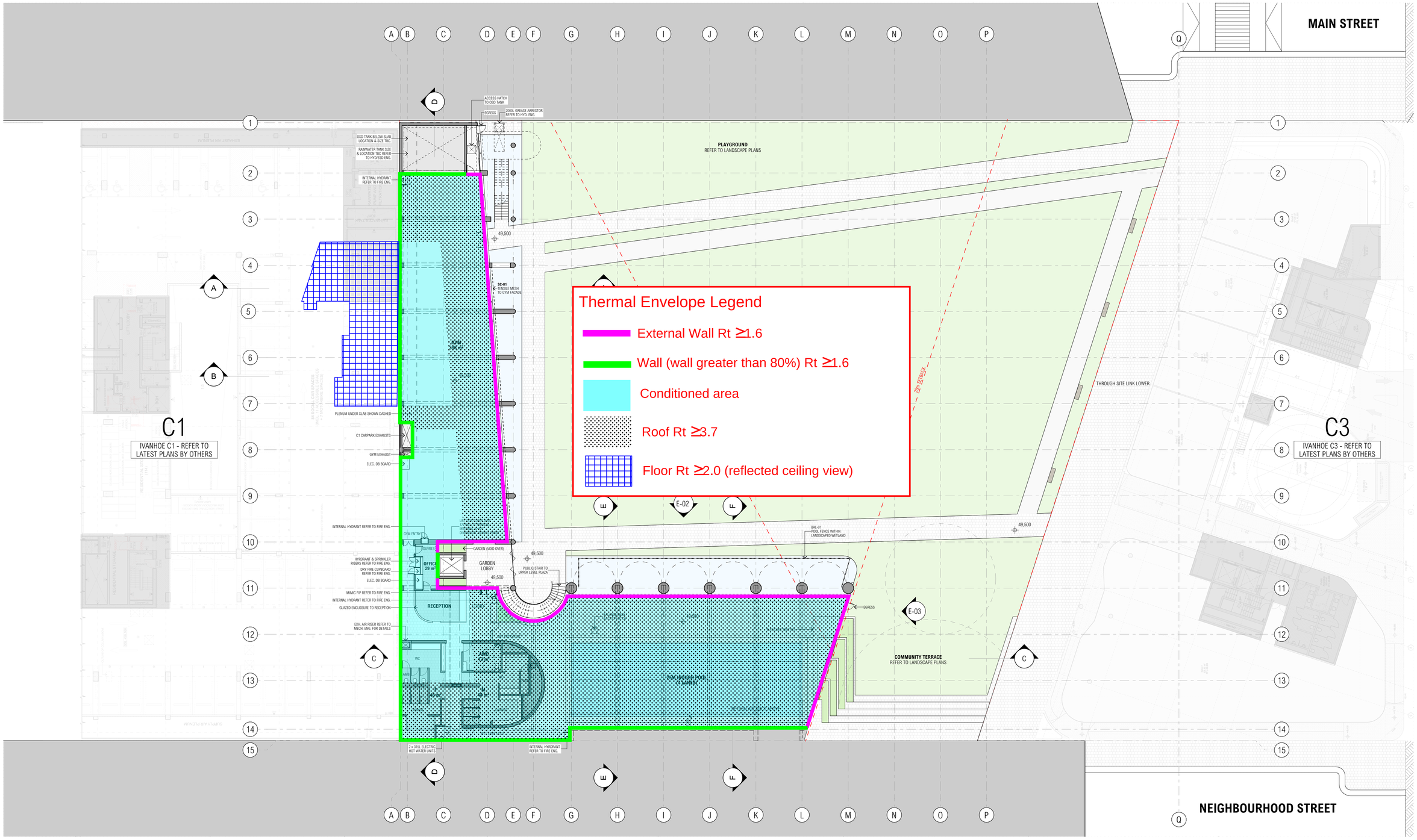
Ivanhoe Precinct - Midtown MacPark

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	31/05/2021	LH	HR	1:200	A1	

DRAWING TITLE

BASEMENT PLAN

DRAWING NUMBER	REVISION
A-A-101	05



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LANDSCAPE ARCHITECT
MCGREGOR COXALL

REV	DATE	ISSUE
01	23/04/2021	CONCEPT DESIGN ISSUE
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04	21/05/2021	DRAFT DA ISSUE 2
05	31/05/2021	DRAFT DA ISSUE 3

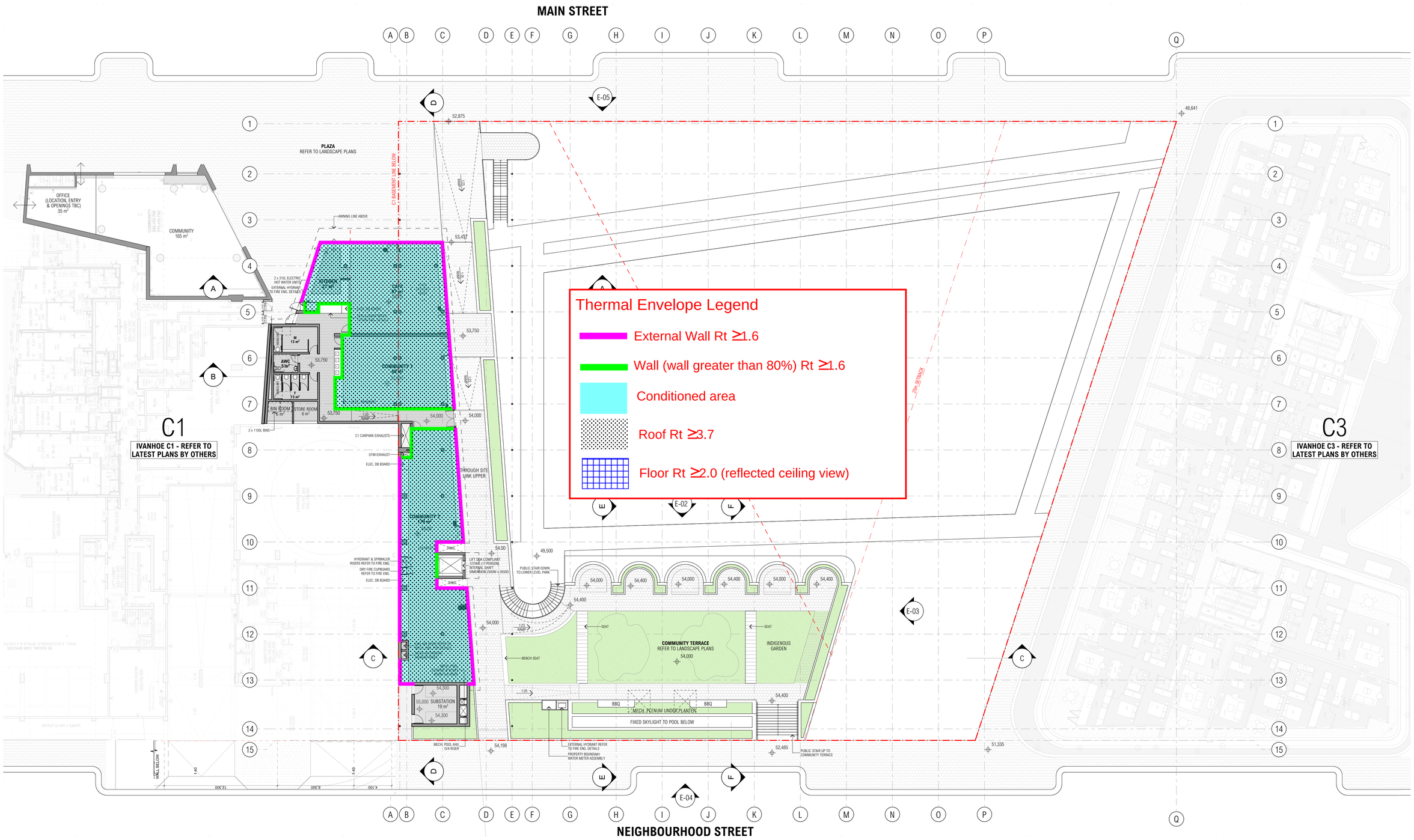
REV	DATE	ISSUE

PROJECT
Ivanhoe Village Green & Community Centre
Ivanhoe Precinct - Midtown MacPark

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	31/05/2021	LH	HR	1:200	A1	

DRAWING TITLE
LOWER GROUND PLAN

DRAWING NUMBER	REVISION
A-A-102	05



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CHOI ROPIHA FIGHERA P/L ACN 144 714 885 ATF CHOI ROPIHA FIGHERA UNIT TRUST T/A CHROFI ABN 22 365 257 187 NOMINATED ARCHITECT JOHN CHOI 8706 TAI ROPIHA 6568 STEVEN FIGHERA 6609 THIS DRAWING SHOULD BE READ IN CONJUNCTION WITH ALL RELEVANT CONTRACTS, SPECIFICATION, REPORT AND DRAWINGS. DO NOT SCALE DRAWINGS. DIMENSIONS GOVERN. VERIFY ALL DIMENSIONS ON SITE BEFORE CONSTRUCTION. COPYRIGHT OF THIS DRAWING IS VESTED IN CHROFI.

CLIENT

FRASERS PROPERTY

LANDSCAPE ARCHITECT

MCGREGOR COXALL

REV	DATE	ISSUE
01	23/04/2021	CONCEPT DESIGN ISSUE
02	30/04/2021	ISSUE FOR COORDINATION
03	14/05/2021	DRAFT DA ISSUE 1
04	21/05/2021	DRAFT DA ISSUE 2
05	31/05/2021	DRAFT DA ISSUE 3

REV	DATE	ISSUE

PROJECT

Ivanhoe Village Green & Community Centre

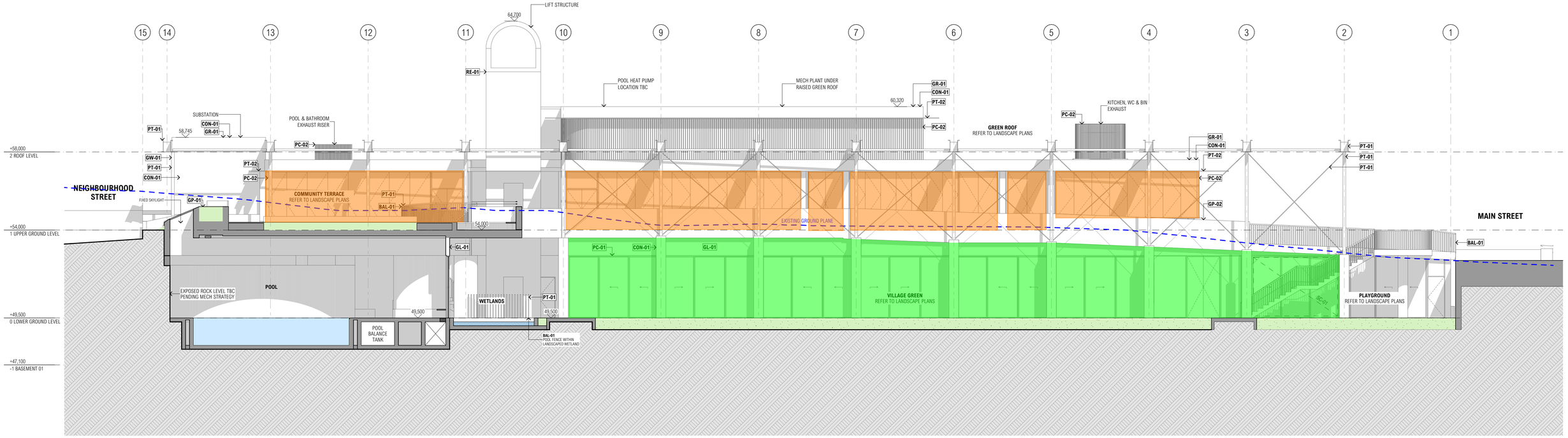
Ivanhoe Precinct - Midtown MacPark

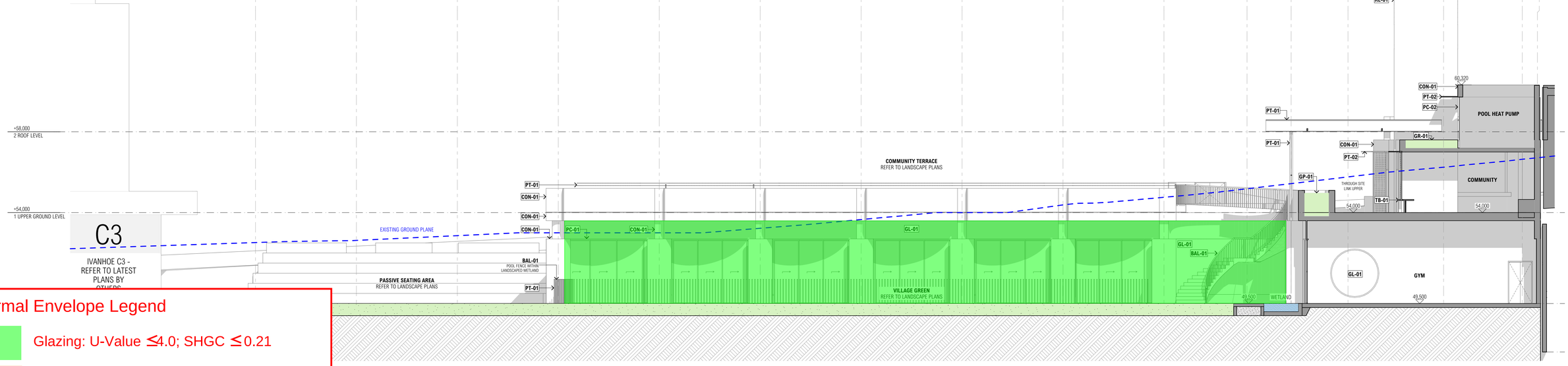
PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	31/05/2021	LH	HR	1:200	A1	N

DRAWING TITLE

UPPER GROUND PLAN

DRAWING NUMBER	REVISION
A-A-103	05





Thermal Envelope Legend

- Glazing: U-Value ≤4.0; SHGC ≤0.21
- Glazing: U-Value ≤3.8; SHGC ≤0.23
- Roof light: U-Value ≤3.9; SHGC ≤0.29

BAL-01 STEEL BALUSTRADE
CON-01 IN SITU CONCRETE
CON-02 IN SITU CONCRETE - COLOURED
FL-01 PORPHYRY PAVING
GL-01 CLEAR GLASS
GP-01 GREEN PLANTER
GR-01 GREEN ROOF
GW-01 GREEN WALL
PC-01 POWDERCOATED ALUMINIUM - DULUX ELECTRO 'SILVER REIGN'
PC-02 POWDERCOATED ALUMINIUM - DULUX DURALLOY 'WILDERNESS'
PT-01 PAINTED STEEL - DULUX ELECTRO 'FLAT WHITE'
PT-02 PAINTED STEEL - DULUX DURALLOY 'WILDERNESS'
RE-01 RENDERED MASONRY WALL - CAMEO PINK
SC-01 TENSILE MESS
TB-01 TIMBER BENCH

ARCHITECT
CHROFI
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LANDSCAPE ARCHITECT
MCGREGOR COXALL

REV	DATE	ISSUE
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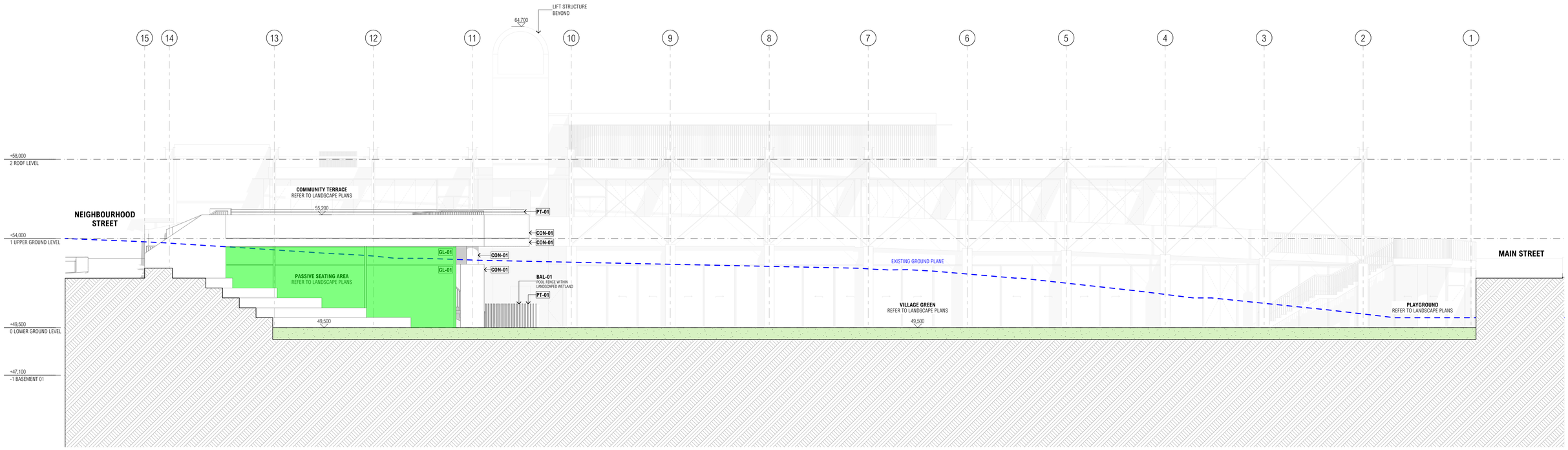
05	31/05/2021	DRAFT DA ISSUE 3

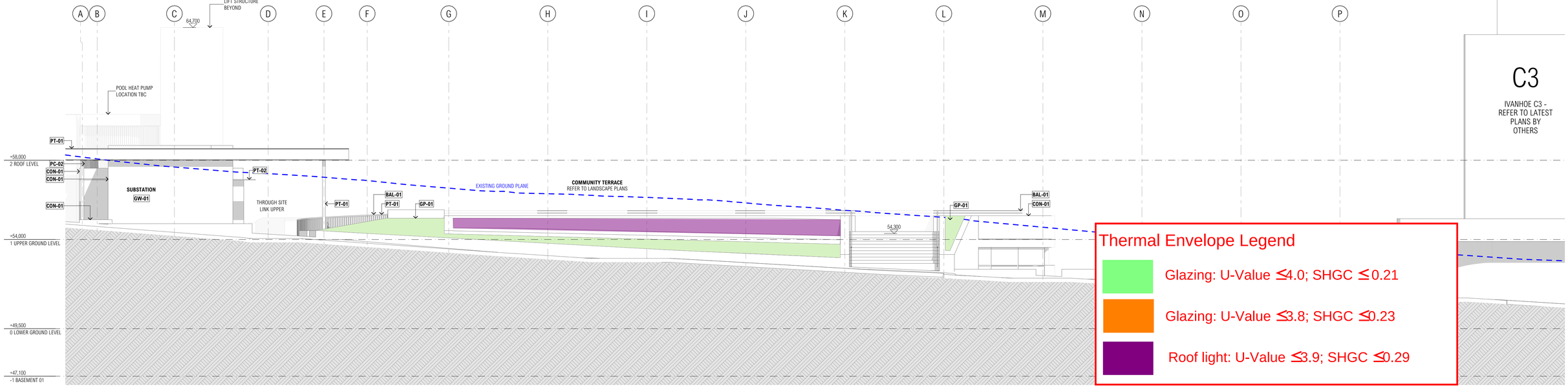
PROJECT
Ivanhoe Village Green & Community Centre
Ivanhoe Precinct - Midtown MacPark

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	31/05/2021	LH	HR	1:100	A1	

DRAWING TITLE
ELEVATIONS 1

DRAWING NUMBER	REVISION
A-A-201	05





C3

IVANHOE C3 - REFER TO LATEST PLANS BY OTHERS

Thermal Envelope Legend

- Glazing: U-Value ≤4.0; SHGC ≤0.21
- Glazing: U-Value ≤3.8; SHGC ≤0.23
- Roof light: U-Value ≤3.9; SHGC ≤0.29

BAL-01 STEEL BALUSTRADE
CON-01 IN SITU CONCRETE
CON-02 IN SITU CONCRETE - COLOURED
FL-01 PORPHYRY PAVING
GL-01 CLEAR GLASS
GP-01 GREEN PLANTER
GR-01 GREEN ROOF
GW-01 GREEN WALL

PC-01 POWDERCOATED ALUMINIUM - DULUX ELECTRO 'SILVER REIGN'
PC-02 POWDERCOATED ALUMINIUM - DULUX DURALLOY 'WILDERNESS'
PT-01 PAINTED STEEL - DULUX ELECTRO 'FLAT WHITE'
PT-02 PAINTED STEEL - DULUX DURALLOY 'WILDERNESS'
RE-01 RENDERED MASONRY WALL - CAMEO PINK
SC-01 TENSILE MESH
TB-01 TIMBER BENCH

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LANDSCAPE ARCHITECT
MCGREGOR COXALL

REV	DATE	ISSUE
01	14/05/2021	DRAFT DA ISSUE 1
02	21/05/2021	DRAFT DA ISSUE 2
03	31/05/2021	DRAFT DA ISSUE 3

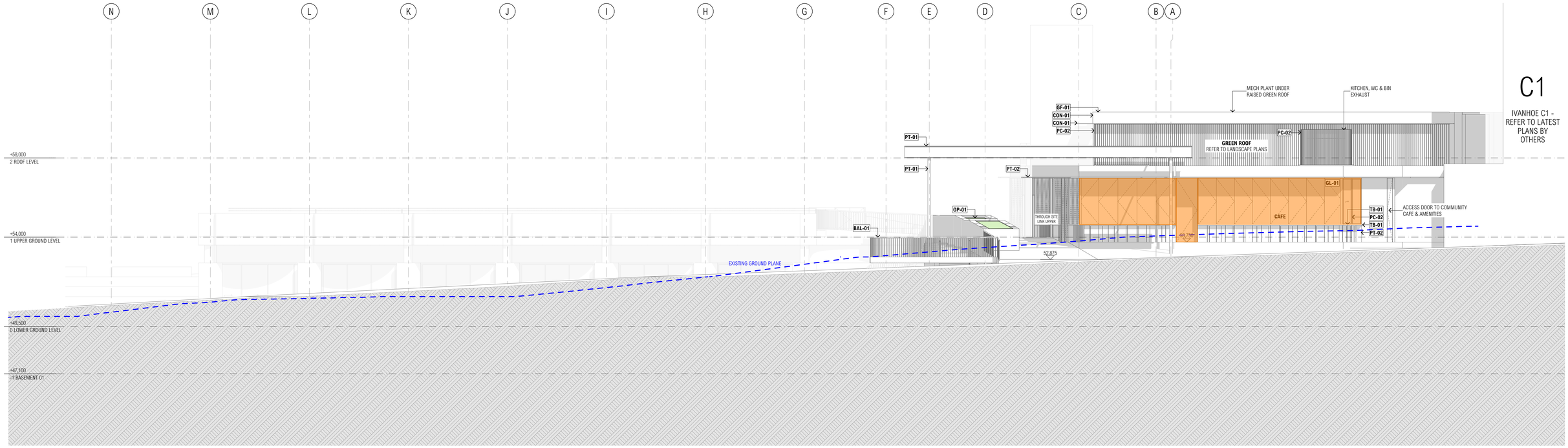
REV	DATE	ISSUE

PROJECT
Ivanhoe Village Green & Community Centre
Ivanhoe Precinct - Midtown MacPark

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	31/05/2021	LH	HR	1:100	A1	

DRAWING TITLE
ELEVATIONS 2

DRAWING NUMBER	REVISION
A-A-202	03



Thermal Envelope Legend

Glazing: U-Value ≤4.0; SHGC ≤0.21

Glazing: U-Value ≤3.8; SHGC ≤0.23

Roof light: U-Value ≤3.9; SHGC ≤0.29

BAL-01 STEEL BALUSTRADE
CON-01 IN SITU CONCRETE
CON-02 IN SITU CONCRETE - COLOURED
FL-01 PORPHYRY PAVING
GL-01 CLEAR GLASS
GP-01 GREEN PLANTER
GR-01 GREEN ROOF
GW-01 GREEN WALL
PC-01 POWDERCOATED ALUMINIUM - DULUX ELECTRO 'SILVER REIGN'
PC-02 POWDERCOATED ALUMINIUM - DULUX DURALLOY 'WILDERNESS'
PT-01 PAINTED STEEL - DULUX ELECTRO 'FLAT WHITE'
PT-02 PAINTED STEEL - DULUX DURALLOY 'WILDERNESS'
RE-01 RENDERED MASONRY WALL - CAMEO PINK
SC-01 TENSILE MESH
TB-01 TIMBER BENCH

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LANDSCAPE ARCHITECT
MCGREGOR COXALL

REV	DATE	ISSUE
01	14/05/2021	DRAFT DA ISSUE 1
02	21/05/2021	DRAFT DA ISSUE 2
03	31/05/2021	DRAFT DA ISSUE 3

PROJECT
Ivanhoe Village Green & Community Centre
Ivanhoe Precinct - Midtown MacPark

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	31/05/2021	LH	HR	1:100	A1	

DRAWING TITLE
ELEVATIONS 3

DRAWING NUMBER	REVISION
A-A-203	03

Appendix B: Façade Calculator Report

Façade

Report

Calculator

Project Summary

Date
29/06/2021

Name
0

Company
0

Position
0

Building Name / Address
0
0

Building State
NSW

Climate Zone
Climate Zone 5 - Warm temperate

Building Classification
Class 9b - public halls, function rooms or the like

Storeys Above Ground
0

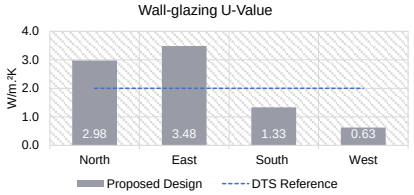
Tool Version
1.2 (June 2020)

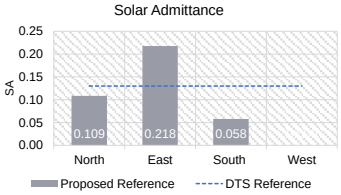
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

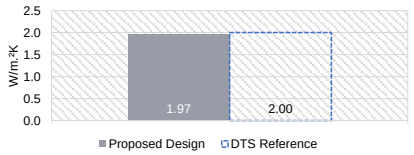
	Method 1 North	Method 1 East	Method 1 South	Method 1 West	Method 2 All
Wall-glazing U-Value (W/m².K)	2.98	3.48	1.33	0.63	1.97
Solar Admittance	0.11	0.22	0.06		
AC Energy V					146

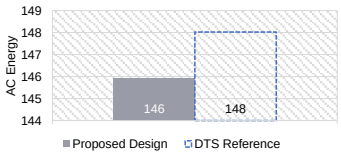
Method 1





Method 2





Project Details

	North	East	South	West
Glazing Area (m²)	150.224	169.933	63.254	0
Glazing to Façade Ratio	70%	85%	21%	0%
Glazing References	Pool North Lobby Curved Stair North	Gym Curved Stair East East Office Glazing East Office 2	Pool South Gym	
Glazing System Types	0	0	0	
Glass Types	0	0	0	
Frame Types	0	0	0	0
Average Glazing U-Value (W/m².K)	4.00	4.00	4.00	
Average Glazing SHGC	0.29	0.29	0.29	0.00
Shading Systems	Horizontal Device	Horizontal Device	Horizontal Device	Horizontal Device
Wall Area (m²)	65.33	30.62	238.99	240.47
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Alex's Wall	Alex's Wall	Alex's Wall	Alex's Wall
Wall Thickness	200	200	200	200
Average Wall R-value (m².K/W)	1.60	1.60	1.60	1.60
Solar Absorptance	0.65	0.65	0.65	0.65

Façade

Report

Calculator

Project Summary

Date
29/06/2021

Name
0

Company
0

Position
0

Building Name / Address
0
0

Building State
NSW

Climate Zone
Climate Zone 5 - Warm temperate

Building Classification
Class 9b - public halls, function rooms or the like

Storeys Above Ground
0

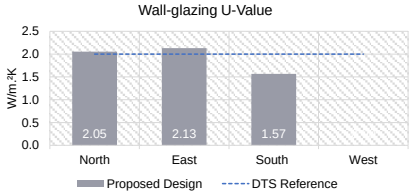
Tool Version
1.2 (June 2020)

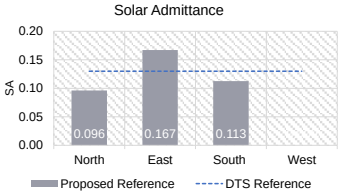
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

	Method 1				Method 2
	North	East	South	West	All
Wall-glazing U-Value (W/m².K)	2.05	2.13	1.57		1.97
Solar Admittance	0.10	0.17	0.11		
AC Energy V					106

Method 1





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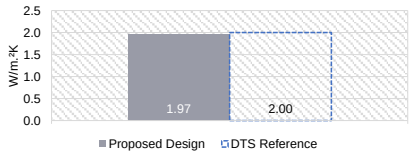
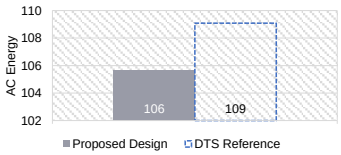




Project Details

	North	East	South	West
Glazing Area (m²)	150.224	169.933	63.254	
Glazing to Façade Ratio	85%	90%	56%	
Glazing References	Pool North Lobby Curved Stair North	Gym Curved Stair East East Office Glazing East Office 2	Pool South Gym	
Glazing System Types	0	0	0	
Glass Types	0	0	0	
Frame Types	0	0	0	0
Average Glazing U-Value (W/m².K)	2.30	2.30	2.30	
Average Glazing SHGC	0.21	0.21	0.21	0.00
Shading Systems	Horizontal Device	Horizontal Device	Horizontal Device	Horizontal Device
Wall Area (m²)	25.84	19.14	49.21	
Wall Types	Wall	Wall	Wall	
Methodology	Wall			
Wall Construction	Alex's Wall	Alex's Wall	Alex's Wall	Alex's Wall
Wall Thickness	200	200	200	
Average Wall R-value (m².K/W)	1.60	1.60	1.60	
Solar Absorptance	0.65	0.65	0.65	0.65

Façade

Report

Calculator

Project Summary

Date
29/06/2021

Name
0

Company
0

Position
0

Building Name / Address
0
0

Building State
NSW

Climate Zone
Climate Zone 5 - Warm temperate

Building Classification
Class 9b - public halls, function rooms or the like

Storeys Above Ground
0

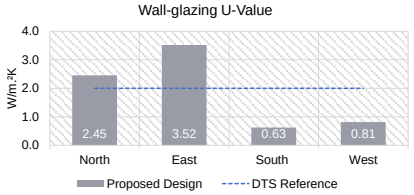
Tool Version
1.2 (June 2020)

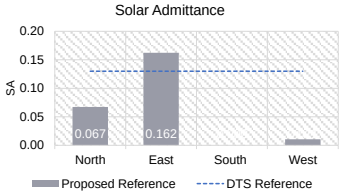
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

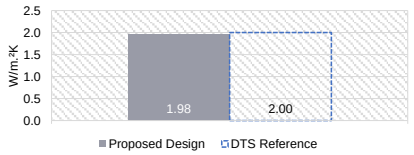
	Method 1 North	Method 1 East	Method 1 South	Method 1 West	Method 2 All
Wall-glazing U-Value (W/m².K)	2.45	3.52	0.63	0.81	1.98
Solar Admittance	0.07	0.16		0.01	
AC Energy V					47

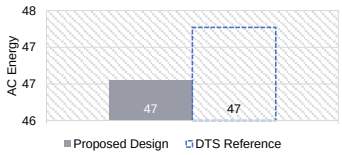
Method 1





Method 2





Project Details

	North	East	South	West
Glazing Area (m²)	33.143	123.0885	0	7.08
Glazing to Façade Ratio	58%	91%	0%	6%
Glazing References	Café 3 Café 4 Café 5	Community 2.1 Louvre 1 Louvre 2 Community 2.2 Community 2.3 Community 2.4 Community 1.1 Community 1.2 Community 1.3 Café 1 Café 2		Café 6
Glazing System Types	0	0		0
Glass Types	0	0		0
Frame Types	0	0		
Average Glazing U-Value (W/m².K)	3.80	3.80		3.80
Average Glazing SHGC	0.23	0.23	0.00	0.23
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	24.44	11.99	71.89	111.9
Wall Types	Wall	Wall	Wall	Wall
Methodology	Wall			
Wall Construction	Alex's Wall	Alex's Wall	Alex's Wall	Alex's Wall
Wall Thickness	200	200	200	200
Average Wall R-value (m².K/W)	1.60	1.60	1.60	1.60
Solar Absorptance	0.65	0.65	0.65	0.65

Façade

Report

Calculator

Project Summary

Date
29/06/2021

Name
0

Company
0

Position
0

Building Name / Address
0
0

Building State
NSW

Climate Zone
Climate Zone 5 - Warm temperate

Building Classification
Class 9b - public halls, function rooms or the like

Storeys Above Ground
0

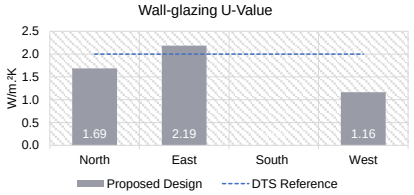
Tool Version
1.2 (June 2020)

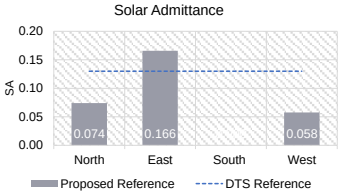
The summary below provides an overview of where compliance has been achieved for Specification J1.5a - Calculation of U-Value and solar admittance - Method 1 (Single Aspect) and Method 2 (Multiple Apects).

Compliant Solution =
Non-Compliant Solution =

	Method 1 North	Method 1 East	Method 1 South	Method 1 West	Method 2 All
Wall-glazing U-Value (W/m².K)	1.69	2.19		1.16	1.95
Solar Admittance	0.07	0.17		0.06	
AC Energy V					49

Method 1





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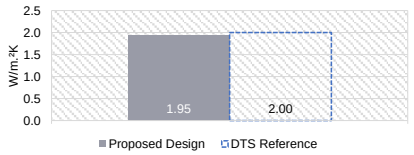
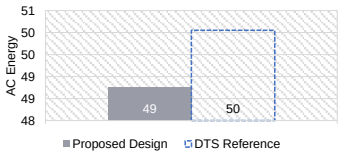
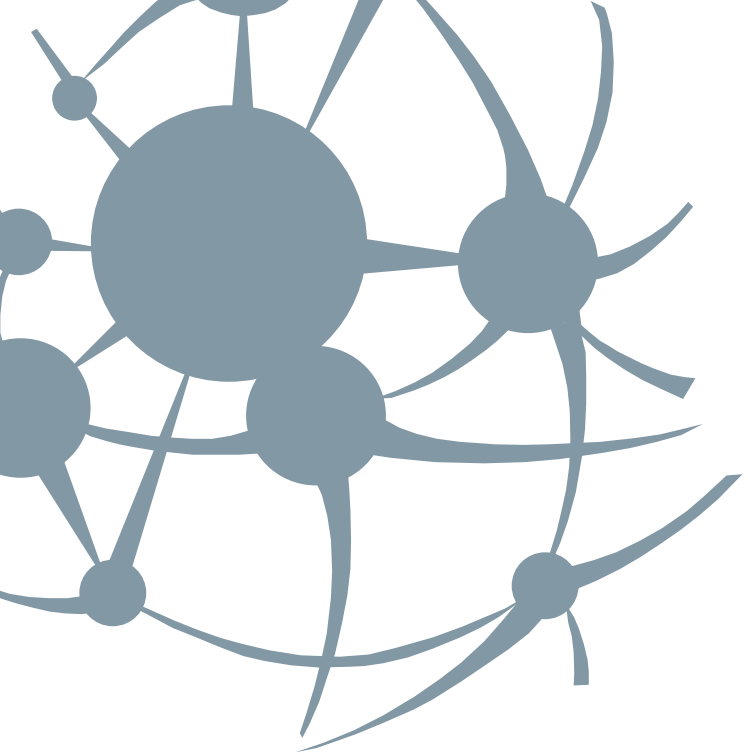




Project Details

	North	East	South	West
Glazing Area (m²)	33.143	123.0885		7.08
Glazing to Façade Ratio	63%	93%		32%
Glazing References	Café 3 Café 4 Café 5	Community 2.1 Louvre 1 Louvre 2 Community 2.2 Community 2.3 Community 2.4 Community 1.1 Community 1.2 Community 1.3 Café 1 Café 2		Café 6
Glazing System Types	0	0		0
Glass Types	0	0		0
Frame Types	0	0		
Average Glazing U-Value (W/m².K)	2.30	2.30		2.30
Average Glazing SHGC	0.23	0.23	0.00	0.23
Shading Systems	Horizontal	Horizontal	Horizontal	Horizontal
Wall Area (m²)	19.17	9.06		14.89
Wall Types	Wall	Wall		Wall
Methodology	Wall			
Wall Construction	Alex's Wall	Alex's Wall		
Wall Thickness	200	200		200
Average Wall R-value (m².K/W)	1.60	1.60		1.60
Solar Absorptance	0.65	0.65	0.65	0.65



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