City Plan Services P/L
30 075 223 353

CONSTRUCTION CERTIFICATE NO. 210791/1

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

APPLICANT

Name of person having benefit of the development consent:	**Daniel Leaf** **Frasers Property Ivanhoe JV2 Pty Ltd**
Address:	**Level 2 Building 1C, Homebush Bay Drive**
Contact Details:	**Phone: 0423 300 698**

DEVELOPMENT CONSENT

Consent Authority/Local Government Area:	**Ryde City Council**
Development Consent No:	**SSD 15822622 & SSD 15822622-Mod-1**
Date of Development Consent:	**28/11/2022 & 14/11/2023**

PROPOSAL

Address of Development:	**Building C3 - 1 Ivanhoe Estate Road, Macquarie Park NSW 2113**
Lot No & DP No:	**Lot 100 & DP1262209**
Building Code of Australia (BCA) Classification:	**Class 2, 6 & 7a**
Applicable version of the BCA:	**BCA 2019 Amdt 1**
Type of Construction:	**Type A**
Description of development:	**Stage 2 development application for the development 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 infrastructures and public domain areas.**
Scope of building works covered by this Certificate:	**Stage 1 - Shoring & Excavation associated with Building C3**
Value of Construction Certificate (Incl GST):	**$96,380,228.00 (Total cost of Building C)**
Plans and Specifications approved:	**Schedule 1**
Fire Safety Schedule:	**N/A**
Critical Stage Inspections:	**See attached Notice**
Exclusions:	**Remainder of works**
Conditions (as per Sections 111 & 115-117 of the *Environmental Planning & Assessment (Development Certification & Fire Safety) Regulation 2021*):	**Nil**

PROJECT BUILDING SURVEYOR	Please contact **Safwat Abdelfattah** for any inquiries
CERTIFIER	**Chris Michaels** for and on behalf of **City Plan Services Pty Ltd**
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** **February** **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

1. Endorsed Architectural plans

Plan Title	Prepared By	Drawing No / Ref	Revision	Date
Cover Sheet	Team 2 Architects	A-0000	E	07/02/24
Grids Setout	Team 2 Architects	A-0010	E	07/02/24
Survey Plan	Team 2 Architects	A-0011	E	07/02/24
Bulk Excavation Plan	Team 2 Architects	A-0020	E	07/02/24
Shoring Elevations 1	Team 2 Architects	A-0040	E	07/02/24
Shoring Elevations 2	Team 2 Architects	A-0041	E	07/02/24

2. Endorsed Structural plans

Plan Title	Prepared By	Drawing No / Ref	Revision	Date
Notes Sheet	Structural Civil Traffic Façade	S0001	AA	06/02/24
Shoring & Footing Plan	Structural Civil Traffic Façade	S1001	AA	06/02/24
Shoring Wall - Elevations - Sheet 1	Structural Civil Traffic Façade	S1011	AA	06/02/24
Shoring Wall Elevations – Sheet 2	Structural Civil Traffic Façade	S1012	AA	06/02/24
Shoring Wall Elevations – Sheet 3	Structural Civil Traffic Façade	S1016	AA	06/02/24
Shoring Details – Sheet 1	Structural Civil Traffic Façade	S1031	AA	06/02/24

3. Other documents relied upon

Title	Prepared By	Reference	Date
CC Application Form	Daniel Leaf - Frasers Property Ivanhoe Pty Limited	CFT-412566	19/02/24
Design Compliance Declaration - Architectural	Team 2 Architects	1	14/02/24
Design Certificate - Structure Engineer	Structural Civil Traffic Facade	1	09/02/24
Geotechnical Report	Douglas Partners	1	11/06/21
Geotechnical Shoring Design Report	Douglas Partners	R.005.Rev 0	16/01/24
Geotechnical Monitoring Plan	Douglas Partners	R.004.Rev 0	12/01/24
Design Compliance Declaration - Structural	Kevin Peter Berry - TTW (NSW) Pty Ltd	DEP10001336	19/02/24
Design Consistent Statement	Team 2 Architects	-	14/02/24
DA Condition A9 & B10.1 - LSL Receipt	Long Service Corporation	L0000133464	17/11/23

Title	Prepared By	Reference	Date
DA Condition A13 - Design Integrity Statement	Studio Johnston	-	-
DA Condition B2 & B3 - Notification to Dept of Planning	Frasers Property	-	-
DA Condition B5 - Compliance Statement	Frasers Property	AustResi-GCOR-006395	-
DA Condition B6 - Pre-Constructions Compliance Report - Ivanhoe Building C3	Parkview	153 – SSD 15822622 Rev B	06/02/24
DA Condition B11 & B12 - Community Consultation Strategy	Frasers Property	Rev 2	07/11/23
DA Condition B14 - Community Consultation Strategy Post Approval Lodgement Form	NSW Government	-	-
DA Condition B14 - Evidence of Submission	Major Projects Planning	-	19/12/23
DA Condition B18 - Pre-Construction Dilap Report	AusDilaps	-	16/11/23
DA Condition B18 - Evidence of Submission of Dilap Report to Council	Mohamed Yaccoub	-	18/01/24
DA Condition B31 - Aboriginal Cultural Heritage Assessment	Urbis	-	06/08/21
DA Condition B35, B38, B39 & B40 - Councils Response to Management Plans	Justine Byrne	-	05/02/24
DA Condition B35, B38, B39 & B40 - Integrated Project Management Plan	Chalouhi	Rev 1	18/01/24
DA Condition B36 - Construction Traffic and Pedestrian Management	Traffix	v03	21/12/23
DA Condition B37 - Construction Noise and Vibration Management Plan	Olivia Moussa	0	08/12/23
DA Condition B41 - Geotechnical Engineer Excavation Impact Certificate	Douglas Partners	R.006.Rev0	22/02/24
DA Condition B44 - Utilities Services	Parkview	AustResi-GCOR-005800	-
DA Condition B49 - Section 73 Application	Sydney Water	-	-
DA Condition B49	Sydney Water	SW-02275959	21/02/24

Title	Prepared By	Reference	Date
- Section 73 Payment Receipt			
DA Condition B67 - Water Access Licence - Title Search	Certificate of Title	WAL44843	21/06/23
DA Condition B79 - Flood & Overflow Protection Letter	ADW Johnson	BMY/LF 300001 (C3)	06/12/23
DA Condition B79 - BMT Report	BMT	L.A11141.002. MidtownStg2_FIA.docx	30/06/21
DA Condition C14 - Site Notice	Parkview	-	-
DA Condition C14 - Site Notice 2	Parkview	-	-
DA Condition C19 - Hoarding	-	-	-
DA Condition C22 - Aboriginal Cultural Heritage Assessment	Urbis	-	06/08/23
DA Condition C32 - Sediment Control	-	-	-
DA Condition C36 - Geotechnical Monitoring	Douglas Partners	86043.23 R.004 Rev 0	12/01/24
DA Condition C36 - Report on Groundwater Quality for Dwatering	Douglas Partners	86043.23 R.008 Rev 0	21/02/24
Post Approval Form	Major Projects Planning	-	15/02/24

REGULATED DESIGN RECORD			
Project Address: 1 Ivanhoe Place, Macquarie Park NSW			
Project Title: C3 Midtown Treehouse			
Consent No: SSD-15822622-Mod-1		Body Corporate Reg No: DEP0000612	
Drawing Title: Cover Sheet			Drawing No: A-0000

Rev	Date	Description	DP Full Name - Reg No

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DRAWING STATUS:

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C	CC1 PRELIMINARY	240122
D	CC1 DRAF FOR REVIEW	240130
E	CC1 ISSUE FOR APPROVAL	240207

FRASERS PROPERTY

City Plan Services Pty Ltd
Reference: 210791/1
Date: 23/02/2024
Construction Certificate
Phillip Marshall
Director
BDC1974

PARKVIEW

Client
FRASERS PROPERTY
1 Homebush Bay Drive
Rhodes NSW, 2138

Builder
PARKVIEW
Level 7, 60 Union Street
Pyrmont NSW 2009

Title:
Cover Sheet

Project #:	Scale:	Drw:	Ckd:
1199	@A1	CH	RW

Drawing #: A-0000 Rev: E

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Reg NSW: 9940
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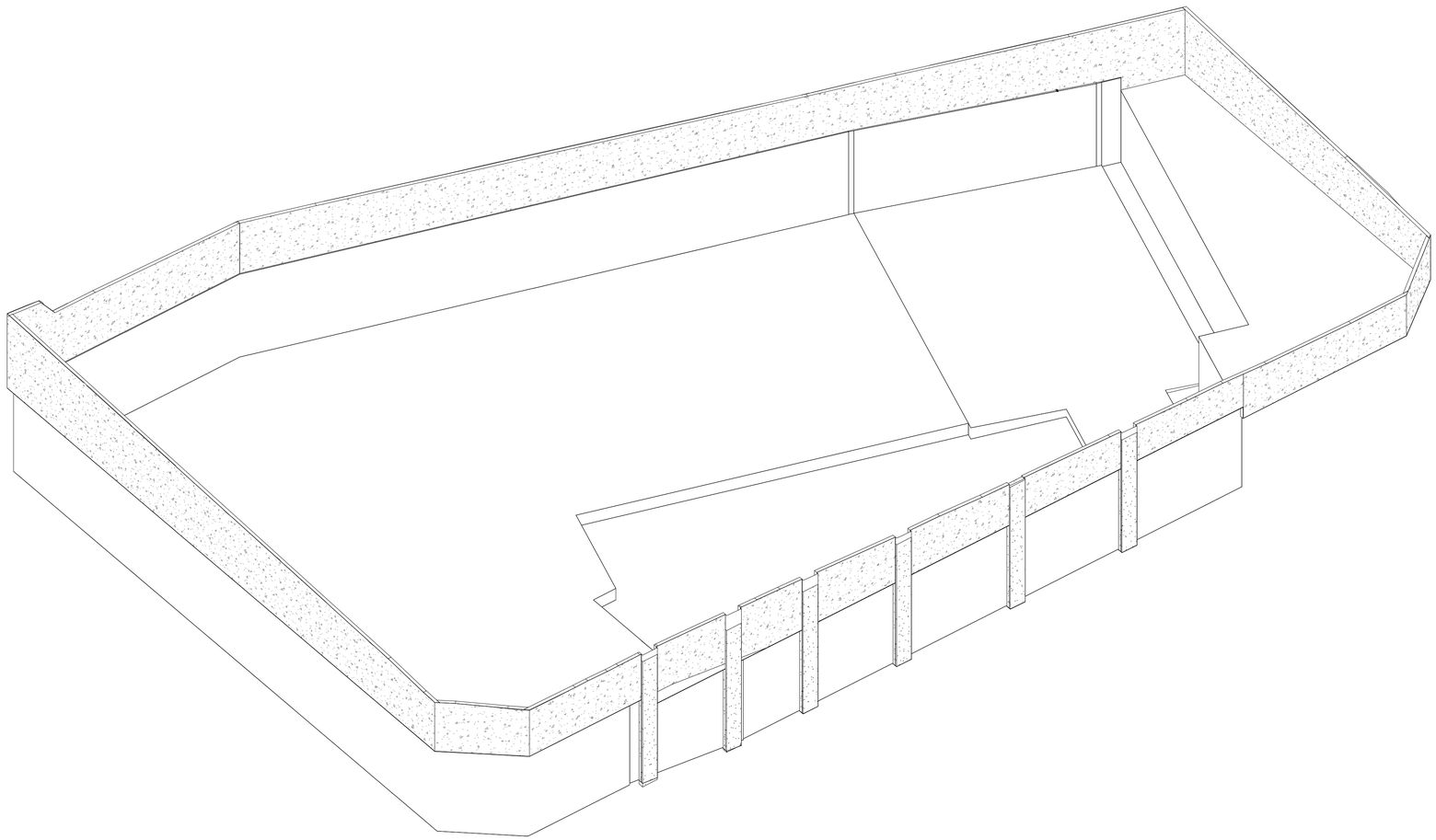
204/9-11 Claremont St,
South Yarra VIC 3141
T: +61 3 8849 9137
Reg Vic: 19340

Project:
C3 Midtown Treehouse
1 Ivanhoe Place, Macquarie Park NSW

SHEETS LIST CC1			
SHEETS		REVISIONS	
NB	NAME	NB	DATE
CC1			
0000 - General			
A-0000	Cover Sheet	E	240207
A-0010	Grids Setout	E	240207
A-0011	Survey Plan	E	240207
A-0020	Bulk Excavation Plan	E	240207
A-0040	Shoring Elevations 1	E	240207
A-0041	Shoring Elevations 2	E	240207

C3 MIDTOWN TREEHOUSE MACQUARIE PARK

CC1 ARCHITECTURAL PARCKAGE 07/02/2024



GENERAL ARCHITECTURAL NOTES

GENERAL:
THESE ARCHITECTURAL DRAWINGS TOGETHER WITH THE ARCHITECTURAL SPECIFICATION AND SCHEDULES SHOW THE INTENT, SCOPE AND PERFORMANCE REQUIREMENTS FOR THE PROJECT. REFER ALSO TO THE STRUCTURAL, CIVIL, MECHANICAL, ELECTRICAL, HYDRAULIC, LANDSCAPE AND OTHER SPECIALIST CONSULTANTS' DRAWINGS, SPECIFICATIONS, SCHEDULES AND REPORTS FOR THE INTENT, SCOPE AND PERFORMANCE REQUIREMENTS OF THESE RESPECTIVE DISCIPLINES.
THE HEAD CONTRACTOR AND ALL SUB-CONTRACTORS ARE TO ALLOW FOR AND PROVIDE ALL MATERIALS, LABOUR AND ACCESSORIES NECESSARY TO COMPLETE THE WORKS TO THE INTENT, SCOPE AND PERFORMANCE SHOWN AND SPECIFIED FOR THE PROJECT. NO VARIATIONS WILL BE CONSIDERED FOR THE PROJECT UNLESS IT IS A CLEAR CHANGE TO THE INTENT AND SCOPE OF THE WORKS INITIATED IN WRITING BY THE SUPERINTENDENT.

DOCUMENTS:
THE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS ARE TO BE READ IN CONJUNCTION WITH ALL THE CONTRACT DOCUMENTS. SEEK CLARIFICATION FROM THE SUPERINTENDENT BEFORE PROCEEDING WITH THE WORK SHOULD ANY DISCREPANCY OR AMBIGUITY BE FOUND IN THE CONTRACT DOCUMENTS
THESE DOCUMENTS HAVE NOT BEEN PRODUCED FOR THE INTENTION OF LETTING OF TRADE PACKAGES AND MUST BE READ AS A COHESIVE SET.

AUTHORITIES:
ALL NEW BUILDING WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE PROVISIONS OF THE BUILDING CODE OF AUSTRALIA (BCA) AND IN ACCORDANCE WITH CLAUSE 98 OF THE ENVIRONMENTAL PLANNING & ASSESSMENT REGULATION 2000.

TERMITE PROTECTION:
THE BUILDING IS TO BE PROTECTED IN ACCORDANCE WITH BCA PART B1.4(i) AND AS 3660: TERMITE MANAGEMENT.

SETTING OUT:
ALL SET OUT DIMENSIONS & LEVELS ARE TO BE CHECKED BY A LICENSED SURVEYOR ON SITE AND ALL OVERALL AND CRITICAL DIMENSIONS ARE TO BE SET OUT FOR SUPERINTENDENT APPROVAL PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION.
THE CONTRACTOR IS TO CHECK AND VERIFY ALL SETOUT, DIMENSIONS & LEVELS ON SITE PRIOR TO THE COMMENCEMENT OF ANY RELEVANT PART OF THE WORKS.
THE LICENSED SURVEYOR IS TO ESTABLISH THE EXACT POSITION OF ALL SET BACKS AND PROPERTY BOUNDARIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION OR EXCAVATION.
BUILDING SETBACKS ARE TO BE SET OUT FROM THE BOUNDARY TO THE FINISHED EXTERNAL FACE OF EXTERNAL WALLS.
NO PART OF THE BUILDING IS TO BE BUILT OVER A SPECIFIED SET-BACK LINE, EASEMENT OR PROPERTY BOUNDARY EXCEPT WHERE SPECIFICALLY SHOWN ON THE DRAWINGS.
REPORT ANY DISCREPANCIES IN THE BUILDING SETOUT TO THE SUPERINTENDENT IMMEDIATELY.
THE RL'S OF PROPOSED PAVING AND OTHER GROUND FINISHES ARE INDICATIVE ONLY. REFER TO THE CIVIL/STRUCTURAL/HYDRAULIC-ENGINEER/LANDSCAPE ARCHITECT'S DRAWINGS FOR ALL PAVING, HARDSTAND & LANDSCAPE RLS, GRADIENTS AND FALLS.

REFERENCE LEVELS:
ALL LEVELS AND RLS INDICATED RELATE TO THE AUSTRALIAN HEIGHT DATUM (AHD).
A BENCHMARK IS TO BE ESTABLISHED ADJACENT TO THE SITE TO AUSTRALIAN HEIGHT DATUM TO ENABLE COMPARISON TO THE FLOOD STANDARD.
ALL LEVELS ARE TO BE CERTIFIED BY A REGISTERED SURVEYOR PRIOR TO POURING OF FLOOR SLABS OR INSTALLATION OF FLOORING.

ABORIGINAL:
SHOULD ANY ABORIGINAL ARTEFACTS (RELICS) BE UNCOVERED DURING EARTHWORKS, WORKS SHOULD CEASE AND THE NSW OFFICE OF ENVIRONMENT AND HERITAGE (OEH) AND THE METROPOLITAN LOCAL ABORIGINAL LAND COUNCIL SHALL BE CONTACTED.

CERTIFICATES & WARRANTIES:
PRIOR TO PRACTICAL COMPLETION THE RELEVANT SUBCONTRACTOR MUST PROVIDE CERTIFICATION THAT THE WORKS HAVE BEEN DESIGNED, SELECTED AND INSTALLED IN ACCORDANCE WITH THE BCA, RELEVANT AUSTRALIAN STANDARDS AND ANY MANUFACTURER'S RECOMMENDATIONS.
PRIOR TO PRACTICAL COMPLETION THE RELEVANT SUBCONTRACTOR MUST PROVIDE COPIES OF ALL

GRIDS NOTES

GRIDS SET IN RELATION TO SITE BOUNDARIES, AS PER SURVEY "220337.9054.C2 PLOT DETAIL" RECEIVED 14/11/2023 AND "MACQUARIE PARK IVANHOE C3 - EXTRA LEVELS" RECEIVED 01/02/2024

DEMOLITION NOTES
1. ALL EXISTING LEVELS TO BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
2. ALL WORKS SHALL BE CARRIED OUT IN ACCORDANCE WITH THE NOMINATED OR APPLICABLE COUNCIL SPECIFICATION. WHERE A SPECIFICATION HAS NOT BEEN NOMINATED THEN THE CURRENT NSW DEPARTMENT OF HOUSING CONSTRUCTION SPECIFICATION IS TO BE USED. THE NOMINATED SPECIFICATION SHALL TAKE PRECEDENCE TO THESE NOTES.
3. ALL DRAWINGS SHALL BE READ WITH THE RELEVANT ARCHITECTURAL DRAWINGS AND DRAWINGS FROM OTHER CONSULTANTS.
4. THE CONTRACTOR SHOULD REPORT ANY DISCREPANCIES ON THE DRAWINGS TO THE ENGINEER RESPONSIBLE FOR THE DESIGN.
5. THE CONTRACTOR SHOULD LOCATE AND LEVEL ALL EXISTING SERVICES PRIOR TO COMMENCING CONSTRUCTION AND PROJECT, AND MAKE ARRANGEMENT WITH THE RELEVANT AUTHORITIES TO RELOCATE AND/OR ADJUST IF NECESSARY. INFORMATION GIVEN ON THE DRAWINGS IN RESPECT TO SERVICES IS FOR GUIDANCE ONLY.
6. THE CONTRACTOR IS NOT TO ENTER UPON NOR DO ANY WORK WITHIN ADJACENT LANDS WITHOUT THE PERMISSION OF THE OWNER.
7. SURPLUS EXCAVATED MATERIAL SHALL BE PLACED WHERE DIRECTED OR REMOVED FROM SITE.
8. ALL NEW WORKS SHALL MAKE A SMOOTH JUNCTION WITH EXISTING.
9. ALL DRAINAGE LINES THROUGH ADJACENT LOTS SHALL BE CONTAINED WITHIN EASEMENTS CONFIRMING TO COUNCIL'S STANDARDS.
10. THE CONTRACTOR SHALL CLEAR THE SITE BY REMOVING ALL RUBBISH, FENCES AND DEBRIS ETC. TO THE EXTENT SPECIFIED
11. PRIOR TO THE COMMENCEMENT OF WORK, THE CONTRACTOR SHALL PROVIDE A TRAFFIC MANAGEMENT PLAN PREPARED BY AN ACCREDITED PERSON IN ACCORDANCE WITH RMS REQUIREMENT, FOR ANY WORK ON OR ADJACENT TO PUBLIC ROADS, PLAN TO BE SUBMITTED TO COUNCIL & RMS
12. ASBESTOS - CONTRACTOR TO ALLOW FOR COMPLETE DEMOLITION & REMOVAL OF ALL ASBESTOS PRODUCTS. ALL ASBESTOS PRODUCTS TO BE REMOVED & HANDLED AS PER RELEVANT AUSTRALIAN STANDARDS.
13. NOISE SHALL BE MINIMISED AS FAR AS PRACTICABLE, BY THE SELECTION OF APPROPRIATE METHODS AND EQUIPMENT, AND BY THE USE OF SILENCING DEVICES WHEREVER PRACTICABLE TO EPA/CODE REQUIREMENTS.

EXCAVATION NOTES

1. DRAWINGS ARE TO BE READ IN CONJUNCTION WITH OTHER RELEVANT CONSULTANTS' DOCUMENTATION IN LATEST REVISION

2. DIMENSIONS SHOWN TO EDGES OF EXCAVATION OR INTERNAL FACE OF SHORING WALLS UNLESS STATED OTHERWISE

ABBREVIATIONS

B.E.L.	BULK EXCAVATION LEVEL
CL	CENTRELINE
EXI	EXISTING CONDITION, TO BE VERIFIED ON SITE
RL	REDUCED LEVEL
SP	SETOUT POINT
SSL	STRUCTURE SLAB LEVEL
TBC	TO BE CONFIRMED
NGL	NATURAL GROUND LEVEL

7/02/2024 5:39:54 PM

REGULATED DESIGN RECORD

Project Address: 1 Ivanhoe Place, Macquarie Park NSW

Project Title: C3 Midtown Treehouse

Consent No: SSD-15822622-Mod-1 | Body Corporate Reg No: DEP0000612

Drawing Title: Grids Setout | Drawing No: A-0010

Rev	Date	Description	DP Full Name - Reg No

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Rev	Revision Description	Date
A	INTERNAL CHECK	N/A
B	GRIDS SETOUT	231219
C	CC1 PRELIMINARY	240122
D	CC1 DRAF FOR REVIEW	240130
E	CC1 ISSUE FOR APPROVAL	240207

FRASERS PROPERTY

City Plan Services Pty Ltd
Reference: 210791/1
Date: 23/02/2024
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Level 7, 60 Union Street
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0 1 2 3 4 5
SCALE 1:100

Title: Grids Setout

Project #:	Scale:	Drw:	Ckd:
1199	1 : 100 @A1	CH	RW

Drawing #: A-0010 | Rev: E

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Reg Vic: 19340

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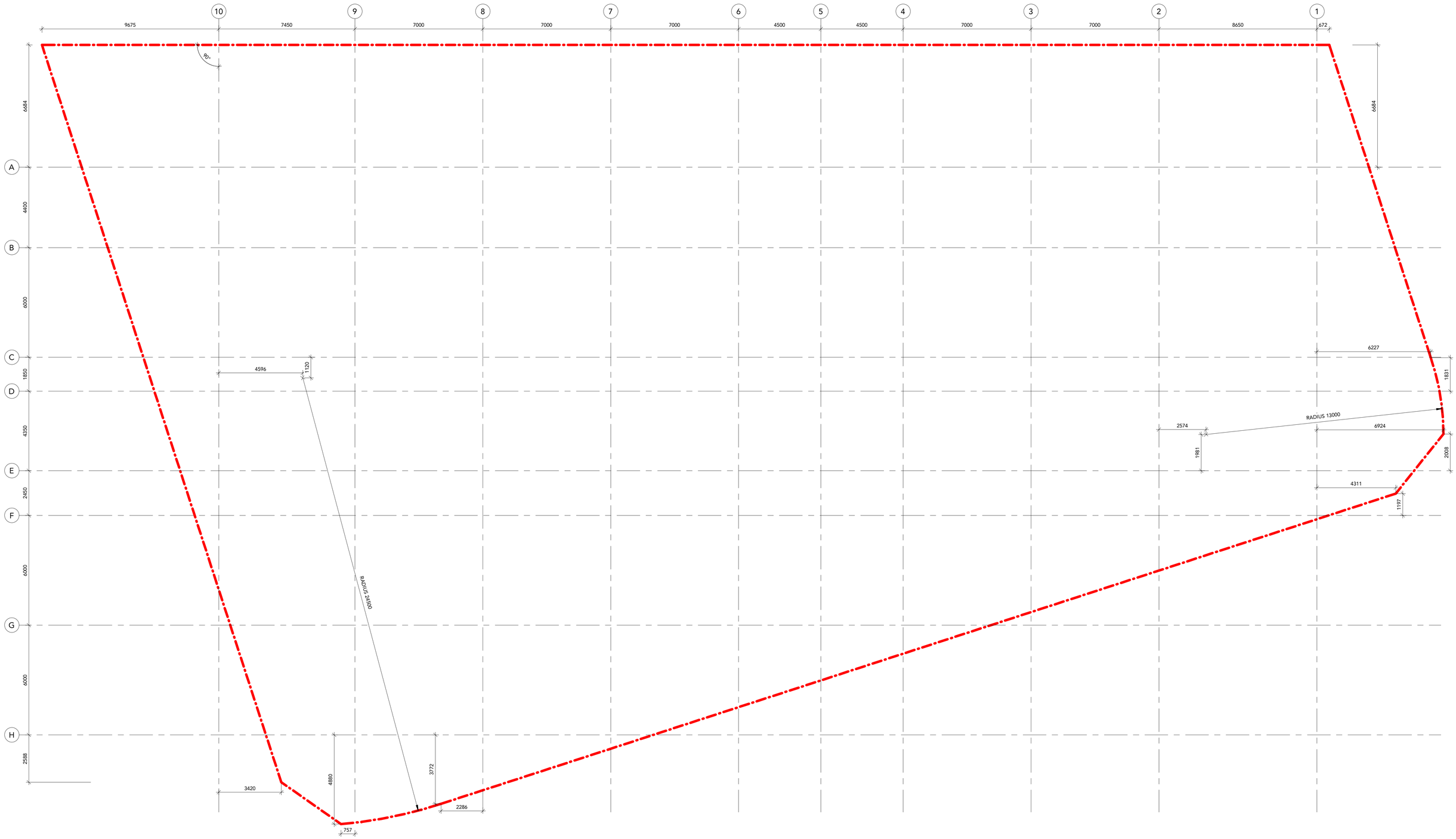
1 Ivanhoe Place, Macquarie Park
NSW



1 Grids Setout
Scale: 1 : 100

REGULATED DESIGN RECORD

Project Address: 1 Ivanhoe Place, Macquarie Park NSW

Project Title: C3 Midtown Treehouse

Consent No: SSD-15822622-Mod-1 | Body Corporate Reg No: DEP0000612

Drawing Title: Survey Plan | Drawing No: A-0011

Rev	Date	Description	DP Full Name - Reg No

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SCALE 1:100

Title: Survey Plan

Project #:	Scale:	Drw:	Ckd:
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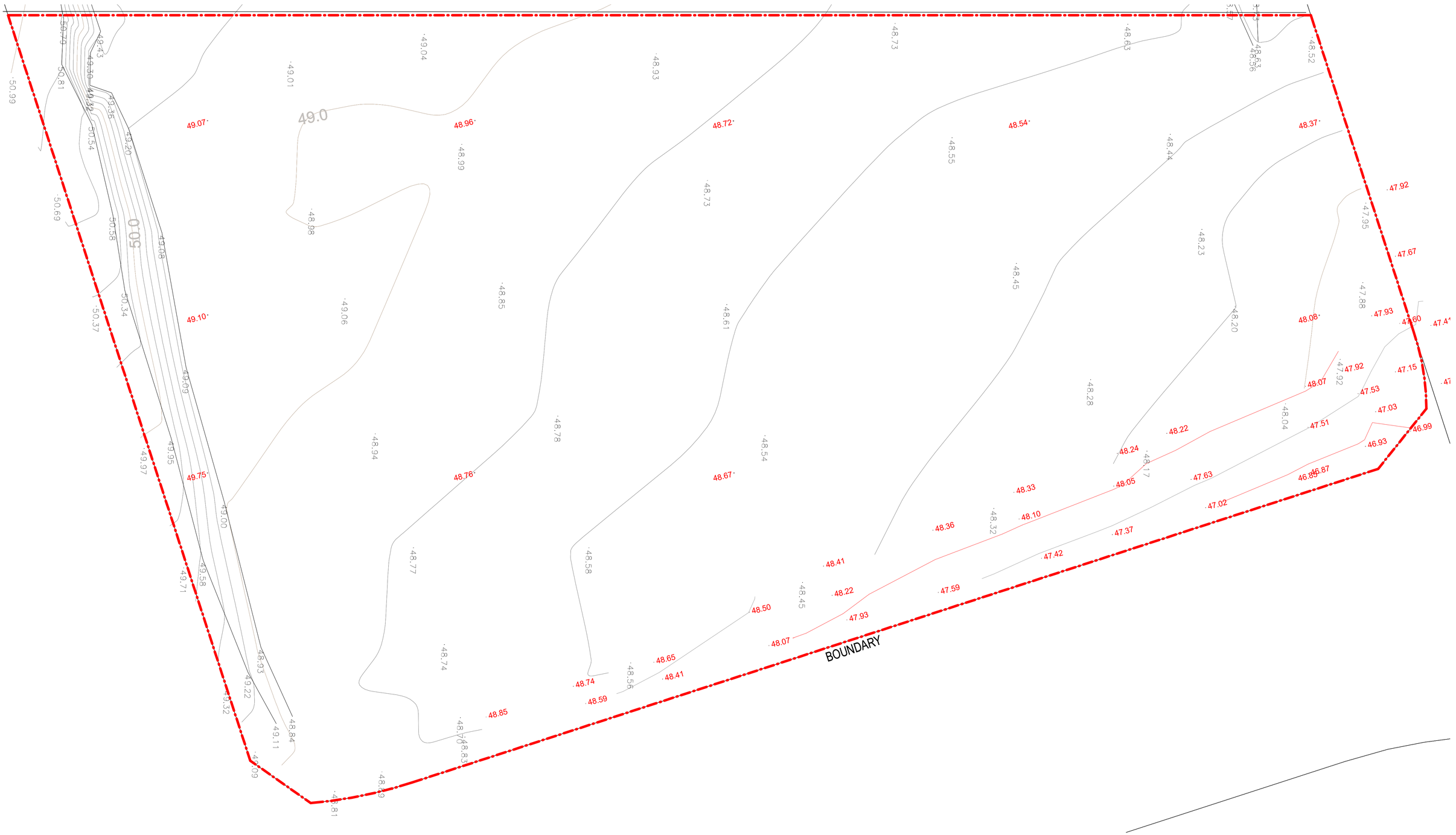
1 Ivanhoe Place, Macquarie Park NSW



1 Survey Plan
Scale: 1 : 100

REGULATED DESIGN RECORD

Project Address: 1 Ivanhoe Place, Macquarie Park NSW

Project Title: C3 Midtown Treehouse

Consent No: SSD-15822622-Mod-1 | Body Corporate Reg No: DEP0000612

Drawing Title: Bulk Excavation Plan | Drawing No: A-0020

Rev	Date	Description	DP Full Name - Reg No

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Chris Mihalas
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Rhodes NSW, 2138

Builder
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Level 7, 60 Union Street
Pyrmont NSW 2009

SCALE 1:100

Title: Bulk Excavation Plan

Project #:	Scale:	Drw:	Ckd:
1199	1 : 100 @A1	CH	RW

Drawing #: A-0020 | Rev: E

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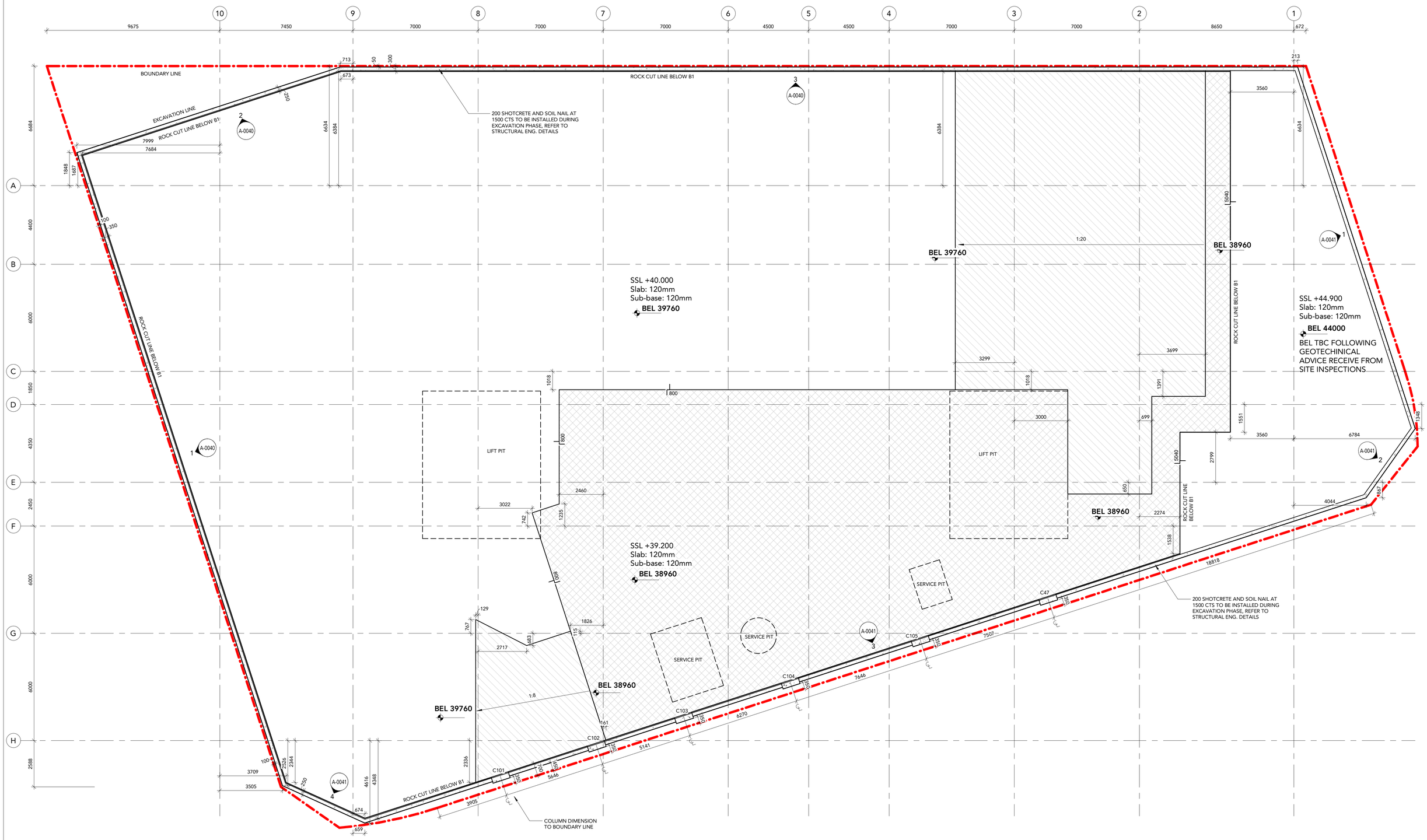
Reg Vic: 19340

Project:
C3 Midtown Treehouse
1 Ivanhoe Place, Macquarie Park
NSW



1 Bulk Excavation Plan
Scale: 1 : 100

REGULATED DESIGN RECORD

Project Address: 1 Ivanhoe Place, Macquarie Park NSW

Project Title: C3 Midtown Treehouse

Consent No: SSD-15822622-Mod-1 | Body Corporate Reg No: DEP0000612

Drawing Title: Shoring Elevations 1 | Drawing No: A-0040

Rev	Date	Description	DP Full Name - Reg No

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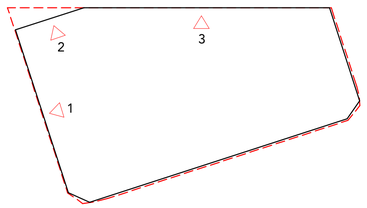
5. Clouds reflect changes since previous revision; reversed clouds reflect area or item on hold/pending input or confirmation.

KEY PLAN



DRAWING STATUS:

PRELIMINARY

Rev	Revision Description	Date
A	INTERNAL CHECK	N/A
B	GRIDS SETOUT	231219
C	CC1 PRELIMINARY	240122
D	CC1 DRAF FOR REVIEW	240130
E	CC1 ISSUE FOR APPROVAL	240207

FRASERS PROPERTY

City Plan Services Pty Ltd
Reference: 210791/1
Date: 23/02/2024
Construction Certificate
Chris Mihalas
Director
BDC1974

PARKVIEW

Client
FRASERS PROPERTY
1 Homebush Bay Drive
Rhodes NSW, 2138

Builder
PARKVIEW
Level 7, 60 Union Street
Pyrmont NSW 2009

0 1 2 3 4 5
SCALE 1:100

Title: Shoring Elevations 1

Project #:	Scale:	Drw:	Ckd:
1199	1 : 100 @A1	CH	RW

Drawing #: A-0040 | Rev: E

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Project:
C3 Midtown Treehouse
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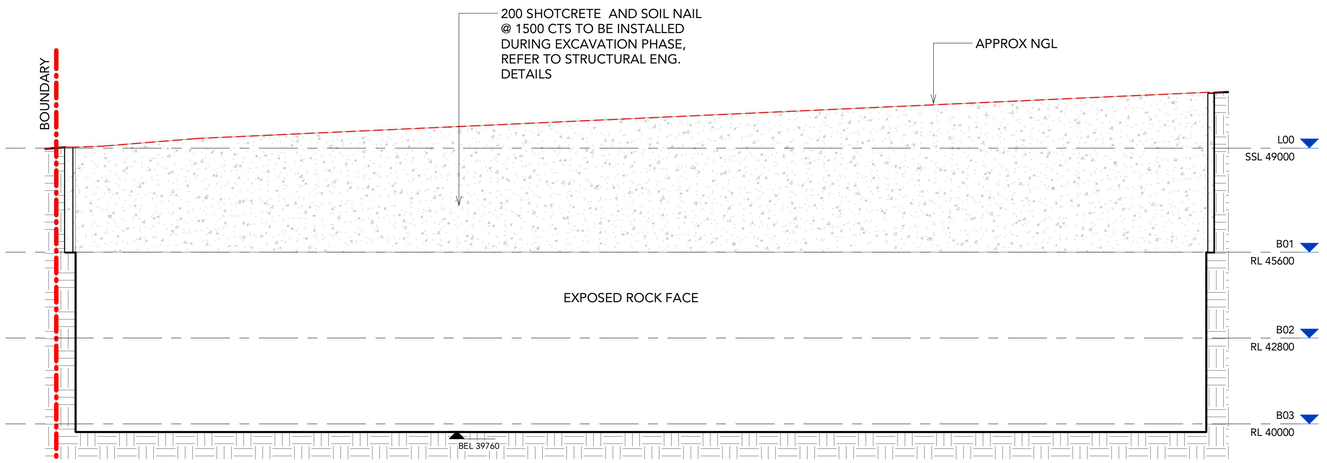
NSW

NOTE:
DUE TO SECTION CUT, BOUNDARY
IS NOT ALWAYS PERPENDICULAR TO
SECTION PLAN



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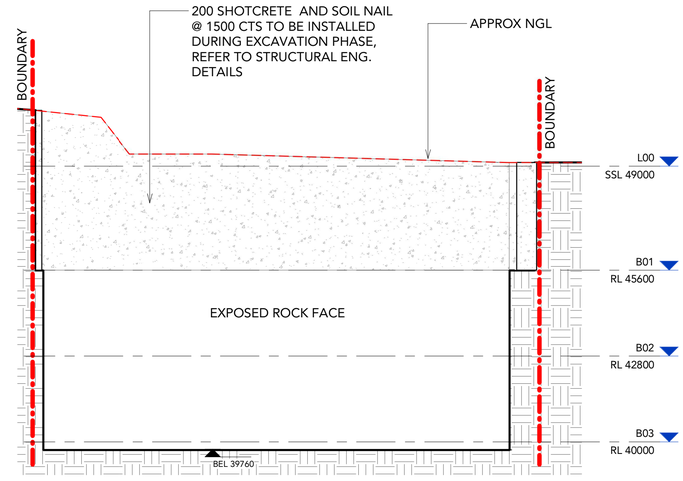
Scale: 1 : 100



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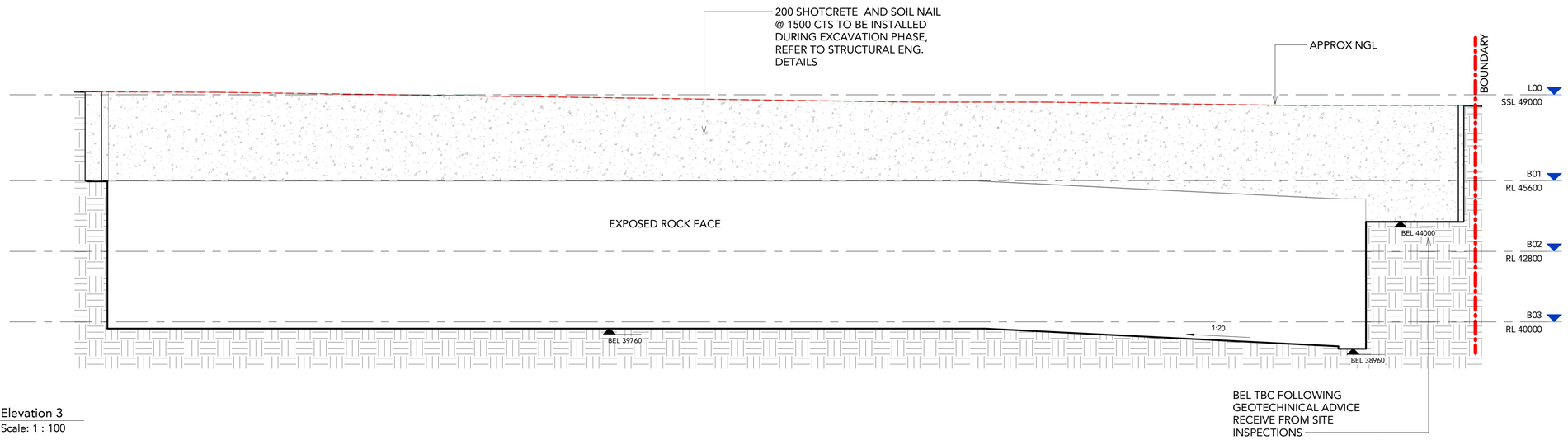

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Scale: 1 : 100

REGULATED DESIGN RECORD

Project Address:	1 Ivanhoe Place, Macquarie Park NSW
Project Title:	C3 Midtown Treehouse
Consent No:	SSD-15822622-Mod-1
Body Corporate Reg No:	DEP0000612
Drawing Title:	Shoring Elevations 2
Drawing No:	A-0041

Rev	Date	Description	DP Full Name - Reg No

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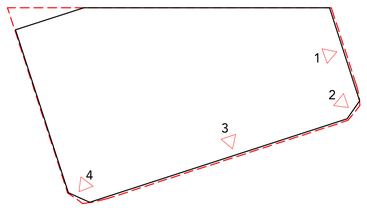

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B	GRIDS SETOUT	231219
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FRASERS PROPERTY

City Plan Services Pty Ltd
Reference: 210791/1
Date: 23/02/2024
Construction Certificate
Phillip Mahar
Director
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PARKVIEW

Client
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Rhodes NSW, 2138

Builder
PARKVIEW
Level 7, 60 Union Street
Pyrmont NSW 2009

0 1 2 3 4 5
SCALE 1:100

Title:
Shoring Elevations 2

Project #:	Scale:	Drw:	Chd:
1199	1 : 100 @A1	CH	RW

Drawing #: A-0041 Rev: E

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Project:
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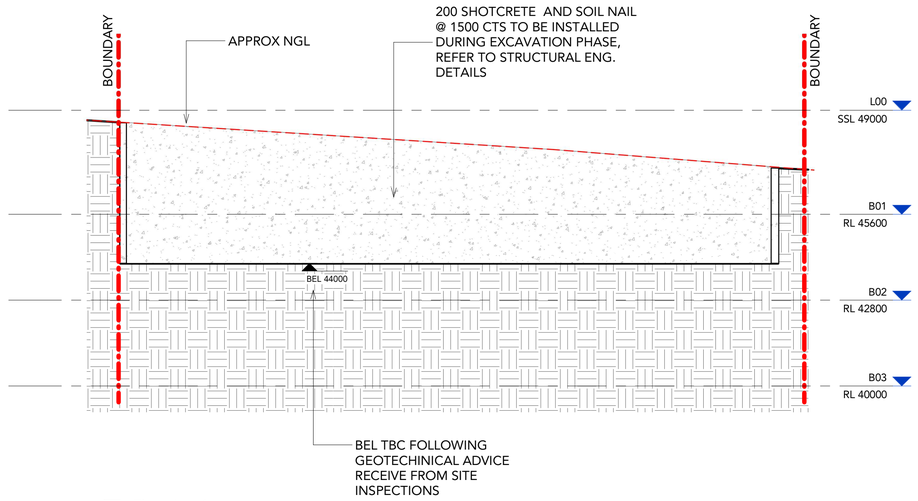

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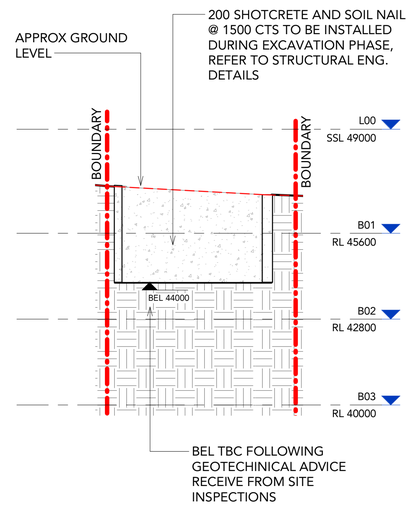

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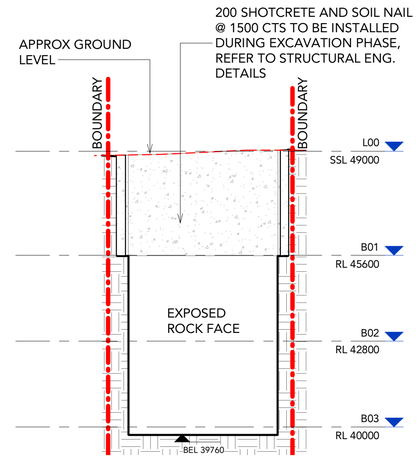
Scale: 1 : 100



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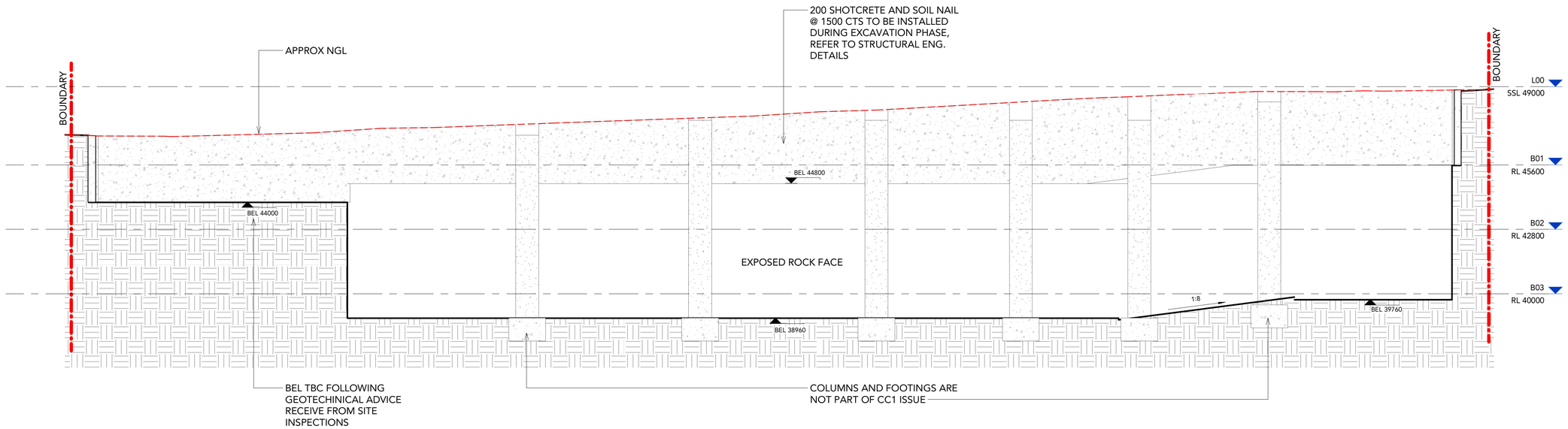

3 Elevation 6
Scale: 1 : 100

Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: NOTES SHEET		**Drawing Number:** S-S0001		

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

IVANHOE STAGE 2 BUILDING C3

City Plan Services Pty Ltd
Reference: 210791/1
Date: 23/02/2024
Construction Certificate
Chris Michaels
Director
BDC1974

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THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING NO. S0001

GENERAL NOTES

1. These drawings are for structural purposes only and are to be read in conjunction with the specification, architectural drawings, other contract documentation and the requirements of the relevant authorities.
2. Verify all setting out dimensions with the Architect.
3. Do not obtain dimensions by scaling the structural elements.
4. Should any ambiguity, error, omission, discrepancy, inconsistency or other fault exist or seem to exist in the contract documents, immediately notify in writing to the Superintendent.
5. Maintain the structure in a stable condition during construction. Temporary bracing/shoring shall be provided by the contractor to keep the structure and excavations stable at all times, ensuring that no part of the documented structure becomes overstressed. For all temporary batters obtain geotechnical engineer's recommendations.
6. All workmanship and materials shall be in accordance with the requirements of current Standards Australia codes and the bylaws, ordinances or other requirements of the relevant building authorities.
7. All proprietary items are to be installed and fixed in accordance with the manufacturers specifications and instructions.
8. All work is to be carried out in accordance with all Workcover requirements and occupational health and safety act regulations
9. Construction using these drawings shall not commence until a Construction Certificate is issued by the Principal Certifying Authority.

DESIGN LOADS:

Floor loads : REFER TO LOADING DIAGRAMS

Wind Loads : Vᴿ = 45 Where R = 500 years
Region = A2
Terrain Category = TC3

Earthquake Loads:

Design Category	=	III
Site Sub-soil class	=	B
Hazard Factor Z	=	0.08
Probability Factor kp	=	1.0
Importance Level	=	2

SAFETY IN DESIGN

TTW operates under Safe Work Australia's Code of Conduct for the Safe Design of Structures.
These drawings shall be read in conjunction with the TTW Transfer of Information Letter and Structural Risk and Solutions Register.
Under the Code of Conduct it is the Client's responsibility to provide a copy of the Structural Risk and Solutions Register to the Principal Contractor.
It is the Principal Contractor's responsibility to review the hazards and risks identified during the design process to ensure a safe workplace is maintained for the construction, maintenance and eventual demolition of the structure.

FOOTING NOTES

1. Foundations have been designed for:
   Allowable Bearing Pressure - 3.5 MPa
2. Foundation material is to be inspected and approved by the geotechnical engineer before casting footings.
3. Refer to geotechnical report No. 86043.06 dated May 2021 by Douglas Partners
4. Locate all pipes, retaining walls and excavation outside a 1:2 (vertical:horizontal) zone of influence from the bottom edge of the footing.
5. Where side shear is required to be developed, clean and roughen the sides of the excavation to the satisfaction of the geotechnical engineer.
6. Footings shall be located centrally under walls and columns unless noted otherwise.
7. Footings to be constructed and backfilled as soon as possible following excavation to avoid softening or drying out by exposure.
8. Contractor is to allow for cost of geotechnical inspections and any required certification.

RETAINING WALL NOTES

1. Drainage shall be provided as shown on the drainage drawings.
2. Backfilling shall be carried out after grout or concrete has reached a minimum strength of 0.85 f'c.
   Backfilling shall be approved granular material compacted in layers not exceeding 200mm to 95% Standard compaction unless noted otherwise.
3. Provide waterproofing to back of walls as specified or noted.
4. Where retaining walls rely on connecting structural elements for stability, do not backfill against the wall unless it is adequately propped or the elements have been constructed and have sufficient strength to withstand the loads.
5. For all temporary batters obtain geotechnical engineers recommendations.

SHORING WALL NOTES

1. The design, supply, installation and tensioning of bolts and nails shall be carried out in compliance with the relevant Australian Standards and the Geotechnical Report.
   Anchorage lengths and curing times shall be determined by the Geotechnical Engineer.
2. Bolts and nail holes should be thoroughly cleaned and the bond grout should be allowed to cure before proof stressing.
3. Grouting shall conform to the requirements of AS 3600 and The Concrete Institute of Australia "Recommended Practice Z3 - Grouting of Prestressing Ducts 2007.
4. For proof stressing loads refer to the Geotech Report.
5. Records of all test loadings are to be submitted to the Geotechnical Engineer for review.
6. Modifications to the arrangement shown on the drawings will require recalculation of the required working loads and shall be notified to the Geotechnical Engineer for approval.
7. Safe Working load shown is the force required after all losses of prestress, including draw in.
8. Bolts and nails shall be located so as to avoid all services and pits etc. The contractor is to determine the location of all services etc prior to installation of anchors.
9. Any variation in location or inclination of nails and bolts shall be submitted to the Geotechnical Engineer for approval.
10. For ratio of ultimate load capacity of anchor to safe working load refer to the Specification.
11. For temporary and semi-permanent anchors the length of tendon protruding beyond wedge grip is not to be less than 600mm to enable monitoring.
12. For corrosion protection requirements refer to the Geotechnical Report.
13. Do not destress temporary or semi-permanent anchors until the Geotechnical Engineer's approval has been obtained.

PNEUMATICALLY APPLIED CONCRETE

1. Concrete to shoring walls to be pneumatically applied in one continuous operation. Concrete to be proportioned to achieve a batch target strength of 32MPa.
2. The pneumatically applied concrete shall be cured by keeping continuously wet over a period of not less than 7 days after placement or by other approved means.
3. Pneumatically applied concrete is to be placed by an experienced operator.
4. Pneumatically applied concrete shall conform to the requirements of the Concrete Institute of Australia Recommended Practice Z5 - Shotcreting in Australia 2020.

CONSTRUCTION SEQUENCE

1. Excavate down to first row or anchor.
   Install anchor as per geotechnical specification.
2. Place shotcrete wall as per the drawings.
3. Stress the ground anchors to Design Loads after concrete is a minimum of 4 days old.
4. Continue second stage as above.
   The 2nd and 3rd drop should be on hit and miss panel sequence (refer to Concept Design 86043.23.R.005.Rev1)
5. For anchor specifications (length, diameter of hole, bar type and diameter, inclination from the horizonal, etc.)
   Refer to Geotechnical report 86043.23.R.005.REV1
6. Typical anchor setouts shown indicatively. Geotechnical engineer to confirm retained height and the requirement for the 2 or 3 rows of anchors.
7. Geotechnical Engineer to confirm retained height and the requirement for the 1 or 2 rows of anchors. Where additional row is required the spacing will be staggered. Refer to Concept Design 86043.23.R.005.Rev1.

CONCRETE NOTES

EXPOSURE CLASSIFICATION : External - B1
Internal - A1
Surface of members in contact with ground - A1

CONCRETE
Place concrete of the following characteristic compressive strength f'c as defined in AS 1379.

Location	f'c MPa at 28 days
Piles	S50
Pile Caps, Footing Beams, Pad Footings	S50
Slabs on Ground	S32
Suspended Slabs and Bands	S40
Walls	Refer Schedule
Dincel and/or AFS Walls	Refer Schedule
Columns	Refer Schedule
Stairs	S40

1. Use Type 'GP' cement, unless otherwise specified.
2. All concrete shall be subject to project assessment and testing to AS 1379.
3. Consolidate by mechanical vibration. Cure all concrete surfaces as directed in the Specification.
4. For all falls in slab, drip grooves, reglets, chamfers etc. refer to the architect's drawings and specifications.
5. Unless shown on the drawings, the location of all construction joints shall be submitted to engineer for review.
6. No holes or chases shall be made in the slab without the approval of the Engineer.
7. Conduits and pipes are to be fixed to the underside of the top reinforcement layer.
8. Slurry used to lubricate concrete pump lines is not to be used in any structural members.
9. All slabs cast on ground require sand blinding with a Concrete Underlay
10. ⟨175⟩ Indicates slab or band thickness

FORMWORK

1. The design, certification, construction and performance of the formwork, falsework and backpropping is the responsibility of the contractor.
2. The proposed method of installation and removal of formwork is to be submitted to the Superintendent for comment prior to work being carried out.

SLAB ON GROUND NOTES

Refer to Geotechnical Report No. 86043.06 dated May 2021 by Douglas Partners for all subgrade and subbase/basecourse requirements and unless directed otherwise the following requirements apply.

1. Strip all topsoil from the construction area and remove from the site.

2. Before placing fill, proof roll exposed subgrade with 6 passes of a 10 tonne minimum roller to test subgrade and then remove soft spots (areas with more than 3mm movement under roller). Soft spots to be replaced with select fill as per table:

SELECT FILL

Sieve Aperture (mm) to AS1152	Percentage passed (by mass)
75.0	100
9.50	100 to 50
2.36	100 to 30
0.60	50 to 15
0.075	<25

- Plasticity index to be > or = 2% and < or = 15%
- Non dispersive (a rating of nil as defined by the "dispersion" test AS1289.3.8.1) Submit proposed select fill for Engineers approval.

3. Compact fill areas and subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.

4. All basecourse material to be crushed hard rock or crushed natural gravel capable of being compacted to an even stable surface and complying with the grading and properties listed in the tables below and compacted to minimum 98% modified standard dry density in accordance with AS 1289 5.2.1

NON-FREE DRAINING BASECOURSE

Sieve aperture (mm) to AS1152	Percentage passed (by mass)
26.5	100
19.0	95 to 100
13.2	75 to 90
9.50	60 to 90
4.75	42 to 76
2.36	28 to 60
0.425	10 to 28
0.075	2 to 10

- Plasticity Index: Not greater than 10%
- Liquid Limit: Not greater than 25%
- California Bearing Ratio: Not less than 35%
- Unsound rock: Not greater than 20%
- Nondispersive (a rating of nil as defined by the dispersion test AS1289.3.8.1)
- Submit proposed basecourse for Engineers approval.

FREE DRAINING BASECOURSE

Sieve aperture (mm) to AS1152	Percentage passed (by mass)
9.50	100
6.70	95 to 98
4.75	58 to 78
2.36	37 to 50
1.38	22 to 30
0.425	10 to 17
0.075	2 to 10

- Plasticity Index: Not greater than 3%
- Liquid Limit: Not greater than 25%
- Coefficient of permeability: Not less than 0.1mm/sec
- Nondispersive (a rating of nil as defined by the 'dispersion test' AS1289.3.8.1)
- Submit proposed basecourse for Engineers approval.

5. Place sand blinding to areas where Concrete Underlays are required.

POST-TENSIONED CONCRETE NOTES

GENERAL

1. Submit all test certificates, theoretical extensions, calculations and shop drawing to the Superintendent as required by the specification prior to construction.
2. All reactions from post-tensioning shall be supplied to the formwork contractor for formwork design.
3. Stressing contractor is to pay particular attention to concrete compaction where ducts cross columns and at all tendon anchors and ensure that pump lines are adequately chaired and restrained so as to be kept separate from tendons and reinforcement.
4. Provide mesh over bands where band depth exceeds 350mm or as required by Workcover.
5. Holes cored through post-tensioned slabs must be approved by the structural engineer in writing.

TENDONS

1. All Strands shall be 7 wire ordinary strands with Class 2 relaxation in accordance with AS 4672.1 and AS 4672.2 unless noted otherwise.
2. Bar shall be high-tensile alloy steel bars in accordance with AS 4672.1 and AS 4672.2 with a nominal tensile strength of 1030 MPa unless noted otherwise.
3. Locate and fix tendons and reinforcement as shown on the contractors drawings and co-ordinate with cast in bolts, conduits and penetrations etc. Tendon profiles shall be parabolic unless noted otherwise.
4. Ducting for slab tendons shall be galvanised steel:
   - 70 x 19 for 5 x 12.7dia strand tendons
   - 90 x 19 for 5 x 15.2dia strand tendons
5. Seal off all ducts and securely tape joints to prevent ingress of mortar during concreting.
6. The performance of the post tensioning anchorages is the responsibility of the stressing contractor and they shall provide any additional bursting reinforcement needed to meet the requirements of their post tensioning system.

TENSIONING AND GROUTING

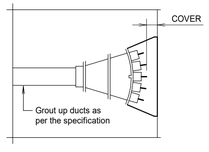
1. Tendons shall be stressed to jacking forces as per the contractors drawings.
2. The first stage of stressing is for 25% of the jacking force to be applied between 18 and 36 hours after concrete placement (f_{cp} = 9 MPa minimum) followed by the remainder of the jacking force at f_{cp} = 22 MPa unless noted otherwise below. Each individual strand or bar shall be tensioned during the first stage unless noted otherwise.
3. 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 cutting of tendons and grouting the ducts.
4. All tendons to be grouted in accordance with the specification.
5. Post-tensioning anchorage pockets shall be fully grouted with a polymer modified repair mortar. Minimum cover to any tendons or anchorage plate shall be as for the element in which they are located.
6. Concrete test cylinders used for assessing strength for tensioning are to be site cured in similar conditions to the concrete element being stressed.

ANCHORAGE RECESS GROUTING
NOT EXPOSED TO WEATHER (INTERNAL)
Exposure Class A1 as per AS3600

1. After final stressing and approval of extensions by the engineer, cut off strands to give 30mm minimum cover to ends of strands.
2. Provide records of measured cover at each anchor recess for the engineer to inspect and provide the opportunity for the engineer to inspect recesses.
3. Thoroughly clean anchorage pocket (use high pressure water jet if necessary) to remove all laitance, polystyrene etc.
4. Prime all concrete surfaces with 'Nitobond EP' or approved equivalent.
5. Grout up recess with 3:1 Sand: Cement grout mix or 'Renderoc HB'. Infill is to be finished flush with surrounding concrete surface.
6. The contractor shall provide records that demonstrate steps 3,4 & 5 have been satisfactorily completed at each anchor recess.

ANCHORAGE RECESS GROUTING
EXPOSED TO WEATHER (EXTERNAL)
Exposure Class B1 as per AS3600 - Near Coastal/Industrial
Exposure Class B2 as per AS3600 - Within 1km of coastline

1. After final stressing and approval of extensions by the engineer, cut off strands to give 30mm minimum cover to ends of strands.
2. Provide records of measured cover at each anchor recess for the engineer to inspect and provide the opportunity for the engineer to inspect recesses.
3. Thoroughly clean anchorage recess (use high pressure water jet if necessary) to remove all laitance, polystyrene etc.
4. Prime all metal surfaces with 'Nitoprime Zincrich' or approved equivalent.
5. Prime all concrete surfaces with 'Nitobond EP' or approved equivalent.
6. Grout up recess with 'Renderoc HB40' - applied as per manufacturers instructions. Infill is to be finished flush with surrounding concrete surface to the Superintendents requirements. A test sample is to be submitted for approval and used for acceptance/rejection criteria.
7. The contractor shall provide records that demonstrate steps 3,4,5 & 6 have been satisfactorily completed at each anchor recess.
8. Alternative products may be used as follows:
   SikaTop 110 in lieu of Nitoprime Zincrich and Nitobond EP Sika MonoTop 615 in lieu of Renderoc HB40



REINFORCEMENT NOTES

1. Fix reinforcement as shown on drawings. The type and grade is indicated by a symbol as shown below. On the drawings this is followed by a numeral which indicates the size in millimetres of the reinforcement.

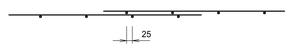
N	Hot rolled ribbed bar	grade D500N
R	Plain round bar	grade R250N
SL	Square mesh	grade 500L
RL	Rectangular mesh	grade 500L

2. Provide bar supports or spacers to give the following concrete cover to all reinforcement unless otherwise noted on drawings.

Footings	-	50 top, 75 bottom, 75 sides.
Slabs	-	25 top, 25 bottom, 25 sides.
	-	30 when exposed to weather or ground.
Beams	-	25 bottom, 25 sides, 25 top to ties.
	-	30 when exposed to weather or ground.
Columns	-	30 to ties and spirals.
	-	30 when exposed to weather or ground.
Walls	-	20 generally.
	-	30 when cast in forms but later exposed to weather or ground.
	-	30 when cast directly in contact with ground.

3. Cover to reinforcement ends to be 50 mm UNO.
4. Provide N12-450 support bars to top reinforcement as required.
   Tension Lap UNO
5. Maintain cover to all pipes, conduits, reglets, drip grooves etc.
6. All cogs to be standard cogs unless noted otherwise.
7. Fabric end and side laps are to be placed strictly in accordance with the manufacturers requirements to achieve a full tensile lap. Fabric shall be laid so that there is a maximum of 3 layers at any location.

FABRIC LAPS



8. Laps in reinforcement shall be made only where shown on the drawings unless otherwise approved. Refer to Reinforcement Lap table below. Gap between lapped bars to be no more than 3 bar diameters as per AS3600 clause 13.2

TENSION LAPS

BAR SIZE	32 MPa CONCRETE: TOP BARS IN BANDS AND BEAMS	32 MPa CONCRETE: HORIZONTAL BARS IN WALLS & TOP BARS IN SLABS > 330 THICK	32 MPa CONCRETE: ALL OTHER BARS
N12	580	620	480
N16	800	920	700
N20	1130	1240	950
N24	1480	1590	1230
N28	1850	1940	1490
N32	2250	2300	1780
N36	2690	2700	2080
N40	3130	3130	2420

BAR SIZE	40 MPa CONCRETE: TOP BARS IN BANDS AND BEAMS	40 MPa CONCRETE: HORIZONTAL BARS IN WALLS & TOP BARS IN SLABS > 330 THICK	40 MPa CONCRETE: ALL OTHER BARS
N12	580	590	480
N16	770	870	670
N20	1050	1150	890
N24	1370	1440	1100
N28	1700	1740	1340
N32	2070	2070	1590
N36	2420	2420	1870
N40	2800	2800	2150

BAR SIZE	50 MPa CONCRETE: TOP BARS IN BANDS AND BEAMS	50 MPa CONCRETE: HORIZONTAL BARS IN WALLS & TOP BARS IN SLABS > 330 THICK	50 MPa CONCRETE: ALL OTHER BARS
N12	580	580	480
N16	770	780	640
N20	950	1040	800
N24	1230	1290	990
N28	1530	1550	1200
N32	1850	1850	1430
N36	2170	2170	1670
N40	2500	2500	1930

COMPRESSION LAPS

BAR SIZE	LAP
N16	640
N20	800
N24	960
N28	1120
N32	1280
N36	1440
N40	1600

Rev	Description	Eng	Draft	Date
1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
NOTES SHEET

Client
PARKVIEW FRASERS PROPERTY

Architect
TEAM2 ARCHITECTS
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Structural Engineer
TTW Structural Civil Traffic Façade
+61 2 9439 7288 | L6 73 Miller Street North Sydney NSW 2065

Scale : A1	Drawn	Authorised
1 : 1	EGB	KPB

Job No	Drawing No	Revision
211086	S0001	1

21/02/2024 12:55:07 PM

FOR CONSTRUCTION

S0001 1
Printed : 21/02/2024 12:55:07 PM by Rajan MISTRY

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A1 0 1 2 3 4 5 6 7 8 9 10

Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING AND FOOTING PLAN		**Drawing Number:** S-S1001		

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

City Plan Services Pty Ltd
Reference: 210791/1
Date: 23/02/2024
Construction Certificate
Chris Michaels
Director
BDC1974

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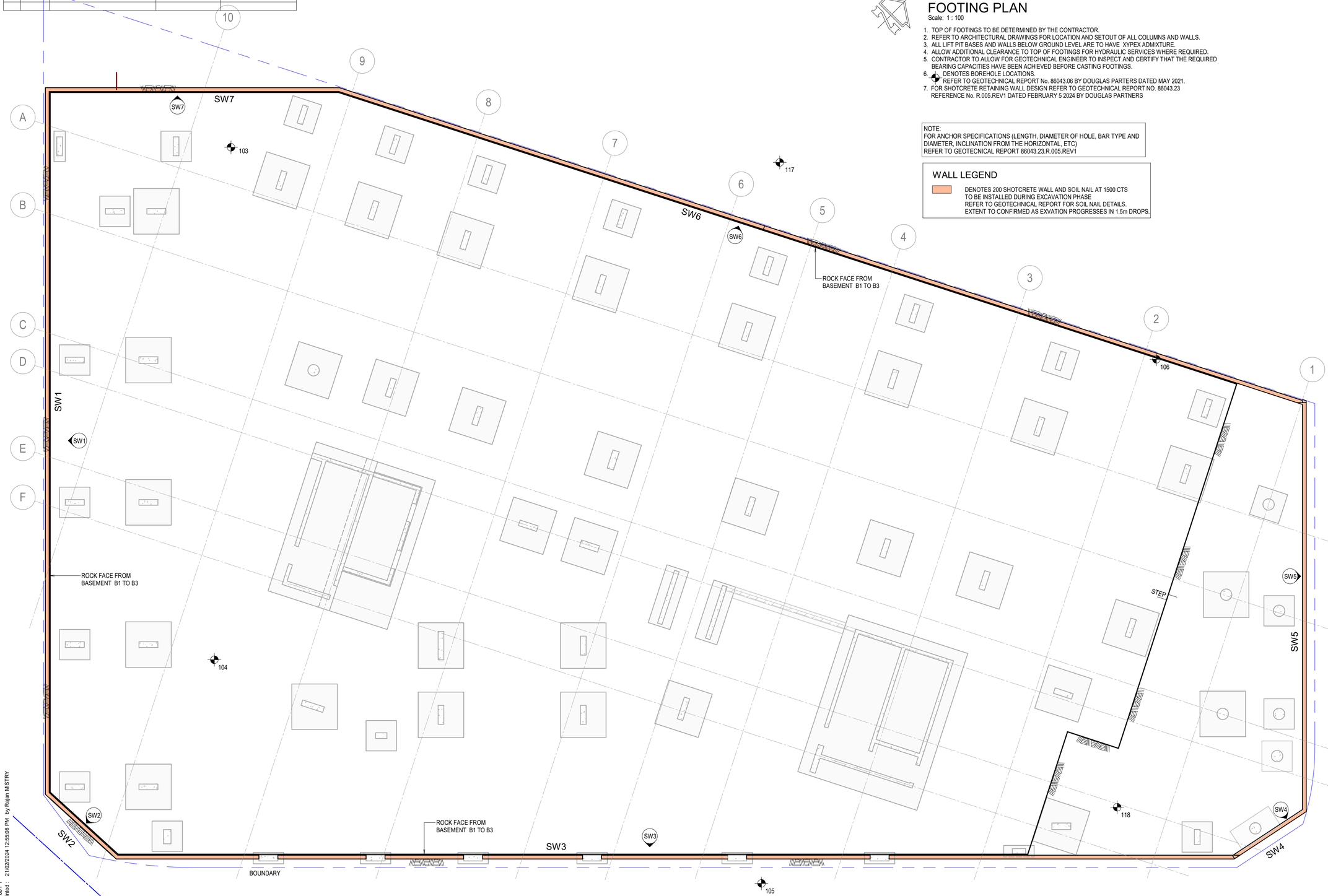
THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING NO. S0001

NOTE:
PAD FOOTINGS AND RETAINING WALLS ARE NOT PART OF CC1 ISSUE



FOOTING PLAN

Scale: 1 : 100

1. TOP OF FOOTINGS TO BE DETERMINED BY THE CONTRACTOR.
2. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION AND SETOUT OF ALL COLUMNS AND WALLS.
3. ALL LIFT PIT BASES AND WALLS BELOW GROUND LEVEL ARE TO HAVE XYPEX ADMIXTURE.
4. ALLOW ADDITIONAL CLEARANCE TO TOP OF FOOTINGS FOR HYDRAULIC SERVICES WHERE REQUIRED.
5. CONTRACTOR TO ALLOW FOR GEOTECHNICAL ENGINEER TO INSPECT AND CERTIFY THAT THE REQUIRED BEARING CAPACITIES HAVE BEEN ACHIEVED BEFORE CASTING FOOTINGS.
6. DENOTES BOREHOLE LOCATIONS. REFER TO GEOTECHNICAL REPORT No. 86043.06 BY DOUGLAS PARTERS DATED MAY 2021.
7. FOR SHOTCRETE RETAINING WALL DESIGN REFER TO GEOTECHNICAL REPORT NO. 86043.23 REFERENCE No. R.005.REV1 DATED FEBRUARY 5 2024 BY DOUGLAS PARTNERS

NOTE:
FOR ANCHOR SPECIFICATIONS (LENGTH, DIAMETER OF HOLE, BAR TYPE AND DIAMETER, INCLINATION FROM THE HORIZONTAL, ETC)
REFER TO GEOTECNICAL REPORT 86043.23.R.005.REV1

WALL LEGEND

DENOTES 200 SHOTCRETE WALL AND SOIL NAIL AT 1500 CTS TO BE INSTALLED DURING EXCAVATION PHASE
REFER TO GEOTECHNICAL REPORT FOR SOIL NAIL DETAILS.
EXTENT TO CONFIRMED AS EXVATION PROGRESSES IN 1.5m DROPS.

Rev	Description	Eng	Draft	Date
1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING AND FOOTING PLAN

Client
PARKVIEW FRASERS PROPERTY

Architect
TEAM2 ARCHITECTS
www.team2.com.au

Structural Engineer
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+61 2 9439 7288 | L6 73 Miller Street North Sydney NSW 2065

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Job No	Drawing No	Revision
211086	S1001	1

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S1001 1
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A1 0 1 2 3 4 5 6 7 8 9 10

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Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING WALL ELEVATIONS - SHEET 1		**Drawing Number:** S-S1011		
Rev	**Date** dd.mm.yy	**Description**	**DP Full Name**	**Reg No**
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

City Plan Services Pty Ltd
Reference: 210791/1
Date: 23/02/2024
Construction Certificate
Chris Michaels
Director
BDC1974

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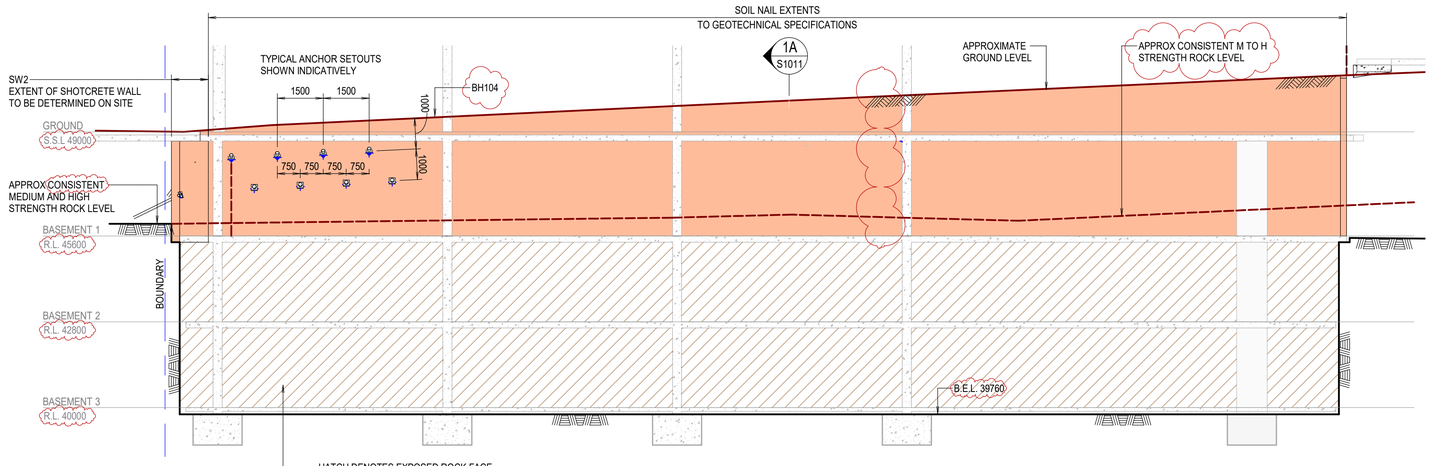

NOTE:
FOR ANCHOR SPECIFICATIONS (LENGTH, DIAMETER OF HOLE, BAR TYPE AND DIAMETER, INCLINATION FROM THE HORIZONTAL, ETC)
REFER TO GEOTECNICAL REPORT 86043.23.R.005.REV1

WALL LEGEND

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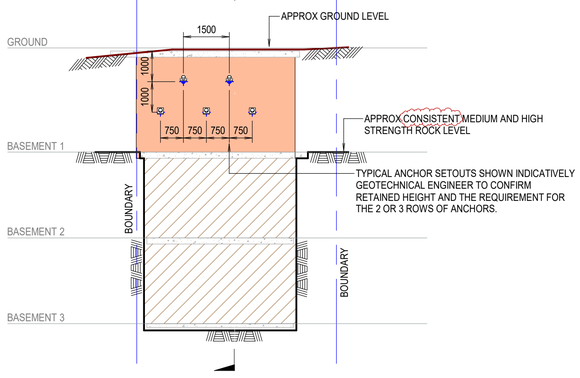
GEOTECHNICAL ENGINEER TO CONFIRM RETAINED HEIGHT AND THE REQUIREMENT FOR THE 1 OR 2 ROWS OF ANCHORS. WHERE 1 ROW IS REQUIRED THE SPACING WILL BE STAGGERED.
REFER TO CONCEPT DESIGN 86043.23.R.005.REV1.

2A
S1011

SW1
Scale: 1 : 100



SW2
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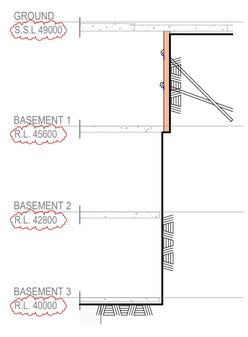
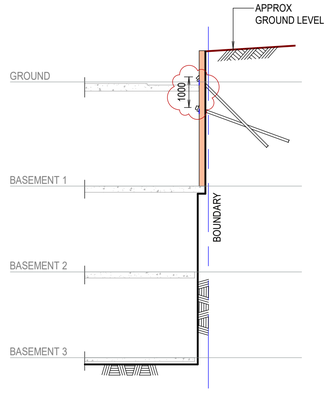


SECTION 2A
Scale 1 : 100
S1011



SECTION 1A
Scale 1 : 100
S1011

Rev	Description	Eng	Draft	Date
1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING WALL
ELEVATIONS - SHEET 1

Client
PARKVIEW FRASERS PROPERTY

Architect
TEAM2 ARCHITECTS
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Structural Engineer
TTW Structural Civil Traffic Façade
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Job No	Drawing No	Revision
211086	S1011	1

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S1011 1
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A1 0 1 2 3 4 5 6 7 8 9 10

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Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING WALL ELEVATIONS - SHEET 2		**Drawing Number:** S-S1012		

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

City Plan Services Pty Ltd
Reference: 210791/1
Date: 23/02/2024
Construction Certificate
Chris Michaels
Director
BDC1974

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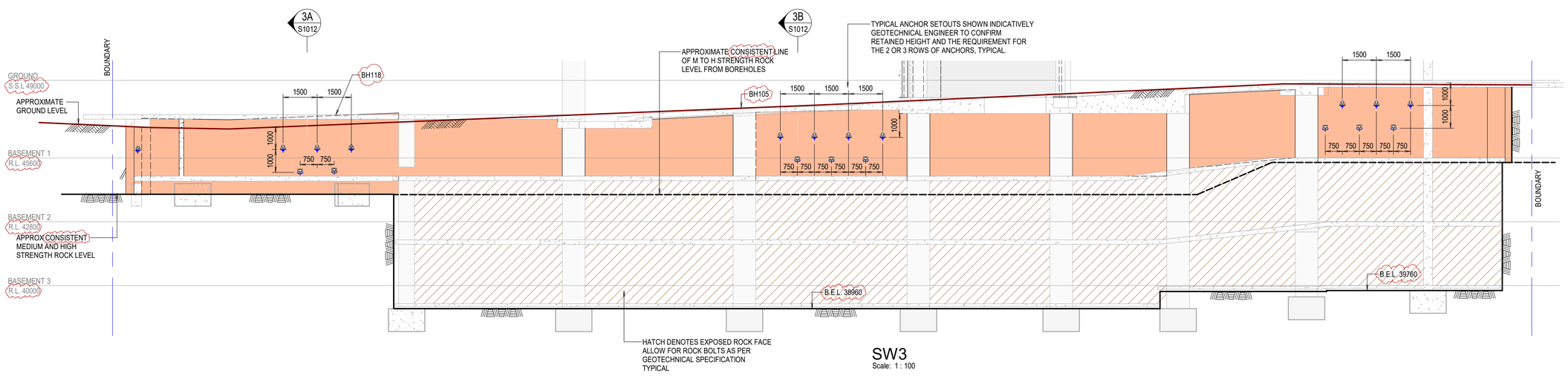

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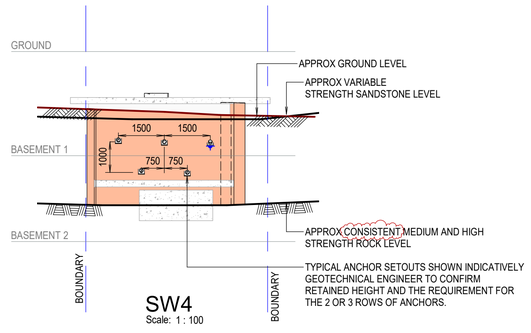

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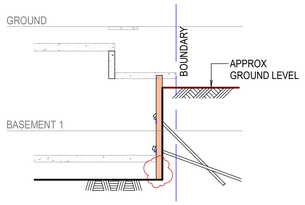
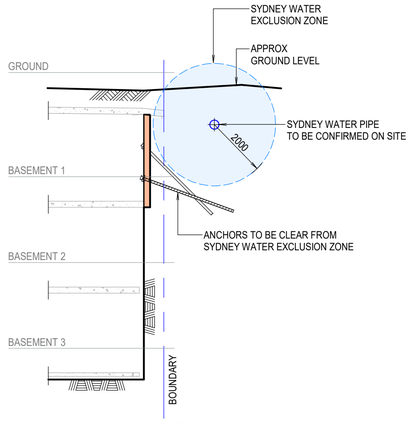


SECTION 3A S1012
Scale 1 : 100



SECTION 3B S1012
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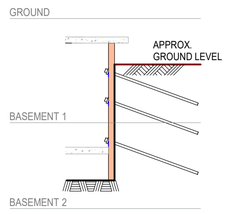

SECTION 5A S1012
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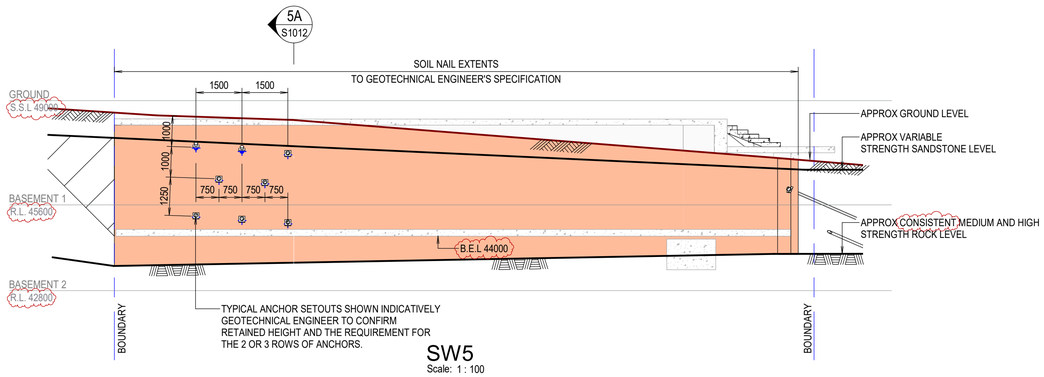

SW5
Scale: 1 : 100

NOTE:
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REFER TO GEOTECNICAL REPORT 86043.23.R.005.REV1

WALL LEGEND

DENOTES 200 SHOTCRETE WALL AND SOIL NAIL AT 1500 CTS
TO BE INSTALLED DURING EXCAVATION PHASE
REFER TO GEOTECHNICAL REPORT FOR SOIL NAIL DETAILS.
EXTENT TO CONFIRMED AS EXVATION PROGRESSES IN 1.5m DROPS.

GEOTECHNICAL ENGINEER TO CONFIRM RETAINED HEIGHT AND THE REQUIREMENT FOR THE 1 OR 2 ROWS OF ANCHORS. WHERE 1 ROW IS REQUIRED THE SPACING WILL BE STAGGERED.
REFER TO CONCEPT DESIGN 86043.23.R.005.REV1.

1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24
Rev	**Description**	**Eng**	**Draft**	**Date**

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING WALL
ELEVATIONS - SHEET 2

Client
PARKVIEW FRASERS PROPERTY

Architect
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Structural Engineer
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Scale : A1	Drawn	Authorised
1 : 100	EGB	KPB

Job No	Drawing No	Revision
211086	S1012	1

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A1 0 1 2 3 4 5 6 7 8 9 10

Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING WALL ELEVATIONS - SHEET 3		**Drawing Number:** S-S1016		

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1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

City Plan Services Pty Ltd
Reference: 210791/1
Date: 23/02/2024
Construction Certificate
Chris Michaels
Director
BDC1974

NOTE:
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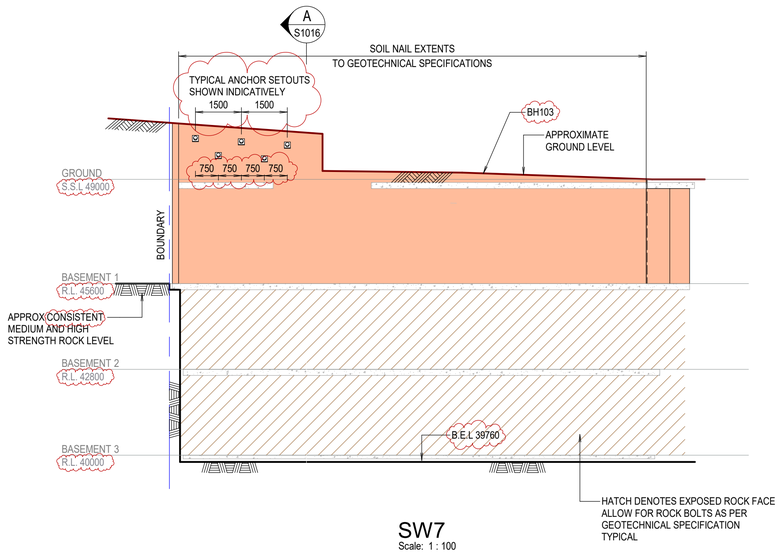
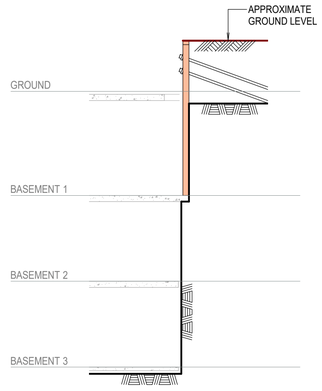
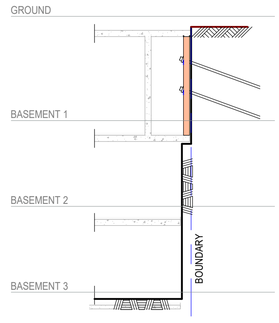


SW7
Scale: 1 : 100



SECTION A
Scale 1 : 100
S1016



SECTION B
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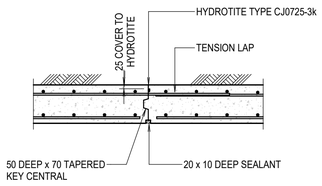
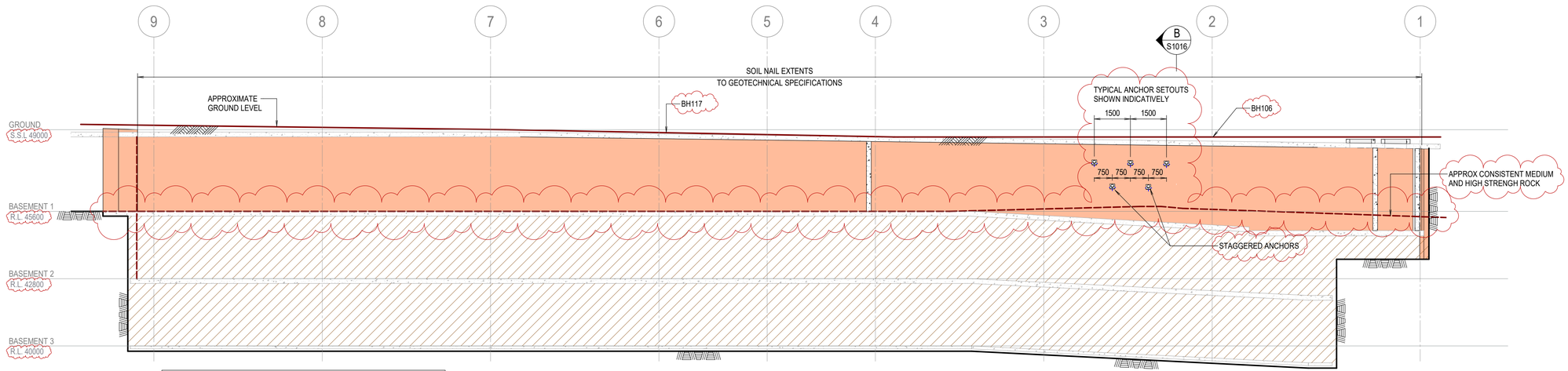
S1016



CJ - CONSTRUCTION JOINT
SCALE 1:20

NOTES:
1. REFER PLANS AND ELEVATIONS FOR LOCATIONS OF JOINTS. WPJ AND CJ MAY BE INTERCHANGED AT ANY LOCATIONS.
2. WATERSTOPS & SEALANTS (WITH BOND BREAKERS) TO BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATION AND THE MANUFACTURERS INSTRUCTIONS.
3. CJ TO BE AT 8000 MAX CTS. EJ TO BE AT 30m MAX CTS
4. SEALANTS TO HAVE A MINIMUM FIRE RATING EQUIVALENT TO WALL.



SW6
Scale: 1 : 100

NOTE:
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REFER TO GEOTECNICAL REPORT 86043.23.R.005.REV1

WALL LEGEND

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REFER TO CONCEPT DESIGN 86043.23.R.005.REV1.

Rev	Description	Eng	Draft	Date
1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING WALL
ELEVATIONS - SHEET 3

Client
PARKVIEW FRASERS PROPERTY

Architect
TEAM2 ARCHITECTS
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Structural Engineer
TTW Structural Civil Traffic Façade
+61 2 9439 7288 | L6 73 Miller Street North Sydney NSW 2065

Scale : A1	Drawn	Authorised
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Job No	Drawing No	Revision
211086	S1016	1

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S1016 1
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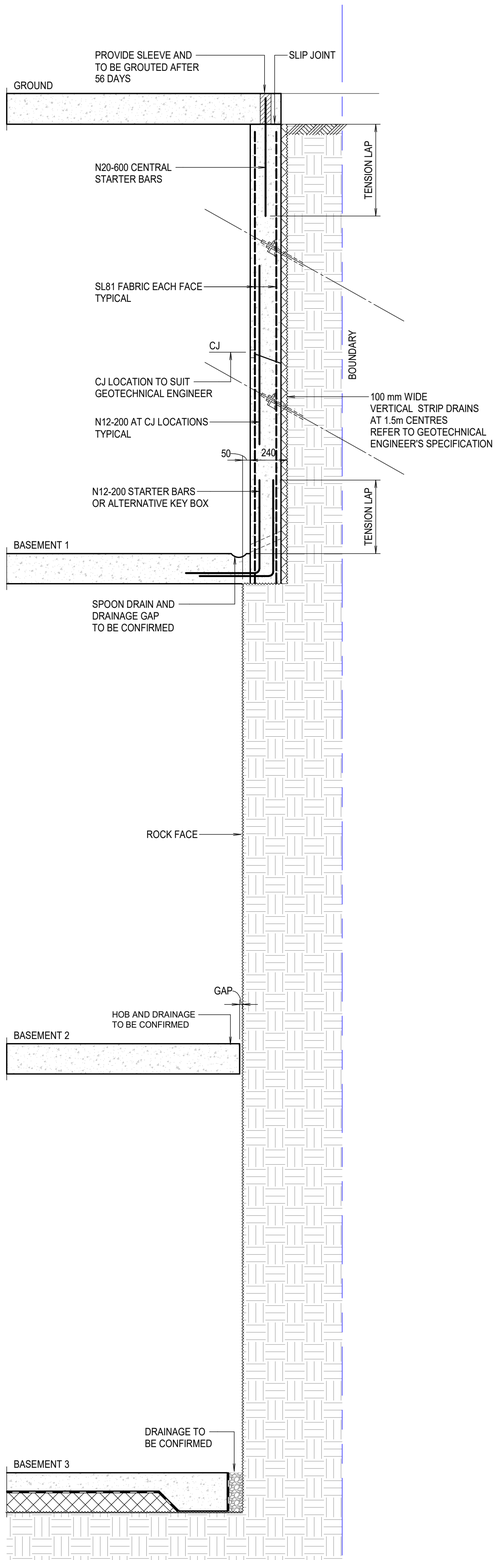
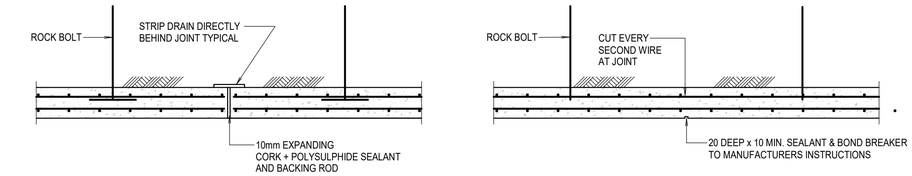
A1 0 1 2 3 4 5 6 7 8 9 10

Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING DETAILS - SHEET 1		**Drawing Number:** S-S1031		
Rev	**Date** dd.mm.yy	**Description**	**DP Full Name**	**Reg No**
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336



TYPICAL SHOTCRETE WALL SECTION
Scale: 1 : 20

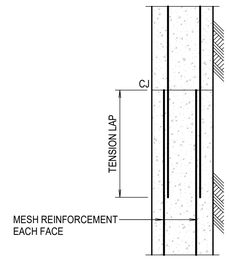


EJ - EXPANSION JOINT

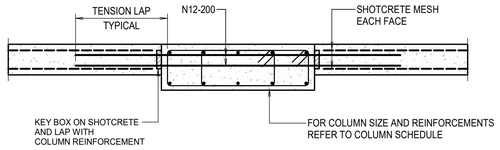
WPJ - WEAKENED PLANE JOINT

TYPICAL WALL JOINT DETAILS

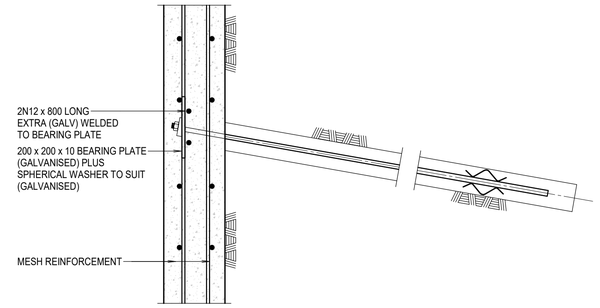
SCALE 1:20
NOTES:
1. REFER TO TYPICAL ROCK BOLT WALL ELEVATION NOTES FOR LOCATIONS OF JOINTS.



TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL
SCALE 1:10



TYPICAL WALL JOINT AT COLUMN
Scale: 1 : 20



TYPICAL ROCK BOLT DETAIL
SCALE 1:10

City Plan Services Pty Ltd
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Date: 23/02/2024
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Chris Michaels
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1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
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Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING DETAILS - SHEET 1

Client
PARKVIEW FRASERS PROPERTY

Architect
TEAM2 ARCHITECTS
www.team2.com.au

Structural Engineer
TTW Structural Civil Traffic Façade
+61 2 9439 7288 | L6 73 Miller Street North Sydney NSW 2065

Scale : A1	Drawn	Authorised
As indicated	EGB	KPB

Job No	Drawing No	Revision
211086	S1031	1

21/02/2024 12:55:13 PM

FOR CONSTRUCTION

S1031 1
Printed : 21/02/2024 12:55:13 PM by Rajan MISTRY

TO BE PRINTED IN COLOUR
A1 0 1 2 3 4 5 6 7 8 9 10

Pre-Application Submission Form

Certificate Case NumberCFT-412566

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	Daniel
Other given name/s	
Family name	Leaf
Contact number	0423300698
Email	daniel.leaf@fraserspropery.com.au
Address	Level 2 Building 1C Homebush Bay Drive
Is the applicant a company?	Yes
Name	FRASERS PROPERTY IVANHOE JV2 PTY LIMITED
ABN	22669307395
ACN	669307395

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	I am the sole owner of 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	PARKVIEW CONSTRUCTIONS PTY. LIMITED
ABN	41078064963
ACN	078064963
Trading Name	PARKVIEW CONSTRUCTIONS PTY LTD
Billing Address	Level 7, 60 Union Street, Pyrmont NSW 2009
Email Address	Antonio.Screnci@parkview.com.au

Long Service Levy

Have you paid the Long Service Levy?	No
Are there any security or site conditions which may impact on the person undertaking the inspection? eg: locked gates, dogs, animals etc	No
Provide details	

Payer details

Payer Type	A company, business, government entity or other similar body
Company Name	FRASERS PROPERTY IVANHOE JV2 PTY LIMITED
ABN	22669307395
ACN	669307395
Trading Name	
Billing Address	Level 2 1C Homebush Bay Drive Rhodes 2138
Email ID	daniel.leaf@frasersproperty.com.au
Title	
First given name	

Other given name/s	
Family name	
Contact number	
Email	
Billing address	

Proposed development details

Selected common application types	Erection of a new structure
Selected development types	Residential Accommodation Multi-dwelling housing
Class of development	Class 2 Class 6 Class 7a
Please provide a detailed description of the development	162 apartment mixed use development located in Midtown MacPark. This Construction certificate is for Bulk Excavation ONLY.
Please provide the estimated cost of the development? Note: please state the full contract price inclusive of GST	$96,380,228.00
Capital Investment Value (CIV)	$96,380,228.00

Information to be collected for the Australian Bureau of Statistics

Total site area (m2)	0
Existing gross floor area (m2)	0
Total Net Lettable Area (m2))	12943
Proposed gross floor area (m2)	15000
What are the current uses of all parts of the building (s)/land? (if vacant please state)	Greenland
What is the proposed use of all parts of the building (s)/land?	Residential Apartments
Is the proposed building is attached, detached (i.e. free standing) or semi-detached?	Detached (Free-standing)

Details about dwelling figures

Number of bedrooms	Number of dwellings to be demolished	Number of dwellings to be erected
Studio	0	2
1 bedroom	0	59
2 bedrooms	0	63
3 bedrooms	0	38
Total	0	162

Ultimate height of the development (m)	55
Number of pre-existing dwellings on site	0
Number of storeys proposed in the new building(s)	20
Number of proposed lots	

Materials to be used

Walls	Unknown (90)
Roof	Unknown (90)
Floor	Unknown (90)
Frame	Unknown (90)

Fire safety measures

Are you proposing to carry out alterations/modifications to existing 'relevant fire safety systems'?	No
Are proposed fire safety measures to be installed in the building?	No

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 and Environment.	Yes

Review of application

What is the outcome of your review?	Accept application
Additional certifier comments	.
Certifier reference number	210791/1
Has the applicant paid the application fees?	Yes
Enter the date the application was lodged into the certifier's system	15/02/24

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

Thomas Maguer

Registration number of design practitioner

DEP 0000170

Class of registration (applicable to this declaration)

Architectural

Body corporate name (if applicable)

Team2 Architects Pty Ltd

Registration number of body corporate (if applicable)

DEP0000612

Email address

info@team2.com.au

Contact number

02 9437 3166

ABN/ACN

2 104 833 507

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 Page	A-0000	1
2. Grids Setout	A-0010	1
3. Survey Plan	A-0011	1
4. Bulk Excavation Plan	A-0020	1
5. Shoring Elevation 1	A-0040	1
6. Shoring Elevation 2	A-0041	1
7.		
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30.		

Number of attachments to the certificate (if applicable)

Part 2. Declaration matters

I, Thomas Maguer

Insert full name acting on behalf of

Team2 Architects Pty Ltd

Insert registered body corporate name (if relevant)

Architectural

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.

Structural drawings as per issued for CC1

3. Standards, codes and requirements (other than the requirements referenced in the *Building 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
- [x] No

If yes, please list or attach information about the standards, codes or requirements that have been applied.

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
- [x] 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.

Structural Engineer- TTW Sydney, Hung Nguyen

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

14/02/2024

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation. For more information visit NSW Fair Trading

09 February 2024 211086

Parkview
Level 7, 60 Union Street
Pyrmont, NSW 2009

Attention: **Mohamed Yaccoub**

Ivanhoe Stage 2, Building C3, Midtown Precinct, Macquarie Park
Structural Design Statement - Shoring

Dear Mohamed,

We certify that we have prepared the structural design of Ivanhoe Stage 2, Building C3, Midtown Precinct Macquarie Park – Shoring Wall, as listed below, in accordance with the following Australian Standards:

AS 3600	Concrete Structures
BCA 2022	Building Code of Australia

And the structure shown would be sufficient to carry the relevant loads specified on our drawings and in -

AS 1170.0	Structural design actions – General principles
AS 1170.1	Structural design actions – Permanent, imposed and other actions
AS 1170.2	Structural design actions – Wind actions
AS 1170.4	Structural design actions – Earthquake actions in Australia

The shotcrete wall has been designed in accordance with Geotechnical report No 86043.06 dated May 2021 and 86043.23. R.005.REV1 dated February 2024 by Douglas Partners. Soil nail design and installation are to be certified by others.

Yours faithfully,
TTW (NSW) PTY LTD



HUNG NGUYEN
TECHNICAL DIRECTOR

P:\2021\2110\211086\Certificates\Parkview\240209 Ivanhoe Bldg C3 Midtown Pct MPark Structural CC1 certificate.docx

Rev.	Drawing
1	S0001 - NOTES SHEET
1	S1001 - SHORING AND FOOTING PLAN
1	S1011 - SHORING WALL ELEVATIONS AND SECTIONS - SHEET 1
1	S1012 - SHORING WALL ELEVATIONS AND SECTION - SHEET 2
1	S1016 - RETAINING WALL ELEVATIONS - SHEET 1
1	S1031 - SHORING DETAILS - SHEET 1

Douglas Partners
Geotechnics / Environment / Groundwater

Integrated Practical Solutions

Report on
Geotechnical Investigation of C3 Site

Stage 2 - Midtown
Herring Road, Macquarie Park

Prepared for
Frasers Property Ivanhoe Pty Ltd

Project 86043.06
August 2021



Douglas Partners
Geotechnics / Environment / Groundwater

Document History

Document details

Project No.	86043.06	Document No.	R.002.Rev2
Document title	Report on Geotechnical Investigation of C3 Site Stage 2 - Midtown		
Site address	Herring Road, Macquarie Park		
Report prepared for	Frasers Property Ivanhoe Pty Ltd		
File name	86043.06.R.002.Rev2.C3.docx		

Document status and review

Status	Prepared by	Reviewed by	Date issued
Revision 0	Sally Peacock	Bruce McPherson	20 May 2021
Revision 1	Sally Peacock	Bruce McPherson	18 June 2021
Revision 2	Sally Peacock	Bruce McPherson	4 August 2021

Distribution of copies

Status	Electronic	Paper	Issued to
Revision 0	1	0	Chris Koukoutaris, Frasers Property Ivanhoe Pty Ltd
Revision 1	1	0	Chris Koukoutaris, Frasers Property Ivanhoe Pty Ltd
Revision 2	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 August 2021
Reviewer		4 August 2021

bsi. ISO 9001 Quality Management
FS 604853

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Douglas Partners
Geotechnics | Environment | Groundwater

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Appendix A: About This Report

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Appendix D: Summary of Groundwater Measurements

Report on Geotechnical Investigation of C3 Site
Stage 2 - Midtown
Herring Road, Macquarie Park

1. Introduction

This revised report presents the results of a geotechnical investigation, undertaken by Douglas Partners Pty Ltd (DP) for the C3 site at the proposed Midtown development (Stage 2) at Herring Road, Macquarie Park. Midtown is located at the former Ivanhoe Estate Social Housing precinct. The investigation was commissioned by Chris Koukoutaris of Frasers Property Ivanhoe Pty Ltd (Frasers) and was undertaken in accordance with the Consulting Services Agreement dated 26 April 2021 and a subsequent variation. Revision 2 has been issued due to the update of Figure 1, only.

The C3 investigation was undertaken in conjunction with geotechnical investigation for the C2 and C4 sites, which together comprise the Stage 2 area, although the detailed results of those investigations will be reported separately. This revised report has been prepared following the completion of supplementary groundwater wells and permeability testing at the C3 and C4 sites in May and June 2021, the relevant results of which have been incorporated into this report.

The investigation also follows previous geotechnical investigation of the greater Midtown site in 2017, and groundwater monitoring from 2017 to 2018. The geotechnical investigation report for the greater Midtown site was updated in 2018 following the completion of that stage of groundwater monitoring.

A high-rise residential development is proposed at the C3 site. The aim of the investigation was to assess the subsurface soil, rock and groundwater conditions at the site, in order to provide geotechnical comment relevant to the proposed development on:

- Excavation conditions, including excavatability, excavation stability, shoring and batters;
- Groundwater conditions; and
- Foundations.

The investigation included the drilling of six boreholes in or immediately adjacent to the C3 basement area, and installation of selected standpipes. Two of the boreholes (Bores 117 and 118) and some groundwater monitoring standpipes (ie. wells) were requested as a variation to the original scope of work. The details of the field work are presented in this report, together with comments and recommendations on the items listed above.

2. Proposed Development

The proposed C3 development is for a residential high-rise building including a ground floor retail area. Basement car parking is proposed, with basement excavation extending to the site boundaries. Lowermost basement floor levels of RL 40.0 to RL 39.3 are proposed across most of the basement footprint, stepping up to RL 42.1 at the north-eastern side of the building footprint.

It is understood that the development of the C3 block is likely to be undertaken following the completion of the adjacent roads and services, but in conjunction with the proposed park at the neighbouring C2 site, that will adjoin the north-western frontage. Therefore, while shoring is expected to be required to support the other boundaries, an 'open cut' may be possible along the north-western frontage, using temporary batters or benches beyond the C3 site boundaries.

3. Background

In September 2015 the Ivanhoe Estate was rezoned by the Department of Planning and Environment as part of the Macquarie University Station (Herring Road) Priority Precinct, to transform the area into a vibrant centre that benefits from the available transport infrastructure and the precinct's proximity to jobs, retail and education opportunities within the Macquarie Park corridor. The new community will be known as Midtown MacPark, or "Midtown".

Douglas Partners Pty Ltd undertook investigation for the greater Ivanhoe Estate (now Midtown) site, in 2017, and undertook groundwater monitoring at 6 bores from November 2017 to June 2018. The detailed results were reported in the following DP Reports:

- 86043.01.R.001.Rev1, Preliminary Geotechnical Investigation of Ivanhoe Estate, dated 30 July 2018, including several boreholes drilled in the general vicinity, but outside of the C3 site in 2017, and revised in 2018 with summary data relating to groundwater monitoring; and
- 86043.01.R.005.Rev0, Groundwater Monitoring, dated 30 July 2018.

Relevant results from those previous investigations have been referenced in the current report.

Since that time, demolition of the previous residences has been completed, and earthworks have commenced for the development of infrastructure, roads and public areas at Midtown. These works have necessarily destroyed several of the previous groundwater monitoring standpipes or wells. While attempts were made during the current field work to locate possible remaining standpipes (at Bores 10, 12 and 13) near Shrimpton's Creek, these bores appear to have been either destroyed or obscured by overgrowth or temporary construction measures such as fencing and sedimentation controls.

The investigation for the C3 site was undertaken in conjunction with investigations for the C2 and C4 sites, which together comprise the Stage 2 works. Reference is made in this report to the relevant results of those investigations, particularly with respect to standpipes and groundwater levels. The detailed results of those investigations, however, will be separately reported in the following DP Reports:

- 86043.06.R.001, Geotechnical Investigation of the C2 site; and
- 86043.06.R.003, Geotechnical Investigation of the C4 site.

Dataloggers have been installed at four standpipes in the Stage 2 area, with results to be reported separately, on completion of monitoring.

4. 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 proposed C3 development, with respect to other Stage 2 sites and the greater Midtown area, is shown in Figure 1.

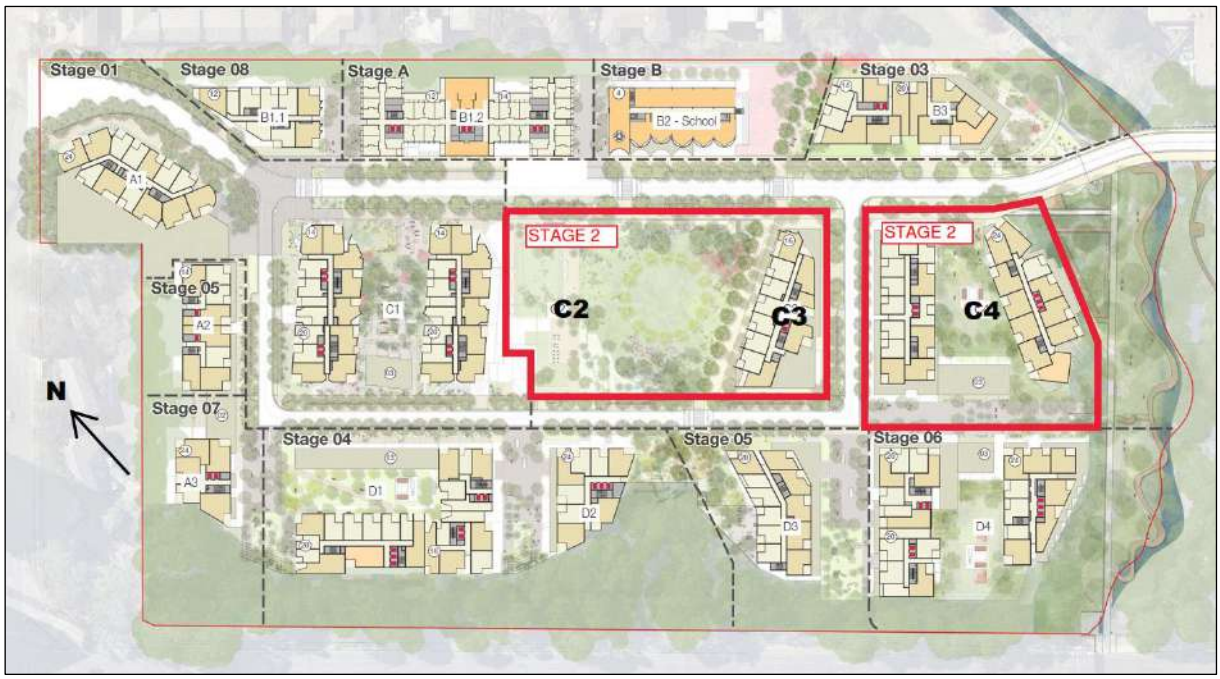


Figure 1: Location of the Stage 2 development areas (red), relative to the greater Midtown site (provided by Client).

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 at the C3 development area typically fall from approximately RL 53 to RL 49, towards the east, though local variation was also present due to earthworks for haul roads, sedimentation controls (including swales and a sedimentation basin), and due to temporary stockpiles. While the typical ground surface levels within the C3 site, are similar to those prior to earthworks at the site, these levels were elevated relative to swales excavated at the north-east and south-west of the site, as part of sedimentation control measures for the Midtown earthworks (see also Figure 1).

5. Published Data

Reference to the regional mapping indicates the following at the C3 site:

- The Sydney Soils Landscape Series Sheet indicates that the site is underlain by the residual Lucas Heights soil landscape. These soils typically comprise sandy clay and clayey sand soils developed from Mittagong Formation and Hawkesbury Sandstone;

- The Sydney Geology Series Sheet indicates that the site is underlain by Hawkesbury Sandstone, near the boundary with Ashfield Shale; and
- The site is in an area of no known risk of coastal Acid Sulfate soils and is outside of the Salinity Potential in Western Sydney mapping.

The results of past and present field work indicate that ground conditions are consistent with the mapping of residual soils over Hawkesbury Sandstone, though a layer of fill is generally present, overlying the residual soil.

Reference to the WaterNSW data on registered boreholes indicates that groundwater bores in the vicinity of the Midtown site are relatively distant from the site but that the results are broadly consistent with the previous groundwater monitoring at the greater Midtown site.

6. Field Work

6.1 Field Work Methods

The field work for the current geotechnical investigation of the C3 site comprised 6 deep, small-diameter boreholes (Bore 103 to 106, and 117 to 118), drilled with a truck-mounted (Explora) drilling rig under the supervision of a geotechnical engineer. The boreholes were drilled using auger or rotary drilling methods to the bedrock surfaces, then continued by NMLC (50 mm diameter) diamond core drilling methods into the underlying bedrock. Sampling and identification of strata was undertaken from the cuttings returned by the auger blade, supplemented by disturbed sampling of soils by Standard Penetration Tests, and by logging of the retrieved rock core. Point load strength index tests were also undertaken on the recovered rock core at typical intervals of 1.0 m. The bores were taken to depths of between 13.8 m and 17.1 m.

Initially, groundwater monitoring wells or standpipes were installed in two of the boreholes; Bore 103 and 106. A further two standpipes were installed at 104A and 118A, adjacent to, and subsequent to, the corresponding investigation bores. Fill works at the 118A site had apparently raised ground levels by approximately 0.4 m between drilling of the original geotechnical bore and installation of the well at 118A.

The wells were installed by drilling or reaming of the boreholes with a PCD bit, with screen lengths within the bedrock backfilled with a gravel pack, then with a bentonite seal above the screened length. Where the original cored borehole was taken to greater depth, any cored length below the standpipe screened interval was sealed by bentonite. Spoil (ie cuttings) was used to backfill the standpipe above the bentonite to near ground surface level, and the standpipe was finished at ground surface with a Gatic cover, concreted in place. The bentonite seal is intended to isolate surface water inflow and shallow ‘perched’ groundwater flows from the screened length of the borehole.

Following the installation of the standpipes, they were purged by pumping to remove drilling fluid from the standpipe. A follow-up visit was then undertaken to obtain a groundwater level (following stabilisation of the water levels after purging) and to perform falling or rising head permeability tests, except at Bore 103, where the standpipe was destroyed by site operations after purging, but prior to measurements being taken. The standpipe construction is summarised in Table 1.

Table 1: Summary of Standpipe Construction in C3 Area

Bore	104A	106	118A
Ground Level (RL)	51.7	49.5	50
Backfill Interval (m)	0-10.5	0-7.0	0-3.0
Bentonite Seal Interval (m)	10.5-11.5	7.0-7.5	3.0-4.0
Gravel Interval (m)	11.5-13.5	7.5-11.0	4.0-6.1
Blank PVC Interval (m)	0-12.0	0-8.0	0.0-4.5
Screened PVC Interval (m)	12.0-13.5	8.0-11.0	4.5-6.1

The field work was undertaken in conjunction with investigations for the nearby C2 and C4 sites, which included drilling using similar small-diameter boreholes, in similar geology and the installation of additional standpipes both upslope and downslope of the C3 site. The standpipes in the broader Stage 2 development area are summarised in Table D2, in Appendix D.

Further details on the methods and procedures employed in the investigation are presented in the notes in Appendix A of this report.

Test locations and ground surface levels at test locations were determined relative to Australian Height Datum (AHD) by high precision differential GPS equipment, as per the previous test locations.

The locations of the bores are shown in Drawing 301, in Appendix B, together with other boreholes drilled nearby during the current and previous investigations.

6.2 Field Work Results

The detailed results of the field work for the C3 site are given in Appendix C of this report, together with relevant notes on classification terms, symbols and abbreviations, and rock core photographs. The results of point load strength index ($I_{s(50)}$) tests are included at the relevant depths on the borehole logs.

The results of the current field work may be broadly summarised as follows:

- **Fill** – variable fill, including concrete, gravelly sand and re-worked natural clay, of apparently variable compaction, to depths of 0.2 m to 1.4 m; underlain by
- **Sandy Clay and Clayey Sand** – residual soil, typically stiff and very stiff or dense, to depths of 0.2 m to 1.4 m; underlain by
- **Sandstone** – variable, fractured, very low to medium strength, including extremely low strength and high strength bands, to depths of 2.4 m to 6 m; becoming

  fractured to slightly fractured, low and medium strength, with variable weathering to depths of 5.7 m to 7 m (absent in some locations); underlain by

  slightly fractured to unbroken, medium and high strength with occasional very high strength bands, variably weathered to 13.8 m to depths of more than 16.0 m, then fresh.

No groundwater was observed whilst augering at the borehole locations.

The results of the groundwater measurements from the current investigation are summarised together with previous groundwater measurements in the vicinity of the Stage 2 development area of the Midtown site, in Table D1, in Appendix D. The results generally show that groundwater levels fall from the upper, north-western part of the site, towards Shrimpton's Creek at the south-east, from approximately RL 45.6 at Bore 106 to RL 41.6 at Bore 104A. Groundwater levels measured in a higher level standpipe at Bore 118A, suggest that a 'stacked' groundwater level may be present following periods of heavy rainfall, with higher standing water levels in some shallow wells compared to wells with a deeper screen interval. A standing water level of RL 44.6 was obtained at Bore 118A, which while within the range indicated by other boreholes, is considered relatively high given the position of the borehole.

Rising or falling head permeability tests were undertaken at the intact standpipes in the C3 and C4 areas. The results of the permeability tests are summarised in Appendix C, together with the base calculations associated with the falling or rising head permeability calculations. The results at Bore 114A could not be readily assessed due to the combination of standing water level and well geometry. Hydraulic conductivities of $1.5x10^{-8}$ m/s to $4.2x10^{-6}$ m/s were estimated from the tests in boreholes in the C3 area, which is considered to be relatively consistent with results obtained in the broader Stage 2 area. These values are considered to be relatively consistent with the sandstone encountered over the screened lengths, if slightly high, though noting that the higher permeability results were associated with closer fracture spacing.

The results of the field work were generally consistent with the results of previous investigations, although higher groundwater levels were indicated by the current investigation when compared to interpolated levels from previous investigations.

7. Comments

7.1 Geotechnical and Hydrogeological Model

7.1.1 Geotechnical Model

An interpreted geological model has been developed for the C3 site, based on the results of current and previous field work. The model is summarised in Table 2.

Table 2: Simplified Geotechnical Model

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 1.0 m, but likely to be deeper, particularly in areas of stockpiles, recent earthworks and past services
2	Residual Soil	Stiff 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), to depths of 0.2 m to 3.2 m at test locations, though absent at some locations.
3a	Sandstone – Variable	Typically very low to low strength, but with extremely low (soil strength), medium and high strength bands, highly weathered ,typically fractured to highly fractured sandstone

Unit	Summary	Typical Description
3b	Sandstone – Low and Medium Strength	Typically low and medium strength, highly to slightly weathered, fractured and slightly fractured sandstone with some highly fractured fractured bands. This layer is only distinct at the upslope side of the site, and is apparently absent due to deeper weathering at the downslope side of the site.
3c	Sandstone – Medium and High Strength	Typically medium and high strength, moderately weathered to fresh, slightly fractured with some fractured and unbroken lengths. This unit includes significant beds of high strength sandstone at some boreholes, but has been distinguished from Unit 3d by weathering.
3d	Sandstone – High Strength	Typically high strength, fresh, slightly fractured to unbroken, includes a very high strength band at Bore 103

The above interpreted units are shown in relation to the C3 boreholes and site levels on the Interpreted Geotechnical Cross-Sections presented on Drawings 302 to 304, in Appendix B. (Note the change in scale for Drawing 304). It should be noted that the subsurface profile is accurate only at the borehole locations, and that substantial variation can occur in between and away from the boreholes. The interpreted geotechnical boundaries are for illustrative purposes and should not be relied upon.

Previous investigation by DP in the general vicinity of the site have also indicated the presence of dykes and thrust faults, which are considered likely to be encountered at the greater Midtown site, though investigations to date have not confirmed their presence. They are nonetheless considered a possible presence at the C3 area.

The following information also informs the geotechnical model for the site:

- **Dykes** – Dykes may be present on this site. Dykes have been identified by previous DP experience on sites to the north-east of the site and in the geological mapping north-west of the site. Both of these dykes may project to near the site, but given that dykes may “step” or “fork” in plan, they may potentially intersect the subject site.

  Dykes in Sydney are typically near-vertical, planar features that may change in thickness, become discontinuous and/or step in plan. Common dyke widths in Sydney range from less than 1 m to approximately 6 m. They are typically completely weathered basalt or dolerite (clay) near surface and are usually weathered and weaker than the surrounding rock to significant depth. The rock adjacent to the dyke can also be highly fractured, variable or abnormally high strength due to the heat and pressure effects of the intrusion. Higher permeability and greater water seepage is also often observed within and on either side of the dyke material.
- **Thrust Faults –** Thrust faulting, often associated with dykes, have been previously identified on nearby sites. A photograph showing the subsurface profile exposed by bulk excavation at a recently developed site to the north-west of the greater Midtown site, is included in Figure 2.



Figure 2: Back thrusts in an excavation wall at a nearby site

These features are of limited lateral extent and may be present but remain undetected by even significant geotechnical investigation. If encountered, the precise influence and treatment (if required) of dykes and thrust faults are often only determined at construction stage, when their presence, extent and orientation with respect to the works can be more reliably assessed.

7.1.2 Hydrogeological Model

The hydrogeology at the C3 site, in the depth of interest, can be characterised by the following:

- Ephemeral, 'perched' groundwater, or seepage, expected to occur within the upper fill and along the top of rock following periods of rainfall or due to human influences such as stormwater runoff and irrigation. Some ephemeral seepage may also migrate through defects within the rock;
- A transient, 'stacked' groundwater level within the upper sandstone, developing after heavy rainfall and responsive to weather variations; and
- Long-term groundwater levels, at depth, within the sandstone. These water levels are expected to respond to both climatic and weather variations, which would be expected to be reflected by natural fluctuations in groundwater levels.

Within the bedrock, groundwater flows would be concentrated along defects within the rock such as joints and bedding planes. Iron-staining of the existing joints are suggestive of past groundwater passage, and greater water ingress would be expected through such joints.

The existing and past standpipes were installed with bentonite seals to limit the influence of the 'perched' seepage through soil on the standpipe measurements.

Interpreted Cross-Sections A-A' to C-C' (Drawings 302 to 304) in Appendix B show the measured standing water levels at standpipe locations with respect to recent measurements up and downslope of the C3 site, and the interpreted groundwater tables. The model is consistent with broader groundwater measurements at the site, which have generally indicated levels that fall towards Shrimpton's Creek (see Drawing 304, and also Table D1, in Appendix D).

Within the Stage 2 area, higher standing water levels were generally obtained from standpipes with relatively shallow screen depths within the sandstone, compared to wells installed at greater depth (eg shallow well at 118A vs deep well at 104, see Drawing 303). It is noted, however, that these relatively shallow water level measurements appear to fall relatively rapidly when follow-up readings were undertaken following periods of no significant rainfall (eg refer data for 109A, 111A, in Table D1 in Appendix D), and so are considered to reflect the transient 'stacked' groundwater level, likely due to a low permeability aquitard (or aquitards) below the shallower screen, such as a thick underlying sandstone bed with limited defects, and the horizontal to vertical permeability contrast expected within Hawkesbury Sandstone.

For the deep groundwater table, natural groundwater fluctuations in the order of 1.5 m are suggested by the comparison of previous water level monitoring at standpipes at the (now destroyed) Bore 07 and recent measurements in the standpipe at the nearby Bore 101. Both of these standpipes are upslope of the C3 area but in an area of expected similar hydrogeology, with recent groundwater levels being at the upper end of the measured range, approximately 1 m above previous monitored levels.

7.2 Excavation

The proposed basement floor levels are between approximately RL 39.3 and RL 42.1. Excavation of approximately 0.5 m below these levels are anticipated for bulk excavation levels, although these have not been confirmed.

Based on the existing information, excavation of up to approximately 10.5 m to 14 m (for a basement floor level at RL 39.3), is anticipated.

Reference to the results of the geotechnical investigation indicates that the excavation will extend through fill and natural soils (Units 1 and 2) and into sandstone bedrock. Within the sandstone, excavation is expected to proceed through variable strength (Unit 3a), then through generally low and medium strength (Unit 3b) into medium and high strength sandstone (Unit 3c). This may include excavation through significant beds of unbroken, high strength sandstone.

Materials in Units 1, 2 and 3a are likely to be readily excavated using conventional earthmoving equipment (e.g. bulldozers and hydraulic excavators, with some rock hammering of stronger bands within the variable sandstone). Medium and high strength sandstone (Unit 3c) is likely to require excavation by ripping tynes mounted on large bulldozers (eg D12 or larger), large rock hammers, rock saws and milling heads. Productivity would slow if very high strength bands (e.g. as encountered at Bore 103, though in Unit 3d, below the depth of excavation) are encountered.

Excavation into the typically fractured low and medium strength sandstone of Unit 3b may also require these heavier excavation methods to maintain productivity, although some limited excavation may be possible using conventional earthmoving equipment, depending on the thickness and continuity of medium and higher strength bands within the unit, and defects within the rock.

The excavatability of the medium and high strength (Unit 3c) bedrock will be governed by the defects within the rock mass. Based on the rock cores, the rock in this unit frequently includes bed spacings of more than 1 m, although more fractured zones are also present. In general, the excavation of high strength sandstone (which is a significant proportion of the Unit 3c sandstone), is likely to be difficult and slow, with low productivity and high hammer/tyne wear expected.

7.2.1 Vibrations

Significant vibrations are anticipated during excavation within low to high strength bedrock. Excavation methods may therefore be limited by acceptable vibration levels, particularly if the new services installed in the adjacent roads are sensitive to vibrations. At this stage, no buildings are within 50 m of the site, but depending on the staging of other site works, consideration may also need to be given to other structures, particularly if they are occupied at the time of the works. Acceptable vibration levels should therefore be confirmed with the asset owners prior to excavation.

The limit may need to be adjusted to reflect the asset requirements, response of neighbouring structures during excavation and vibration dosage once the neighbouring building is occupied.

A vibration trial may be required to size equipment at the commencement of excavation into rock. The trial may indicate that minimum offset distances are required from vibration-sensitive assets for the preferred plant, or that alternative excavation methods or equipment are required.

Where a vibration trial indicates that the equipment may potentially exceed vibration levels, or where buildings or occupants are otherwise sensitive to vibration levels, consideration could be given to continuous vibration monitoring during the works. These monitors may be set up to activate a flashing 'alarm' light, or send text messages, if pre-set vibration levels are exceeded during the work.

7.2.2 Batters

Batters or excavation support will be required for excavations through soil and extremely low to very low strength sandstone, and also for fractured low and medium strength rock (i.e. Units 1, 2, 3a and 3b),

Preliminary safe batter slopes are provided in Table 3, for batter slopes no greater than 3 m in height, with horizontal ground beyond the crest and below the toe, no deflection sensitive structures or services above the crest, no surcharges above the crest and no seepage from the face.

Table 3: Preliminary Safe Batter Slopes for Batter Slopes ≤ 3 m Height

Unit	Material	Maximum Temporary Safe Batter Slope (Horizontal:Vertical)
1	Fill	2:1
2	Residual Soil	1.5:1
3a	Sandstone – Variable	1:1
3b	Sandstone – Low and Medium Strength	0.5:1
3c	Sandstone – Medium and High Strength	Vertical

Such batters are only currently anticipated in the temporary case along the north-western side of the excavation, due to the expected prior construction of services in the adjacent road reserves.

Batters higher than 3 m, steeper batters, or batters subject to surcharges behind the crest (within an exclusion zone equal to the height of the batter, extending back from the crest), adjacent sloping ground or seepage would generally require more detailed geotechnical assessment. Along the north-western

site boundary, for example, batters from current ground levels to the base of Unit 3b, would exceed the 3 m batter height, and may encounter some water seepage at the base of the batter slope (see Drawing 302, Interpreted Geotechnical Cross-Section A-A'). These conditions would require specific analysis but would also be dependent on the site levels and operations within the adjacent C3 park during the C2 excavation works.

All batter slopes should be subject to inspection by an experienced geotechnical professional at maximum 1.5 m drops. Flatter or steeper slopes may be required, depending on the results of assessment. Protection for the face of the batter slope may also be required to reduce the risk of loose materials falling into the excavation below.

Within the medium and high strength sandstone (Unit 3c) the rock is likely to be able to be cut vertically and stand unsupported, even for cut depths greater than 3 m, but subject to regular defect and localised stability assessment by an experienced geotechnical professional, at drops no greater than 1.5 m. This may indicate that additional local support (e.g. bolts or anchors) and/or shotcrete is required due to adverse jointing or other defects.

7.2.3 Waste Classification

All excavated materials will need to be disposed of in accordance with the provisions of the current legislation and guidelines including the Waste Classification Guidelines (EPA, 2014). This includes fill and natural materials that may be removed from the site.

7.3 Shoring/Retaining Walls

7.3.1 General

Shoring will be required where the rock strength or condition is unsuitable for vertical excavation, and conditions are unsuitable for batters (eg inadequate space). Shoring is therefore anticipated along all boundaries, except if and where acceptable batters may be formed in the adjacent site to the north-west. Shoring may still be required along part, or all, of the north-western boundary, depending on the adjoining ground and possibly groundwater levels.

Soldier pile shoring walls are considered suitable for this site, with walls taken down through the Unit 1, 2, 3a and 3b material to socket in or bear on at least medium strength, slightly fractured sandstone (ie Unit 3c) with infill shotcrete panels constructed between the piles as excavation proceeds. Typical soldier pile spacings at 2 m to 2.5 m are likely to be suitable for the support of the natural clay soils and weathered rock above the groundwater table.

Bored, concrete piles would be suitable for the construction of shoring piles at this site, although casing may be required for drilling through fill and possibly soil materials, to prevent side wall material falling into the pile excavation. A heavy-duty, high torque drilling rig is likely to be required to obtain significant socket (i.e. embedment) into medium and high strength sandstone, as is expected at this site, particularly given the medium and high strength bands present in some areas in the Unit 3b material. DP note that while some significant bands of medium strength materials are present in the Unit 3b material (e.g. at Bore 103), the investigation results suggest that these layers are fractured to slightly fractured, with some relatively steep defects, and that the medium strength bands are relatively discontinuous across the site.

Given the depth of excavation, anchors would generally be required to provide temporary lateral support to the shoring wall, with final support provided by the basement structure.

Inspections are recommended during the pile excavation to allow for geotechnical assessment of the foundation material, deepening of the piles where necessary, and advance notice of areas where poorer ground conditions are present. Inspections of the exposed rock face between soldier piles during excavation is also recommended at 1.5 m drops, prior to placement of mesh and shotcrete, to allow assessment of possible steep joints or defects which might require additional support.

If encountered, the presence of dykes or thrust faulting may result in locally poorer rock conditions, which may lead to additional support being required in some areas of the site. Detailed investigation and/or careful monitoring and inspection of ground conditions during excavation (including for soldier piles) would generally be appropriate to ensure that support is taken down to an appropriate depth in any affected areas. It is not likely to be practical to assess the presence of dykes in advance, unless a dyke location and orientation is determined during an earlier stage of works at the site.

7.3.2 Shoring Design

For a shoring wall supported by multiple rows of anchors or props, preliminary design may be based on a uniform rectangular earth pressure distribution of 4H (where H is the wall height in metres, and pressure is in kPa), provided that deflections are not a concern. Where walls are constructed close to existing deflection-sensitive structures or utilities, a pressure of between 6H and 8H should be considered, depending on the sensitivity of the utilities and the soil profile to be retained. Higher pressures would be appropriate where batters (ie sloping ground) are present above the wall, or where concentrated loads are proposed behind the wall, either during construction (eg plant) or in the permanent case (eg elevated garden beds or roads).

The detailed design of shoring/retaining walls is nowadays normally undertaken using software that can account for the soil-structure interaction during the progressive excavation and support installation sequence (eg Wallap, Flac, Plaxis.)

Allowance should be made for the provision of drainage behind retaining structures, or alternatively the walls should be designed for full hydrostatic pressures. Appropriate drainage (eg strip or core drains) should be included to prevent hydrostatic water levels rising above the design hydrostatic level of the shoring/retaining wall design.

For piled wall systems terminating above the bulk excavation level it may be necessary, depending on the design of wall restraint, to install ‘toe bolts’ or anchors at the base of each pile for stability purposes.

7.3.3 Anchor Design

The preliminary design of anchors may be based on the bond strengths indicated in Table 4.

Table 4: Parameters for Preliminary Anchor Design

Material	Ultimate Bond Strength
Variable sandstone (Unit 3a)	100 kPa
Low and medium strength sandstone (Unit 3b)	300 kPa

Material	Ultimate Bond Strength
Medium and High strength Sandstone (Unit 3c)	1000 kPa

The above values assume that the anchor holes are adequately cleaned and free of clay smear. It would be appropriate for these values to be confirmed by the anchoring contractor based on their specific installation methods and experience, and for the rock conditions encountered during anchor installation at the site. Pull-out tests may be appropriate if higher bond values are to be adopted.

After installation, all temporary anchors should be proof loaded to 125% of the nominal working load, then locked off at 70% of the working load. For anchors supporting any structures on the boundaries, lock off values should be 90% of the working load. Checks should also be made at regular intervals to ensure that load is maintained in anchors and not lost due to creep effects.

While it is expected that the adjacent sites will be under the control of the developer at the time of construction, appropriate permissions from adjacent landowners would be required if support measures (eg anchors) are proposed across site boundaries. Anchors should also be de-stressed following the provision of permanent lateral support by the basement structure.

7.3.4 Shoring Wall and Excavation Movement

Typical horizontal movements in the order of 0.15% of the wall height would be expected for a well-constructed and designed, high stiffness shoring wall (ie with multiple rows of anchors), but depending on the excavation and support sequence and support provided. For a 6 m high shoring wall, this corresponds to approximately 10 mm movement.

In addition to retaining wall movements, basement excavations into medium and high strength sandstone bedrock may result in lateral movement of the sandstone faces due to stress relief effects. Release of these stresses may cause horizontal movements along the rock bedding surfaces and defects, with estimated movements of between 0.5 mm and 2 mm per metre depth of excavation into medium and high strength sandstone, at the midpoint of the excavation. It is not practical to provide restraint against stress-relief movements, and appropriate allowance should instead be made for such movements in construction and planning.

Survey monitoring of the excavation and retaining walls would generally be appropriate to assess movement of any shoring walls during excavation, particularly where any deflection-sensitive structures or services are present behind the walls.

7.4 Groundwater and Dewatering

7.4.1 Groundwater Inflows

As can be seen from Drawing 304 in Appendix B, the proposed basement floor levels are below the measured groundwater levels, within bedrock. Some groundwater inflow or seepage is expected to occur through defects within the rock (eg bedding planes and joints). Inflow is expected to be greater in sandstone where fracturing is more closely spaced, or where existing iron-staining is present,

suggesting past groundwater flows. Groundwater flow into the excavation through Units 3a, 3b and 3c are expected.

As noted in Section 7.1.2, comparison between past monitoring and recent measurements in the sideslope area suggest that the current groundwater levels are elevated compared to past monitoring results, possibly due to the prolonged period of wet weather earlier this year. Groundwater inflows through the Unit 3a and 3b sandstone, as suggested by the recent groundwater level measurements, may therefore only occur following periods of wetter weather, or during years of relatively wet weather.

The results of permeability testing indicated hydraulic conductivities ranging from $1.5x10^{-8}$ m/s to $4.2x10^{-6}$ m/s in the C3 area, with other results in the Stage 2 area falling within this range. This range is generally considered to be consistent with expected permeabilities in Hawkesbury Sandstone, though noting that the upper permeabilities are relatively high compared to typical values, but are nonetheless within previous DP experience in similar ground conditions.

The test results in the Stage 2 area did not indicate a strong correlation between hydraulic conductivity and the units of the geotechnical model, as can be seen in Figure 3, although the variability in hydraulic conductivity does appear to reduce in the underlying, Unit 3D materials.

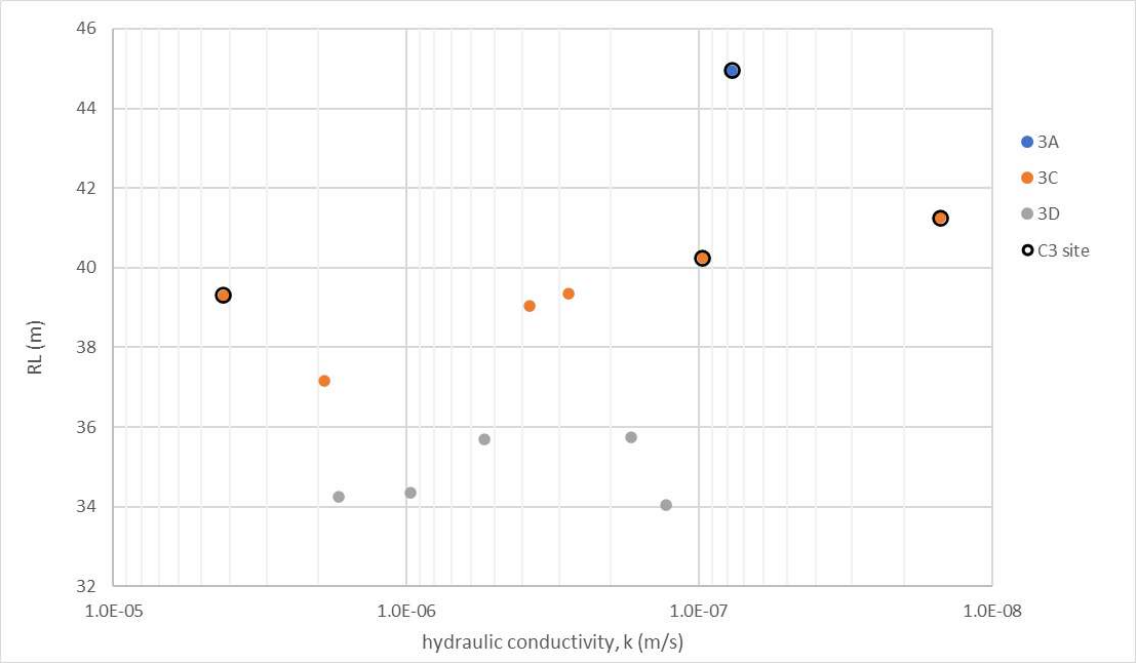


Figure 3: Summary of results of Hydraulic Conductivity (k) for Stage 2 area permeability tests, with respect to the Geotechnical Model Units 3A, 3C and 3D.

In considering these results, it is noted that the gravel pack (and screened length) interval was often located at depths where the rock core indicated higher fracture spacings, in order to capture data from expected higher permeability zones.

Estimates of medium to long-term groundwater inflow to a drained C3 basement excavation, have been separately analysed by Seep/W and reported in DP Memo 86043.06.R.004, dated 18 June 2021. The analysis, suggests likely groundwater inflows of approximately 2 ML/year into the C3 basement excavation. Higher inflows would be expected immediately following initial excavation, as stored water

is lost to the excavation and groundwater levels around the basement stabilise, with inflow levels expected to stabilise to long-term typical inflows in approximately one year after excavation. Fluctuations in groundwater inflow will still occur following periods of rainfall.

While not identified by the current investigation, dykes or thrust faults may be associated with significantly increased permeabilities, relative to those considered in the inflow estimates, if encountered during excavation. While initial inflows from the defects would be significantly higher, their medium and long-term influence on inflows will depend on their continuity and connectivity to defects within and beyond the site.

7.4.2 Management of Groundwater Seepage

Based on the above inflow estimates, it is considered that a drained basement would be technically feasible for the C3 basement, with manageable water inflows expected for a robust permanent basement drainage system. As discussed in the following section, however, current government regulations should be considered, as well as the long-term costs of maintaining such a drainage/pumping system and any levies or costs associated with groundwater treatment (if required) and disposal.

It is understood that a Water Access Licence exemption would apply to the excavation of the building and for ongoing dewatering of the basement, subject to monitoring requirements, if groundwater inflows are less than 3 ML/year. The inflow estimates suggest that groundwater inflows to a drained basement are likely to be less than 3 ML/year but may possibly exceed these values.

Options for management of short and long-term groundwater inflows may therefore include the following:

1. A watertight, 'tanked' basement would reduce or remove risks associated with obtaining licenses, and ongoing management and maintenance of a drained basement.
2. Design and construction of a drained basement based on the expected inflows of less than 3 ML/year. This would require a commitment to construction-stage (and possibly longer-term) grouting, if required, in areas of higher inflow to manage the groundwater inflows to avoid exceedances. Approvals, monitoring and reporting of groundwater inflows will still be required. If elevated groundwater inflows are not effectively managed by grouting, then dewatering, excavation and construction may need to cease until management works are effective, or until Option 1 or 3 can be implemented.
3. Design and construction of a drained basement allowing for groundwater inflows to potentially exceed 3 ML/year. This would require that groundwater take is approved and properly accounted for under a Water Access Licence. This would involve an ongoing commitment to the costs associated with obtaining and maintaining the Water Access Licence, potentially for the life of the building, and would be subject to licensing and approval. Obtaining the necessary entitlements is a separate process to DA and early discussions with the Natural Resources Access Regulator (NRAR) would be key to confirm that a license (and therefore a drained basement) is achievable. This option could allow groundwater inflows to revert to an exemption in the long term, if subsequent management works (eg grouting) can reduce groundwater inflows to less than 3 ML/year.

These options may be controlled by the associated approvals and licenses that are required prior to dewatering, rather than by DA approvals and therefore may be limited by the regulator. Early discussions with the regulator will be important to confirm that the adopted approach will be accepted.

During excavation, from a practical perspective, groundwater seepage into the basement excavation is likely to be readily managed using 'sump-and-pump' methods, in the temporary case, complemented by grouting if excessive local inflows occur. This is consistent with DP experience with other deep excavations near the subject site. As the C3 site is part of the state significant "Ivanhoe Estate" redevelopment, it is understood that a Water Supply Works Approval will not be required at this site, subject to assessment and the Conditions of Consent,

Further information may be required to support the assessment, such as the current groundwater monitoring program.

The selection of an appropriate strategy for basement design should therefore include consideration of the regulatory risks (ie whether or not the necessary approvals and licenses can be obtained, or Conditions of Consent become too onerous), construction stage risks (eg excessive costs or delays due to grouting and groundwater management, and dewatering or design changes), long-term risks (eg cost of ongoing groundwater management/licenses), and geotechnical risks (eg presence of a high-permeability defect at the base of the excavation), as well as the known costs of design and construction.

Excavation of the basement would largely involve excavation in sandstone in the usual manner. Targeted grouting of bedding planes and joint swarms below the groundwater table may be appropriate to limit groundwater inflows into the basement to facilitate temporary management of groundwater. Grouting for groundwater management may only be economical where significant groundwater inflows are relatively localised, and of limited permeability, as grouting of large areas or where significant inflow is occurring can be costly and time consuming.

If a tanked basement design is selected, this would involve the construction of a waterproof basement floor and walls, to reduce or prevent groundwater inflows into the basement. Given that deep groundwater fluctuations in the order of 1.5 m have been observed, it is recommended that allowance be made for potential deep groundwater level rises of at least a further 1.0 m above the highest measured deep (long-term) water values, (ie to a design level of RL 45.6, based on current data), for the tanked basement design. This is expected to also cater for the anticipated groundwater level increase of less than 0.5 m anticipated on the upslope side of the basement due to the damming effect of the basement. This should be confirmed by groundwater modelling and analysis, based on the proposed tanking design, noting that excessive groundwater increases may require drainage around the outside of the tanked basement.

Seepage above the level of (partial) basement tanking may still occur due to higher, transient groundwater levels, particularly following periods of wet weather, and as such the basement design should allow for drainage of any groundwater seepage above the level of the tanked basement design, such as by a series of relief drains at the design level of tanking. For a tanked design based on the above recommendations, such seepage is expected to be below the 3 ML/year threshold, but would still require monitoring and reporting of this seepage 'take'. Alternatively, the basement may be designed as fully tanked (i.e. waterproof walls to the ground surface), to effectively eliminate even short-term seepage into the basement. Any tanked (or partially tanked) basement design must also consider uplift forces that may arise.

Seepage is likely to be iron-rich and a precipitate (gelatinous 'sludge') may develop within drains over time, which could cause 'clogging' and blockage of drainage lines and pumps. Allowance should be made for future maintenance to clear such material from drainage lines and from pump fixtures.

It is noted that, given the relatively low permeability of the sandstone, any dewatering activities are expected to only cause drawdown to a relatively short distance from the C3 basement. Given that the groundwater levels are within bedrock, dewatering activities are not expected to create any risk of ground surface settlement, or have any influence on acid sulphate soils.

7.5 Foundations

The excavation for the C3 basement will extend into medium and high strength sandstone, and shallow foundations are therefore expected to be adopted to support the building loads.

Preliminary rock classification of the sandstone below RL 40 at the subject bores has been undertaken for foundation performance based on Pells et al (1998) and summarised in Table 5. These classifications are for foundation performance, only, and accordingly the rock 'strength' has been downgraded due to defects. A 1.0 m plan footing dimension has been assumed to perform the classification.

Table 5: Sandstone Foundation Classification at Bore Locations Below RL41

Sandstone Class	RL at Bore					
	103	104	105	106	117	118
III/IV	41.0	39.7	41.0 to 38.0 or below 36.2	41.0, but not below RL38.5	41.0	41.0
II/III	41.0	38.4	41.0 to 38.0 or below 36.2	41.0, but not below RL38.5	39.7, but not below RL39.1	41.0, but not below RL37.6
I/II	41.0 to 39.1 or below 38.5	38.4	41.0 to 38.0 or below 36.2	41.0, but not below RL38.5	NA	40.7, but not below RL37.6

Note: The classification is based on an interval of rock below the foundation level, with the interval dependent on the plan dimension of the footings.

As can be observed in the above table, a range of allowable bearing pressures may be adopted, though higher classifications may be more difficult to achieve on site, and so require additional excavation and/or re-design during the construction stage, depending on local conditions.

Maximum allowable bearing pressures for the design of shallow foundations founded on sandstone below bulk excavation level are provided in Table 6.

Table 6: Foundation Design Parameters

Sandstone Class	Allowable Bearing Pressure[1,2] (MPa)	Ultimate Bearing Pressure[2,3] (MPa)	Typical Youngs Modulus (MPa)	Minimum Additional Testing / Requirements[4]
III/IV	3.5	15	350	-

Sandstone Class	Allowable Bearing Pressure[1,2] (MPa)	Ultimate Bearing Pressure[2,3] (MPa)	Typical Youngs Modulus (MPa)	Minimum Additional Testing / Requirements[4]
II/III	6	40	900	Spoon testing of 1/3 of footings
I/II	10	100	1500	Additional cored boreholes (e.g. after excavation to basement level), and spoon testing of 1/2 of footings

Note: 1. Allowable pressures assume allowable settlements of less than 1% of the minimum footing plan dimension. Alternative, settlements can be estimated for the proposed load based on the typical Youngs Modulus.

2. All bearing pressures may be limited by defects, subject to inspection of the excavation and possible spoon testing, which may require the bearing pressure to be downgraded. Allowable bearing pressures assume that the bedrock is in a confined state, and that no nearby current or future excavations are present below an imaginary 'influence' line drawn at 1H:1V down from the edge of the footing. Such excavations would require inspection to confirm that adverse jointing is not present. Reduced values of approximately 50% of the value given in Table 6 may also apply.

3. Ultimate values assume settlement of more than 5% to 10% of the minimum footing plan dimension.

4. Geotechnical inspection of all footing excavations is recommended to confirm that the material is consistent with the design requirements; the minimum testing is to provide additional information on defects to confirm that foundation performance is as expected. Additional or lesser testing may be warranted, subject to the results of initial foundation testing and depending on the design bearing pressures.

All foundations should be inspected by a geotechnical professional following excavation and cleaning, to confirm that the foundation material is consistent with the design requirements.

The higher bearing pressures given in Table 6 require the additional testing outlined in that table, and may be associated with a higher risk of inspection 'failures'. This use of a 10 MPa design bearing pressure would require additional cored borehole investigation, which may indicate that the sandstone does not meet the requirements of Class I/II Sandstone.

Spoon testing should be carried out in at least one third of all footings that are designed for an allowable end bearing capacity of more than 3.5 MPa. Spoon testing involves drilling a 50 mm diameter hole below the base of the footing, to a depth of at least 1.5 times the footing width, with the hole left full of water for 24 hours prior to testing to check for the presence of weak/clay bands. If excessive weak seams are detected then the foundation capacity may need to be downgraded, or the footings taken deeper to reach suitable foundation material.

For shoring piles founded in Class 3c materials, but above bulk excavation level, the ultimate bearing capacity will be the unconfined strength of the underlying bedrock, but may be reduced by adverse defects, if present below the foundation. Given these risks, it is suggested that design be based on an ultimate bearing pressure of no greater than 3 MPa, and an 'allowable' bearing pressure of no greater than 1 MPa. The vertical component of any anchors should be considered in the total loads on the pile. The vertical bearing pressure should be reviewed during excavation, prior to vertical loading of the piles.

Should thrust faults or dykes be identified near foundation level then the foundation parameters given in Table 6 may not be achieved, and re-design may be required in the affected area to suit to the conditions encountered.

7.6 Further Investigation and Assessment

Additional investigation and/or assessment may be appropriate, depending on the detailed design and planning decisions for the proposed site, and to support a dewatering management plan, if required. Such works may include:

- Water quality tests to provide information on the chemical composition of groundwater at the site, to support planning for groundwater management and disposal assessment;
- Repeat permeability tests at standpipe locations, to confirm the 'repeatability' of the current test data (particularly if a drained basement is to be adopted); and
- Additional investigation, to reduce the geotechnical risk of excessive inflows to the excavation. This may include inclined boreholes, to provide greater coverage of the site area, and reduce (though not eliminate) the risk of unexpected defects that may cause concentrated seepage inflows to the excavation, and/or 'pilot' excavations to observe inflows to a test pit or similar, excavated to bulk excavation level.

It is noted that data loggers have been installed in Bores 106 and118A (and Bores 114 and 111A, downslope) to monitor groundwater levels. This monitoring is ongoing, and the results of the groundwater monitoring will be reported, separately.

8. References

Pells, P. J., Mostyn, G., & Walker, B. F. (1998). Foundations on Sandstone and Shale in the Sydney Region. *Australian Geomechanics, No 33 Part 3*, 17-29.

9. Limitations

Douglas Partners (DP) has prepared this report for this project at Midtown, Macquarie Park in accordance with the Consultancy Services Agreement dated 26 April 2021, and approved variations. This report is provided for the exclusive use of Frasers Property 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 this investigation. 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 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.

The scope for work for this investigation/report did not include the assessment of surface or sub-surface materials or groundwater for contaminants, within or adjacent to the site. Should evidence of fill of unknown origin be noted in the report, and in particular the presence of building demolition materials, it should be recognised that there may be some risk that such fill may contain contaminants and hazardous building materials.

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.

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

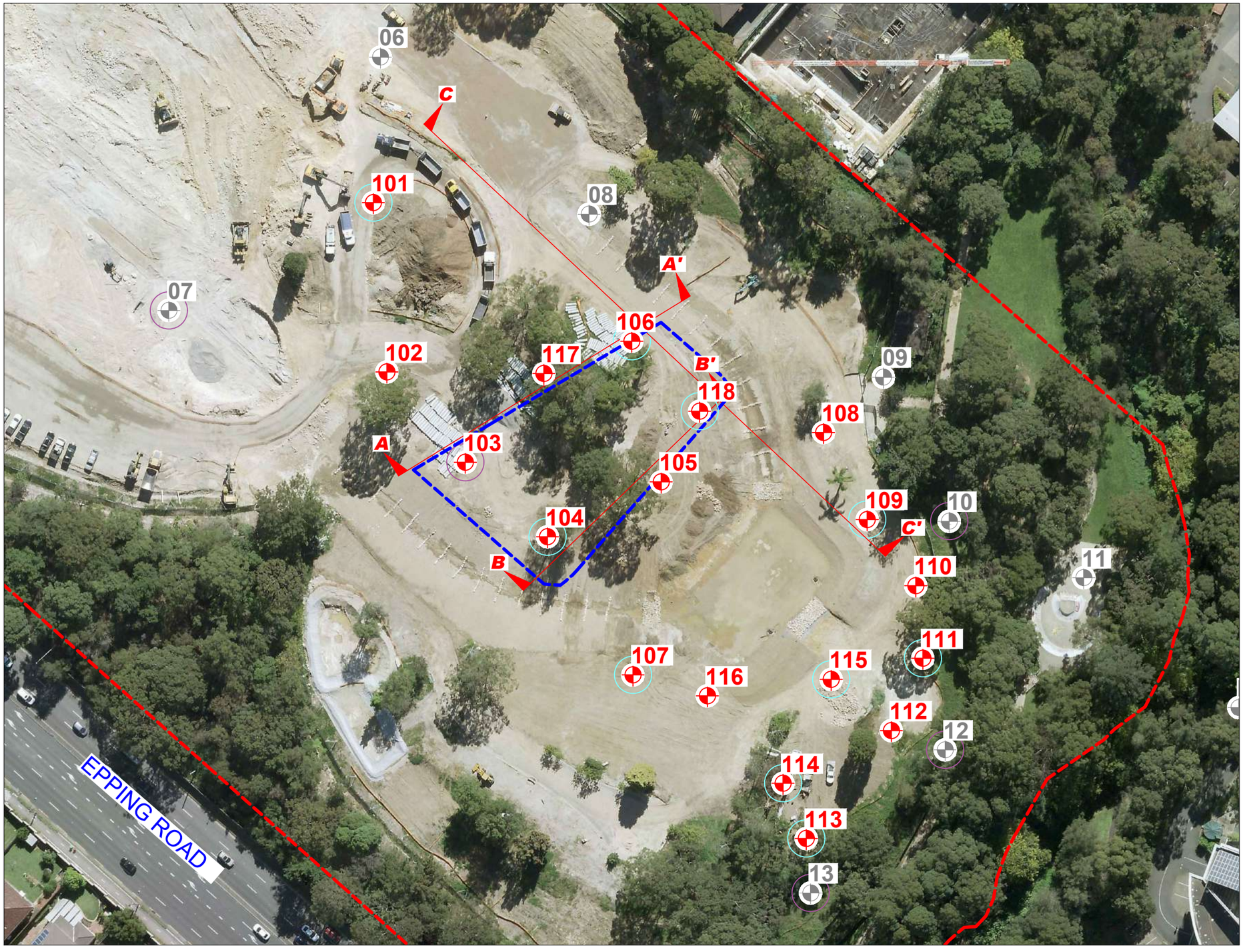
Where information obtained from this report is provided for tendering purposes, it is recommended that all information, including the written report and discussion, be made available. In circumstances where the discussion or comments section is not relevant to the contractual situation, it may be appropriate 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.

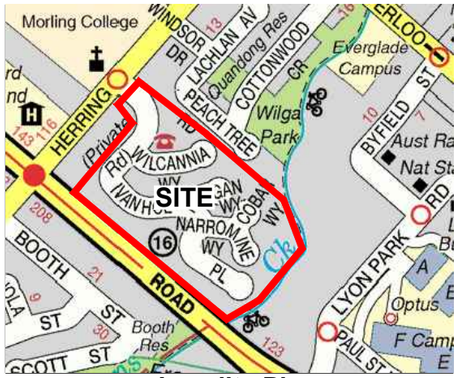
Site Inspection

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.

Appendix B

Drawings





Locality Plan

LEGEND

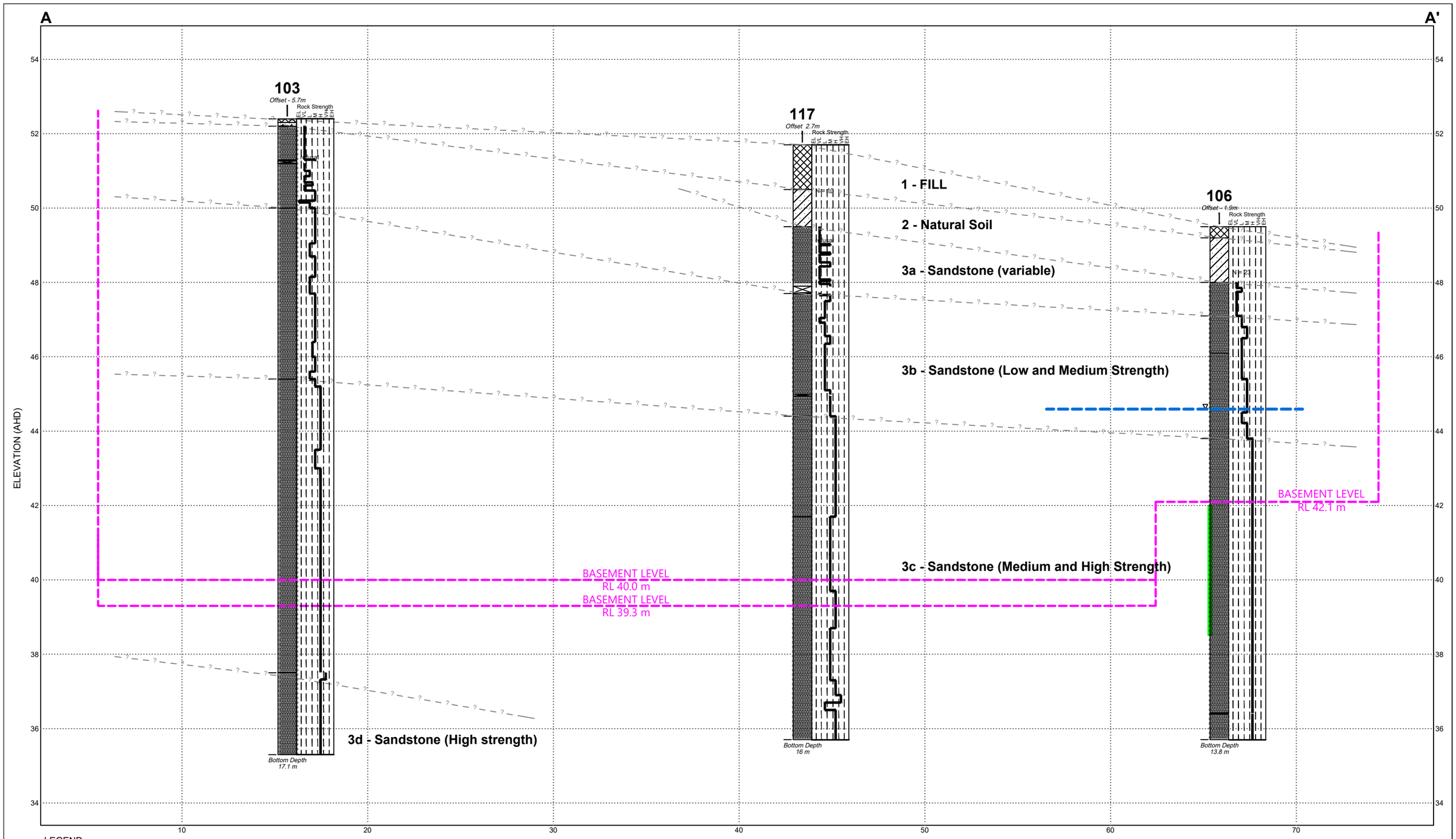
- Borehole Location (C3 Site)
- Cored Bore Location (2021, Beyond C3 Site)
- Previous (2017) Cored Bore Location (Beyond C3 Site)
- Standpipe Location (Current)
- Standpipe Location (Damaged or Missing)
- C3 Area Boundary
- Site Boundary

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 - C3 Site**	PROJECT No: 86043.06
OFFICE: Sydney	DRAWN BY: PSCH/MG	**Proposed Residential Development**	DRAWING No: 301
SCALE: 1:1000 @ A3	DATE: 11.06.2021	**Midtown, Macquarie Park**	REVISION: 1



LEGEND

- Core Loss
- Concrete
- Filling
- Sandstone
- Sandy Clay

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.

ROCK STRENGTH

EL -	Extremely Low
VL -	Very Low
L -	Low
M -	Medium
H -	High
VH-	Very High

SOIL CONSISTENCY

vs -	Very Soft
s -	Soft
f -	Firm
st -	Stiff
vst -	Very Stiff
h -	Hard

TESTS / OTHER

- N - Standard penetration test value
- Interpreted geotechnical boundary
- Water level
- Interpreted deep water table
- Standpipe Gravel Pack Length

Horizontal Scale (metres) 0 4

Vertical Exaggeration = 2.0

Douglas Partners
Geotechnics | Environment | Groundwater

CLIENT: Frasers Property Ivanhoe Pty Ltd		TITLE: **Interpreted Geotechnical Cross-Section A-A'**	PROJECT No: 86043.06
OFFICE: Sydney	DRAWN BY: SCP	**Proposed Stage 2 Development - Site C3**	DRAWING No: 302
SCALE: 1:200 (H) 1:100 (V) @ A3	DATE: 11.06.2021	**Midtown, Maquarie Park**	REVISION: 1

B

B'

104

Offset 5.3m

Rock Strength

EL VL L M H VH

N=5

105

Offset - 4.4m

Rock Strength

EL VL L M H VH

N=15

refusal

118

Offset 1.5m

Rock Strength

EL VL L M H VH

N=10

refusal

1 - FILL

2 - Natural Soil

3a - Sandstone (variable)

3c - Sandstone (Medium and High Strength)

3d - Sandstone (High strength)

118A

BASEMENT LEVEL
RL 42.1 m

BASEMENT LEVEL
RL 40.0 m

BASEMENT LEVEL
RL 39.3 m

Bottom Depth
16.25 m

Bottom Depth
15.9 m

Bottom Depth
14.17 m

ELEVATION (AHD)

54 52 50 48 46 44 42 40 38 36 34

0 10 20 30 40 50 60 70

DISTANCE ALONG PROFILE (m)

LEGEND

- Core Loss
- Clayey Sand
- Filling
- Sandstone
- Sandy Clay

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.

ROCK STRENGTH

- EL - Extremely Low
- VL - Very Low
- L - Low
- M - Medium
- H - High
- VH - Very High

SOIL CONSISTENCY

- vs - Very Soft
- s - Soft
- f - Firm
- st - Stiff
- vst - Very Stiff
- h - Hard

TESTS / OTHER

- N - Standard penetration test value
- Interpreted geotechnical boundary
- Water level
- Interpreted deep water table
- Standpipe Gravel Pack Length
- Interpreted transient water table

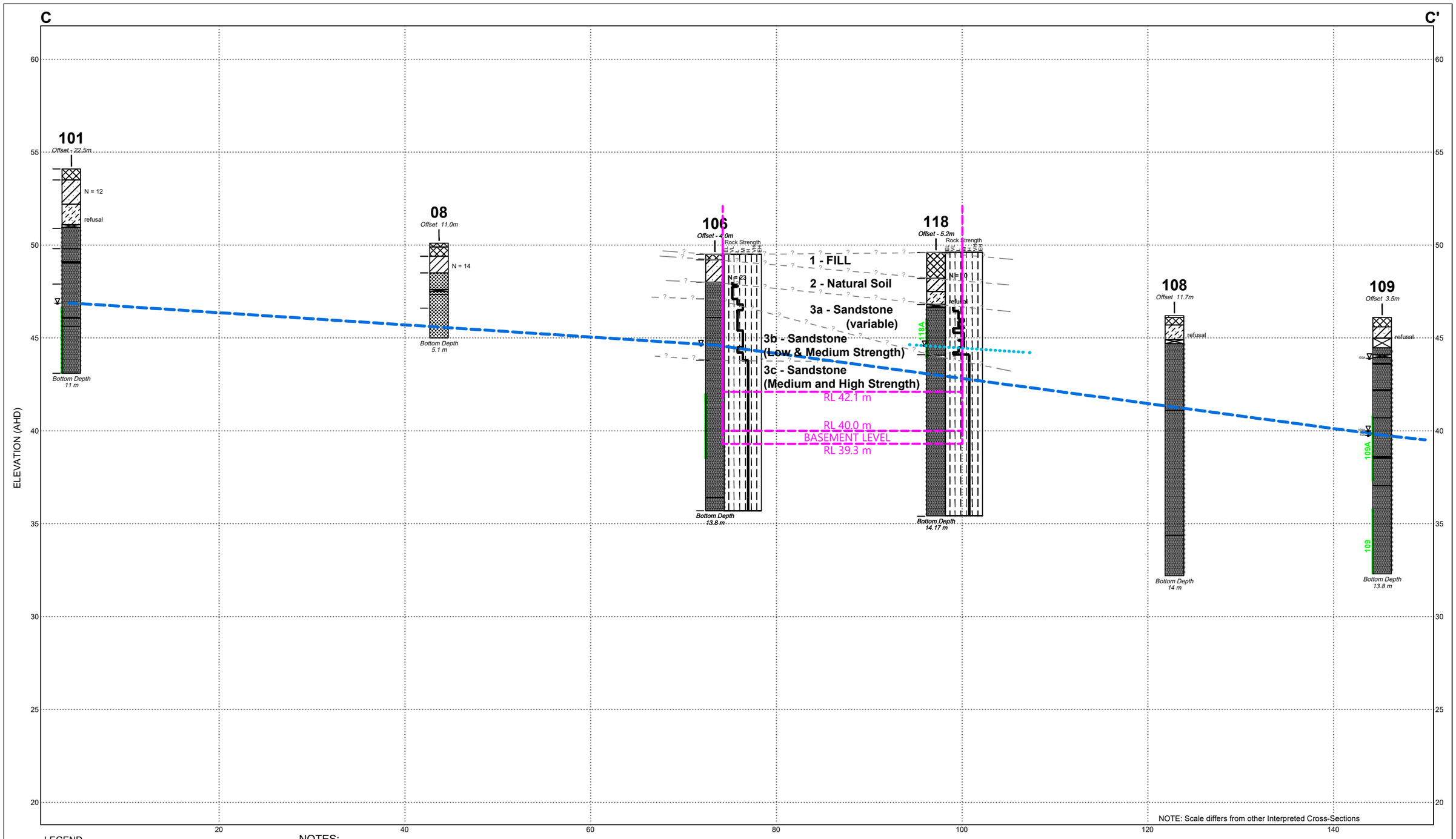
0 4

Horizontal Scale (metres)

Vertical Exaggeration = 2.0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Frasers Property Ivanhoe Pty Ltd		TITLE: **Interpreted Geotechnical Cross-Section B-B'**	PROJECT No: 86043.06
OFFICE: Sydney	DRAWN BY: SCP	**Proposed Stage 2 Development - Site C3**	DRAWING No: 303
SCALE: 1:200 (H) 1:100 (V) @ A3	DATE: 11.06.2021	**Midtown, Maquarie Park**	REVISION: 1



LEGEND

- Core Loss
- Bricks
- Clay
- Clayey Sand
- Filling
- Sandstone
- Sandstone coarse grained
- Sandy Clay

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. Bores 01 to 13 were logged based on AS1726-1993, and differences in the simplified logs should be expected between those logs and logging according to current practice, based on AS1726-2017, particularly in the upper, weathered rock profile.

ROCK STRENGTH

EL -	Extremely Low
VL -	Very Low
L -	Low
M -	Medium
H -	High
VH-	Very High

SOIL CONSISTENCY

vs -	Very Soft
s -	Soft
f -	Firm
st -	Stiff
vst -	Very Stiff
h -	Hard

TESTS / OTHER

- N - Standard penetration test value
- Interpreted geotechnical boundary
- Water level
- Interpreted deep water table
- Standpipe Gravel Pack Length
- Interpreted transient water table

Horizontal Scale (metres) 0 8

Vertical Exaggeration = 2.0

Douglas Partners
Geotechnics / Environment / Groundwater

CLIENT: Frasers Property Ivanhoe Pty Ltd		TITLE: **Interpreted Cross-Section C-C'**	PROJECT No: 86043.06
OFFICE: Sydney	DRAWN BY: SCP	**Proposed Stage 2 Development - Site C3**	DRAWING No: 304
SCALE: 1:400 (H) 1:200 (V) @ A3	DATE: 11.06.2021	**Midtown, Maquarie Park**	REVISION: 1

Appendix C

Results of Field Work

Sampling Methods

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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.

Description and Classification Methods

The methods of description and classification of soils and rocks used in this report are generally based on Australian Standard AS1726:2017, Geotechnical Site Investigations. 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	19 - 63
Medium gravel	6.7 - 19
Fine gravel	2.36 – 6.7
Coarse sand	0.6 - 2.36
Medium sand	0.21 - 0.6
Fine sand	0.075 - 0.21

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

The proportions of secondary constituents of soils are described as follows:

In fine grained soils (>35% fines)

Term	Proportion of sand or gravel	Example
And	Specify	Clay (60%) and Sand (40%)
Adjective	>30%	Sandy Clay
With	15 – 30%	Clay with sand
Trace	0 - 15%	Clay with trace sand

In coarse grained soils (>65% coarse)
- with clays or silts

Term	Proportion of fines	Example
And	Specify	Sand (70%) and Clay (30%)
Adjective	>12%	Clayey Sand
With	5 - 12%	Sand with clay
Trace	0 - 5%	Sand with trace clay

In coarse grained soils (>65% coarse)
- with coarser fraction

Term	Proportion of coarser fraction	Example
And	Specify	Sand (60%) and Gravel (40%)
Adjective	>30%	Gravelly Sand
With	15 - 30%	Sand with gravel
Trace	0 - 15%	Sand with trace gravel

The presence of cobbles and boulders shall be specifically noted by beginning the description with ‘Mix of Soil and Cobbles/Boulders’ with the word order indicating the dominant first and the proportion of cobbles and boulders described together.

Soil Descriptions

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
Friable	Fr	-

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	Density Index (%)
Very loose	VL	<15
Loose	L	15-35
Medium dense	MD	35-65
Dense	D	65-85
Very dense	VD	>85

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;
- Extremely weathered material – formed from in-situ weathering of geological formations. Has soil strength but retains the structure or fabric of the parent rock;
- Alluvial soil – deposited by streams and rivers;
- Estuarine soil – deposited in coastal estuaries;
- Marine soil – deposited in a marine environment;
- Lacustrine soil – deposited in freshwater lakes;
- Aeolian soil – carried and deposited by wind;
- Colluvial soil – soil and rock debris transported down slopes by gravity;
- Topsoil – mantle of surface soil, often with high levels of organic material.
- Fill – any material which has been moved by man.

Moisture Condition – Coarse Grained Soils

For coarse grained soils the moisture condition should be described by appearance and feel using the following terms:

- Dry (D) Non-cohesive and free-running.
- Moist (M) Soil feels cool, darkened in colour.
  Soil tends to stick together.
  Sand forms weak ball but breaks easily.
- Wet (W) Soil feels cool, darkened in colour.
  Soil tends to stick together, free water forms when handling.

Moisture Condition – Fine Grained Soils

For fine grained soils the assessment of moisture content is relative to their plastic limit or liquid limit, as follows:

- 'Moist, dry of plastic limit' or 'w <PL' (i.e. hard and friable or powdery).
- 'Moist, near plastic limit' or 'w ≈ PL (i.e. soil can be moulded at moisture content approximately equal to the plastic limit).
- 'Moist, wet of plastic limit' or 'w >PL' (i.e. soils usually weakened and free water forms on the hands when handling).
- 'Wet' or 'w ≈LL' (i.e. near the liquid limit).
- 'Wet' or 'w >LL' (i.e. wet of the liquid limit).

Rock Strength

Rock strength is defined by the Unconfined Compressive Strength and it 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 Point Load Strength Index $Is_{(50)}$ is commonly used to provide an estimate of the rock strength and site specific correlations should be developed to allow UCS values to be determined. The point load strength test procedure is described by Australian Standard AS4133.4.1-2007. The terms used to describe rock strength are as follows:

Strength Term	Abbreviation	Unconfined Compressive Strength MPa	Point Load Index * $Is_{(50)}$ MPa
Very low	VL	0.6 - 2	0.03 - 0.1
Low	L	2 - 6	0.1 - 0.3
Medium	M	6 - 20	0.3 - 1.0
High	H	20 - 60	1 - 3
Very high	VH	60 - 200	3 - 10
Extremely high	EH	>200	>10

* 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
Residual Soil	RS	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are no longer visible, but the soil has not been significantly transported.
Extremely weathered	XW	Material is weathered to such an extent that it has soil properties. Mass structure and material texture and fabric of original rock are still visible
Highly weathered	HW	The whole of the rock material is discoloured, usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable. Rock strength is significantly changed by weathering. Some primary minerals have weathered to clay minerals. Porosity may be increased by leaching, or may be decreased due to deposition of weathering products in pores.
Moderately weathered	MW	The whole of the rock material is discoloured , usually by iron staining or bleaching to the extent that the colour of the original rock is not recognisable, but shows little or no change of strength from fresh rock.
Slightly weathered	SW	Rock is partially discoloured with staining or bleaching along joints but shows little or no change of strength from fresh rock.
Fresh	FR	No signs of decomposition or staining.
Note: If HW and MW cannot be differentiated use DW (see below)		
Distinctly weathered	DW	Rock strength usually changed by weathering. The rock may be highly discoloured, usually by iron staining. Porosity may be increased by leaching or may be decreased due to deposition of weathered products in pores.

Rock Descriptions

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 occasional fragments
Fractured	Core lengths of 30-100 mm with occasional shorter and longer sections
Slightly Fractured	Core lengths of 300 mm or longer with occasional sections of 100-300 mm
Unbroken	Core contains very few fractures

Rock Quality Designation

The quality of the cored rock can be measured using the Rock Quality Designation (RQD) index, defined as:

$$\text{RQD \%} = \frac{\text{cumulative length of 'sound' core sections} \geq \text{100 mm long}}{\text{total drilled length of section being assessed}}$$

where 'sound' rock is assessed to be rock of low strength or stronger. 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

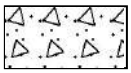
Symbols & Abbreviations

Graphic Symbols for Soil and Rock

General


Asphalt


Road base


Concrete


Filling

Soils


Topsoil

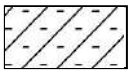

Peat


Clay

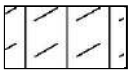

Silty clay

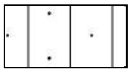

Sandy clay

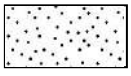

Gravelly clay


Shaly clay

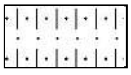

Silt

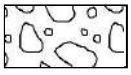

Clayey silt


Sandy silt

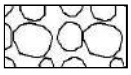

Sand

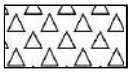

Clayey sand


Silty sand


Gravel

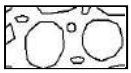

Sandy gravel


Cobbles, boulders

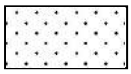

Talus

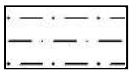
Sedimentary Rocks

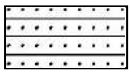

Boulder conglomerate

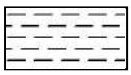

Conglomerate


Conglomeratic sandstone

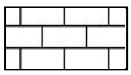

Sandstone


Siltstone

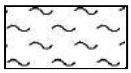

Laminite

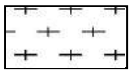

Mudstone, claystone, shale

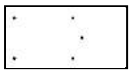

Coal


Limestone

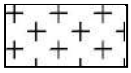
Metamorphic Rocks


Slate, phyllite, schist

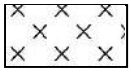

Gneiss


Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 52.4 AHD
EASTING: 325617.7
NORTHING: 6260365.1
DIP/AZIMUTH: 90°/--

BORE No: 103
PROJECT No: 86043.06
DATE: 28/4/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
52	0.1	FILL/ Clayey SAND: fine to medium, brown, trace fine to medium sandstone gravel, moist							C			
	0.2	LEAN MIX CONCRETE							A			
		SANDSTONE: fine to medium grained, yellow-brown, very low strength, highly weathered, Hawkesbury Sandstone										25/70 mm refusal
51	1.1								S			
	1.2	SANDSTONE: fine to medium grained, red-brown and pale grey, very low to medium strength with an extremely low strength band, highly weathered, fractured, Hawkesbury Sandstone						1.13m: CORE LOSS: 70mm 1.2m: Fg 30mm 1.25m: Cs 30mm 1.41-1.73m: B0°-5° (x6) pl, ro, cln & cly vn 1.58m: Cs 20mm 1.8m: Cs30mm 1.9m: Cs 30mm 2.2m: Ds 50mm 2.37m: Cs 20mm	C	94	24	PL(A) = 0.17 PL(A) = 0.3
50	2.4	SANDSTONE: fine to medium grained, pale grey with some red-brown and orange-brown staining, low and medium strength, moderately weathered, fractured to slightly fractured, Hawkesbury Sandstone						3.37m: B0°, pl, ro, cly 2mm 3.42m: Cs 10mm 3.52m: Cs 15mm, fe stn 3.75m: J30°, pl, ro, cbs vn 3.96m: Cs 10mm 4.25m: Cs 10mm 4.52m: Ds 10mm 4.62m: Ds 10mm	C	100	90	PL(A) = 0.73 PL(A) = 0.36 PL(A) = 0.53
47								5.08m: B0°-5° (x2), pl, sm, cly co 5.45m: Cs 10mm 5.52m: Fg 20mm, cly inf, fe stn 5.62m: J45° (x2), pl, ro, fe stn 6.03m: J80°, pl, sm, cly vn 6.33m: Cs 10mm 6.74m: Ds 60mm 6.75m: B5°, pl, ro, fe stn 6.84m: B0° (x3), pl, ro, fe stn 6.91m: J70°-90°, ir, ro, fe stn	C	100	85	PL(A) = 0.4 PL(A) = 0.53
45	7.0	SANDSTONE: medium to coarse grained, yellow-brown and pale grey, medium and high strength, moderately to slightly weathered, slightly fractured, Hawkesbury Sandstone										PL(A) = 1.9
43		Below 9.4m: high strength						8.49m: B10°, pl, ro, fe stn 8.75m: Cs 20mm 8.84m: B0°, pl, ro, fe stn 8.95m: B5°, un, ro, cly vn 9.06m: B5°, pl, ro, fe stn 9.06-9.42m: B0°-10° (x4), pl, ro, fe stn 9.27m: B10°, pl, sm, cly 1mm, fe stn	C	100	82	PL(A) = 0.39

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 1.0m, HQ to 1.1m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Rotary to 1.1m; NMLC-Coring to 17.1m; PCD to 11.0 m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 15.0m (screen 15.0-12.0m; blank 12.0-0.0m; gravel 15.0-11.5m; bentonite 11.5-11.0m; backfill to GL; gatic at surface); Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 52.4 AHD
EASTING: 325617.7
NORTHING: 6260365.1
DIP/AZIMUTH: 90°/--

BORE No: 103
PROJECT No: 86043.06
DATE: 28/4/2021
SHEET 2 OF 2

RL	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)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
42		SANDSTONE: medium to coarse grained, yellow-brown and pale grey, medium and high strength, moderately to slightly weathered, slightly fractured, Hawkesbury Sandstone *(continued)*						10.12m: B5°, pl, ro, cly vn	C	100	82	PL(A) = 1.6
11		Below 11.07m: slightly fractured to unbroken						11.07m: B5°, pl, sm, cly co				PL(A) = 1.2
41												
12												PL(A) = 1.6
40									C	100	100	
13												PL(A) = 1.5
39												
14								13.83m: B0°, pl, sm, cly 2mm, fe stn 13.92m: Fg 20mm, fe stn				PL(A) = 2
38	14.88											
15		SANDSTONE: medium to coarse grained, pale grey, strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone										PL(A) = 3.5
37									C	100	99	
16								16.1m: Fg 10mm				PL(A) = 1.9
36												
17	17.1	Bore discontinued at 17.1m Target depth reached										PL(A) = 1
35												
18												
34												
19												
33												

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 1.0m, HQ to 1.1m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Rotary to 1.1m; NMLC-Coring to 17.1m; PCD to 11.0 m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 15.0m (screen 15.0-12.0m; blank 12.0-0.0m; gravel 15.0-11.5m; bentonite 11.5-11.0m; backfill to GL; gatic at surface); Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BORE: 103 PROJECT: MACQUARIE PARK APRIL 2021



1.10 – 5.00m

BORE: 103 PROJECT: MACQUARIE PARK APRIL 2021



5.00 – 10.00m

BORE: 103 PROJECT: MACQUARIE PARK APRIL 2021



10.00 – 15.00m

BORE: 103 PROJECT: MACQUARIE PARK APRIL 2021



15.00 – 17.10m

BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 51.8 AHD
EASTING: 325637.8
NORTHING: 6260346.9
DIP/AZIMUTH: 90°/--

BORE No: 104
PROJECT No: 86043.06
DATE: 27/4/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
51	0	FILL/ Sandy CLAY: low to medium plasticity, brown, fine to medium sand, with fine to medium sandstone gravel, w<PL							A			
	1								A			
	1.2	Sandy CLAY CL-CI: low to medium plasticity, yellow-brown, fine to medium sand, w<PL, stiff, residual							A			3,3,6 N = 9
	1.5	SANDSTONE: fine to medium grained, yellow-brown then pale grey and red-brown, very low to low strength with some medium strength bands, highly weathered, fractured, Hawkesbury Sandstone							S			PL(A) = 0.06
50	2							1.6m: B0°, pl, ro, cly vn 1.7m: B5°, pl, sm, cly 1mm 1.97m: Cs 20mm 2.25m: Cs 10mm	C	100	70	PL(A) = 0.08
49	3							2.92m: Cs 60mm				PL(A) = 0.19
48	4							3.78m: Cs 10mm 3.87m: B0°, pl, ro, fe stn 4.12m: B5° (x2), pl, ro, fe stn & cly vn 4.48m: Ds 30mm	C	100	75	PL(A) = 0.23
47	5											PL(A) = 0.26
	5.41							5.3m: CORE LOSS: 110mm				
46	6	SANDSTONE: medium to coarse grained, orange brown and pale grey, high strength, slightly weathered, slightly fractured, Hawkesbury Sandstone						5.62m: Cs 10mm 5.8m: Fg 40mm, cly co 5.88m: Cs 10mm 5.95m: Ds 50mm 6.25m: B5°, pl, ro, fe stn				PL(A) = 1.1
45	7							7.20-7.67m: B0°-5° (x4), pl, ro, fe stn	C	97	65	PL(A) = 1.8
44	8							7.85m: J80°, pl, ro, cln 8.08m: Cs 20mm 8.17m: Cs 10mm				PL(A) = 1.1
43	9											PL(A) = 1.5
42	10.0							9.33m: J80°, pl, ro, cln	C	100	100	

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 1.0m, HQ to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Rotary to 1.5m; NMLC-Coring to 16.25m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▽	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 51.8 AHD
EASTING: 325637.8
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DIP/AZIMUTH: 90°/--

BORE No: 104
PROJECT No: 86043.06
DATE: 27/4/2021
SHEET 2 OF 2

RL	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)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
41	11	SANDSTONE: medium to coarse grained, orange brown and pale grey, high strength, slightly weathered, slightly fractured, Hawkesbury Sandstone *(continued)*						10.74m: B5°, pl, ro, cln	C	100	100	PL(A) = 1.6 PL(A) = 1.6
40	12							11.41m: J30°, pl, ro, cly vn 11.71m: Cs 10mm 11.79m: B0°, pl, ro, cly vn	C	80	65	
	12.12	Between 12.12-14.70m: red brown, moderately weathered						11.93m: CORE LOSS: 190mm 12.32m: B0°, pl, ro, fe stn 12.5m: J80°, pl, ro, fe stn 12.82m: B0°, pl, ro, cly vn 12.87m: Cs 10mm 12.9m: Ds 100mm 13m: CORE LOSS: 90mm 13.25m: B0°-5° (x2), pl, ro, fe stn				PL(A) = 2.2
39	13								C	95	83	PL(A) = 1.6
38	14											PL(A) = 2.9
	14.7	SANDSTONE: medium to coarse grained, pale grey, high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone										
37	15							15.08m: B0°, pl, ro, cln	C	100	100	PL(A) = 1.7
36	16							15.92m: B0°, pl ro, cly vn				PL(A) = 1.7
	16.25	Bore discontinued at 16.25m Target depth reached										
35	17											
34	18											
33	19											
32												

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 1.0m, HQ to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Rotary to 1.5m; NMLC-Coring to 16.25m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BORE: 104 PROJECT: MACQUARIE PARK APRIL 2021



1.50 – 6.00m

BORE: 104 PROJECT: MACQUARIE PARK APRIL 2021



6.00 – 11.00m

BORE: 104 PROJECT: MACQUARIE PARK APRIL 2021



11.00 – 16.00m

BORE: 104 PROJECT: MACQUARIE PARK APRIL 2021



16.00 – 16.25m

BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 49.9 AHD
EASTING: 325665.6
NORTHING: 6260360.3
DIP/AZIMUTH: 90°/--

BORE No: 105
PROJECT No: 86043.06
DATE: 24/4/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
			EW HW MW SW FS FR		Ex Low / Very Low / Low / Medium / High / Very High / Ex High		0.01 / 0.05 / 0.10 / 0.50 / 1.00	B - Bedding J - Joint S - Shear F - Fault				
49	0.0	FILL/ SAND: fine to medium, dark brown, with clay, moist							A			
									A			
	0.8	Sandy CLAY CI: medium plasticity, yellow-brown, fine to medium sand, w<PL, stiff, residual							A			
48	1								S			4,5,10 N = 15
	2.1	Clayey SAND SC: fine to medium sand, pale grey and red-brown, moist, very dense, extremely weathered Hawkesbury Sandstone							A			
	2								S			25/70 mm refusal
	2.7	SANDSTONE: fine to medium, pale grey and red-brown, very low to medium strength, highly weathered, fractured, Hawkesbury Sandstone										PL(A) = 1.7
47	3							3.1m: J50°, pl, cly co 3.16m: J50°-60° (x3), pl, ro, cln 3.47m: B10°, pl, ro, cln 3.53m: B5°, pl, ro, fe stn 3.8m: B0°, pl, ro, cly vn 3.92m: Cs 40mm	C	100	75	PL(A) = 0.38
46	4							4.29m: B5°, pl, ro, cln 4.4m: B10°, pl, ro, fe stn 4.53m: B5°, pl, ro, fe stn				
	4.77	SANDSTONE: medium to coarse grained, orange-brown and pale grey, high strength, moderately to slightly weathered, slightly fractured, Hawkesbury Sandstone						4.61m: J50°, pl, ro, cln 4.7m: Cs 30mm 4.74m: CORE LOSS: 30mm				PL(A) = 0.75
45	5							5.3m: B0°, pl, ro, fe stn 5.34m: Cs 10mm (x2) 5.4m: J80°, pl, ro cln 5.77m: B0°, pl, ro cln	C	98	90	PL(A) = 1.4
44	6							6.12m: B0°, pl, ro, cln 6.63m: B0°, pl ro, fe stn				
	6.88							6.84m: CORE LOSS: 40mm				PL(A) = 1.3
43	7											
42	8							8.4m: B0°, pl, sm, cly vn	C	99	99	PL(A) = 1
41	9							9.45m: B0°, pl, ro, cly vn				PL(A) = 1
40	10.0								C	100	100	PL(A) = 2.1

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 2.5m, HQ to 2.7m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Rotary to 2.7m; NMLC-Coring to 15.9m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 49.9 AHD
EASTING: 325665.6
NORTHING: 6260360.3
DIP/AZIMUTH: 90°/--

BORE No: 105
PROJECT No: 86043.06
DATE: 24/4/2021
SHEET 2 OF 2

RL	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)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
39	11	SANDSTONE: medium to coarse grained, orange-brown and pale grey, high strength, moderately to slightly weathered, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*						10.4m: B10°, pl, ro, cly vn				PL(A) = 1.8
38	12							11.35m: B5°, pl, ro, cln	C	100	100	PL(A) = 2.3
37	13											PL(A) = 2.6
36	14 14.0	At 13.62m: band of low strength siltstone						13.62m: B0°, pl, ro, fe stn				PL(A) = 1.4
		SANDSTONE: medium to coarse grained, pale grey, high strength, fresh, slightly fractured to unbroken, Hawkesbury Sandstone							C	100	99	
35	15							14.7m: B0°-5° (x2) pl, ro, cly vn				PL(A) = 1.5
34	15.9 16	Bore discontinued at 15.9m Target depth reached										PL(A) = 1.6
33	17											
32	18											
31	19											
30												

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 2.5m, HQ to 2.7m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Rotary to 2.7m; NMLC-Coring to 15.9m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BORE: 105 PROJECT: MACQUARIE PARK APRIL 2021



2.70 – 7.00m

BORE: 105 PROJECT: MACQUARIE PARK APRIL 2021



7.00 – 12.00m

BORE: 105 PROJECT: MACQUARIE PARK APRIL 2021



12.00 – 15.90m

BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 49.5 AHD
EASTING: 325658.4
NORTHING: 6260394.7
DIP/AZIMUTH: 90°/--

BORE No: 106
PROJECT No: 86043.06
DATE: 28/4/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
49	0.3	FILL/ Sandy CLAY: low plasticity, brown, trace rootlets and fine to medium igneous gravel, w<PL							A			
		Sandy CLAY CL-CI: low to medium plasticity, yellow-brown, fine to medium sand, trace fine to medium sandstone gravel, w<PL, stiff, residual							A			
48	1.5								A S			3,6,17 N = 23
		SANDSTONE: fine to medium grained, pale grey and red-brown, very low to medium strength, highly weathered, fractured, Hawkesbury Sandstone						1.5m: Ds 150mm 1.68m: J45°, pl, ro, fe stn 1.78m: Ds 20mm 1.95m: Ds 20mm 2.19m: Ds 150mm 2.35m: J60°, pl, ro, cln 2.47m: B0°-5° (x3), pl, ro, cly vn 3.06m: Cs 30mm 3.3m: Cs 20mm	C	100	0	PL(A) = 0.09
47												PL(A) = 0.7
46	3.4	SANDSTONE: fine to medium grained, pale grey, orange-brown and red-brown, low to medium strength, moderately weathered, slightly fractured						3.8m: Cs 10mm 3.85m: Cs 40mm 3.9m: B0°, pl, sm, cly co 4.71m: B5°, pl, ro, cly vn 5.02m: B0°-10° (x6), pl, sm, cly co & fe stn	C	100	70	PL(A) = 0.16 PL(A) = 0.51
45						11-05-21						
44	5.7	SANDSTONE: medium to coarse grained, red-brown, orange-brown and pale grey, high strength, slightly weathered to fresh, slightly fractured, Hawkesbury Sandstone						5.68m: B10°, pl, ro, fe stn & Fg 20mm	C	100	95	PL(A) = 2.6
43								6.8m: B0° (x4), pl, ro, fe stn				PL(A) = 1.2
42		Below 7.4m: moderately weathered band										PL(A) = 1.1
41									C	100	96	
40								9.36m: Cs 5mm				PL(A) = 1.5
									C	100	98	PL(A) = 1.6

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 1.0m, HQ to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Rotary to 1.5m; NMLC-Coring to 13.8m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 11.0m (screen 11.0-8.0m; blank 8.0-0.0m; gravel 11.0-7.5m; bentonite 7.5-7.0m; backfill to GL; gatic at surface); Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 49.5 AHD
EASTING: 325658.4
NORTHING: 6260394.7
DIP/AZIMUTH: 90°/--

BORE No: 106
PROJECT No: 86043.06
DATE: 28/4/2021
SHEET 2 OF 2

RL	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)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
39	11	SANDSTONE: medium to coarse grained, red-brown, orange-brown and pale grey, high strength, slightly weathered to fresh, slightly fractured, Hawkesbury Sandstone *(continued)*						10.21m: B0°, pl, ro, cln				PL(A) = 1.6
38	12								C	100	98	PL(A) = 2
37	13							12.52m: Cs 10mm 12.67m: Cs 10mm 12.88m: B0°, pl, ro,cln				PL(A) = 2.7
36	13.08 13.11							13.08m: CORE LOSS: 30mm 13.11m: B0°, pl, ro, fe stn 13.17m: B10°, pl, ro, fe stn 13.24m: Fg 60mm, fe stn 13.35m: J30°, pl,ro, fe stn 13.64m: J30°, pl, ro, cbs co	C	97	70	PL(A) = 2.3
35	13.8 14	Bore discontinued at 13.8m Target depth reached										
34	15											
33	16											
32	17											
31	18											
30	19											

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 1.0m, HQ to 1.5m

TYPE OF BORING: Solid flight auger (TC-bit) to 1.0m; Rotary to 1.5m; NMLC-Coring to 13.8m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Groundwater well installed to 11.0m (screen 11.0-8.0m; blank 8.0-0.0m; gravel 11.0-7.5m; bentonite 7.5-7.0m; backfill to GL; gatic at surface); Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BORE: 106 PROJECT: MACQUARIE PARK APRIL 2021



1.50 – 5.00m

BORE: 106 PROJECT: MACQUARIE PARK APRIL 2021



5.00 – 10.00m

BORE: 106 PROJECT: MACQUARIE PARK APRIL 2021



10.00 – 13.80m

BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 51.7 AHD
EASTING: 325636.9
NORTHING: 6260386.8
DIP/AZIMUTH: 90°/--

BORE No: 117
PROJECT No: 86043.06
DATE: 21/4/2021
SHEET 1 OF 2

RL	Depth (m)	Description of Strata	Degree of Weathering	Graphic Log	Rock Strength	Water	Fracture Spacing (m)	Discontinuities (B - Bedding, J - Joint, S - Shear, F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
51	0	FILL/ SAND: fine to medium, dark brown, trace silt, clay and fine to medium gravel, moist							A			
	1								A			
	1.2	Sandy CLAY CL: low plasticity, yellow-brown, fine to medium sand, w<PL, stiff, residual							S			5,4,6 N = 10
50		Below 1.6m: pale grey and red-brown, grading to extremely weathered Hawkesbury Sandstone							A			
	2											
	2.2	SANDSTONE: fine to medium, pale grey and red-brown, very low and medium strength, highly weathered, Hawkesbury Sandstone							A			
									S			25/130 mm refusal
49	3							2.70-4.02m: B0°-10° (x12), pl, ro, fe stn	C	100	8	PL(A) = 0.4
48												PL(A) = 0.91
	3.98							3.8m: CORE LOSS: 180mm				
	4.0	SANDSTONE:fine to medium grained, pale grey and red brown with some yellow-brown, very low to medium strength, highly weathered, slightly fractured, Hawkesbury Sandstone										
47	4							4.69m: Cs 10mm	C	89	70	PL(A) = 0.23
	5							5.13m: B5°, pl, ro, cly vn 5.29m: B5°, pl, ro, fe stn 5.33m: J70°, pl, ti				
46												PL(A) = 0.16
	6							6.27m: Cs 10mm 6.32m: J30°, pl, ro, cly vn				
45	6.76	Below 6.76m: moderately to slightly weathered						6.56-6.88m: B0°-10° (x9), pl, ro, fe stn & he	C	95	70	PL(A) = 0.4
	7							6.71m: CORE LOSS: 50mm 7.04m: Ds 20mm 7.09m: Ds 20mm				
	7.3	SANDSTONE: medium to coarse grained, pale grey and orange, medium and high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone						7.3m: Ds 10mm				
44	8											PL(A) = 1.6
								8.56m: B0°, pl, ro, fe stn	C	100	100	
43	9											PL(A) = 1.3
42	10.0											PL(A) = 1

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 2.5m, HQ to 2.67m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Rotary to 2.67m; NMLC-Coring to 16.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 51.7 AHD
EASTING: 325636.9
NORTHING: 6260386.8
DIP/AZIMUTH: 90°/--

BORE No: 117
PROJECT No: 86043.06
DATE: 21/4/2021
SHEET 2 OF 2

RL	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)	Water	Fracture Spacing (m) (0.01, 0.05, 0.10, 0.50, 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Type	Core Rec. %	RQD %	Test Results & Comments
41	11	SANDSTONE: medium to coarse grained, pale grey and yellow-brown, medium to high strength, moderately weathered, slightly fractured, Hawkesbury Sandstone *(continued)*						10.05m: J80°, pl, ro, cln 10.38m: B10°, pl, ro, cly vn 10.44m: B0°, pl, ro, cly vn 10.98m: J80°, pl, ro, cln 11.06m: J80°, pl, ro, cln 11.41m: J80°, pl, ro, cln 11.55m: J80°, pl, ro, cln	C	100	95	
40	12							11.86m: B10°, pl, sm, cly vn 12.08m: J70°, pl, ro, cln	C	100	95	PL(A) = 0.56
39	13								C	100	97	PL(A) = 0.41 PL(A) = 2.2
38	14							14.14m: B10°, pl, sm, cly 2mm 14.2m: B5°, pl, ro, cly vn 14.38m: B5°, pl, ro, cly vn				PL(A) = 0.78
37	15	Between 14.8-15.0m: very high strength Between 15.0-15.2m: band of interbedded siltstone clasts and low strength, highly weathered sandstone						15.0-15.2m: J50°-70° (x4), pl, ro, fe stn	C	100	100	PL(A) = 3.2
36	16 16.0								C	100	80	PL(A) = 1.8
35	17	Bore discontinued at 16.0m Target depth reached										
34	18											
33	19											
32												

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 2.5m, HQ to 2.67m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Rotary to 2.67m; NMLC-Coring to 16.0m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

Douglas Partners
Geotechnics / Environment / Groundwater

BORE: 117 PROJECT: MACQUARIE PARK APRIL 2021



2.67 – 7.00m

BORE: 117 PROJECT: MACQUARIE PARK APRIL 2021



7.00 – 12.00m

BORE: 117 PROJECT: MACQUARIE PARK APRIL 2021



12.00 – 16.00m

BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 49.6 AHD
EASTING: 325675
NORTHING: 6260377.6
DIP/AZIMUTH: 90°/--

BORE No: 118
PROJECT No: 86043.06
DATE: 27/4/2021
SHEET 1 OF 2

RL	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)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
49	0	FILL/ Sandy CLAY: medium plasticity, dark brown, fine to medium sand, trace rootlets and fine to medium sandstone gravel, w<PL							A			
	1								S			6,5,5 N = 10
48	1.4	Sandy CLAY Cl: medium plasticity, yellow-brown, fine to medium sand, w<PL, stiff, residual										
	2											
47	2.1	Clayey SAND SC: fine to medium, pale grey and red-brown, trace fine to medium ironstone gravel, moist, very dense, extremely weathered Hawkesbury Sandstone							S			20,25/130 mm refusal
	2.8							2.8m: CORE LOSS: 150mm				
	2.95	SANDSTONE: fine to medium,pale grey and red-brown,very low to low strength, highly weathered, fractured, Hawkesbury Sandstone						2.95m: J90°, pl, ro, cln 3.06m: J70°, pl, ro, fe stn	C	88	45	PL(A) = 0.2
46	3											
	4							3.92m: Ds 80mm				PL(A) = 0.94
45								4.26m: Cs 20mm				
	5							4.7m: B10°, pl, ro, fe stn & Ds 20mm				PL(A) = 0.23
								5.13m: J60°-70° (x2), pl, ro, cln 5.36m: Cs 10mm 5.5m: Cs 10mm	C	100	80	
44	5.53	SANDSTONE: medium to coarse grained, red-brown then orange-brown and pale grey, high strength, moderately weathered to fresh, slightly fractured to unbroken, Hawkesbury Sandstone										
	6							6.03m: B20°, pl, ro, fe stn				PL(A) = 1.6
43												
	7							6.95m: J80°, pl, ro, cln				PL(A) = 1.5
42								7.61m: B0°, pl, ro, fe stn 7.62m: Cs 20mm 7.81m: J70°, pl, ro, cln				PL(A) = 1.1
	8								C	100	98	
41								8.8m: Ds 20mm				
	9											PL(A) = 1.1
40									C	100	100	

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 2.5m, HQ to 2.8m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Rotary to 2.8m; NMLC-Coring to 14.17m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BOREHOLE LOG

CLIENT: Frasers Property Ivanhoe Pty Ltd
PROJECT: Proposed Stage 2 Development
LOCATION: Midtown, Maquarie Park

SURFACE LEVEL: 49.6 AHD
EASTING: 325675
NORTHING: 6260377.6
DIP/AZIMUTH: 90°/--

BORE No: 118
PROJECT No: 86043.06
DATE: 27/4/2021
SHEET 2 OF 2

RL	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)	Water	Fracture Spacing (m) (0.01 / 0.05 / 0.10 / 0.50 / 1.00)	Discontinuities (B - Bedding J - Joint S - Shear F - Fault)	Sampling & In Situ Testing: Type	Core Rec. %	RQD %	Test Results & Comments
39	11	SANDSTONE: medium to coarse grained, red-brown then orange-brown and pale grey, high strength, moderately weathered to fresh, slightly fractured to unbroken, Hawkesbury Sandstone *(continued)*						>>				PL(A) = 1
												PL(A) = 2.2
38	12								C	100	100	PL(A) = 1.5
37	13							12.9m: B0°, pl, ro, cln				PL(A) = 2.2
36	14							13.49-13.59m: J20°-50° (x5), pl, ro, fe stn & he	C	100	92	PL(A) = 1.9
	14.17	Bore discontinued at 14.17m Target depth reached						14.02m: B20°, pl, ro, cly vn				
35	15											
34	16											
33	17											
32	18											
31	19											
30												

RIG: Explora **DRILLER:** JD **LOGGED:** TM **CASING:** HW to 2.5m, HQ to 2.8m

TYPE OF BORING: Solid flight auger (TC-bit) to 2.5m; Rotary to 2.8m; NMLC-Coring to 14.17m

WATER OBSERVATIONS: No free groundwater observed whilst augering

REMARKS: Coordinates and surface levels obtained from differential GPS

SAMPLING & IN SITU TESTING LEGEND

A	Auger sample	G	Gas sample	PID	Photo ionisation detector (ppm)
B	Bulk sample	P	Piston sample	PL(A)	Point load axial test Is(50) (MPa)
BLK	Block sample	U_x	Tube sample (x mm dia.)	PL(D)	Point load diametral test Is(50) (MPa)
C	Core drilling	W	Water sample	pp	Pocket penetrometer (kPa)
D	Disturbed sample	▷	Water seep	S	Standard penetration test
E	Environmental sample	▼	Water level	V	Shear vane (kPa)

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BORE: 118 PROJECT: MACQUARIE PARK APRIL 2021



2.80 – 7.00m

BORE: 118 PROJECT: MACQUARIE PARK APRIL 2021



8.00 – 12.00m

BORE: 118 PROJECT: MACQUARIE PARK APRIL 2021



12.00 – 14.17m

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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

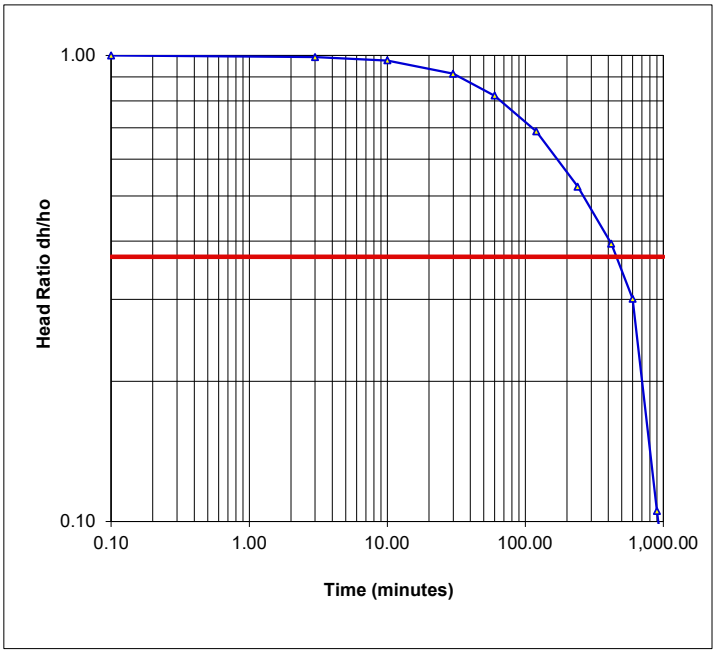
Details of Well Installation

Well casing diameter (2r)	70	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 δH (m)	δH/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 =**	**2.9E-08**	m/sec
	=	**0.010**	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

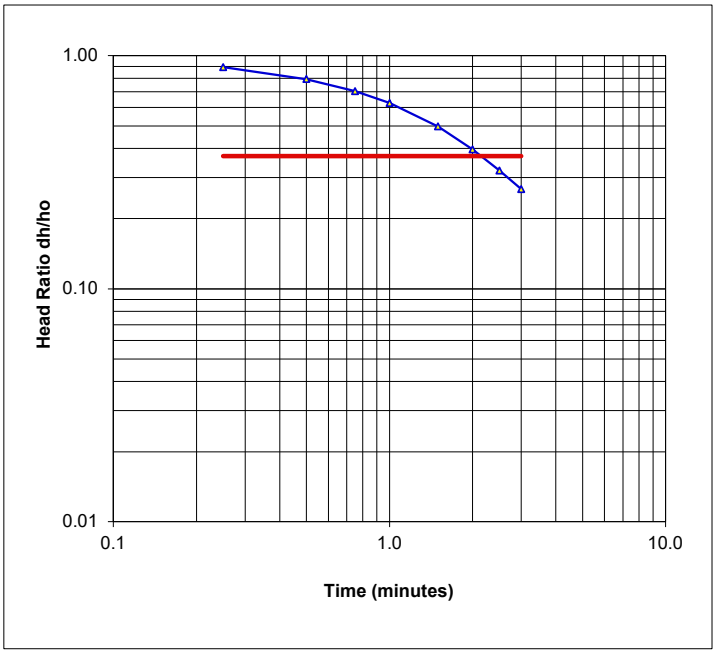
Description:	Unit 3C	**Test No.**	BH104A	
Material type:	Sandstone	Easting:	325637.8	m
		Northing	6260346.9	m
		Surface Level:	51.8	m AHD

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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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

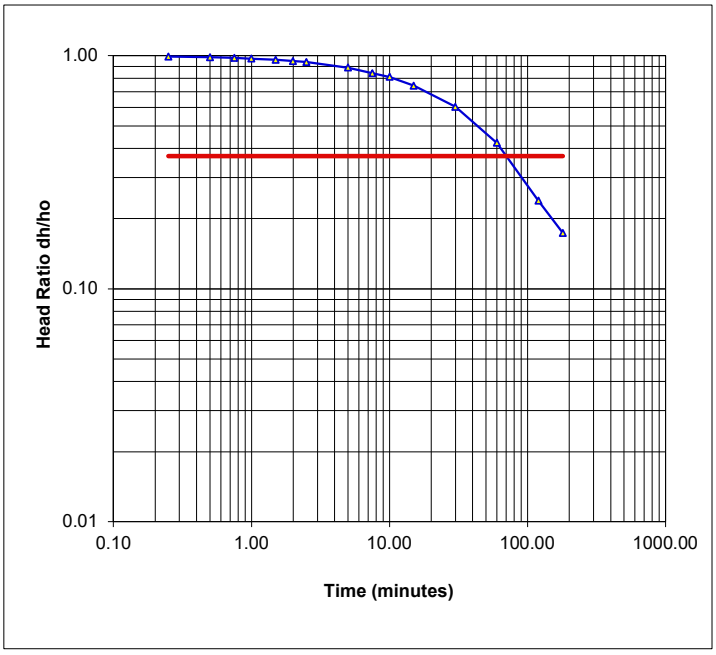
Description:	Unit 3C	**Test No.**	BH106	
Material type:	Sandstone	Easting:	325661.8	m
		Northing	6260395.3	m
		Surface Level:	49.4	m AHD

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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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

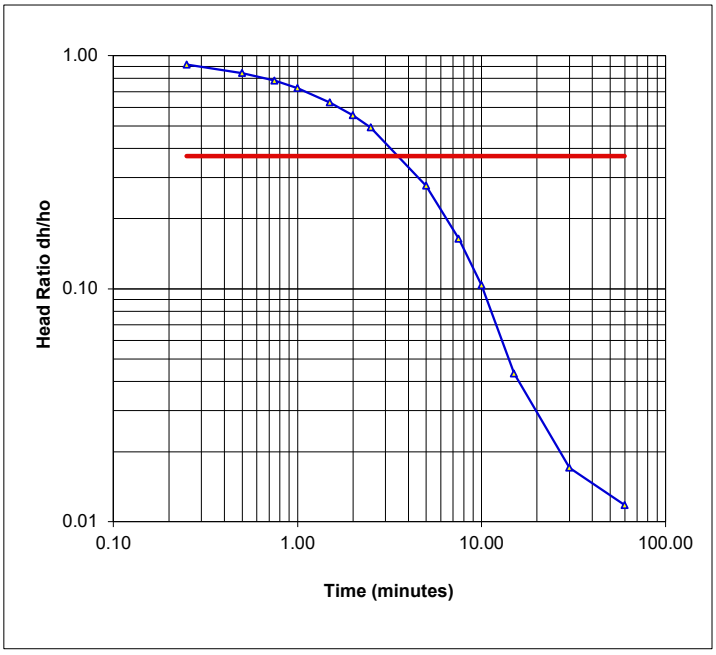
Description:	Unit 3D	**Test No.**	BH107	
Material type:	Sandstone	Easting:	325658.7	m
		Northing	6260313.1	m
		Surface Level:	49.7	m AHD

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

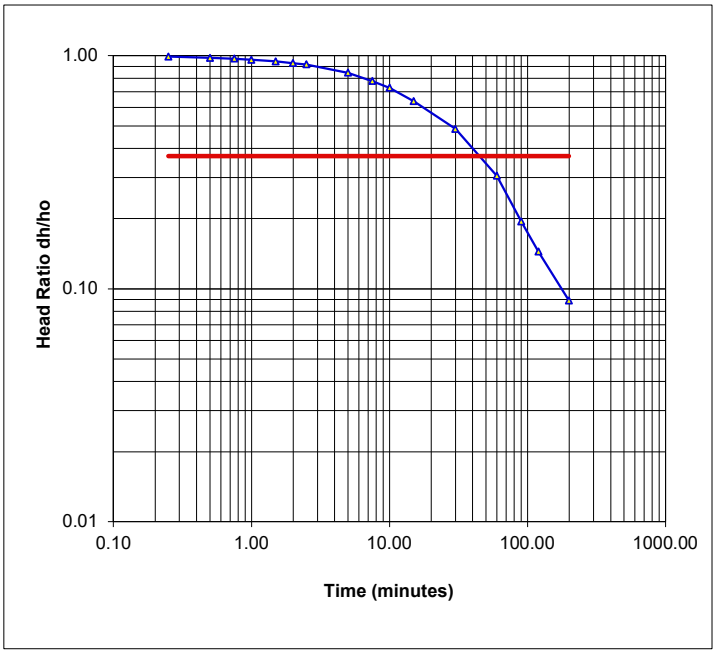
Description:	Unit 3D	**Test No.**	BH109	
Material type:	Sandstone	Easting:	325716	m
		Northing	6260351.1	m
		Surface Level:	46.1	m AHD

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

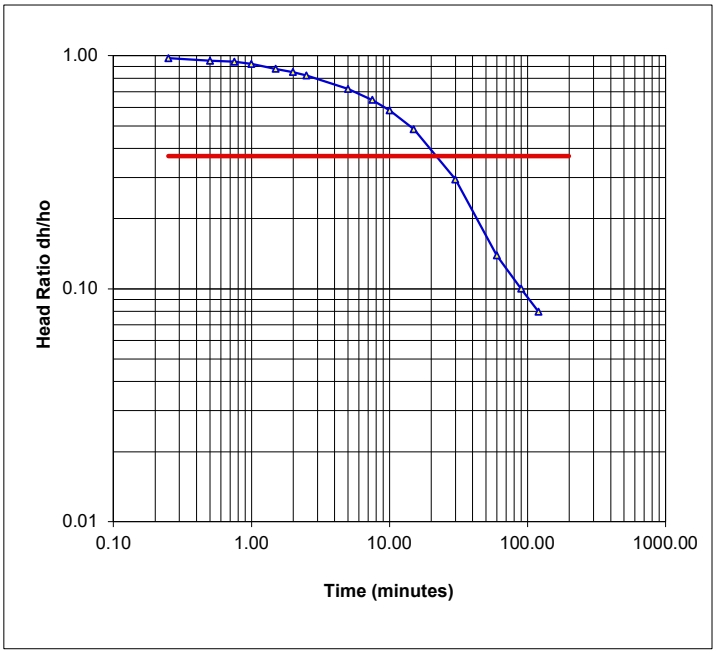
Description:	Unit 3C	**Test No.**	BH109A	
Material type:	Sandstone	Easting:	325716	m
		Northing	6260351.1	m
		Surface Level:	46.1	m AHD

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

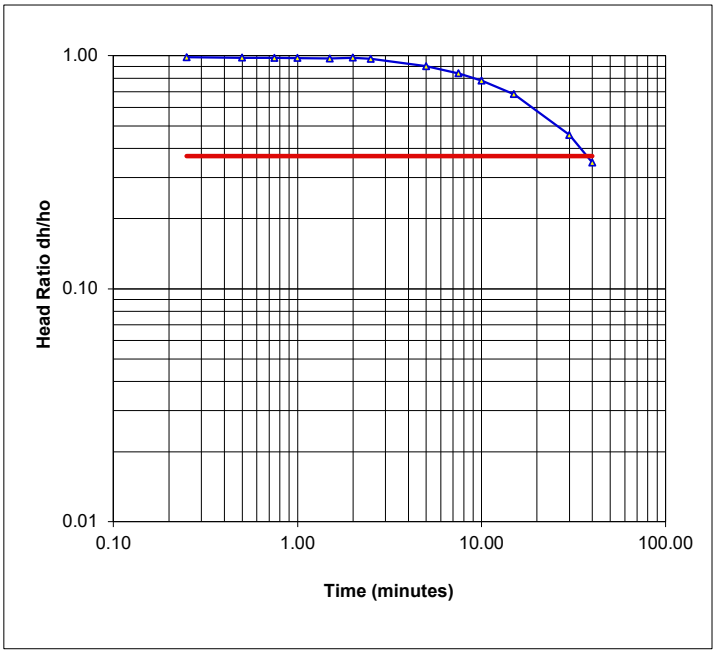
Description:	Unit 3D	**Test No.**	BH111	
Material type:	Sandstone	Easting:	325729.6	m
		Northing	6260317.2	m
		Surface Level:	45.8	m AHD

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

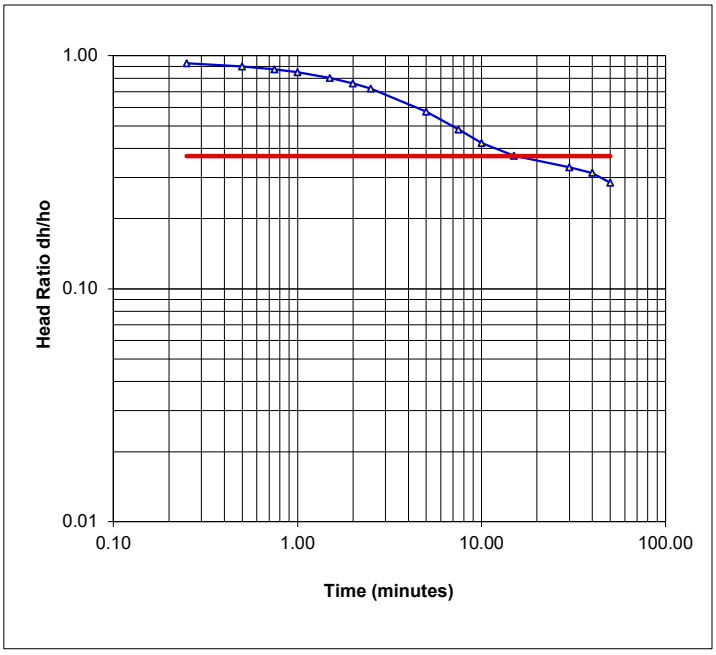
Description:	Unit 3D	**Test No.**	BH111A	
Material type:	Sandstone	Easting:	325729.6	m
		Northing	6260317.2	m
		Surface Level:	45.8	m AHD

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

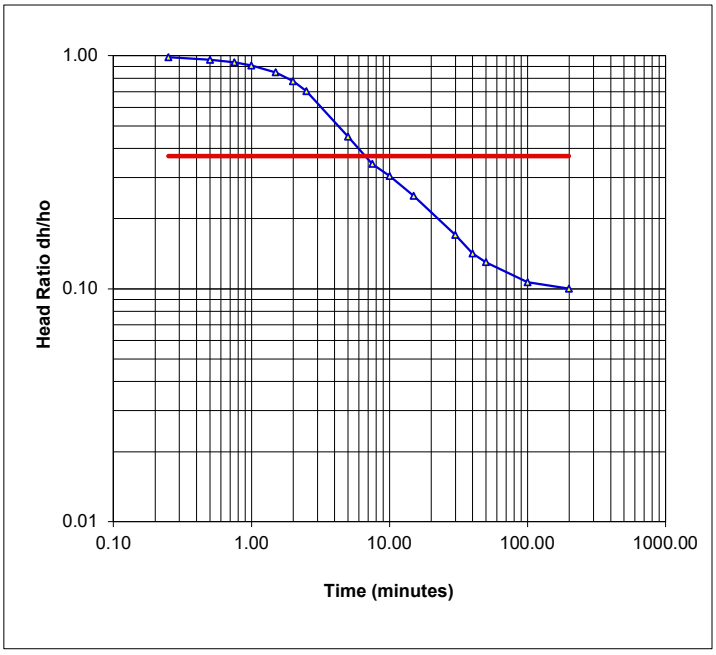
Description:	Unit 3D	**Test No.**	BH113	
Material type:	Sandstone	Easting:	325701.1	m
		Northing	6260273.1	m
		Surface Level:	46.9	m AHD

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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Project:	Stage 2 - Midtown	Date:	28-May-21
Location:	Herring Road, Macquarie Park	Tested by:	LS

Test Location

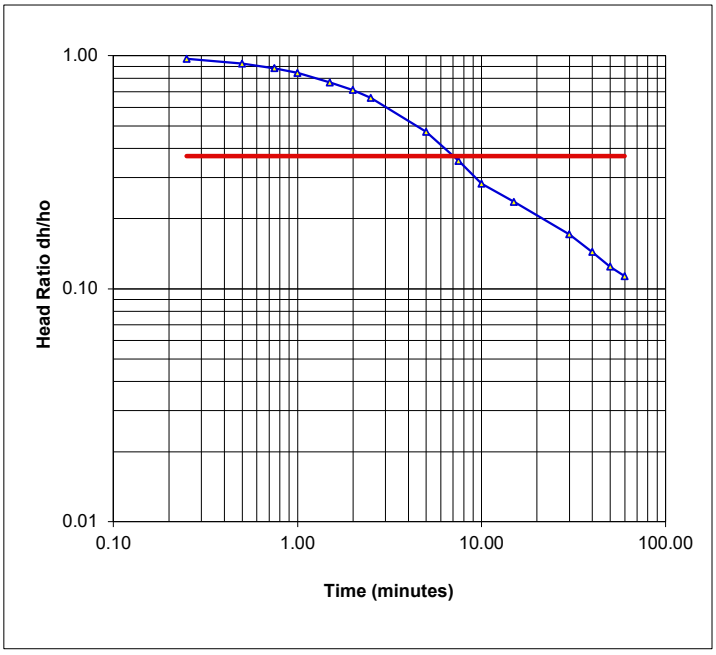
Description:	Unit 3D	**Test No.**	BH114	
Material type:	Sandstone	Easting:	325695.41	m
		Northing	6260286.6	m
		Surface Level:	47.3	m AHD

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

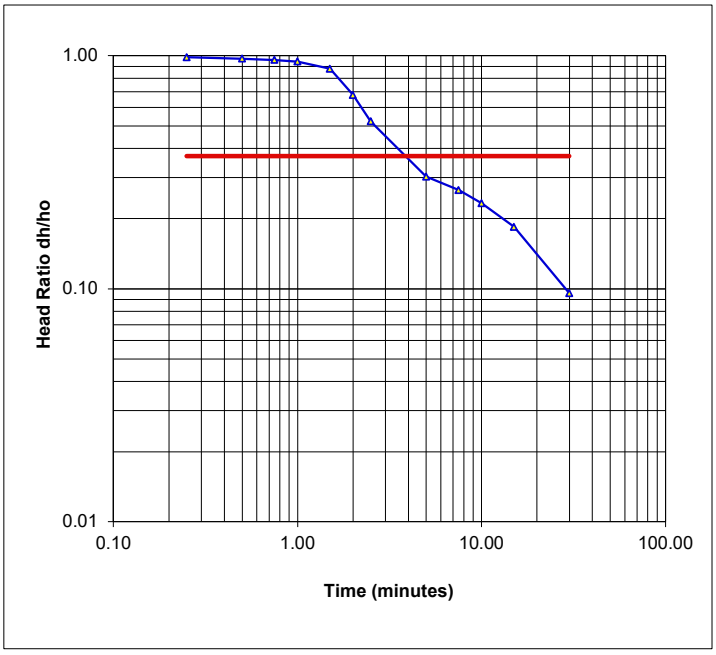
Description:	Unit 3C	**Test No.**	BH115	
Material type:	Sandstone	Easting:	325707.2	m
		Northing	6260312	m
		Surface Level:	46.4	m AHD

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

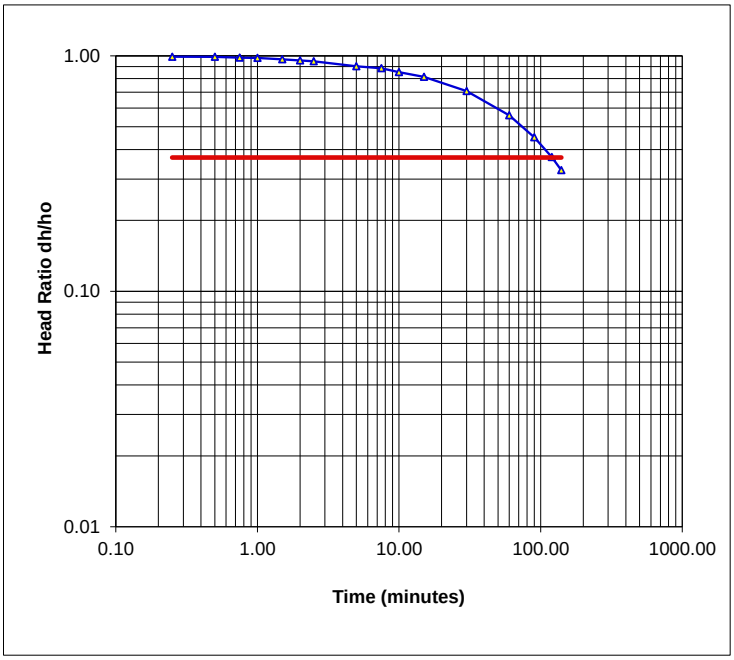
Description:	Unit 3A	**Test No.**	BH118A	
Material type:	Sandstone	Easting:	325675	m
		Northing	6260378	m
		Surface Level:	46.4	m AHD

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	

Appendix D

Summary of Groundwater Measurements

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

Douglas PARTNERS | GROUNDED EXPERTISE

Memorandum

To:	Parkview Constructions Pty Ltd	Date:	16 January 2024
Attention:	Santi Mantarro	Project No.:	86043.23
Email:	Santi.mantarro @parkview.com.au	Reference:	R.005.Rev0
From:	Peter Hunt		
Subject:	Concept Design for Shotcrete Retaining Wall Ivanhoe Estate, Macquarie Park		

This report details the concept design of a temporary shotcrete wall to be installed around the perimeter of the proposed excavation for the C3 Development at Ivanhoe Estate. The concept design outlines the proposed temporary anchor design to avoid hitting services and is for discussion with the structural engineer who will design the shotcrete. It is understood that the building will support the wall in the long term.

Earth Pressures

We have assessed the earth pressures based on the borehole information (see DP geotechnical report 86043.06.R.002.Rev2.C3) for TTW to design the shotcrete along shoring walls SW1 to SW5. From boreholes BH103, BH104, BH105, BH106 and BH118, the depth of rock face requiring support is expected to be up to 3 to 4 m. The design can be based on a maximum 4 m height, a unit weight of 22 kN/m^3 and an active co-efficient of earth pressure (Ka) of 0.1 for the variable sandstone, together with a unit weight of 20 kN/m^3 and an active co-efficient of earth pressure (Ka) of 0.3 for the clay soils (in the north-east corner of the site). A diagram of the earth pressures for the worst case ground profile (1.5 m of clay over 2.5 m of variable sandstone) is shown on the attached sketch.

The shotcrete should be designed by the structural engineer to accommodate the earth pressures shown on the attached sketch as well as resultant shear and bending moments. The design should incorporate 100 mm wide vertical strip drains at 1.5 m centres. Note that all surcharge (construction materials, equipment or road/pavement) should be allowed for and conveyed to the geotechnical engineer for review. The shotcrete base should sit on a rock ledge of width at least equal to the width of shotcrete.

SW2 (Southern Boundary), SW3 (South-Eastern Boundary) and SW4 (Eastern Boundary)

Where the retained height is 4 m there will need to be three rows of temporary dowels (see Figure 1). Where the required retained height is determined by the geotechnical engineer to be less, the bottom row of bolts will not be required. The temporary dowels should be constructed as per the following details:

- The top row of anchors will need to be 3 m long, 22 mm diameter BluGeo GRP60 bars in a 0.1 m diameter hole, drilled at 1 m down from the crest and at 45 degrees to the horizontal in order to avoid services.
- The second row of anchors will need to be 3 m long, 22 mm diameter BluGeo GRP60 bars in a 0.1 m diameter hole, drilled at 2 m down from the crest and at 20 degrees to the horizontal. The second row of anchors should be offset from the first row by 0.75 m.
- The third row of anchors will need to be 2 m long, 22 mm diameter BluGeo GRP60 bars in a 0.1 m diameter hole, drilled at 3.25 m down from the crest and at 20 degrees to the horizontal.

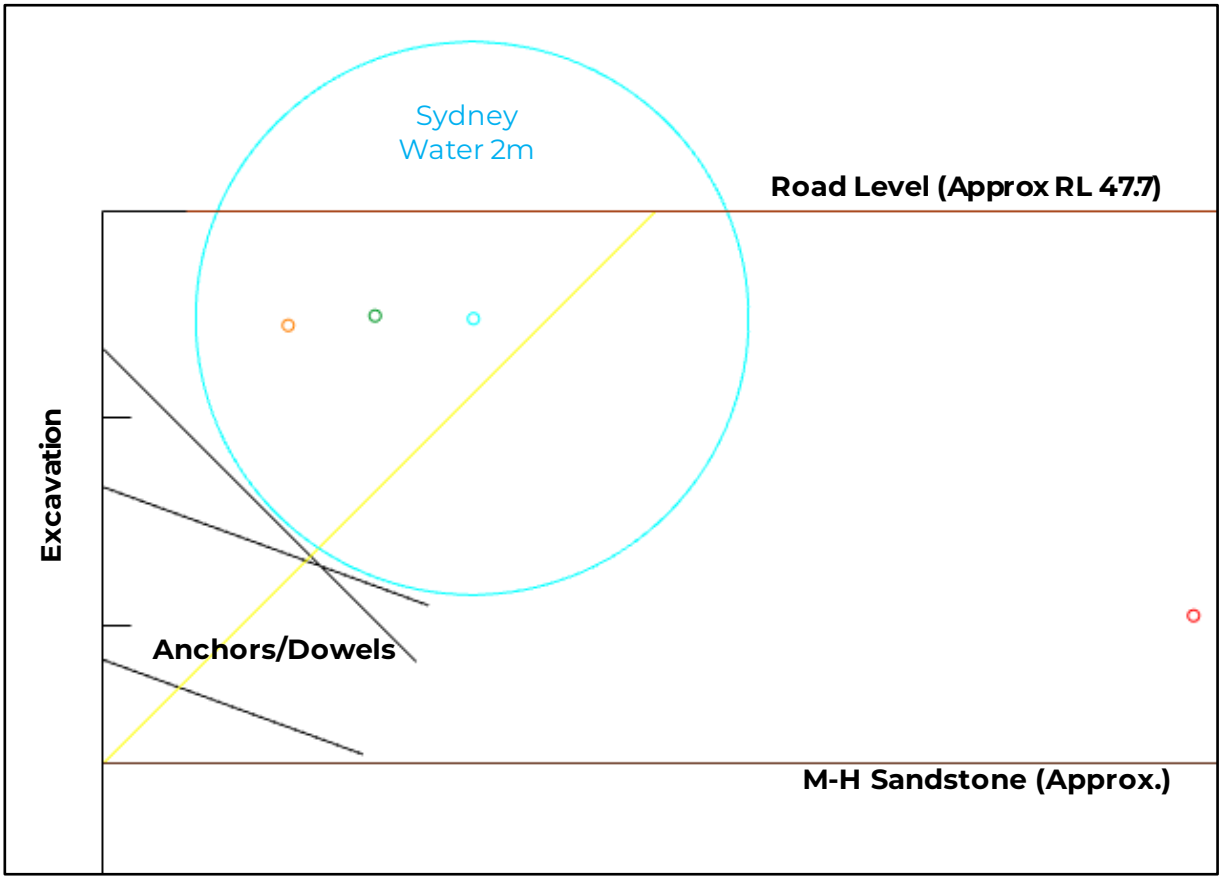


Figure 1: Cross-Section through South-Eastern Boundary showing Anchors

GRP bars are recommended due to the proximity of electrical services to the anchors and that these temporary bars can be readily excavated once the building provides permanent support should additional trenching etc be required around the perimeter of the site.

Excavation of the faces should be carried out in maximum 1.5 m drops. To maintain stability of the shotcrete and ground above, the second and third drop will have to be carried out in a hit and miss panel sequence. Excavated panels will need to comprise a 1.5 m wide 'hit' panel with a 1.5 m wide berm ('miss' panel) left in place either side to allow for installation of the shotcrete and anchor at the hit panel. Once the hit panel anchors and shotcrete have gained strength, the berm at the miss panels can be removed, and the remaining anchors and shotcrete installed.

All anchors will need to be at 1.5 m spacing. Holes should be tremie filled with thixotropic grout (min fc=32 MPa) once clean. The GRP bars should be inserted immediately after the hole has been grouted. Once the grout has gained strength and the shotcrete is in place, bars should be locked off at a nominal 50 kN with a GRP dome nut and headplate sitting on the shotcrete face. Vertical 100 mm wide strip drains should be installed at 1.5 m centres behind the shotcrete, tailing out at the base of the shotcrete to allow free drainage. If the rock is not of sufficient quality, longer anchors may be required (anchor length to be advised).

SW5 (North-Eastern Boundary)

Where the retained height is 4m there will need to be three rows of temporary dowels (see Figure 2). Where the required retained height is determined by the geotechnical engineer to be less, the bottom row of bolts will not be required. The temporary dowels should be constructed as per the following details:

- The top row of anchors will need to be 3 m long, 22 mm diameter bars BluGeo GRP60 in a 0.1 m diameter hole, drilled at 1 m down from the crest and at 20 degrees to the horizontal.
- The second row of anchors will need to be 3 m long, 22 mm diameter BluGeo GRP60 bars in a 0.1 m diameter hole, drilled at 2 m down from the crest and at 20 degrees to the horizontal.
- The third row of anchors will need to be 2 m long, 22 mm diameter BluGeo GRP60 bars in a 0.1 m diameter hole, drilled at 3.25 m down from the crest and at 20 degrees to the horizontal.

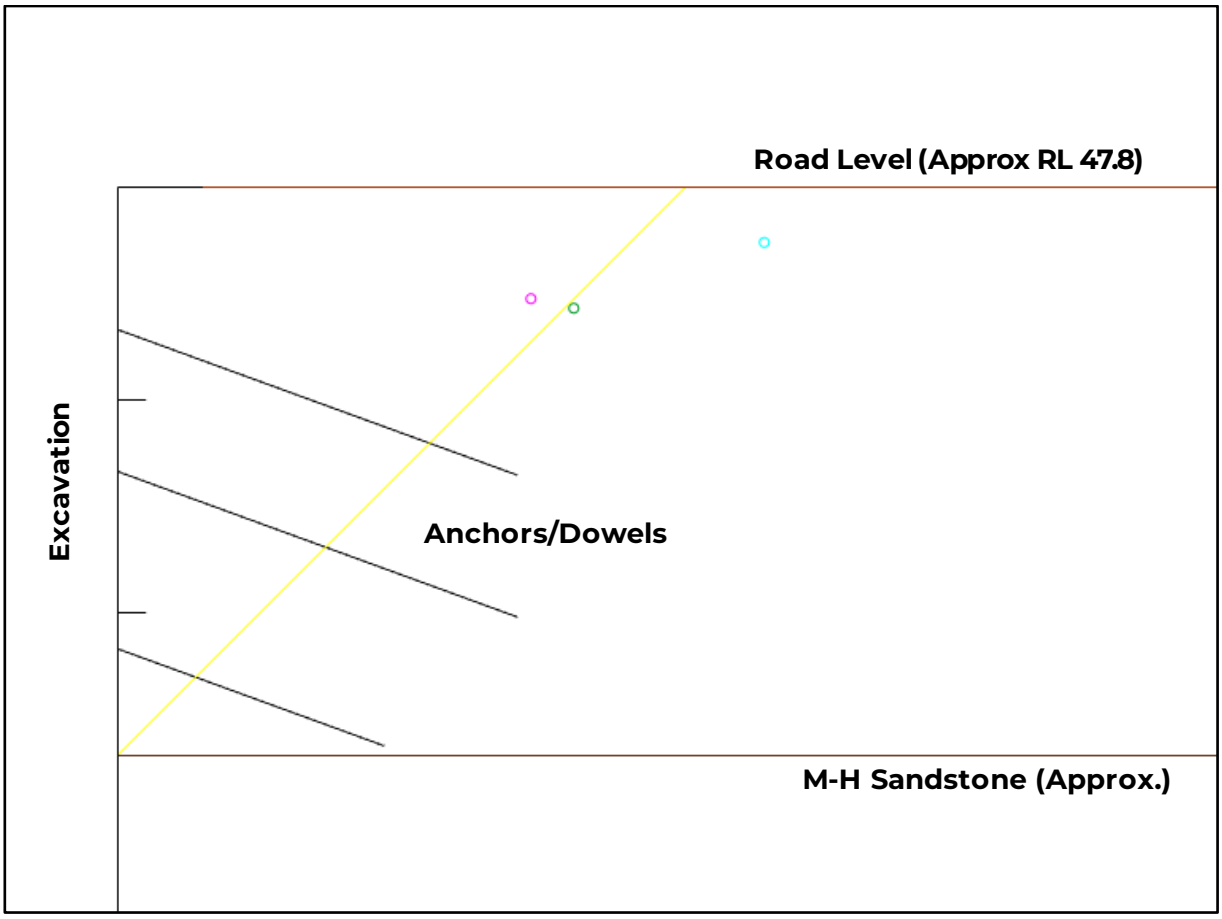


Figure 2: Cross-Section through North-Eastern Boundary showing Anchors

GRP bars are recommended due to the proximity of electrical services to the anchors and that these temporary bars can be readily excavated once the building provides permanent support should additional trenching etc be required around the perimeter of the site.

Excavation of the faces should be carried out in maximum 1.5 m high drops. To maintain stability of the shotcrete and ground above, the second and third drop will have to be carried out in a hit and miss panel sequence. Excavated panels will need to comprise a 1.5 m wide 'hit' panel with a 1.5 m wide berm ('miss' panel) left in place either side to allow for installation of the shotcrete and anchor at the hit panel. Once the hit panel anchors and shotcrete have gained strength, the berm at the miss panels can be removed, and the remaining anchors and shotcrete installed.

All anchors will need to be at 1.5 m spacing. Holes should be tremie filled with thixotropic grout (min fc=32 MPa) once clean. The GRP bars should be inserted immediately after the hole has been grouted. Once the grout has gained strength and the shotcrete is in place, the bars should be locked off at a nominal 50 kN with a GRP dome nut and headplate sitting on the shotcrete face. Vertical 100 mm wide strip drains should be installed at 1.5 m centres behind the shotcrete, tailing out at the base of the shotcrete to allow free drainage. If the

rock is not of sufficient quality, longer anchors may be required (anchor length to be advised).

SW1 (South-Western boundary)

A short section towards the eastern end of this boundary will likely require support. The design for SW3 should be continued along this face where instructed by the geotechnical engineer.

General Comments

Notwithstanding that the services haven't been handed over, we suggest Parkview consults with the service providers as per Table B of Safework NSW guideline[1]. Table B in the guideline indicates that the asset owner must be contacted regarding clearances for individuals carrying out work near Assets and also for the No Go Zone for powered excavation near those assets.

Parkview should obtain any restrictions for drilling and installing dowels as well as for powered excavation for services which are close to the proposed excavation face. Parkview should also find out the width of the service trenches as a small sliver of rock may be left between the trench sidewall and the future excavation face which may require additional support.

The design includes using fibreglass bars instead of steel to reduce the risk of stray currents. Note, however, that drilling equipment will be required to drill the holes for the dowels.

All services should be positively identified before any rock face support works commence.

Please contact the undersigned if you have any questions on this matter.

Douglas Partners Pty Ltd

Peter Hunt
Senior Associate

Reviewed by

Hugh Burbidge
Principal

Attachments: Notes About this Report
Sketches

[1] Work Near Underground Assets – Guide, Safework NSW 2007

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.

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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;
- 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.

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- 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

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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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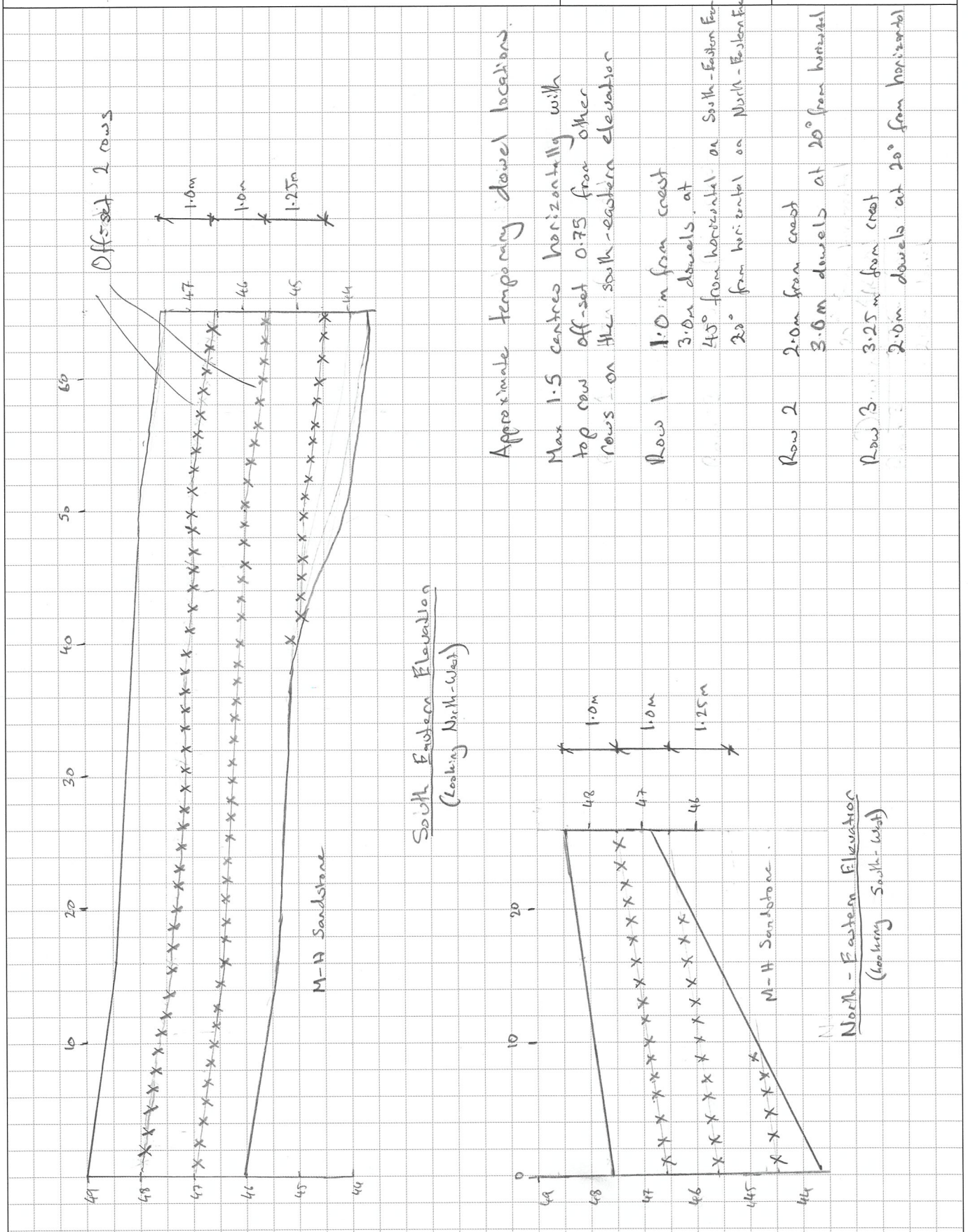
Douglas Partners
Geotechnics / Environment / Groundwater

PROJECT Proposed C3 Development. Ivanhoe Estate	Job No 86043.23	Page 1 of 1



Comps By PH 16 / 1 / 24	Checked By HB 16 / 01 / 24	Approved By / /

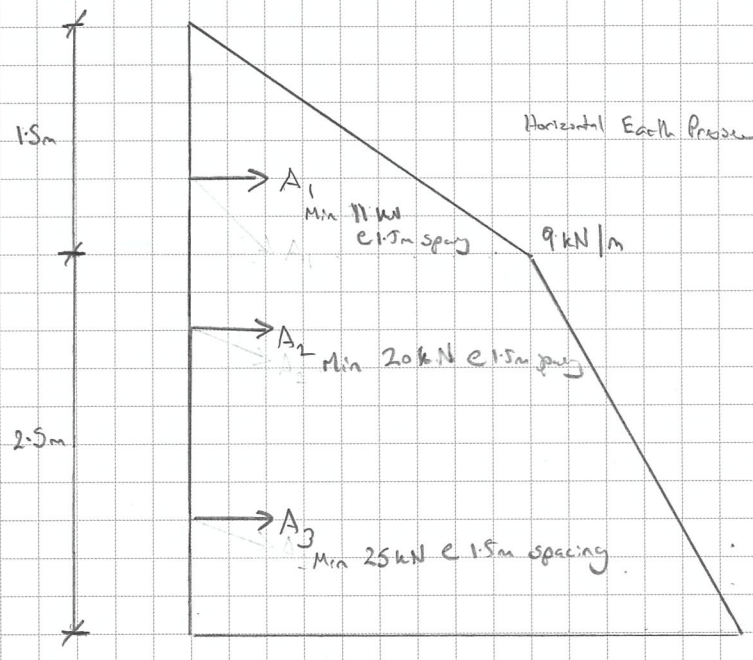
Douglas Partners
Geotechnics / Environment / Groundwater

PROJECT Proposed C3 Development, Ivanhoe Estate	Job No 86043.23	Page 1 of 1

Earth Pressures

Based on boreholes and testpits the worst-case geology includes 1.5 m stiff to very stiff clay over 2.5 m of variable strength sandstone.

Material Properties:	Active Earth Pressure, k_a	Density γ kN/m^3	Allowable Bond Capacity (kPa)
Clay	0.3	20	N/A
VL-L Sandstone	0.1	22	100



Horizontal Earth Pressure at 1.5m deep = $k_a \times \gamma \times$ depth
= 0.3 x 20 x 1.5
= 9 kN/m

Additional horizontal earth pressure at 4m deep from VL-L Sandstone only = $k_a \times \gamma \times$ depth
= 0.1 x 22 x 2.5
= 5.5 kN/m

Total horizontal earth pressure at 4m depth = 9 + 5.5
= 14.5 kN/m

Comps By PH 16 / 01 / 24	Checked By HB 16 / 01 / 24	Approved By / /

Douglas PARTNERS | GROUNDED EXPERTISE

Parkview Constructions Pty Ltd

Attention: Roben Naamo

Email: roben.namoo@parkview.com.au

Project 86043.23

12 January 2024

R.004.Rev0

CAS/SP

Report on Geotechnical Monitoring Plan
C3 Site
Ivanhoe Estate, Macquarie Park

1. Introduction

This Geotechnical Monitoring Plan (GMP) sets out the proposed geotechnical monitoring requirements during basement excavation works for the proposed C3 Building of the Ivanhoe Estate at Ivanhoe Place, Macquarie Park. This GMP has been prepared to address condition B41(b) of the Development Consent by the Minister for Planning (Ref: SSD 15822622 dated 2022).

The proposed bulk excavation level (BEL) is about RL 39 to RL 40 m AHD, which would require a maximum depth of cut of about 12 m below the original ground level, which, it is understood, has since been partially stripped down by about 1 to 1.5 m depth with rock present at surface towards the southwest end. The basement is shallower at RL 42 at the northeast end, requiring a maximum depth of cut of about 6 m.

It is expected that the excavation will generally be unsupported through sandstone bedrock, except for localised rockbolting (as required). Dowels and shotcrete support (subject to services in the road) is proposed at the northeastern face (SW5), the eastern face (SW4) and up to half-way along the southeastern face (SW3), depending on the ground conditions encountered during excavation. Temporary batters are proposed along the northwestern boundary (RTW2).

A geotechnical investigation was previously carried out by Douglas Partners (DP) at the site for Stage 2 of the development comprising C2, C3 and C4 sites (Ref: 86043.06.R.002.Rev2.C3 dated 4 August 2021). At C3 site, the investigation comprised six rock-cored boreholes to a maximum depth of 17.1 m. As mentioned above, the original ground level has since been lowered which should be taken into account when considering the ground profile information.

The proposed basement footprint is located well inside the Ivanhoe site boundaries, approximately 40 m away from neighbouring structures, and about 80 m from Epping Road to the south-west. Within the site, the nearest structure is C2 building about 60 m to the northwest.

Note that this monitoring plan is a live document and may require updating as the works progress. Also note that Principal Contractor and Builder are used interchangeably and essentially mean the same entity. The term geotechnical engineers means a suitably experienced geotechnical engineer or engineering geologist.

2. Objectives

The objectives of the GMP are to provide a sequence for geotechnical monitoring activities expected during excavation and construction, showing the responsible parties, as well as hold points to manage the geotechnical aspects of the construction processes.

The plan has been separated into the following three sections:

- **Geotechnical** – movement or settlement of temporary and permanent works and structures, excavation support, and adequacy of foundation materials.
- **Hydrogeological** - potential changes of the groundwater;
- **Vibration** – vibration generated by excavation works.

The Principal Contractor for the proposed development is responsible for implementing the measures outlined in this plan. The contractor shall engage the services of suitably qualified and experienced professionals for the required monitoring activities.

3. Geotechnical Monitoring

The key geotechnical aspects which require monitoring on this project are as follows:

- stability of excavations;
- groundwater;
- stability of adjacent existing buildings; and,
- adequacy of the foundation materials to provide support to footings.

The impact of the excavation of any adjacent structures is dependent on the stability of the proposed basement excavation. At this site, there are no adjacent structures within 40 m of the proposed basement footprint.

For monitoring stability of the excavation, visual inspections by a suitably qualified and experienced geotechnical engineer will be carried out at regular intervals, as construction progresses, together with regular instrumented survey of the excavation faces (if required). Following the inspections and/or review of the survey data, installation of temporary or permanent rock face support, comprising rockbolts/anchors, may be required to stabilise potentially unstable blocks of rock (wedges or feather edges) formed at the intersection of joints or of a joint with the excavation face.

The geotechnical engineer is to inspect the excavated base of footings to confirm the bearing capacity of the rock.

3.1 Geotechnical Monitoring Procedure

The steps shown in Table 1 are recommended, with Hold Points identified where information should be provided to the structural or geotechnical engineers prior to continuing with the works. Provided no new structures are built within 15 m of the excavation footprint prior to or during the

course of the basement construction, survey monitoring of the cut faces to measure stress-relief movement in the sandstone is considered unnecessary.

Table 1: Summary of Geotechnical Monitoring Activities

Step	Description	Hold Point
G1. Prior to Commencement of Works		
G1.1	The Principal Contractor and any relevant subcontractors should familiarise themselves with the structural engineer's drawings, the geotechnical reports and this monitoring plan.	
G2. During Excavation		
G2.1	Inspection of 20% (distributed evenly around site) of the shoring system (expected to be dowels and shotcrete in hit and miss panels) by a geotechnical engineer to check ground conditions are as per design assumptions and installation as per design.	Hold Point
G2.2	Builder to carry out daily visual inspections of the excavation crest and faces to check for any signs of ground movement/instability/loose material.	
G2.3	At maximum 1.5 m depth intervals – progressive inspection of cut faces by a geotechnical engineer to identify any adversely inclined geological structures (e.g., joints) or previously undetected conditions and features, which may require support. If the geotechnical engineer considers that additional stabilisation measures are required, then these measures should be implemented to the satisfaction of the geotechnical engineer prior to continuing with the next drop.	Hold Point
G3. After Excavation		
G3.1	Inspection of the base of the excavation at bulk level by the geotechnical engineer to assess the ground conditions prior to detailed excavation.	Hold Point
G3.2	Inspection of the base of all footing excavations by a geotechnical engineer to confirm that the bearing capacity meets the requirements of the design, including spoon testing of the footings (requiring 50 mm diameter core holes to be drilled by the contractor through the base of the footings 24 hours ahead of inspections to 1.5 x the footing width), to check defect spacing and confirm the rock classification. The frequency of spoon testing will be dependent on the design bearing pressure adopted.	Hold Point

3.2 Trigger Levels/Contingency Plans

There are no trigger levels relevant to the monitoring activities in Table 1 other than those described.

If the subsurface conditions encountered during the excavation are different to those indicated in the geotechnical report, both the geotechnical and structural engineers must be immediately informed. The geotechnical and structural engineers should then inspect the site and re-design the excavation support (i.e., shoring), foundations or another feature, as required.

Contingency measures for adverse movement at the excavation crest and the rock face will depend on the nature and extent of the movement. Measures could include backfilling against the shoring wall/rock face, installation of additional anchors, and installation of internal props/bracing.

4. Groundwater

Reference should be made to the overall Stage 2 Dewatering Management Plan (DP Report 86043.06.R.008.Rev0 dated May 2022) for background on groundwater monitoring requirements for Stage 2 development.

Based on the available information, the pre-excavation level of the permanent groundwater table in the vicinity of C3 reduces from approximately RL 45 m AHD up-slope to approximately RL 42 m AHD downslope. Subsequent monitoring at Ivanhoe Estate suggests that these levels may be impacted by more recent basement dewatering at sites external to Ivanhoe Estate.

Note that as part of the dowel and shotcrete support for the upper layers, vertical strip drains should be installed behind the shoring to collect all seepage that may occur and to direct the seepage to the subfloor drainage system, from where it can be removed using "sump-and-pump" methods.

Suitable protection of the wells to be provided by the Builder to ensure safe and continuous access to wells for monitoring and water sampling and reduce the risk of malicious or accidental interference. If it is not possible to access the groundwater monitoring wells, or they are damaged or destroyed during the works or cannot be used for some reason, then the monitoring wells must be replaced within one (1) week. Provided that detailed excavation has been completed for at least one month, then replacement of a monitoring well may not be required if the data already collected indicates no significant groundwater impact.

Table 2 shows the steps recommended, with Hold Points identified, where information should be provided to the structural or geotechnical engineer prior to continuing with the works.

Table 2: Summary of Hydrogeological (Groundwater) Monitoring Activities

Step	Description	Hold Point	Ref
H1. Prior to Excavation below RL 46 m AHD			
H1.1	Builder to obtain a copy of the written permission to discharge into the stormwater system/Shrimpton's Creek from the relevant controlling authority, including any requirements of the controlling body. This information must be provided to the geotechnical engineer for reference purposes.	Hold Point	SSD B65/6
H1.2	Builder to obtain a copy of the Water Access Licence for the Stage 2 site, and written statement of the entitlements available for the C3 basement excavation, based on sub-allocation of the entitlements by Frasers. This information must be provided to the geotechnical engineer for reference purposes.	Hold Point	SSD B67
H1.3	Builder to install three groundwater monitoring wells outside of the basement perimeter extending to at least 3 m below basement level or to the base of any local excavations for measurement of water levels. One well to be installed upslope and two wells downslope at locations to allow triangulation of water flow across the site. Additional wells to be installed if adequate triangulation is not achievable with 3 locations.	Hold Point	DMP

Step	Description	Hold Point	Ref
H1.4	Groundwater sampling on a suitable number of samples from wells, and laboratory testing of samples to evaluate hydrochemistry for potential dewatered groundwater against the requirements of the controlling body (as provided in H1.1). A report to be prepared by the geotechnical engineer nominating likely treatment requirements/exceedances.	Hold Point	SSD C36
H1.5	Groundwater treatment methodology to be prepared by Builder (or their treatment subcontractor) to address actual or potential groundwater discharge treatment requirements, including a schedule of sampling and testing to be undertaken and recorded by the builder. Preliminary monitoring requirements are given in the DMP. Methodology to include daily quality monitoring for first week of groundwater discharge then weekly until the completion of works, and appropriate record keeping.	Hold Point	C37q DMP
H1.6	Methodology, monitoring and recording requirements of H1.4 to be reviewed by the treatment subcontractor or geotechnical engineer, to confirm general suitability.	Hold Point	C37q
H1.7	At least three weeks of daily readings at all wells and geotechnical engineer to establish pre-excavation baseline levels in the wells.	Hold Point	DMP
H1.8	Installation of a rain gauge at a fixed point at the site which is not overshadowed by existing structure or topography. Daily rainfall measurements to be provided to geotechnical engineer as required.	Hold Point	DMP
H2. Excavation below RL 46 m AHD to Bulk and Detailed Level			
H2.1	Daily measurement of water levels in monitoring wells using a datalogger. Data to be uploaded and reviewed by the geotechnical engineer weekly. Monthly reporting by the geotechnical engineer.		C37
H2.2	Daily monitoring of water quality for the first week requiring groundwater discharge to stormwater, then weekly thereafter, in accordance with the monitoring and reporting established by item H1.4.	Hold Point	C37
H2.3	Builder to carry out daily inspection of well surrounds to ensure continuous access and damage free.		
H2.4	Builder to maintain written daily record of: • rainfall (see H1.8); • excavation level; • excavation extent; • location of water pump-out sumps; • time and date of record; and, • estimated inflow, from inflow to sumps of pre-determined size, or collection to secondary tanks using a calibrated flowmeter. The above information to be provided to the geotechnical engineer on a weekly basis.	Hold Point	DMP
H2.5	Both daily and weekly record of volume of discharge to stormwater to be maintained by the Builder using a calibrated flowmeter. Measurements to be recorded in accordance with reporting requirements of the Water Access Licence (WAL). Records to include flowmeter numbers and calibration certificates.		DMP

Step	Description	Hold Point	Ref
H2.6	The discharge volume information from H2.5 is to be provided to Frasers on a monthly basis to meet their reporting obligations for the Stage 2 WAL.	Hold Point	WAL
H2.7	The discharge volume information from H2.5 is to be provided to geotechnical engineer on a weekly basis, together with item H2.3.	Hold Point	B41
H3. Following Completion of Excavation and Commencement of Building Construction			
H3.1	Measurement, monitoring and reporting to continue in line with Step H2, unless otherwise notified in writing by the geotechnical engineer.		
H3.2	Evaluation of information obtained from Steps H1 and H2 by the geotechnical engineer, to determine ongoing frequency of monitoring and reporting given in H1 and H2.	Hold Point	DMP
H3.3	Builder to advise geotechnical engineer when stormwater system effectively separates stormwater collection from groundwater inflow collection.		
H4. Prior to Handover/OCC			
H4.1	Re-evaluation by geotechnical engineer of predicted long term groundwater inflows to basement, based on ongoing records during construction.	Hold Point	DMP
H4.2	Re-evaluation by geotechnical engineer of groundwater inflow quality and treatment, based on long-term inflow quality.	Hold Point	DMP
H4.3	Builder to prepare documentation confirming their compliance with the monitoring and reporting requirements required by this GMP.	Hold Point	
H4.4	Builder to confirm that the as-built groundwater management system includes suitable measures to allow for the long-term groundwater treatment, quality evaluation and volume discharge requirements of the permanent groundwater management system.	Hold Point	DMP

4.1 Trigger Levels/Contingency Plans

4.1.1 Water Quality

If the results of groundwater quality measurements indicate an impact on existing groundwater conditions, or on disposal requirements for the pumped water, a plan must be developed to mitigate any impacts on existing groundwater conditions, and to provide treatment to meet the appropriate groundwater disposal requirements.

4.1.2 Water Level Outside the Basement

Previous groundwater monitoring indicates a natural groundwater fluctuation of approximately 1 m in this area. Groundwater levels that fall by more than 0.5 m below initial levels (taking into fluctuation into account) should trigger an assessment of the records of pumped groundwater volumes, records of pumped groundwater/seepage volumes and weather/climatic factors. A plan may need to be developed to reduce groundwater take if the drawdown is considered to be due to the excavation. This may include localised grouting/sealing such as polymer based emulsion grout etc.).

4.1.3 Groundwater Inflow

If groundwater inflow is assessed as excessive relative to the predicted or allocated inflow (refer DMP Report DP86043.06.R.008.Rev0), reanalysis or re-allocation of the overall Water Access Licence allocation may need to be required to reduce groundwater inflow. This may also include localised grouting/sealing such as polymer-based emulsion grout etc.) as above.

5. Vibration Monitoring

A review of the site features indicated that the nearest existing buildings are not "sensitive structures" and are located at least 60 m away (within the site) or 40 m away (on adjacent properties) from the proposed excavation footprint. Therefore, an allowable vibration limit of 8 mm/s Vector Sum Peak Particle Velocity (VSPPV) at the foundation level of nearby buildings is suggested. The proposed allowable vibration limit at the foundation level of adjacent buildings is also adequate to reduce the risk of structural damage to buildings and road assets on the adjacent properties, including buried services. However, vibration sensitivity of the services should be confirmed with the asset owners prior to excavation. The limit may need to be adjusted to reflect the asset requirements, response of neighbouring structures during excavation and vibration dosage once the neighbouring building is occupied.

The proposed limit takes into account both structural damage and human comfort criteria given in relevant Standards (e.g., ISOAS 2670, EPA guidelines, German DIN4150 Standard and Australian Standard AS 2187-2 (2006)).

A vibration trial may be required to size equipment at the commencement of excavation into rock. The trial may indicate that minimum offset distances are required for the preferred plant, or that alternative excavation methods are required.

5.1 Monitoring Procedures

For this site, due to the distances from existing structures or infrastructure, it is suggested that vibration monitoring be limited to carrying out an initial trial of excavation equipment. If the trial indicates that the vibration limits could be exceeded, then the contractor is to install a permanent monitoring system which will allow 'self-management' of vibration.

If required, geophones should be installed on or near the base of the walls of the neighbouring buildings. The geophones should be firmly attached to the building's structure or footings and should be connected to a data monitor, which is capable of measuring vibrations to 0.5 mm/sec PPVi or less. The monitor shall be set up to record all vibrations which exceed 5 mm/sec. A warning light or sound signal shall be attached to the monitor, which is configured with an alarm threshold of 8 mm/sec PPVi to warn the excavation contractor of vibration exceedances. The system should also automatically send a text message to the site superintendent should an exceedance occur, for the superintendent to investigate.

Table 3 shows the steps recommended, with Hold Points identified, where information should be provided to the structural or geotechnical engineer prior to continuing with the works.

Table 3: Summary of Vibration Monitoring Activities.

Step	Description	Hold Point
V1. Prior to Commencement of Bulk Excavation Works		
V1.1	When excavation encounters medium strength rock, undertake a vibration trial using the largest machine of each equipment category (e.g., rock breaker, bulldozer with ripping tyne, rock saw) to be used in order to determine the minimum buffer distances to neighbouring structures for each equipment type. Geotechnical engineer to advise on whether proposed equipment is likely to exceed allowable vibration levels and whether continuous monitoring is required.	Hold Point
V1.2	If the vibration trial indicates that vibration limits may be exceeded by the proposed works, then geophones and monitors are to be installed and configured to undertake continuous unattended monitoring of vibration. Install geophone at the base of the neighbouring structure closest to the excavation works. Connect geophone to data monitor and install a flashing light or sound warning signal and enable automatic text messaging to the site superintendent. Set warning light to trigger at 8 mm/s VSPPV.	Hold Point
V2. During Excavation		
V2.1	If continuous monitoring is required (see Step 1 above) – data from the monitor is to be uploaded weekly, with direct feedback to site personnel of the number of recorded events exceeding the Allowed Limit. Reports should include a tabulation of times and levels of any events exceeding a recording threshold of 8 mm/s VSPPV, for correlation with site activity records. The weekly vibration monitoring reports should be forwarded to the geotechnical engineer for review.	
V2.2	If the number of exceedances on any day is more than 10 then the respective excavation works shall stop, and the geotechnical engineer shall be notified. The geotechnical engineer will investigate the causes of the exceedances and provide advice on measures to avoid further vibration exceedances.	Hold Point

5.2 Trigger Levels/Contingency Plans

If the vibration trials indicate that continuous monitoring is required, then the monitor shall be configured such that either an SMS message is sent automatically to nominated mobile phones (including the monitoring entity and the site superintendent), or a flashing light or sound signal is triggered when the vibration at the base of the neighbouring structure exceed 8 mm/s VSPPV. If the SMS message is sent or the warning signal is triggered, then the machinery operator should reduce the force generated by his equipment or move further away from the neighbouring structure.

Occasional exceedances may be allowed, however, if a sustained exceedance occurs, an inspection by the structural and geotechnical engineers should be made of the potentially affected building and excavation should only resume if no vibration-induced damage can be seen.

If the warning light is being triggered frequently (e.g., >10 times/day), excavation works are to stop, the geotechnical engineer is to be notified and a site visit carried out by the geotechnical engineer to investigate the cause of the exceedances. A change in excavation method may be recommended as a result of the inspection, or on the basis of recorded vibration data.

6. Limitations

Douglas Partners (Douglas) has prepared this report for this project at Ivanhoe Estate, Macquarie Park in accordance with Douglas' proposal dated 30 November 2023 and acceptance received from Antonio Screnci. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Parkview Constructions 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 DP for any loss or damage. In preparing this report Douglas 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 Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas 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 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. 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.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully

Douglas Partners Pty Ltd

Reviewed by



Craig Stemp/Sally Peacock
Associate/Senior Associate



Hugh Burbidge
Principal

Attachments: 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.

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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

Ivanhoe Stage 2, Building C3, Midtown Precinct, 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

Kevin Peter Berry

Registration number of design practitioner

DEP10001336

Class of registration (applicable to this declaration)

Structural Engineering

Body corporate name (if applicable)

TTW (NSW) Pty Ltd

Registration number of body corporate (if applicable)

DEP0000532

Email address

kevin.berry@ttw.com.au

Contact number

02 8437 7215

ABN/ACN

74 649 974 112 / 649 974 112

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. NOTES SHEET	211086 - S0001	1
2. SHORING AND FOOTING PLAN	211086 - S1001	1
3. SHORING WALL ELEVATIONS - SHEET 1	211086 - S1011	1
4. SHORING WALL ELEVATIONS - SHEET 2	211086 - S1012	1
5. SHORING WALL ELEVATIONS - SHEET 3	211086 - S1013	1
6. SHORING DETAILS - SHEET 1	211086 - S1031	1
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30.		

Number of attachments to the certificate (if applicable)

Part 2. Declaration matters

I, Kevin Peter Berry

Insert full name acting on behalf of

TTW (NSW) Pty Ltd

Insert registered body corporate name (if relevant)

Structural Engineering

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 A-0000-1; A-0010-1; A-0011-1; A-0020-1; A-0040-1; 1-0041-1, prepared by Team2 Archite
Geotechnical Report No.86043.06, May 2021 prepared by Douglas Partners
Shotcrete Retaining Wall No.86043.23.R.005.REV1, Designed by Douglas Partners

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.

AS 3600 - 2018 Concrete Code
AS 1170.0 - 2002 Structural Design Actions
AS 1170.1 - 2002 Minimum Design Loads
AS 1170.2 - 2021 Structural Design Wind Actions
AS 1170.4 - 2007 Structural Design Earthquake Actions

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
- [x] 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.

Architect - Team2 Architects - Thomas Maguer- Phone (02) 9437 3166
Geotechnical Engineer - Douglas Partners - Peter Hunt - Phone (02) 9809 0666
Main contractor - Parkview - Mohamed Yaccoub - Phone (02) 9506 1500

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

Kevin Berry Digitally signed by Kevin Berry Date: 2024.02.19 10:59:17 +11'00'

Date

19/02/2024

This form relates to obligations under the *Design and Building Practitioners Act 2020* and supporting Regulation. For more information visit NSW Fair Trading

PARKVIEW
Level 7, 60 Union Street, Pyrmont NSW 2009
PO Box R1779 Royal Exchange NSW 1225
Mohamed Yaccoub
+61 427 520 238

TEAM2
ARCHITECTS
Team 2 Architects Pty Ltd

Lvl1/45 Chandos Street,
St Leonards NSW 2065
T 02 9437 3166

204/9-11 Claremont St,
South Yarra VIC 3123
T 03 8849 9137

E info@team2.com.au
W team2.com.au

ABN 72 104 833 507 I REG. NO. 9940

14/02/2024

F/1199/0401 Design Verification Statement

Your Ref:

Re: **Design Verification Statement**
Project No: 1199
Project Address: C3 Midtown MacPark

DESIGN STATEMENT BY QUALIFIED DESIGNER

Dear Sir or Madam,

The below statement is to address clause 15 of the Environmental Planning and Assessment Regulation 2021.

I, Richard Webster (NSW Reg 9947), hereby confirm that the development:

- achieves the Nine design quality principles (as described in *State Environmental Planning Policy No 65—Design Quality of Residential Apartment Development*).
- achieves compliance with the architectural items of the NCC 2022;
- is consistent with the DA approved architectural plans (SSD-15822622-mod-1, dated 28/11/2022)
- incorporates architectural recommendations that are relevant to the current CC, from Arborist Report, Historical Assessment Report, Geotech Report, Groundwater Management Report, Remediation Action Plan, Statement of Environmental Effects & Utility Services Report.

The present certificate relates to the following drawings:

- A-0000 Cover Sheet
- A-0010 Grids Setout
- A-0011 Survey Plan
- A-0020 Bulk Excavation Plan
- A-0040 Shoring Elevations 1
- A-0041 Shoring Elevations 2

Yours faithfully,

For and on behalf of Team2 Architects Pty Ltd



Richard Webster

Director

Receipt No.L0000133464

Levy Receipt

Date: 17/11/2023

Development Applicant

Andrew Alker
LEVEL 2 1C HOMEBUSH BAY DR, RHODES NSW 2138

Development Details

Application Type:	Development Application
Application No.:	SSD15822622
Approving Authority:	CITY OF RYDE COUNCIL
Site Address:	1 IVANHOE PL MACQUARIE PARK NSW 2113

Levy Details

Levy No.:	L0000133464
Cost of Works (incl. GST):	$96,380,228.00
Levy Payable:	$240,950.00
Total Amount Paid (excl. Surcharge):	**$240,950.00**

STUDIO JOHNSTON

L1/268a Devonshire Street
Surry Hills NSW 2010
02 9211 2700

FEB 2024

MIDTOWN MACPARK C3 | TREEHOUSE

DESIGN VERIFICATION STATEMENT

We advise that Studio Johnston Pty Ltd (the Consultant) has been engaged in the design documentation phase for the above-mentioned project, in accordance with the DESIGN INEGRITY condition A13 of the Determination.

We can confirm that:

a) We have reviewed the For Construction documentation procured by the Applicant for the Project

b) The For Construction documentation provided by the Applicant – the drawings, specifications, schedules and other documentation procured by the Applicant for the construction of the works – is consistent with the design as approved

(b) We have been engaged to carry out periodic reviews of the documentation in accordance with the construction program to ensure the design integrity is upheld

Please contact our office if you require anything further.



Conrad Johnston
Director Studio Johnston
Architect
NSW No. 8270

NOTIFICATION OF COMMENCEMENT

Thursday 15th February 2024

Department of Planning and Environment

Re: SSD 15822622
Ivanhoe Estate, Macquarie Park (Lot 100 DP1262209)

NOTIFICATION OF COMMENCEMENT

SSD 15822622 - Consent Conditions B2; and B3 (refer below)

> *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.*
>
> *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.*

Please be advised that physical works and operations on Ivanhoe Estate Building C3 will commence on, or after the 20th of February 2024.

Please be advised this notification only serves as notice for Building C3 stage of the development; and those other stages included within SSD 15822622 (Building C2 and Building C4) are subject to future commencement notices and do not form a part of this notification of commencement.

Please contact our office if you require anything further.

Regards,

Daniel Leaf
Project Manager
Frasers Property Australia

Chris Michaels

From: no-reply@majorprojects.planning.nsw.gov.au
Sent: Thursday, 15 February 2024 3:55 PM
To: Sarah Martin
Cc: Robert Cauchi
Subject: Ivanhoe Estate Redevelopment - Stage 2 - Post Approval Document Received - (SSD-15822622-PA-3)
Attachments: Post Approval Form_20240215045432.pdf

You don't often get email from no-reply@majorprojects.planning.nsw.gov.au. Learn why this is important

EXTERNAL EMAIL: Do not click links or open attachments unless you recognise the sender and know the content is safe.

Dear sarah ,

Thank-you, your post approval document in relation to the Ivanhoe Estate Redevelopment - Stage 2 has been received by the Department. Details of this document are below and in the attachment.

Date Lodged
15/02/2024

Document Name
Notice of Commencement - Building C3

Description of Document
Please find attached Notification of Commencement for Building C3 at Ivanhoe in accordance with condition B2 & B3 of the Development Consent.

Applicable Conditions

Schedule	Condition
B	2
B	3

To sign in to your account click here or visit the Major Projects Website.
Please do not reply to this email.

Kind regards

The Department of Planning and Environment

NSW GOVERNMENT

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This email is intended for the addressee(s) named and may contain confidential and/or privileged information.

If you are not the intended recipient, please notify the sender and then delete it immediately.

PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL



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-3

Name of Document

Notice of Commencement - Building C3

Related matter

Incident or non-compliance Report

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

Please find attached Notification of Commencement for Building C3 at Ivanhoe in accordance with condition B2 & B3 of the Development Consent.

Applicable Conditions

Schedule	Condition
B	2
B	3

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
SSD 15822622 - Building C3 - Notification of Commencement.pdf	Post Approval Document

MAIL TYPE	MAIL NUMBER	REFERENCE NUMBER
General Correspondence	AustResi-GCOR-006395	AustResi-GCOR-006395

Building C3 - Access to Information - Consent Condition B5

From	Mr Daniel Leaf - Frasers Property Australia - Residential
To (2)	Mr Chris Michaels - City Plan Services Mr Safwat Abdelfattah - City Plan Services
Cc (7)	Mr Andrew Alker - Frasers Property Australia - Residential Sarah Martin - Frasers Property Australia - Residential Mr Joe Avgoustis - Frasers Property Australia - Residential Ms Michaela Zipkis - Frasers Property Australia - Residential Mr Antonio Screnci - Parkview Constructions Mr Mohamed Yaccoub - Parkview Constructions Mr Warwick Davidson - Parkview Constructions
Sent	Friday, 16 February 2024

MAIL ATTACHMENTS (1)

	Mail Number	Subject	From	Sent
	AustResi-GCOR-006389	Building C3 - Consent Conditions B5 & B6 - Compliance Reporting	Mr Daniel Leaf - Frasers Property Australia - Residential	15/02/2024

MESSAGE

Hey Chris, Saf,

In relation the Condition B5 Access to Information - please see below extract from conditions and my notes in red to accompany with relevant links.

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: We have made various documents available on our website under the 'Info Hub' please hover over the 'Info Hub' icon at the top of page and you will note items related to the below - https://www.frasersproperty.com.au/NSW/Midtown/info-hub

(i) the documents referred to in condition A2 of this consent; Stage 2 Approval Documents located here, note this pack includes C2 C3 and C4 - https://www.frasersproperty.com.au/NSW/Midtown/info-hub/Approval-

documents

(ii) all current statutory approvals for the development; All statutory approvals located on above website - nil applicable for Stage 2 and the CC1 documentation for C3 will be uploaded on receipt. Please note other CCs for Stage 1 buildings as evidence of upload.

(iii) all approved strategies, plans and programs required under the conditions of this consent; Once PKV have completed management plans and we have approval for management plans they will be uploaded. Please note that we are in the process of uploading the Pre-Construction report - this should be completed in next 48 hours.

(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; To be completed as required and stored on website - please refer website for Stage 1 audits as evidence of FPA strategy to upload - https://www.frasersproperty.com.au/NSW/Midtown/info-hub/Approval-documents

(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; To be completed as required and stored on website - please refer website for Stage 1 audits as evidence of FPA strategy to upload - https://www.frasersproperty.com.au/NSW/Midtown/info-hub/Approval-documents

(vi) a summary of the current stage and progress of the development; Please note website includes a 'Project Progress' page detailing project progress of the development - https://www.frasersproperty.com.au/NSW/Midtown/whats-Happening/Construction-Plan

(vii) contact details to enquire about the development or to make a complaint; Please note our website includes contact details and complaint lodgement page - https://www.frasersproperty.com.au/NSW/Midtown/whats-Happening/Complaints-Register

(viii) a complaints register, updated monthly; As per above refer complaints page - these are loaded to the website page.

(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; To be completed as required and stored on website - please refer website for Stage 1 audits as evidence of FPA strategy to upload - https://www.frasersproperty.com.au/NSW/Midtown/info-hub/Approval-documents

(x) any other matter required by the Planning Secretary; and To be completed as required and stored on website - please refer website for Stage 1 as evidence of FPA strategy to upload - https://www.frasersproperty.com.au/NSW/Midtown/info-hub/Approval-documents

(b) keep such information up to date, to the satisfaction of the Planning Secretary Note that we provide evidence of submission to Planning Secretary via Major Projects Planning portal as has been provided in AustResi-GCOR-006394 and AustResi-GCOR-006389 (also attached to this mail for your ease of reference).

Any questions please let me know.

Thanks,

Daniel Leaf
Project Manager - Development
Frasers Property Australia

Mob: +61 423 300 698 Tel: +61 2 9767 2922

PARKVIEW



IVANHOE ESTATE – BUILDING C3

JOB NO. 3.153 – SSD 15822622 (CONDITION B6 & B7)

PRE-CONSTRUCTION COMPLIANCE REPORT

6 February 2024

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EXECUTIVE SUMMARY

Under condition B6 & B7 of SSD 15822622, a pre-construction compliance report has been prepared for work occurring this SSD – Ivanhoe Estate Building C3 (the Project). This pre-compliance report and the information provided is intended to be the pre-construction compliance report for those purposes.

1. INTRODUCTION

This Pre-Construction Compliance report is associated with the Separable Portion 1 – Earthworks for Building C3 and Separable Portion 2 – Residential Building for Ivanhoe Estate Building C3 under SSD 15822622. The Pre-Construction Compliance report covers the following:

Contractor: Parkview Constructions Pty Ltd

Works: Separable Portion 1 Earthworks (Building C3), Separable Portion 2 – Residential Building for Ivanhoe Estate Building C3

Period: 25th January 2024 – 19th January 2026

Site Address: 1 Ivanhoe Place, Macquarie Park NSW

The Works will involve a Design and Construct Contract (AS4902 modified) for the Design and Construction Works of the C3 building. The works included in SSD 15822622 consists of the construction of a new 16-storey residential apartment building with 162 units (with a mix of 1, 2 and 3 bed apartments), retail space on the ground floor incorporating one (1) goods lift, three-storey basement carpark incorporating vehicle spaces and car wash bay, 4 residential lifts, basement storage cages, and associated landscaping works including communal external areas and a landscaped terrace on level 15. The building features four (4) distinctive forest rooms with their own environmental setting. Listed below is a summary of the works:

- Excavation & Shoring
- Construction of a 16-storey building with 162 Residential Apartments
- Cold-Shell Retail Tenancies on Ground Floor
- Landscaping works to residential communal areas including communal roof on L15
- External Public Domain Works

1.1 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

1.2 STAGING OF THE WORKS

The Works are being carried out in a single stage with relation to Building C3 while maintaining access for works undertaken on the remainder of the site and ensuring an efficient construction methodology.



1.3 CONTACTS

Parkview Team

Warwick Davidson – Project Manager

Phone 0439 076 147

Email warwick.davidson@parkview.com.au

Mohamed Yaccoub – Project Engineer

Phone 0427 520 238

Email mohamed.yaccoub@parkview.com.au

Roben Naamo – Senior Contracts Administrator

Phone 0487 081 234

Email roben.naamo@parkview.com.au

Peter Doyle – Senior Site Manager

Phone 0428 216 570

Email peter.doyle@parkview.com.au

2. PREVIOUS REPORT 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

Nil to report, no current modifications undertaken under SSD 15822622.

4. COMPLIANCE STATUS SUMMARY

Please refer to appendix A containing the summary of the environmental audits undertaken as part of the Parkview auditing process through the reporting period.

Table 2 – 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 3 – 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 lodgement date for this report will be no later than 12th February 2024.

5. INCIDENTS

A register of all incidents, as defined by the conditions of consent, is to be maintained with the following information:

- The cause and nature of the incident, the date it occurred and the date it was identified;
- Location of the incident;
- How the incident was identified;
- The agency, or agencies to whom the incident was reported;

- Detailed of any corrective and preventative action required by agencies and any undertaken by the proponent; and
- 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@fraserspropertyy.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. Parkview have received no complaints to date.

Date of complaint	Date of response	Nature of complaint	Development approval	Project response	Complaint status	Emergency complaint?

In accordance with Condition B5 (viii) – A complaints register will be maintained and updated monthly.

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.

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Appendix A

Action Status Table

Please see below spreadsheet detailing the table actions that will be completed during construction.

Source	Condition of Consent	Action Proposed	Proposed Action	Action Status

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Appendix B

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, minimise, 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.	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 – N/A (no adjoining properties)	Not Triggered
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 No.L0000133464 on 17/11/2023	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.	Application for construction and occupation certificates, engineering and design and plan reviews	Not Triggered
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 will be provided	Not Triggered
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, licences etc).	Compliant

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	Compliant
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.	Record keeping system for communications with Planning including department notification	Not Triggered
A19	Subsequent notification must be given, and reports submitted in accordance with the requirements set out in Appendix 1.	Record keeping system for communications with Planning including department notification	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.	Application notification to Planning Secretary Certifier notification to Planning Secretary	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.	Record Keeping System for communications with Planning Secretary & Certifier Details to be included in notification as per requirements of A21	Not Triggered
A22	A non-compliance which has been notified as an incident does not need to also be notified as a non-compliance.	Note	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
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.	Record Keeping System for communications with the department advising construction start date. Written notification to the department (for Prior to Construction/ commencement of physical work). Email to be issued to DPIE at least 48 hours before construction start.	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.	Record Keeping System for communications with the department advising construction start date.	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).	Record keeping for communications with the Certifier. Will be notified and uploaded as required.	Not Triggered
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.	Record keeping for communications with the Certifier.	Not Triggered
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 aluminium 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 1,624 m*. The GFA of Building C3 must not exceed 15,000 m*. The GFA of Building C4 must not exceed 37,758 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.	Plans to be submitted to confirm the GFA to the Certifying Authority. Not applicable for CC1	Not Triggered
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+.	Not applicable to C3	Not Triggered
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.	Not applicable to C3	Not Triggered
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.	To be surveyed and details submitted. Not applicable for CC1	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 storey 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 to C3	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.	Inspection sign off and issue to Certifying Authority	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 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.	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.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	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. Not applicable to CC1	Not Triggered
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 odours 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 neighbouring 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.	Copy of records/ certificates of Compliance.	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.	Compliance Certificate for water and sewerage infrastructure servicing of the site under section 73.	Not Triggered
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.	Record of submission to satisfaction of Certifier. Copy of records/ certificates of Compliance.	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.	Record keeping system for submission to the Certifying Authority. Not applicable to CC1	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 Triggered
NUMBER OF CAR PARKING SPACES			
B58	A minimum of 1s 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.	Submission of information for occupation certificate. Record keeping system for submission to the Certifying Authority.	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.	Submission of information for occupation certificate. Record keeping system for submission to the Certifying Authority.	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.	Submission of information for occupation certificate. Record keeping system for submission to the Certifying Authority.	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.	Submission of information for occupation certificate. Record keeping system for submission to the Certifying Authority.	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 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 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.	Submission of information for occupation certificate. Record keeping system for submission to the Certifying Authority.	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.	Submission of information for occupation certificate. Record keeping system for submission to the Certifying Authority.	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.	Record keeping for communications to the satisfaction of the Certifier.	Not Triggered
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.	Record keeping for communications to the satisfaction of the Certifier.	Not Triggered
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 C3 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 C3 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 manoeuvring. (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	Provide waste storage information to the satisfaction of Certifier and Planning Secretary.	Not Triggered
PUBLIC ART PLAN			

B73	Prior to the issue of the relevant Crown Building Works Certificate or Construction Certificate, a Public Art Plan shall be prepared in consultation with Council and submitted to and approved by the Planning Secretary. The Public Art Plan shall explore opportunities for public art within the Village Green, Building C2, Building C3, 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.	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 Offstreet Parking. The width of the new crossing shall be sufficient to accommodate turning manoeuvres 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.	Record keeping for communications with Certifier, Council, Planning Secretary and other agencies as relevant.	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.	Not Triggered
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 shall be prepared in consultation with Council, and submitted to and approved by the Planning Secretary.	Record keeping for communications with Certifier, Council, Planning Secretary.	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.	Not Triggered
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.	Not Triggered
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

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Appendix C

Compliance Report Declaration

Compliance Report Declaration Form

Project Name	Ivanhoe C3
Project Application Number	SSD 15822622
Description of Project	Stage C3 of precinct development – Design and Construction of Building C3 and surrounding works
Project Address	1 Ivanhoe Place, Macquarie Park NSW 2113
Proponent	Parkview Constructions Pty Ltd
Title of Compliance Report	SSD 15822622 Condition B6 & B7
Date	January 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	Warwick Davidson
Title	Project Manager
Signature	
Qualification	Project Management
Company	Parkview Constructions Pty Ltd
Company Address	Level 7, 60 Union Rd Pyrmont, NSW 2009

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Appendix D

Figures and Photos

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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

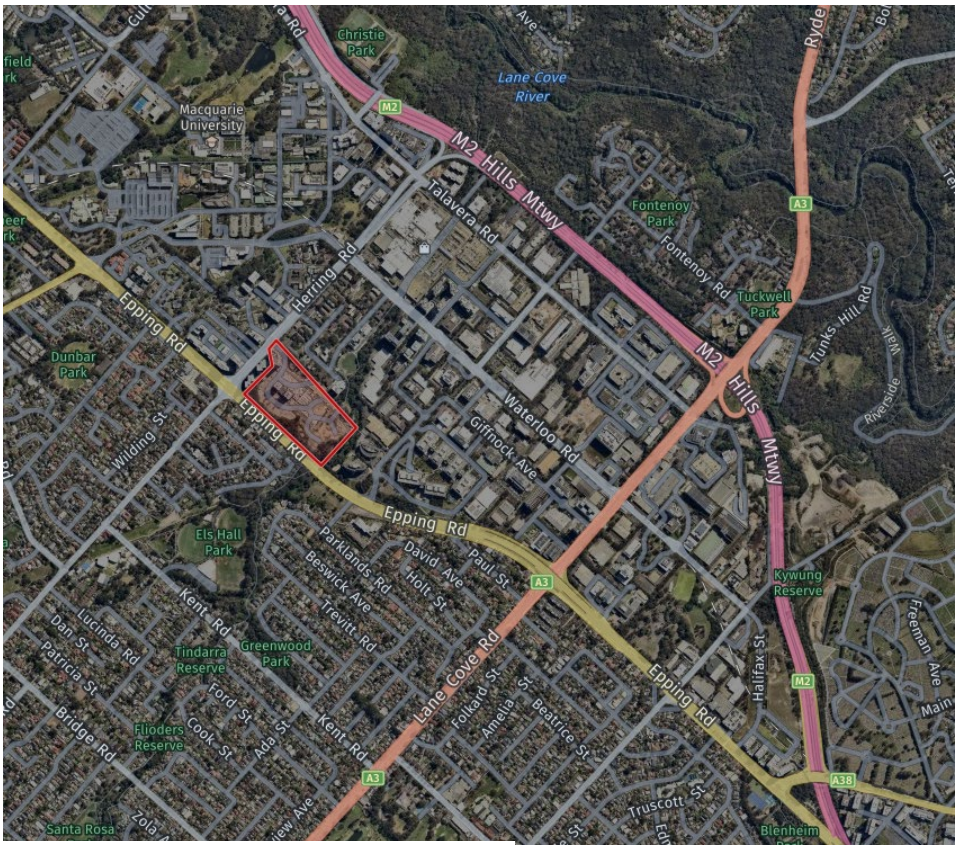
» the realignment of private apartments adjacent to the existing ecology community

» greater amenity

» improved integration with the existing community.

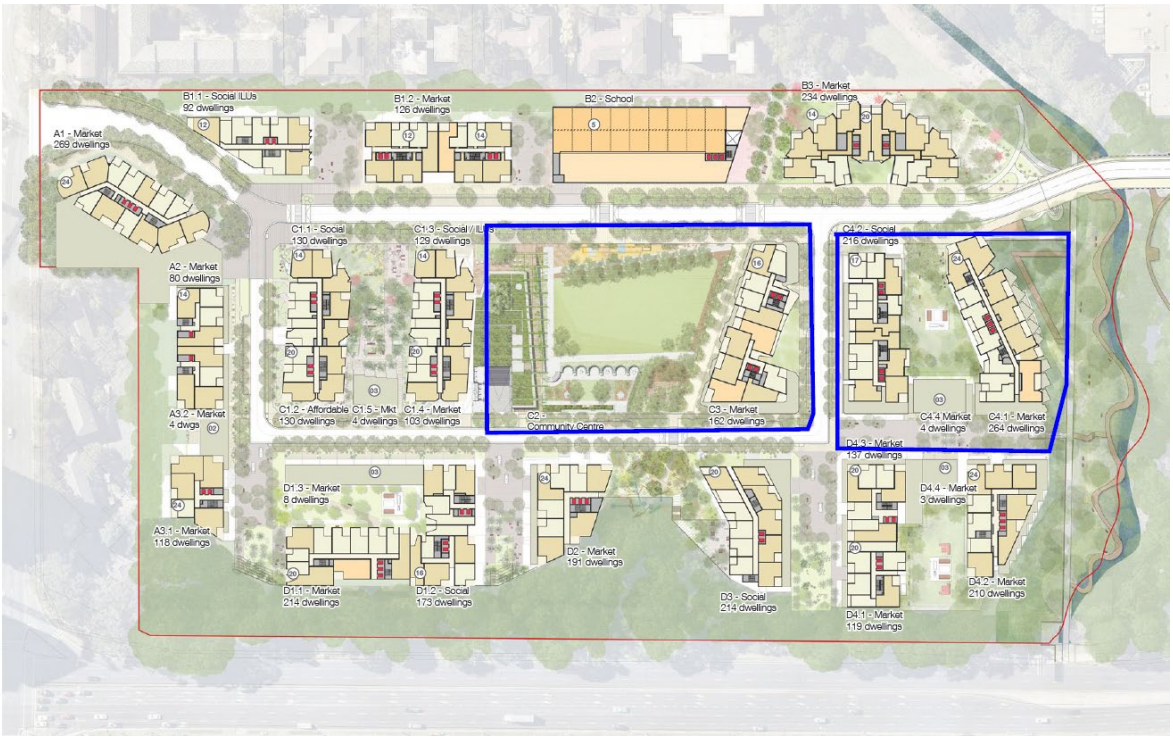
Other features of the urban renewal project include a new primary school, two childcare centres, community centre, gym and pool, a supermarket, cafes and specialty retail shops, nature-based playgrounds and exercise stations and community gardens.

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.

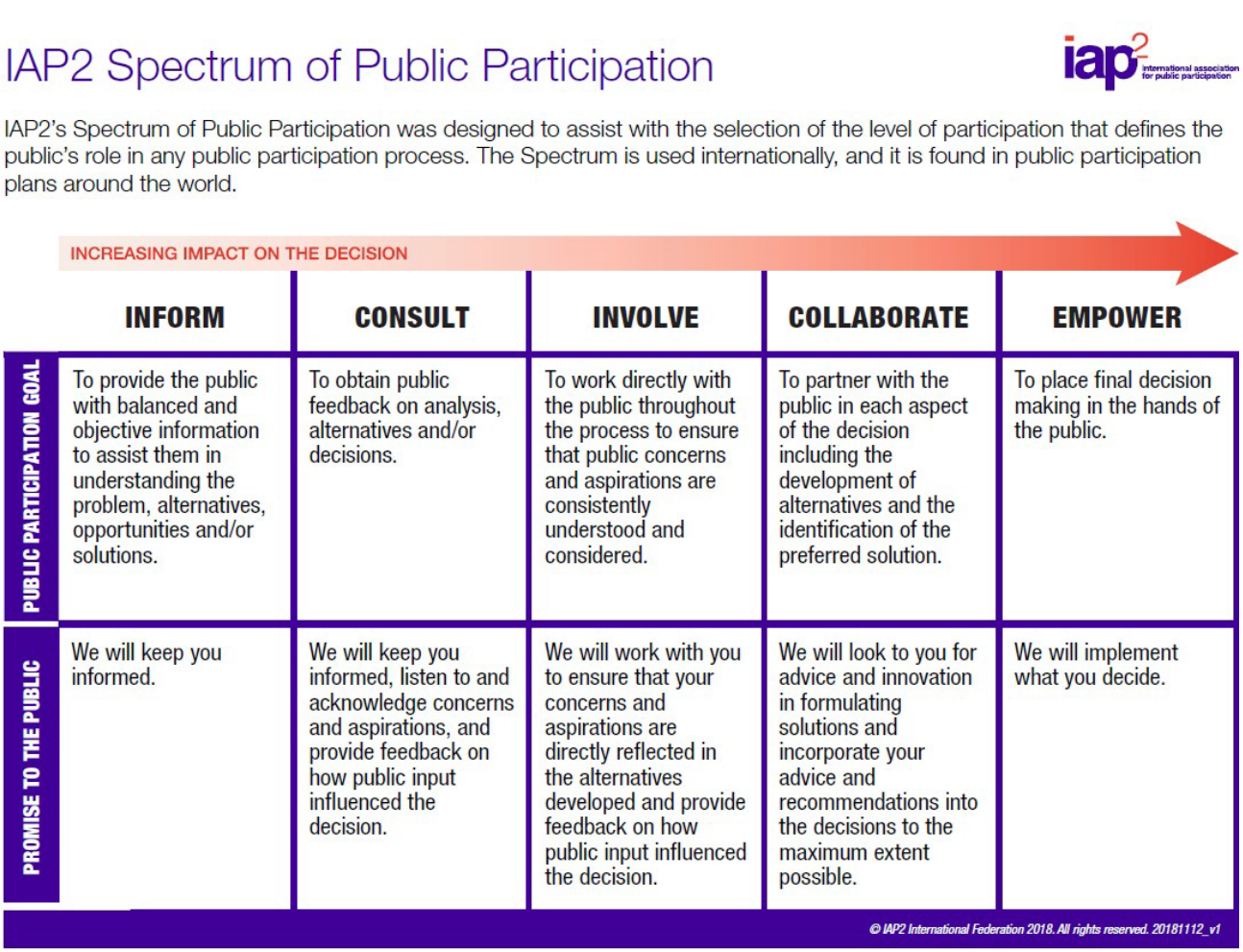
This Strategy will advance the engagement objectives that have guided communications throughout planning and initial phases, including:

- » 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.

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-1

Name of Document

Community Communication Strategy - Stage 2

Related matter

Compliance Report, Annual Review, Audit Report

Type of Document Lodgement

New Document

Description of the document and reason for submission / Overview of changes made to existing documents

In accordance with requirements of SSD 15822622 - please refer attached Community Consultation Strategy to comply with conditions B12, B13 and B14.

Applicable Conditions

Schedule	Condition
2	B12
2	B13
2	B14

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
Stage 2 - Community Consultation Strategy rev 1.pdf	Post Approval Document

Saf Abdelfattah

From: no-reply@majorprojects.planning.nsw.gov.au
Sent: Tuesday, 19 December 2023 3:14 PM
To: Robert Cauchi
Cc: rodger.roppolo@planning.nsw.gov.au; Pat.petrulla@facs.nsw.gov.au
Subject: Ivanhoe Estate Redevelopment - Stage 2 - Community Communication Strategy

EXTERNAL EMAIL: Do not click links or open attachments unless you recognise the sender and know the content is safe.

This email is to acknowledge receipt of the Community Communication Strategy for the Ivanhoe Estate Redevelopment - Stage 2 .

The Department has no comments on the document at this time.

If you have any enquiries, please contact Rodger Roppolo on 02 82896876 /at rodger.roppolo@planning.nsw.gov.au.

To sign in to your account click here or visit the Major Projects Website.

Please do not reply to this email.

Kind regards

The Department of Planning and Environment

NSW GOVERNMENT

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GEOTAGGED PRE CONSTRUCTION SURVEY

OPT-32515 Building C3 Stage 2 Ivanhoe Estate - Epping Road, Macquarie Park NSW

INSPECTION DATE: 16 November 2023

WEATHER: Sunny, 25°C

JOB REFERENCE: ADN23369A

INSPECTOR: Brandon Wang
Structural Engineer
B.Eng Civil

SITE SURVEYED: Council Assets
Ivanhoe Place
MACQUARIE PARK NSW 2113



COMMISSIONED BY: Parkview Constructions Pty Ltd
Level 6, 235 Pyrmont Street
PYRMONT NSW 2009

REPORT PREPARED BY: Jen McCann

GLOBAL COMPLIANCE CERTIFICATION
GCC
ISO 9001 Certified

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Resident Noted Concerns

Explanation of Revisions

AusDilaps was commissioned by
Parkview Constructions Pty Ltd
to carry out a pre-construction condition inspection and report in accordance with AS.4349.0 for the
Building C3 Stage 2 Ivanhoe Estate - Epping Road, Macquarie Park NSW project.

PURPOSE OF THIS REPORT

This is a visual pre-construction inspection in accordance with AS 4349.0 and is intended to record the pre-construction condition of the property inspected and the surrounding areas prior to commencement of construction works. This is not a structural report and will not provide comment on the structural integrity or design of the inspected property; however it does include a photographic record of the main defects visible at the time of the inspection. The report is does not comment to the cause of any defect noted and is intended to be used to determine if change has occurred post-construction and if so, to what extent. This report and included photographs will be retained for use in/or during post-construction condition surveys.

LIMITATIONS

In accordance with AS 4349.0:

- A visual only inspection may be of limited use to the client. In addition to a visual inspection, to thoroughly inspect the readily accessible areas of the property, further testing may be required whenever necessary.
- This report does not include the inspection and assessment of items or matters outside the scope of the requested inspection and report.
- This report does not include the inspection and assessment of items or matters that do not fall within the consultant's direct expertise.
- The inspection only covers the readily accessible areas of the property and does not include areas, which were inaccessible or obstructed at the time of inspection. Obstructions are defined as any condition or physical limitation which inhibits or prevents inspection.
- Australian Standard Inspection of Buildings, Part 1: Property Inspections – Residential buildings recognises that a standard property inspection report is not a warranty or an insurance policy against problems developing with the building in the future.

GPS LIMITATIONS

- GPS Trilateration typical accuracy is <4m.
- Cellular network reception and other factors outside of AusDilaps control may affect GPS accuracy.
- In the event that adequate GPS accuracy is unachievable (<10m) we will perform a standard inspection. It is difficult to know whether desired GPS accuracy is able to be achieved until we arrive at site location.

EXCLUSIONS

The client acknowledges that this report does not cover or deal with:

- solving or providing costs for any rectification or repair work;
- the structural design or adequacy of any element of construction;
- detection of wood destroying insects such as termites and wood borers;
- the operation of fireplaces and chimneys;
- any building services or appliances on the property;
- any swimming pools and associated pool equipment or spa baths and spa equipment or the like;
- whether the ground on which the building rests has been filled, is liable to subside, swell or shrink, is subject to landslip or tidal inundation, or if it is flood prone.

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TERMS AND CONDITIONS

Important information regarding the scope and limitations of inspection and this report: Any person who relies upon the contents of this report does so acknowledging that the following clauses form an integral part of the report.

This report is not an all encompassing structural survey.
It is a reasonable attempt to identify any obvious or significant defects apparent at the time of the inspection. Whether a defect is considered significant or not, to a large extent, depends on the age and type of the building or property inspected. This report is not a Certificate of Compliance with the requirements of any act, regulation, ordinance or by-law or, as a warranty or an insurance policy against problems developing with the building or property in the future.

Only areas to which reasonable access is available were inspected.
AS 4349.0 defines reasonable access as “areas where safe, unobstructed access is provided and the minimum clearances specified below are available, or where these clearances are not available, areas within the inspector’s unobstructed line of sight and within arm’s length...”. Reasonable access does not include removing screws and bolts to access covers or the use of destructive/invasive inspection methods, cutting or making access traps, moving heavy furniture, floor coverings or stored goods.

This report does not and cannot make comment upon:
- The assessment or detection of defects which may be subject to the prevailing weather conditions.
- Whether or not services have been used for some time prior to the inspection and whether this will affect the detection of leaks or other defects.
- The presence or absence of timber pests, gas-fittings, common property areas, environmental concerns, the proximity of the property to flight paths, railways, or busy traffic.
- Noise levels, health and safety issues, heritage concerns, security concerns or systems; fire protection, site drainage.
- Detection and identification of illegal building work, illegal plumbing work, durability of exposed finishes, neighbourhood problems, electrical installation, cables or reception systems, any matters that are solely regulated by statute.
- Accordingly, this report does not guarantee that defects and/or damages do not exist in any inaccessible or partly inaccessible areas or sections of the property.

Asbestos, Lead and Mould Disclaimer:
No inspection for asbestos, lead or mould was carried out at the property and no professional report on the presence or absence of them is provided. If asbestos is noted as present within the property or if the building was built prior to 1990 and you are concerned they may be present within the property then you should seek advice from a qualified specialist to identify the amount and importance of their presence and the cost of sealing or removal.

Estimating Disclaimer:
This report does not provide any estimates on repair or remedial works. We recommend you consult a licenced builder to give an estimate on any work required.

Disclaimer of Liability:
No liability shall be accepted on an account of failure of the report to notify any problems in the area(s) or section(s) of the subject property physically inaccessible during inspection, or to which access is denied. No responsibility can be accepted for defects which are latent or otherwise not reasonably detected on a visual inspection.

Disclaimer of Liability to Third Parties:
This report is made solely for the use and benefit of the client named on the front of this report. No liability or responsibility whatsoever, in contract or tort, is accepted to any third party who may rely on the report wholly or in part. Any third party acting or relying on this report, in whole or in part does so at their own risk.

PROPERTY DESCRIPTION

Property Type:
Council Assets

Building Type:
Not Applicable

GENERAL INSPECTION RESTRICTIONS

- None noted at the time of the inspection.

SAFETY ISSUES

- Please refer to 'Major Defects' for any Safety Issues related to building defects.

Important Note: Per AS 4349.0 Clause 4.2.f.2, the report shall identify any observed item that may constitute a present or imminent serious safety hazard.

PROPERTY SITES INSPECTED

- Kerbs/Gutters/Footpaths/Street Signage
- Roadways
- Kerbs/Gutters/Footpaths Outside the Property Boundary
- Driveway/Crossover

Inspector Commentary:

- Path of Travel: The inspector started the inspection on Ivanhoe Place travelling north. He then travelled east along Narromine Way. He then inspected the west side of Wilcannia Way while travelling north. He then crossed the road and inspected the east side of the roadway while travelling south.
- General Notes: None noted at the time of inspection.

Important Note: The areas listed above are a broad indication of the areas inspected. Damage and/or defects may be present and not detected in areas where the inspection was limited, obstructed, or access was not gained. Within these areas, some further restrictions may have been present restricting or preventing our inspection. If any recommendation has been made within this report to gain access to areas, gain further access to areas, or any area has been noted as being at "high risk" due to limited access, then further access must be gained. We strongly recommend that such access be gained to enable a more complete report to be submitted.

Drainage - Surface Water: Not inspected
Important Note: The site should be monitored during heavy rain to determine whether the existing drains can cope. If they cannot cope, then additional drains may be required.

Services: Not inspected
Important Note: In regard to plumbing or electrical, it should be noted that we are not plumbers or electricians and no comments are made to electrical or plumbing. We recommend that a qualified contractor be engaged to make comment on any matter dealing with plumbing or electrical issues.

DEFECT ASSESSMENT

Any crack/damage identified during the visual inspection of the property is measured using a crack gauge and is described for each location as per the following table.

CRACKING/DAMAGE CLASSIFICATIONS

Hairline cracks.	<0.1 mm	0 Hairline
Fine cracks that do not need repair.	<1 mm	1 Fine
Cracks noticeable but easily filled.	<5 mm	2 Slight
Crack can be repaired and possibly a small amount of wall/ paving will need to be replaced.	<5 mm to 15 mm, or several cracks > 3mm	3 Moderate
Extensive repair work involving breaking out and replacing sections of walls/paving. Walls lean or bulge noticeably. Some loss of bearing in beams. Realignment work may be required for paving.	<15 mm to 25 mm, depends on number of cracks	4 Severe

**Referred to in AS.2670: Residential slabs and footings - Construction, Table C1*

Defects in this report are classified in two categories of Major and Minor:

MAJOR DEFECTS:

According to AS 4349.0 clause 1.3.9, a major defect is defined as “A defect of sufficient magnitude where rectification has to be carried out in order to avoid unsafe conditions, loss of utility or further deterioration of the property”. Per AS 4349.1 clause 4.2.4.1, where a major defect is mentioned in the report, it should be clearly described; including a general statement as to any observed minor defects and an explanation given as to why it is a major defect, along with its specific locations. AusDilaps, in consideration of ‘Acceptance Criteria’ as defined by AS 4349.0 Clause 2.4, and its years of experience and professional knowledge of staff, identifies and describes the major defects at the time of inspections based on one of the following reasons:

Reason for Identifying Major Defect
Large area is affected by the defect
Defect has substantially affected the serviceability of element
Defect presents risks of harm to people or damage to propertie(s)

Pg # Description:

None noted at the time of inspection.

MINOR DEFECTS:

According to AS 4349.1, clause 4.2.4.2, minor defects are common to most properties and may include minor blemishes, corrosion, cracking, weathering, general deterioration, unevenness, and physical damage to materials and finishes. It is expected that defects of this type would be rectified as part of a normal ongoing maintenance.

Pg #	Description:
10	Figure: 0004 Hairline cracking in the kerb.
11	Figure: 0007 Chipping in the kerb and gutter.
20	Figure: 0036 Hairline cracking in the kerb and gutter.
48	Figure: 0119 Fine cracking in the kerb.
53	Figure: 0134 Fine cracking in the kerb and gutter.
53	Figure: 0135 Fine cracking in the kerb and gutter.
92	Figure: 0250 Hairline cracking in the kerb and gutter.
109	Figure: 0303 General view of the roadway. Showing chipping in the kerb.
111	Figure: 0307 Patching in the crossover.

RESIDENT NOTED CONCERNS

Any noted conditions within this section of the report are raised by residents only and may not be able to be verified by AusDilaps with photographic evidence or may not qualify under our standard of defects.

- None noted at the time of the inspection.

EXPLANATION OF REVISIONS

- Not applicable

I, Brandon Wang, Structural Engineer of Australian Dilapidations, have attended the property addressed on this report and conducted a full visual condition assessment per scope identified in the report.
Regards,



Brandon Wang
B.Eng | Civil

Yours faithfully



Michael Burford

AUSTRALIAN DILAPIDATIONS
Office: 1800 Dilaps (345 277)
Email: info@ausdilaps.com.au





Figure: 0001
IVANHOE PLACE





Figure: 0002
General view of the roadway.





Figure: 0003
General view of the kerb and gutter.





Figure: 0004
Hairline cracking in the kerb.





Figure: 0005
General view of the roadway.





Figure: 0006
General view of the kerb and gutter.





Figure: 0007
Chipping in the kerb and gutter.





Figure: 0008
General view of the roadway.





Figure: 0009
General view of the kerb and gutter.





Figure: 0010
General view of the parking spaces.





Figure: 0011
General view of the roadway.





Figure: 0012
General view of the kerb and gutter.





Figure: 0013
General view of the parking spaces.





Figure: 0014
General view of the roadway.





Figure: 0015
General view of the kerb and gutter.





Figure: 0016
General view of the lamp post.





Figure: 0017
General view of the lamp post.





Figure: 0018
General view of the parking spaces.





Figure: 0019
General view of the roadway.





Figure: 0020
General view of the kerb and gutter.





Figure: 0021
General view of the kerb and gutter.





Figure: 0022
General view of the roadway.





Figure: 0023
General view of the kerb and gutter.





Figure: 0024
General view of the kerb and gutter.





Figure: 0025
General view of the roadway.





Figure: 0026
General view of the storm drain. Showing obstructed view.





Figure: 0027
General view of the substation





Figure: 0028
General view of the kerb and gutter.





Figure: 0029
General view of the roadway.





Figure: 0030
General view of the kerb and gutter.





Figure: 0031
General view of the kerb and gutter.





Figure: 0032
General view of the roadway.





Figure: 0033
General view of the kerb and gutter.





Figure: 0034
General view of the kerb and gutter.





Figure: 0035
General view of the roadway.





Figure: 0036
Hairline cracking in the kerb and gutter.





Figure: 0037
General view of the kerb and gutter.





Figure: 0038
General view of the roadway.





Figure: 0039
General view of the kerb and gutter.





Figure: 0040
General view of the parking spaces.





Figure: 0041
General view of the roadway.





Figure: 0042
General view of the kerb and gutter.





Figure: 0043
General view of the parking spaces.





Figure: 0044
General view of the roadway.





Figure: 0045
General view of the kerb and gutter.





Figure: 0046
General view of the kerb and gutter.

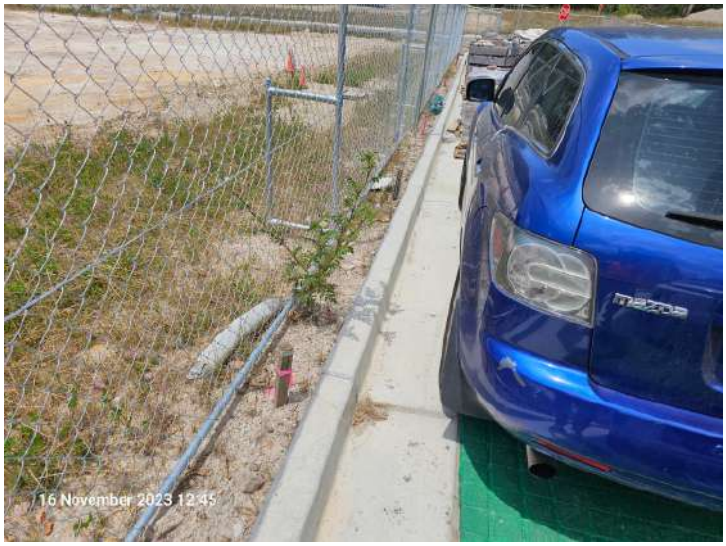



Figure: 0047
General view of the kerb and gutter.





Figure: 0048
General view of the kerb and gutter.





Figure: 0049
General view of the roadway.





Figure: 0050
General view of the kerb and gutter.





Figure: 0051
General view of the parking spaces. Showing obstructed view.





Figure: 0052
General view of the roadway.





Figure: 0053
General view of the kerb and gutter.





Figure: 0054
General view of the parking spaces. Showing obstructed view.





Figure: 0055
General view of the roadway.





Figure: 0056
General view of the kerb and gutter.





Figure: 0057
General view of the parking spaces. Showing obstructed view.





Figure: 0058
General view of the roadway.





Figure: 0059
General view of the kerb and gutter.





Figure: 0060
General view of the lamp post.





Figure: 0061
General view of the lamp post.





Figure: 0062
General view of the kerb and gutter.





Figure: 0063
General view of the roadway.





Figure: 0064
General view of the storm drain.





Figure: 0065
General view of the street sign.





Figure: 0066
General view of the kerb and gutter.





Figure: 0067
General view of the roadway.





Figure: 0068
General view of the kerb and gutter.





Figure: 0069
General view of the kerb and gutter.





Figure: 0070
General view of the roadway.





Figure: 0071
General view of the storm drain.





Figure: 0072
General view of the kerb and gutter.





Figure: 0073
General view of the kerb and gutter.





Figure: 0074
NARROMINE WAY





Figure: 0075
General view of the roadway.





Figure: 0076
General view of the kerb and gutter.



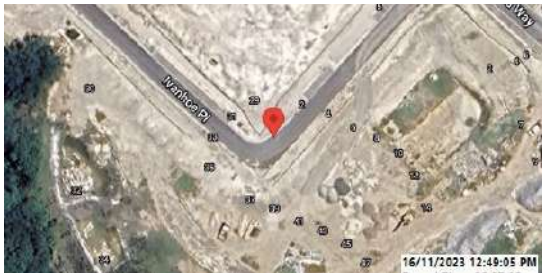

Figure: 0077
General view of the kerb and gutter.



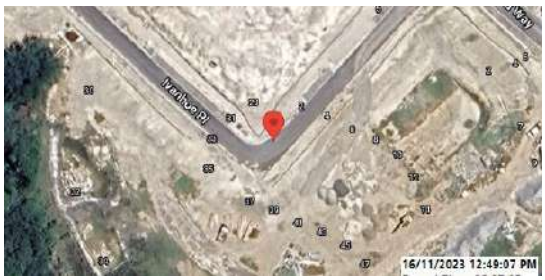

Figure: 0078
General view of the roadway.



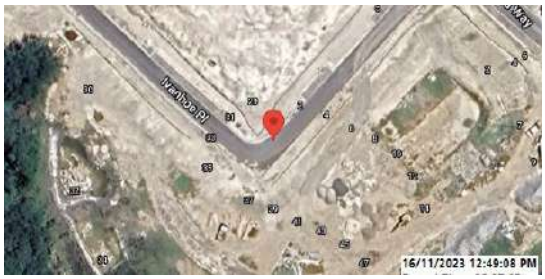

Figure: 0079
General view of the kerb and gutter.





Figure: 0080
General view of the lamp post.





Figure: 0081
General view of the lamp post.





Figure: 0082
General view of the kerb and gutter.





Figure: 0083
General view of the roadway.





Figure: 0084
General view of the kerb and gutter.





Figure: 0085
General view of the kerb and gutter.





Figure: 0086
General view of the roadway.





Figure: 0087
General view of the kerb and gutter.





Figure: 0088
General view of the street sign.





Figure: 0089
General view of the parking spaces.





Figure: 0090
General view of the parking spaces.





Figure: 0091
General view of the roadway.





Figure: 0092
General view of the kerb and gutter.





Figure: 0093
General view of the kerb and gutter.





Figure: 0094
General view of the parking spaces.





Figure: 0095
General view of the roadway.





Figure: 0096
General view of the kerb and gutter.





Figure: 0097
General view of the storm drain.





Figure: 0098
General view of the parking space.





Figure: 0099
General view of the roadway.





Figure: 0100
General view of the storm drain.





Figure: 0101
General view of the street sign.





Figure: 0102
General view of the kerb and gutter.





Figure: 0103
General view of the roadway.





Figure: 0104
General view of the crossover.





Figure: 0105
General view of the kerb and gutter.





Figure: 0106
General view of the roadway.





Figure: 0107
General view of the crossover.





Figure: 0108
General view of the lamp post.





Figure: 0109
General view of the lamp post.





Figure: 0110
General view of the kerb and gutter.





Figure: 0111
General view of the roadway.





Figure: 0112
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Figure: 0113
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Figure: 0114
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Figure: 0115
General view of the roadway.





Figure: 0116
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Figure: 0117
General view of the kerb and gutter.





Figure: 0118
General view of the roadway.





Figure: 0119
Fine cracking in the kerb.





Figure: 0120
General view of the kerb and gutter.





Figure: 0121
General view of the parking spaces.





Figure: 0122
General view of the roadway.





Figure: 0123
General view of the kerb and gutter.





Figure: 0124
General view of the kerb and gutter.





Figure: 0125
General view of the roadway.





Figure: 0126
General view of the kerb and gutter.





Figure: 0127
General view of the kerb and gutter.





Figure: 0128
General view of the parking spaces.





Figure: 0129
General view of the roadway.





Figure: 0130
General view of the kerb and gutter.





Figure: 0131
General view of the kerb and gutter.





Figure: 0132
General view of the parking space.





Figure: 0133
General view of the roadway.





Figure: 0134
Fine cracking in the kerb and gutter.



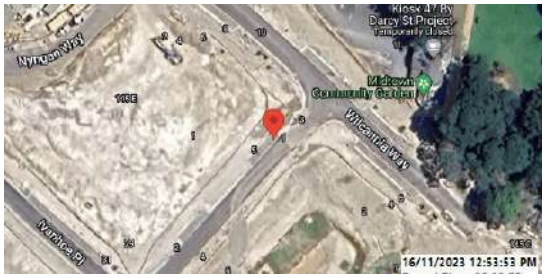

Figure: 0135
Fine cracking in the kerb and gutter.





Figure: 0136
General view of the roadway.





Figure: 0137
General view of the kerb and gutter.





Figure: 0138
General view of the kerb and gutter.





Figure: 0139
General view of the roadway.





Figure: 0140
General view of the kerb and gutter.





Figure: 0141
General view of the footpath.





Figure: 0142
General view of the footpath.





Figure: 0143
General view of the kerb and gutter.





Figure: 0144
WILCANNIA WAY

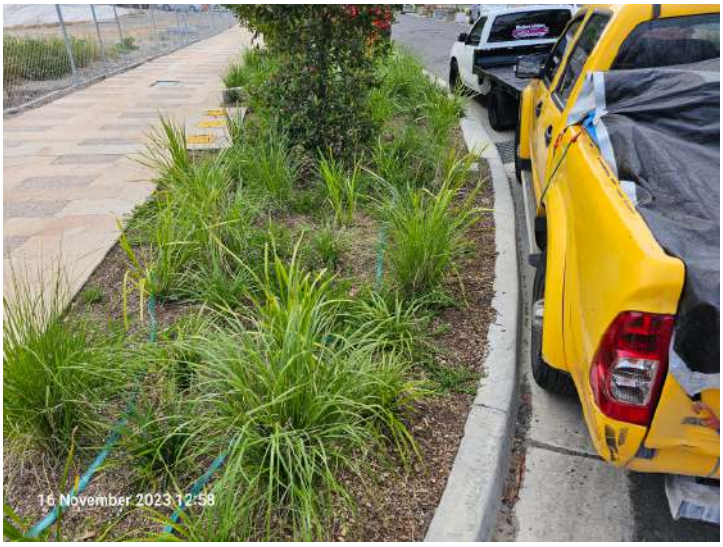



Figure: 0145
General view of the garden.





Figure: 0146
General view of the roadway.





Figure: 0147
General view of the street sign.





Figure: 0148
General view of the garden area.





Figure: 0149
General view of the footpath.





Figure: 0150
General view of the kerb and gutter.





Figure: 0151
General view of the roadway.





Figure: 0152
General view of the footpath.





Figure: 0153
General view of the garden area.





Figure: 0154
General view of the tree.





Figure: 0155
General view of the garden area.





Figure: 0156
General view of the roadway.





Figure: 0157
General view of the footpath.





Figure: 0158
General view of the parking spaces.





Figure: 0159
General view of the kerb and gutter.





Figure: 0160
General view of the roadway.





Figure: 0161
General view of the footpath.

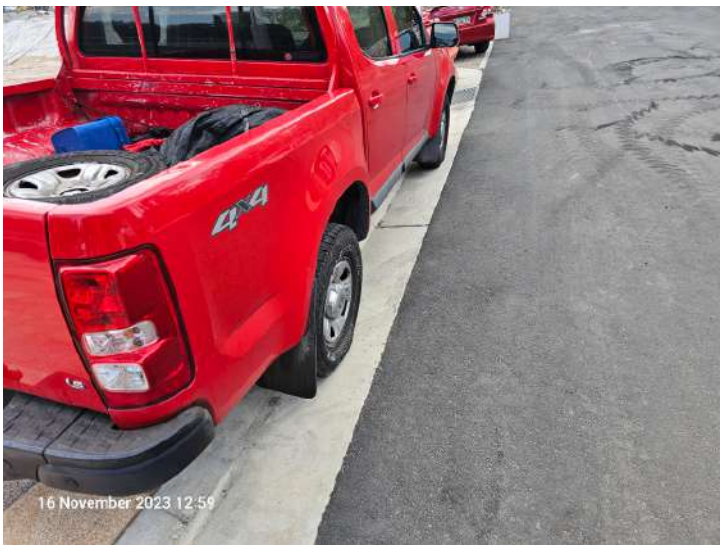



Figure: 0162
General view of the kerb and gutter. Showing obstructed view.





Figure: 0163
General view of the roadway.





Figure: 0164
General view of the lamp post.





Figure: 0165
General view of the lamp post.





Figure: 0166
General view of the footpath.





Figure: 0167
General view of the garden area.





Figure: 0168
General view of the storm drain.





Figure: 0169
General view of the roadway.





Figure: 0170
General view of the tree.





Figure: 0171
General view of the street sign.





Figure: 0172
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Figure: 0173
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Figure: 0174
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Figure: 0175
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Figure: 0187
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Figure: 0188
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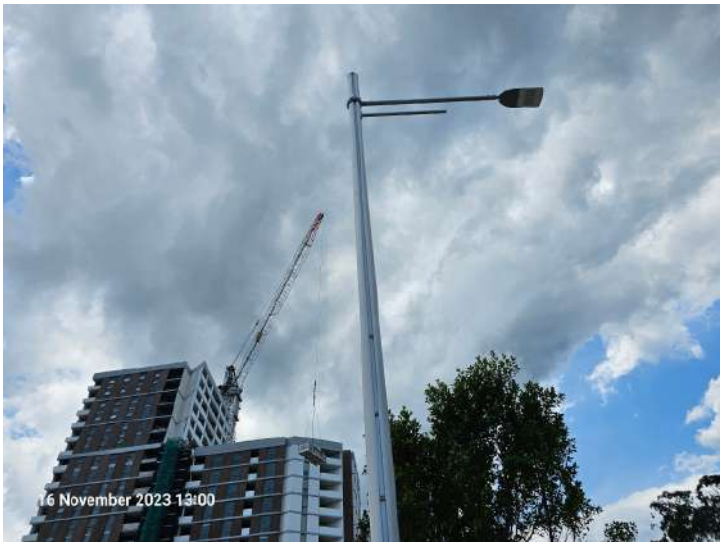



Figure: 0190
General view of the lamp post.





Figure: 0191
General view of the footpath.





Figure: 0192
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Figure: 0193
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Figure: 0194
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Figure: 0195
General view of the tree.





Figure: 0196
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Figure: 0197
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Figure: 0198
General view of the roadway.





Figure: 0199
General view of the parking spaces.





Figure: 0200
General view of the roadway.





Figure: 0201
General view of the tree.





Figure: 0202
General view of the tree.





Figure: 0203
General view of the footpath.





Figure: 0204
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Figure: 0205
General view of the tree and footpath.





Figure: 0206
General view of the tree.





Figure: 0207
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Figure: 0208
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Figure: 0209
General view of the parking spaces. Showing obstructed view.





Figure: 0210
General view of the roadway.

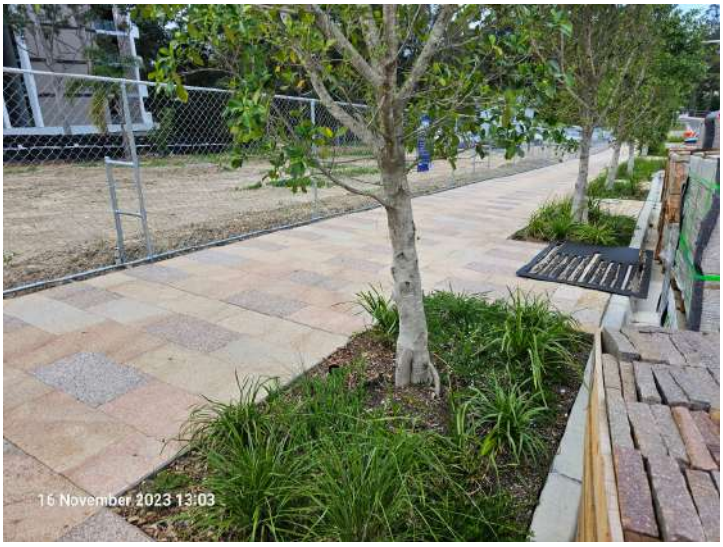



Figure: 0211
General view of the tree and footpath.





Figure: 0212
General view of the tree.





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General view of the footpath.





Figure: 0214
General view of the kerb and gutter.





Figure: 0215
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Figure: 0218
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Figure: 0219
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Figure: 0220
General view of the trees.





Figure: 0221
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Figure: 0223
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General view of the roadway.





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Figure: 0236
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Figure: 0237
General view of the tree.





Figure: 0238
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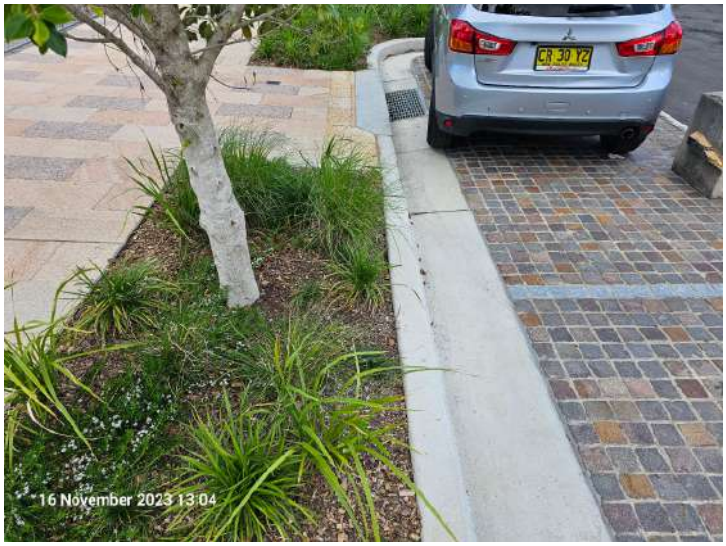



Figure: 0239
General view of the kerb and gutter.





Figure: 0240
General view of the parking space.

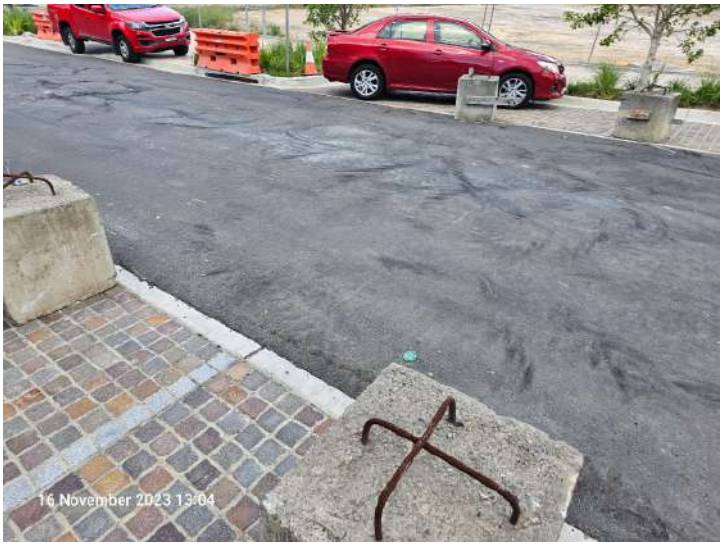



Figure: 0241
General view of the roadway.





Figure: 0242
General view of the footpath.

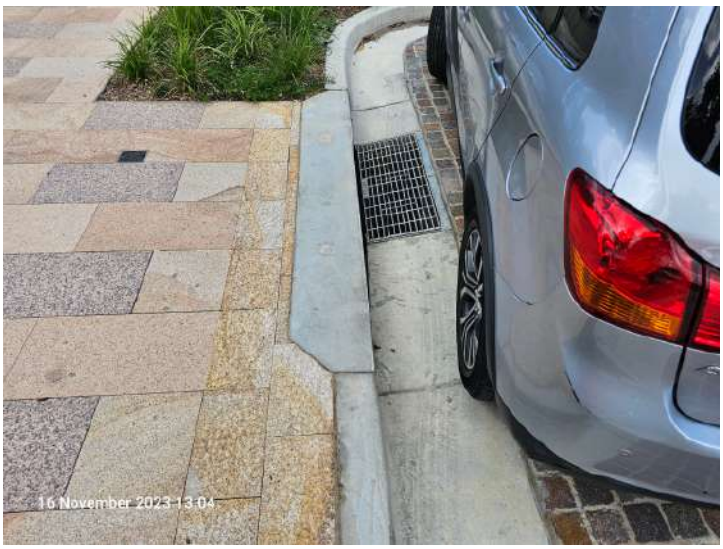



Figure: 0243
General view of the kerb and gutter.





Figure: 0244
General view of the parking space.





Figure: 0245
General view of the roadway.





Figure: 0246
General view of the footpath.





Figure: 0247
General view of the tree.





Figure: 0248
General view of the footpath.





Figure: 0249
General view of the kerb and gutter.





Figure: 0250
Hairline cracking in the kerb and gutter.





Figure: 0251
General view of the kerb and gutter.





Figure: 0252
General view of the street sign.





Figure: 0253
General view of the tree.





Figure: 0254
General view of the tree.





Figure: 0255
General view of the lamp post.





Figure: 0256
General view of the lamp post.





Figure: 0257
General view of the footpath.





Figure: 0258
General view of the kerb and gutter.





Figure: 0259
General view of the roadway.





Figure: 0260
General view of the footpath.





Figure: 0261
General view of the kerb and gutter.





Figure: 0262
General view of the roadway.





Figure: 0263
General view of the footpath.





Figure: 0264
General view of the footpath.





Figure: 0265
General view of the kerb and gutter.





Figure: 0266
General view of the roadway.

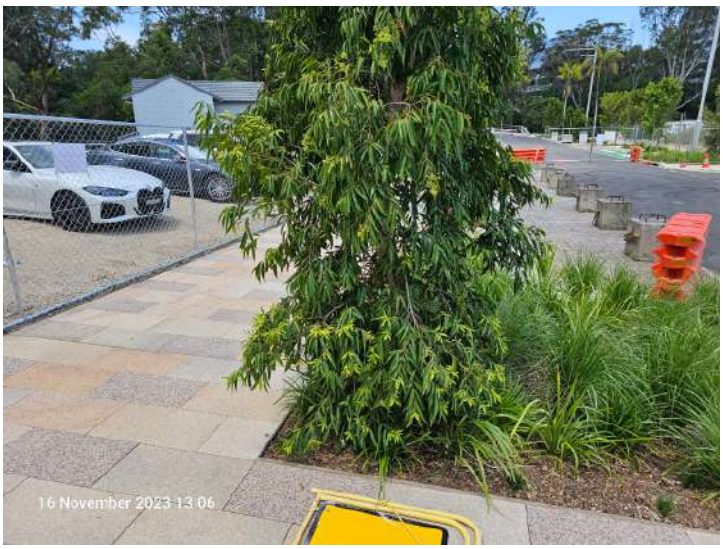



Figure: 0267
General view of the tree.





Figure: 0268
General view of the tree.

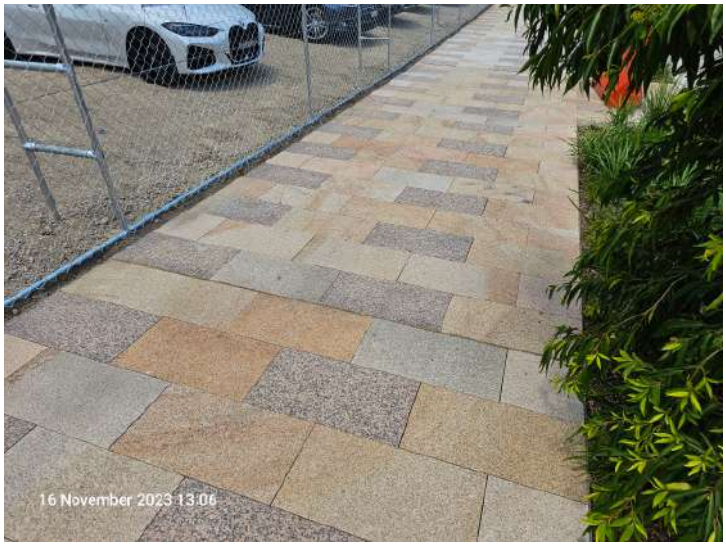



Figure: 0269
General view of the footpath.





Figure: 0270
General view of the kerb and gutter.





Figure: 0271
General view of the roadway.





Figure: 0272
General view of the street sign.





Figure: 0273
General view of the footpath.





Figure: 0274
General view of the kerb and gutter.

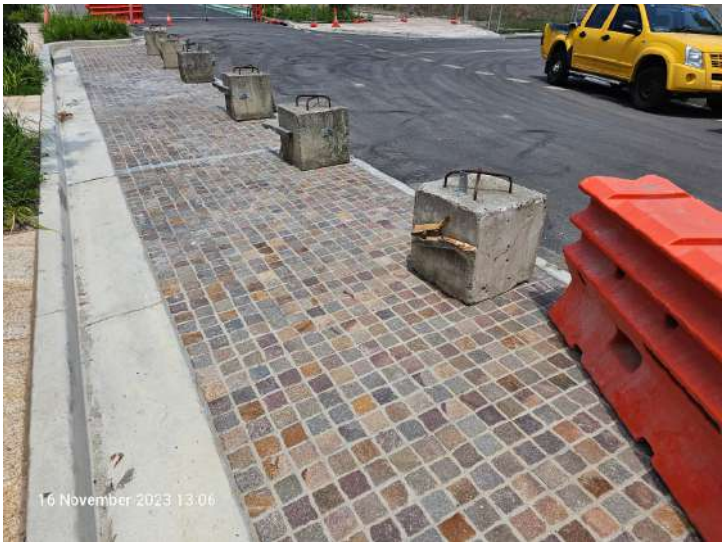



Figure: 0275
General view of the parking spaces.





Figure: 0276
General view of the roadway.





Figure: 0277
General view of the tree.





Figure: 0278
General view of the tree.

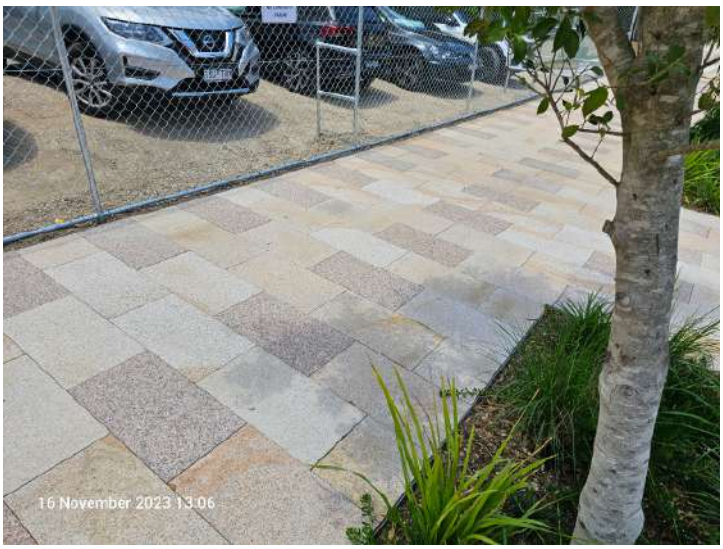



Figure: 0279
General view of the footpath.





Figure: 0280
General view of the kerb and gutter.





Figure: 0281
General view of the parking spaces.





Figure: 0282
General view of the roadway.





Figure: 0283
General view of the footpath.





Figure: 0284
General view of the kerb and gutter.





Figure: 0285
General view of the parking spaces.





Figure: 0286
General view of the roadway.





Figure: 0287
General view of the footpath.

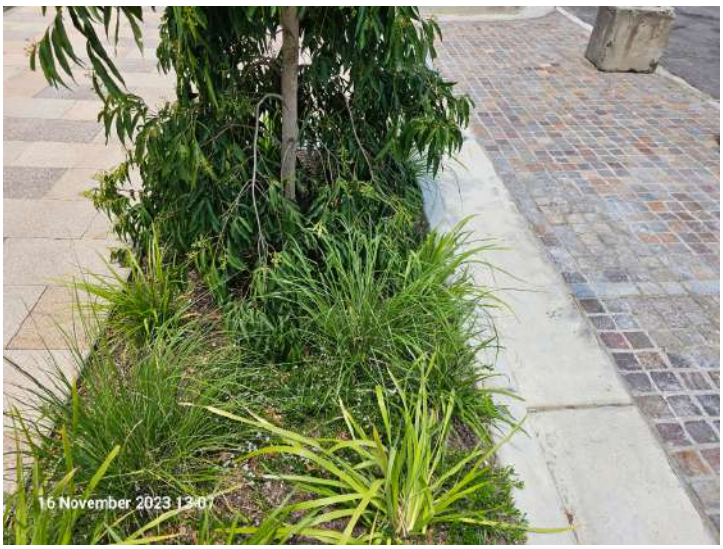



Figure: 0288
General view of the kerb and gutter.





Figure: 0289
General view of the parking spaces.





Figure: 0290
General view of the roadway.





Figure: 0291
General view of the tree.





Figure: 0292
General view of the tree.





Figure: 0293
General view of the footpath.





Figure: 0294
General view of the kerb and gutter.





Figure: 0295
General view of the parking spaces.





Figure: 0296
General view of the roadway.

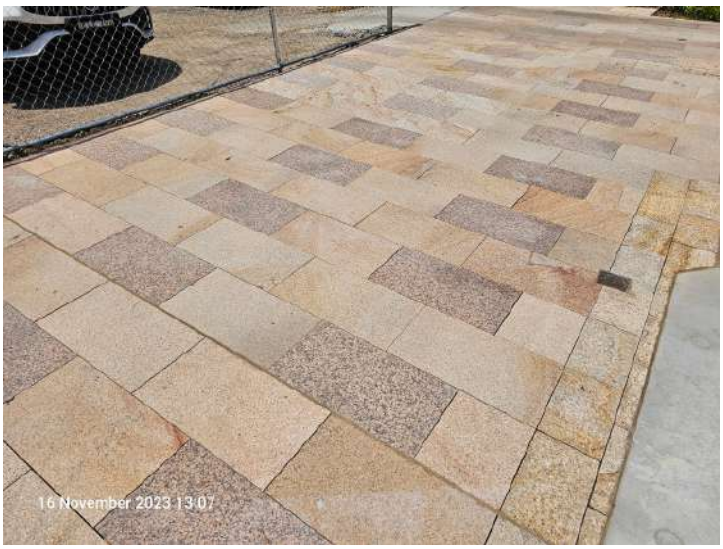



Figure: 0297
General view of the footpath.





Figure: 0298
General view of the storm drain, kerb and gutter.





Figure: 0299
General view of the parking space.





Figure: 0300
General view of the roadway.





Figure: 0301
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Figure: 0302
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Figure: 0303
General view of the roadway. Showing chipping in the kerb.





Figure: 0304
General view of the footpath.





Figure: 0305
General view of the footpath.





Figure: 0306
General view of the kerb and gutter.





Figure: 0307
Patching in the crossover.

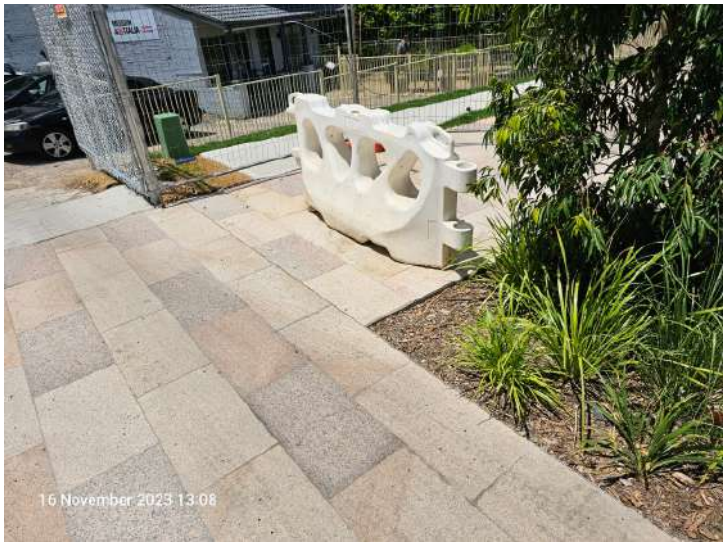



Figure: 0308
General view of the footpath.





Figure: 0309
General view of the tree.





Figure: 0310
General view of the tree.





Figure: 0311
General view of the kerb and gutter.





Figure: 0312
General view of the roadway.





Figure: 0313
General view of the roadway.





Figure: 0314
General view of the street sign.

Saf Abdelfattah

From: Mohamed Yaccoub
Sent: Thursday, 18 January 2024 4:37 PM
To: City of Ryde
Subject: Condition B18 - Pre-Construction Dilapidation Report building C3 Ivanhoe Estate

Hi to whom it may concern,

Please see below link of the pre-construction dilapidation report for building C3 Stage 2 Ivanhoe estate – Epping Road, Macquarie Park NSW for your information.

- ADN23369A Council Assets Ivanhoe Place MACQUARIE PARK - https://ddec1-0-en-ctp.trendmicro.com:443/wis/clicktime/v1/query?url=https%3a%2f%2fausdilaps.box.com%2fs%2fpui5qx78tk732b6gty7043dyx85i4xms&umid=d8223f75-5759-469e-820d-743e6b2552b6&auth=85b6e0ad92c778369558f50311e1fc1a4367f0fd-7655036a71f376f0aff5a9df8c14b60264a5c55b

URBIS

ABORIGINAL CULTURAL HERITAGE ASSESSMENT

IVANHOE ESTATE,
MACQUARIE PARK

Prepared for
FRASERS PROPERTY AUSTRALIA
6 August 2021

URBIS STAFF RESPONSIBLE FOR THIS REPORT WERE:

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Project Code	P0032333
Report Number	D01 – Issued 8th July 2021
	F01 – Issued 6th August 2021

Urbis acknowledges the important contribution that Aboriginal and Torres Strait Islander people make in creating a strong and vibrant Australian society.

We acknowledge, in each of our offices the Traditional Owners on whose land we stand.

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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).

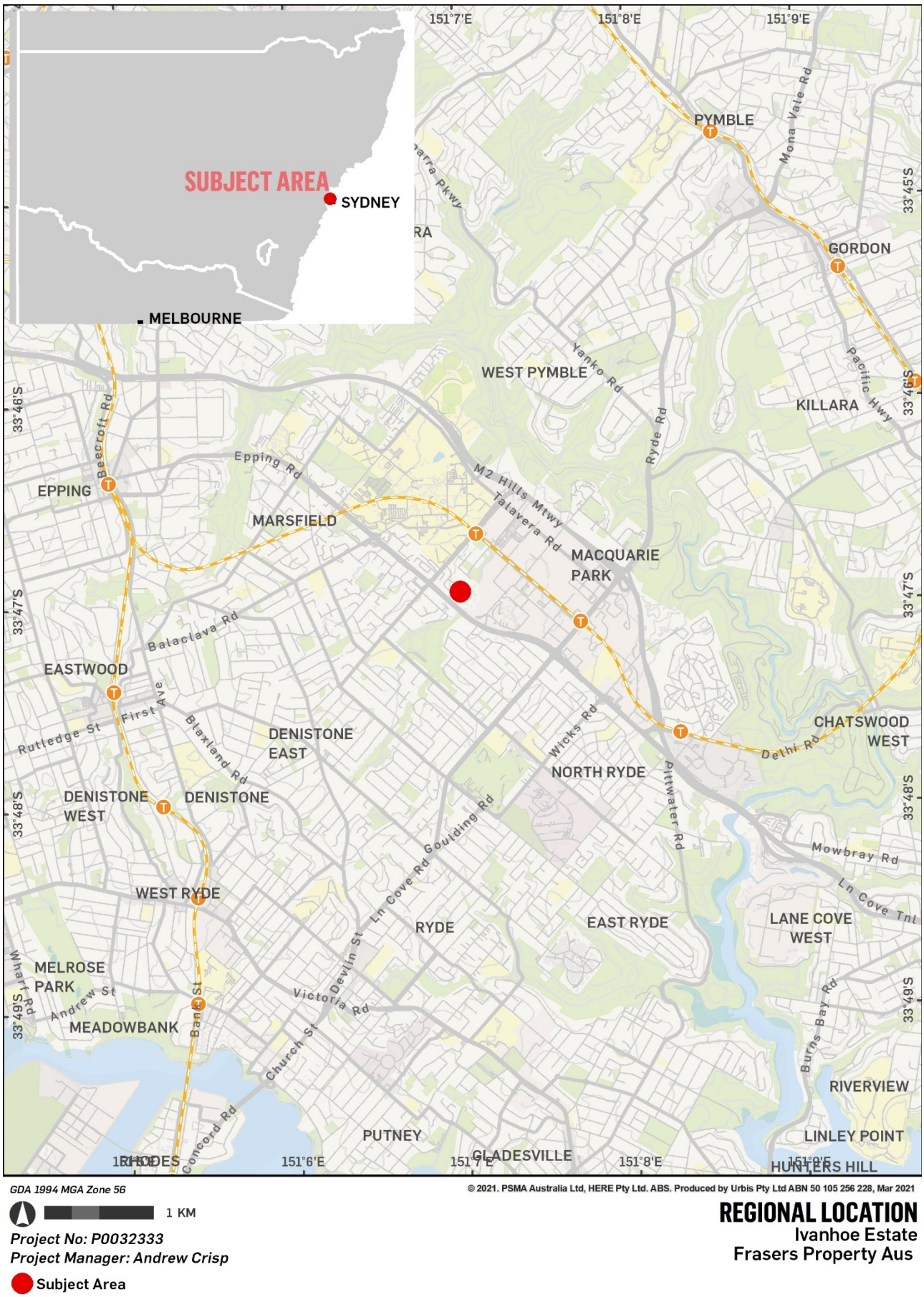

Figure 1 – Regional location



Figure 2 – Location of the subject area

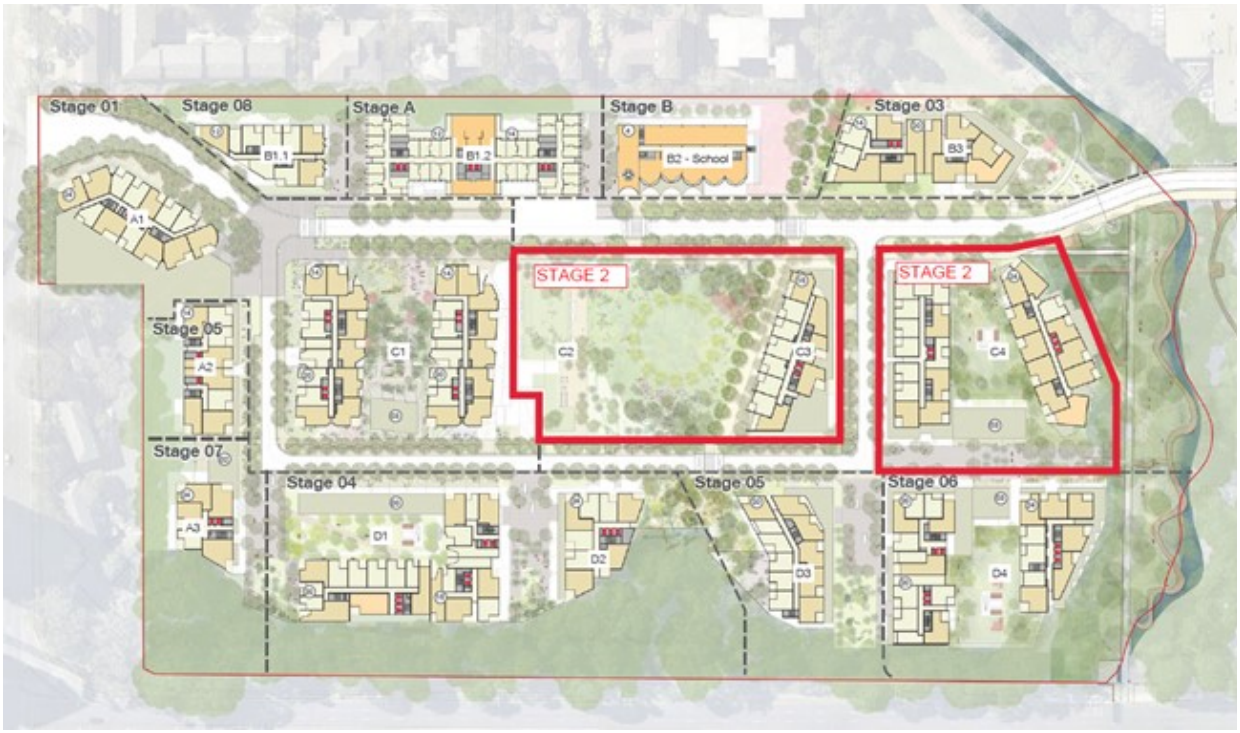

Figure 3 – Ivanhoe Masterplan
Source: Ethos Urban

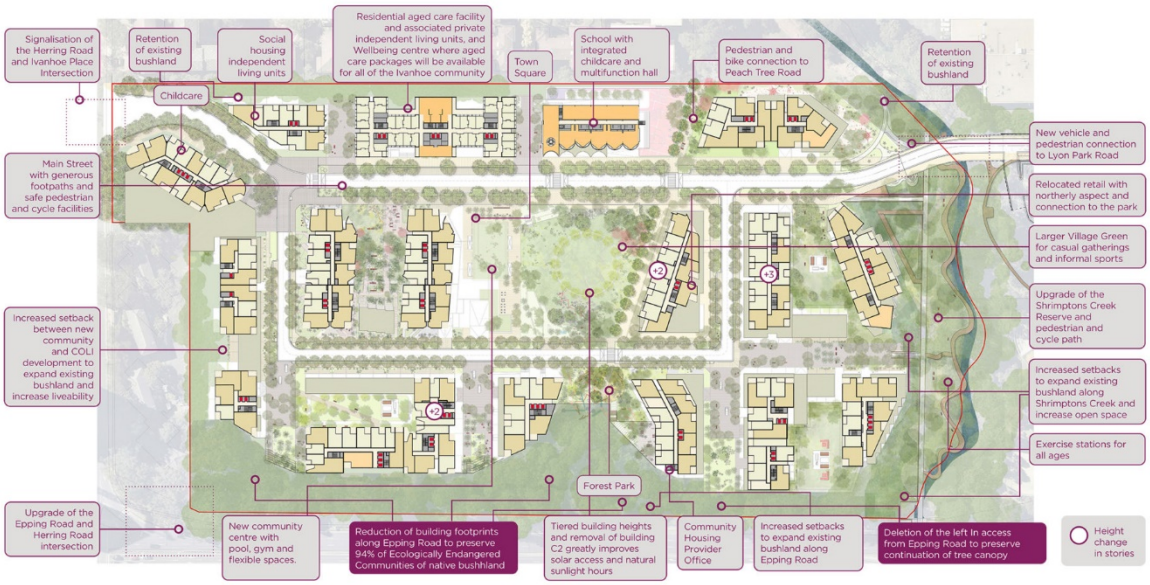

Figure 4 – Ivanhoe Masterplan
Source: Ethos Urban

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%**

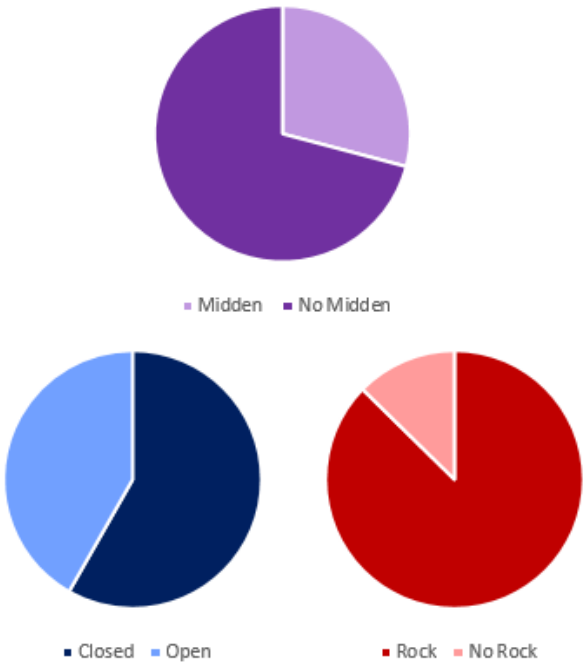

Figure 6 – Analysis of AHIMS search results (Client Service ID: 574117)

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

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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

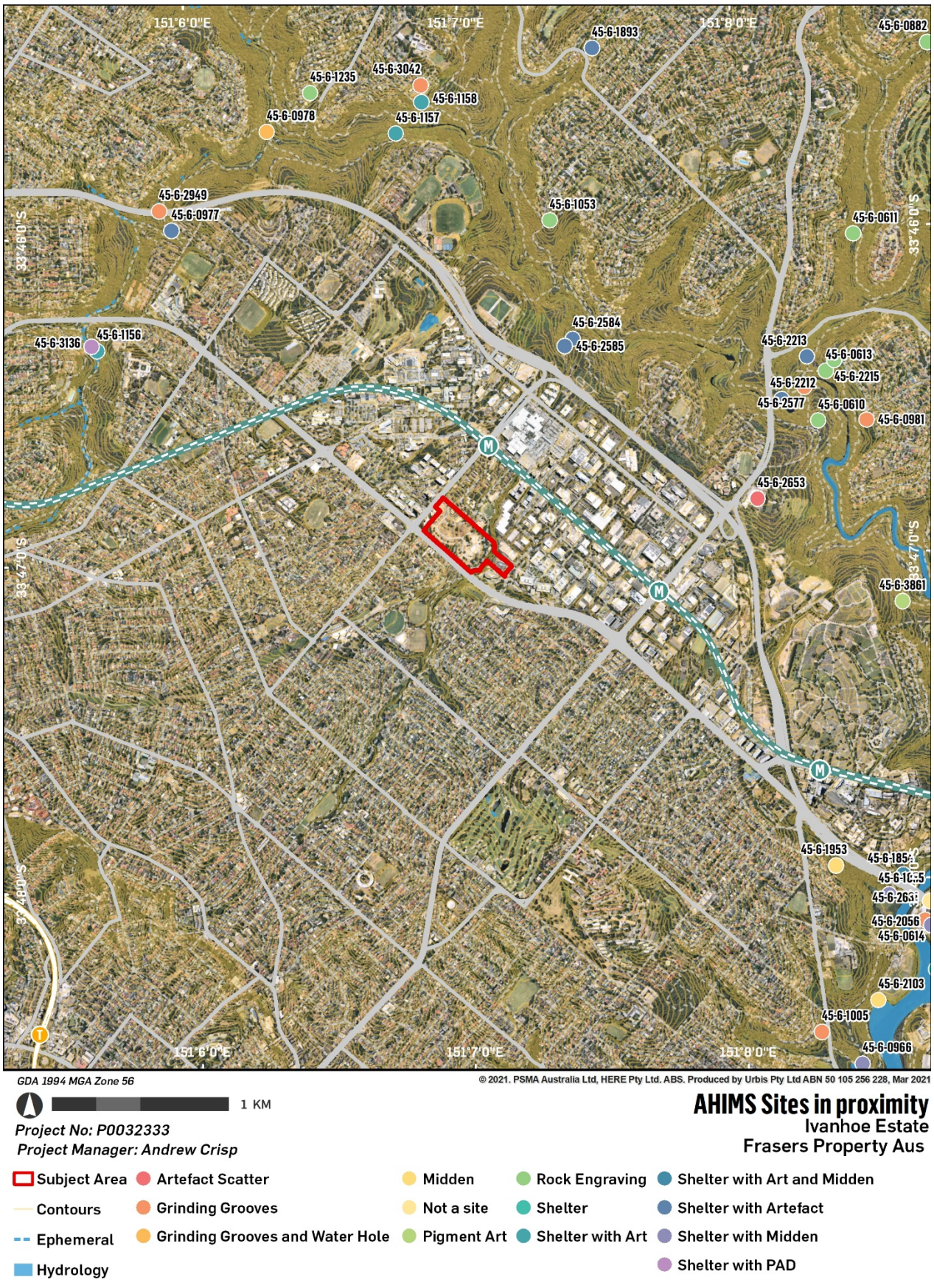


Figure 8 – Registered Aboriginal sites within proximity to the subject area

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

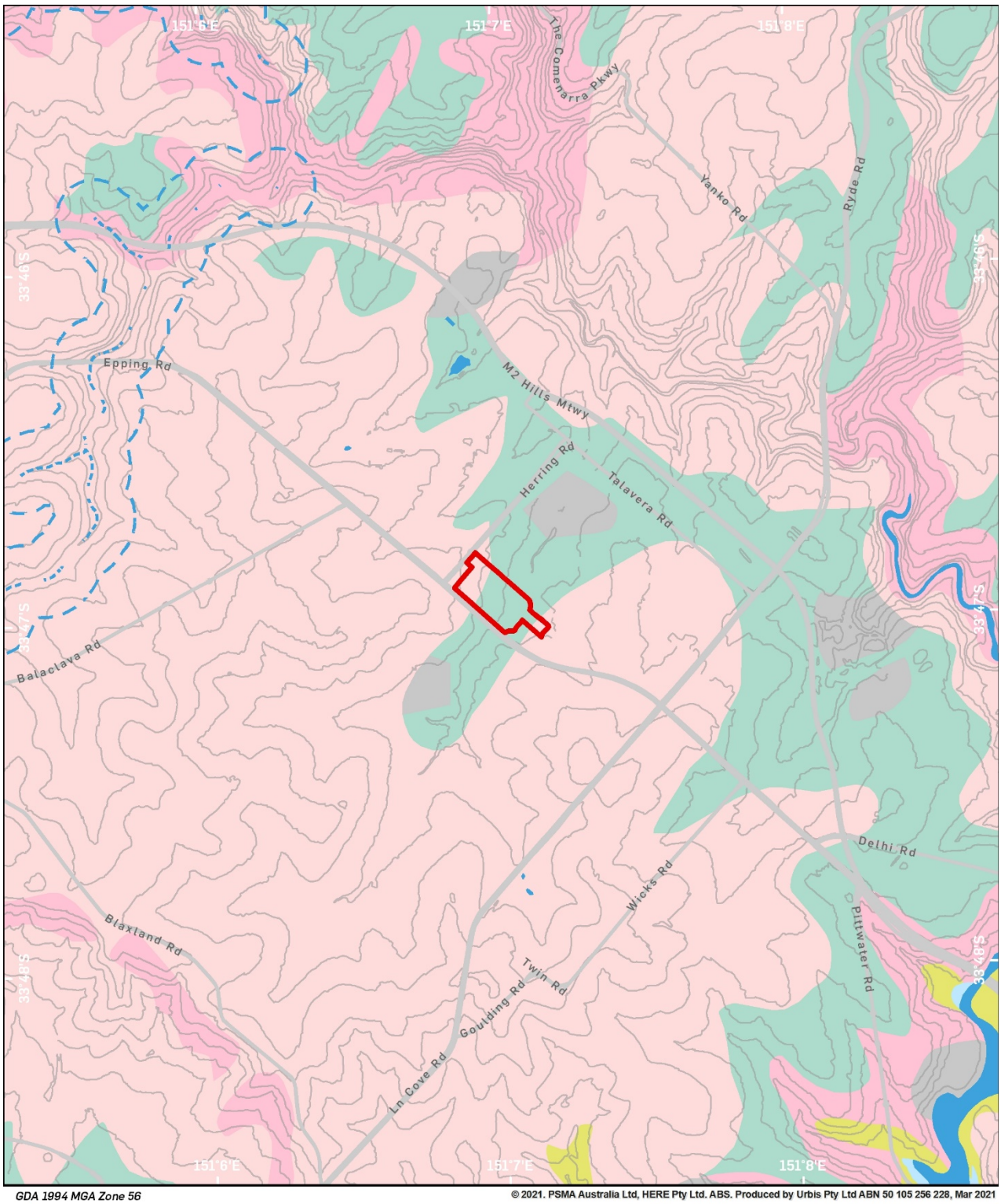
Certain soil landscapes and geological features are associated with greater archaeological potential for Aboriginal objects and places. For example, sand dune systems are associated with the potential presence of burials and sandstone outcrops are associated with the potential presence of grinding grooves 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
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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.

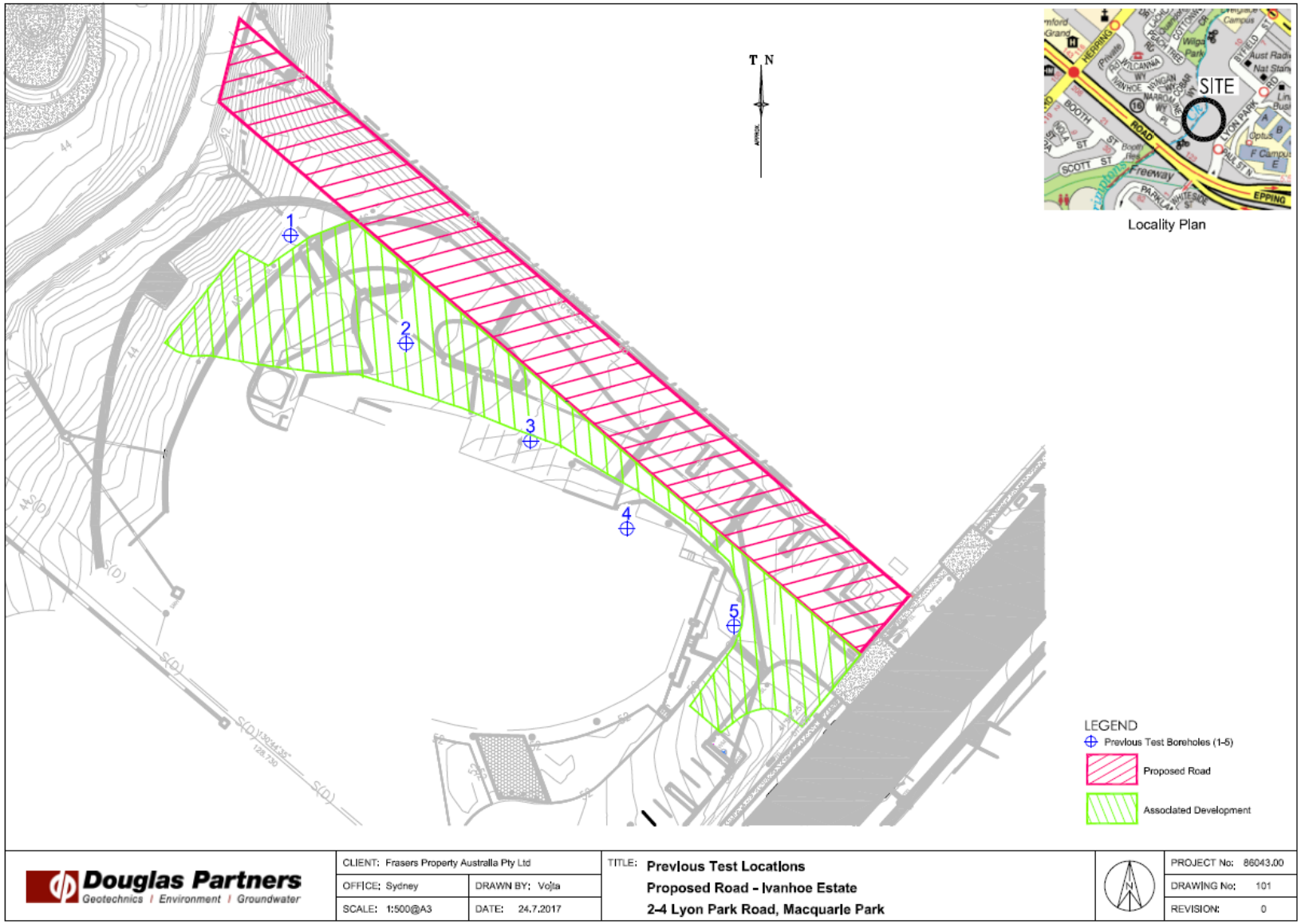

Figure 10 – Borehole locations
Source: Douglas Partners

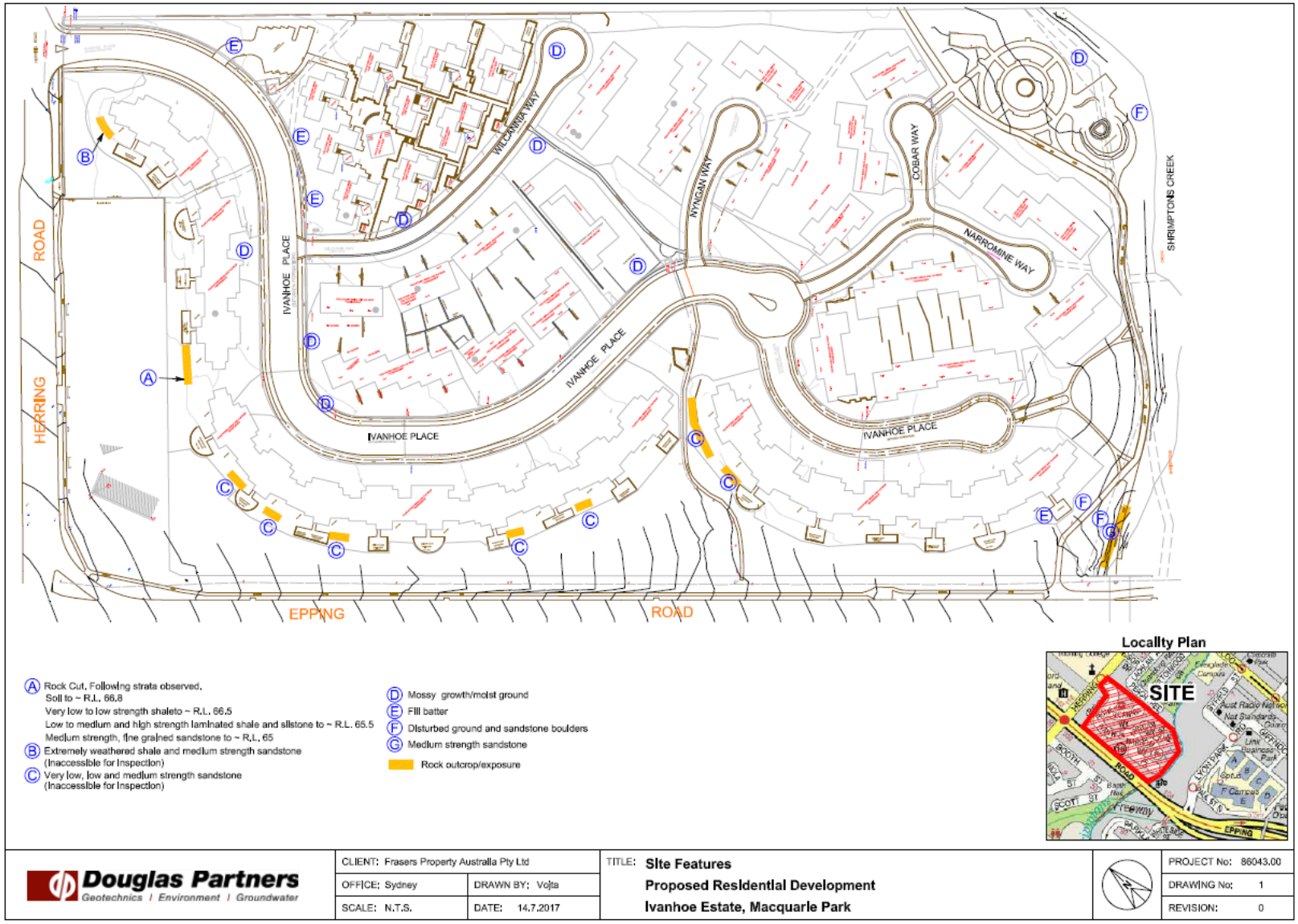

Figure 11 – Subject area features
Source: Douglas Partners

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).

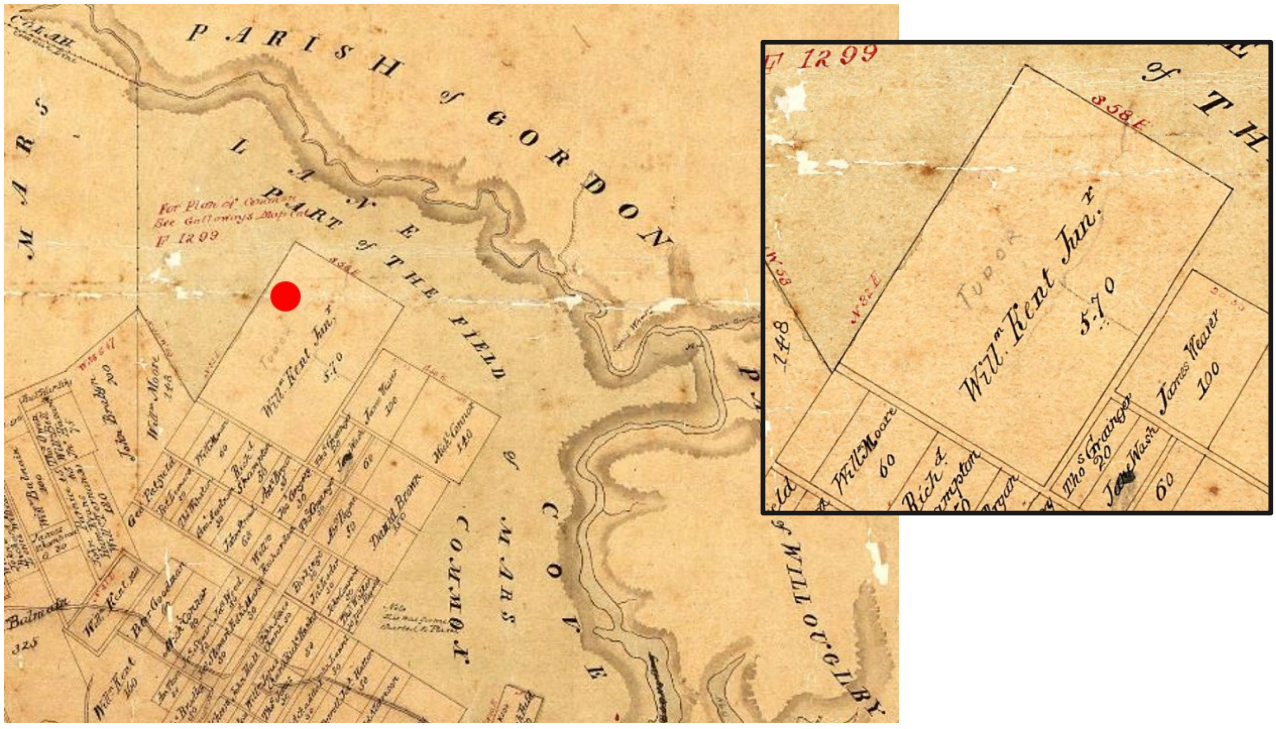

Figure 12 – Parish map of Hunters Hill, c. 1860s; red dot indicates approximate location of subject area in "Tudor" farm
Source: NSWLRS

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.



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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

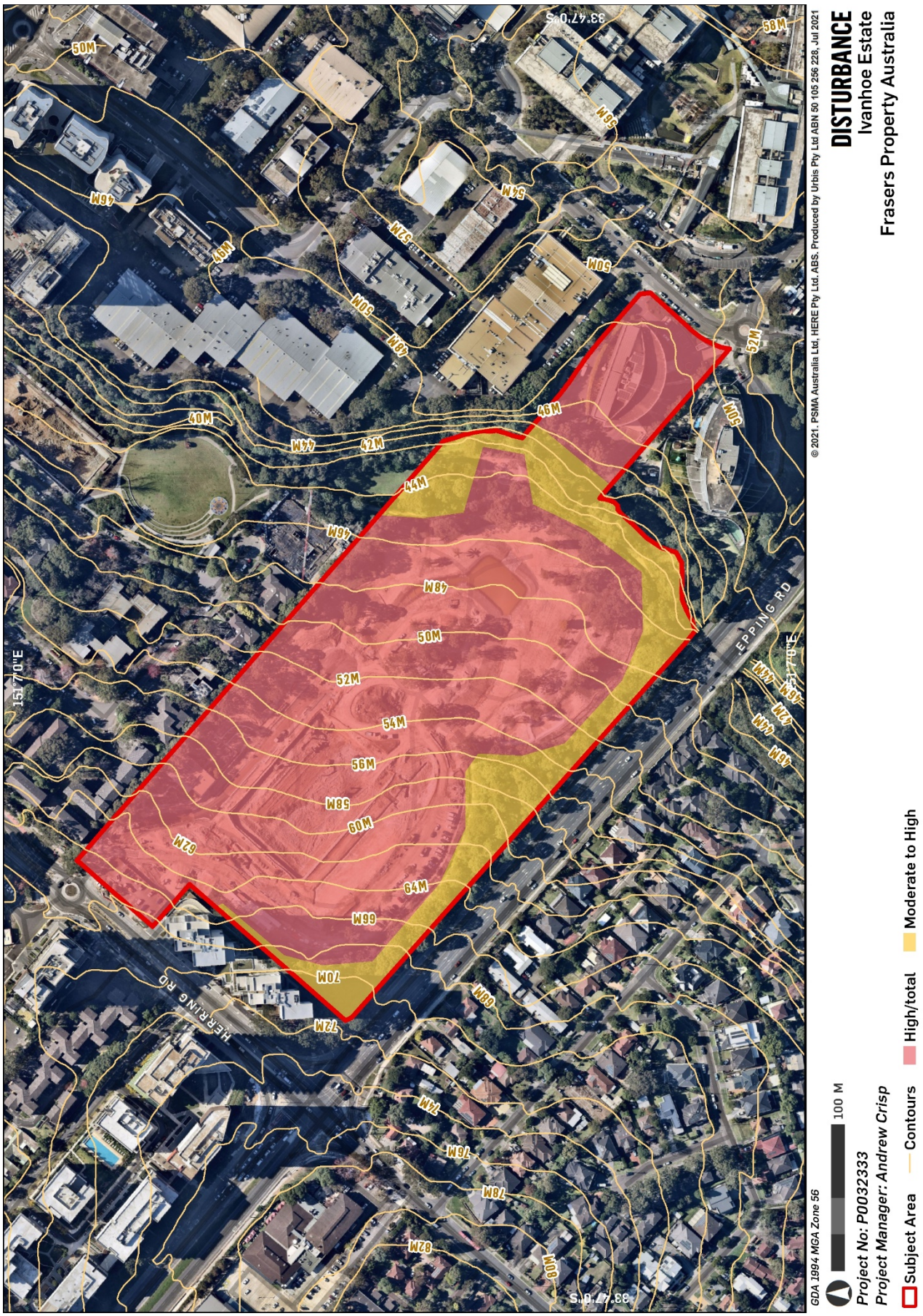

Figure 16 – Disturbance within the Subject Area

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.

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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

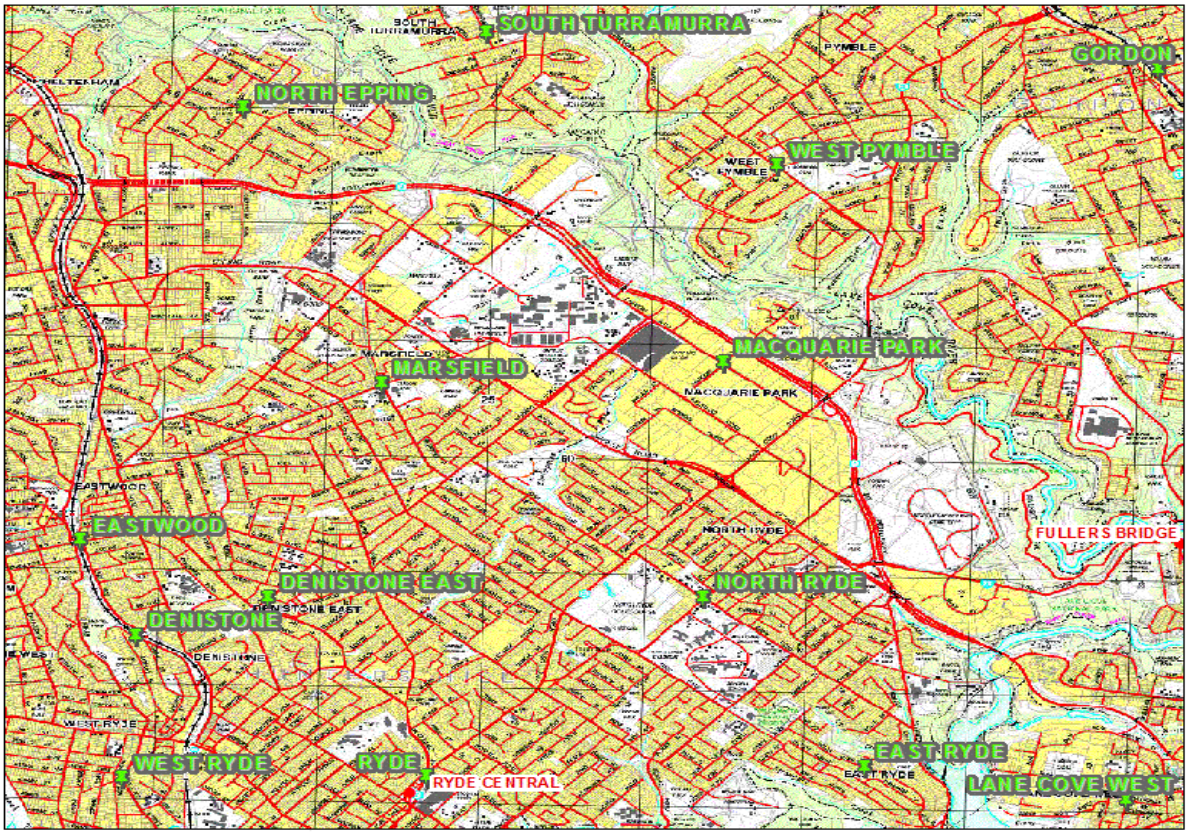
Email: mwalker@urbis.com.au

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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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
	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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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.**

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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

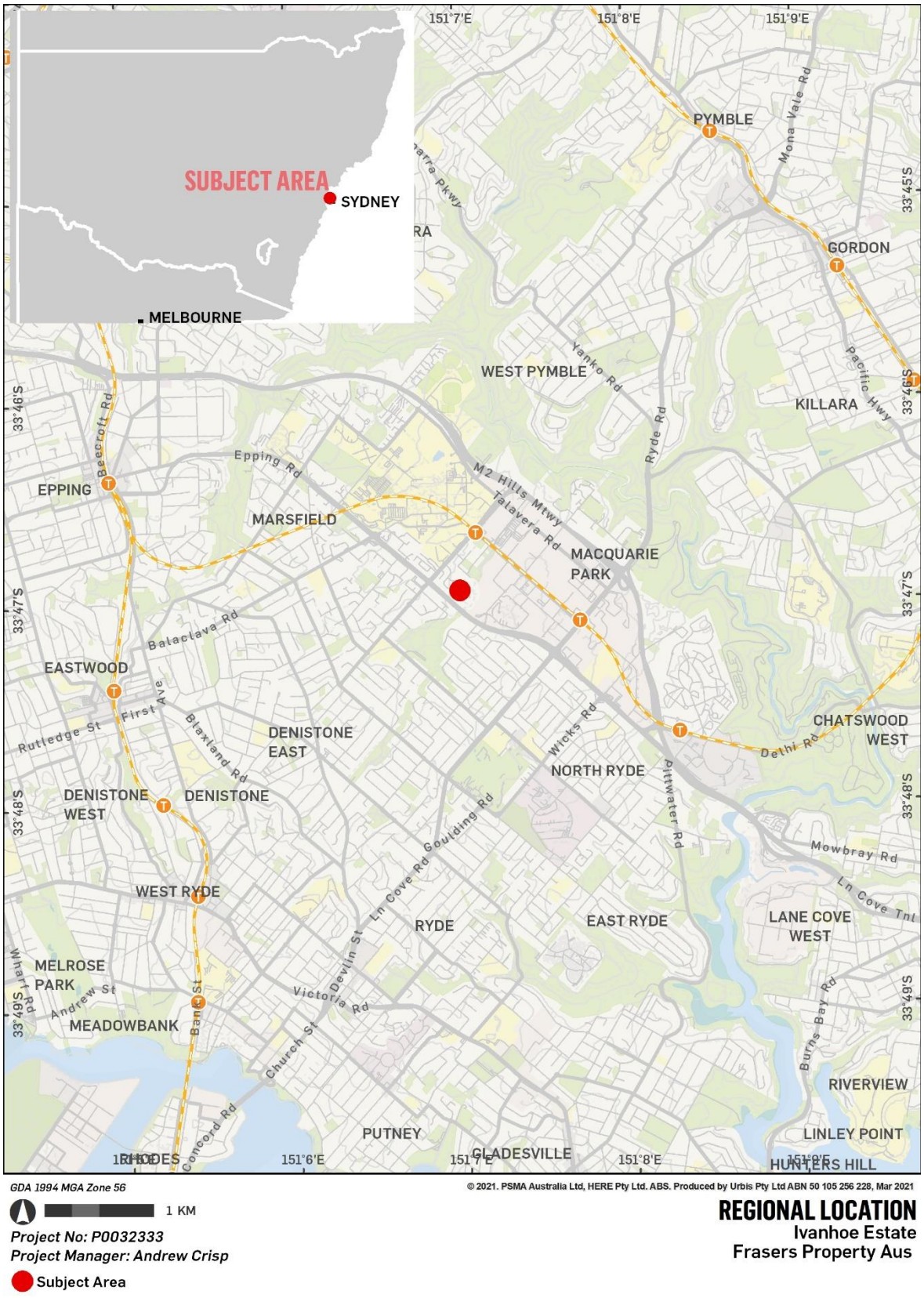

Figure 1 – Regional location



Figure 2 – Location of the subject area



Figure 3 - Ivanhoe Estate Concept Masterplan

Source: Ethos Urban

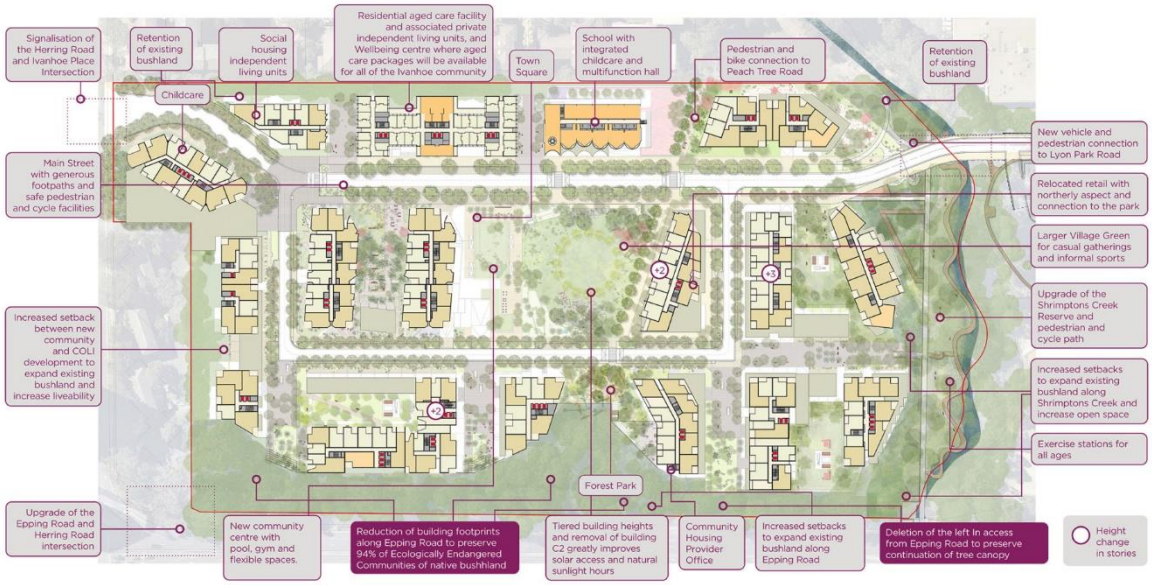

Figure 4 – Ivanhoe Estate Concept Masterplan - details

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.
If you are not the intended recipient, please notify the sender and then delete it immediately.
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

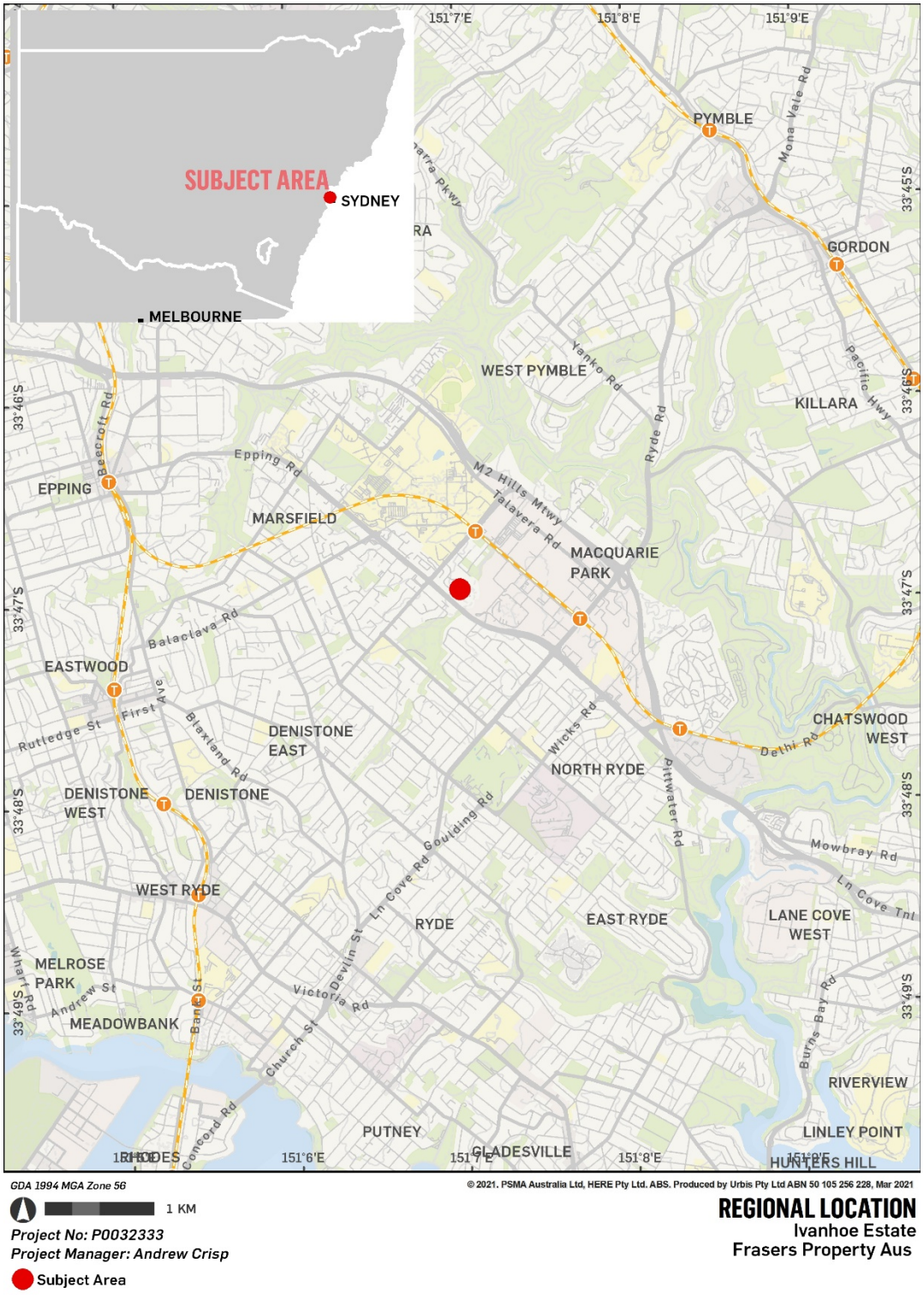

Figure 1 – Regional Location of the subject area



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).

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

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

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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.

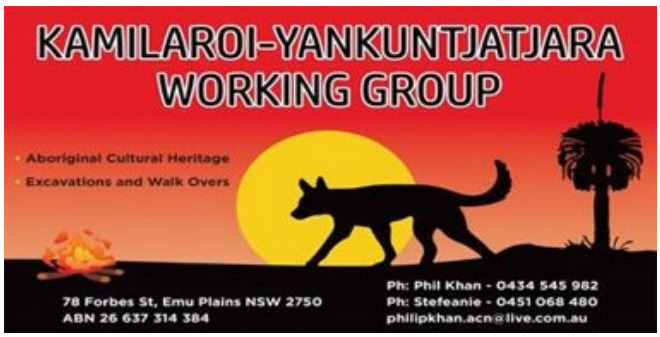
As a senior Aboriginal person for the past 50yrs, I actively participate in the protection of the Aboriginal Cultural Heritage throughout the Sydney Basin, & particularly throughout Western Sydney, on behalf of Kamilaroi Yankuntjatjara Working Group I wish to provide to you my organisation's registration 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

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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).
>
> 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.

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

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.

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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).
>
> 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.
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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

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ANGEL PLACE, LEVEL 8, 123 PITT STREET
SYDNEY, NSW 2000, AUSTRALIA

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--
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.

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SYDNEY NSW 2000

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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

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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.

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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).

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

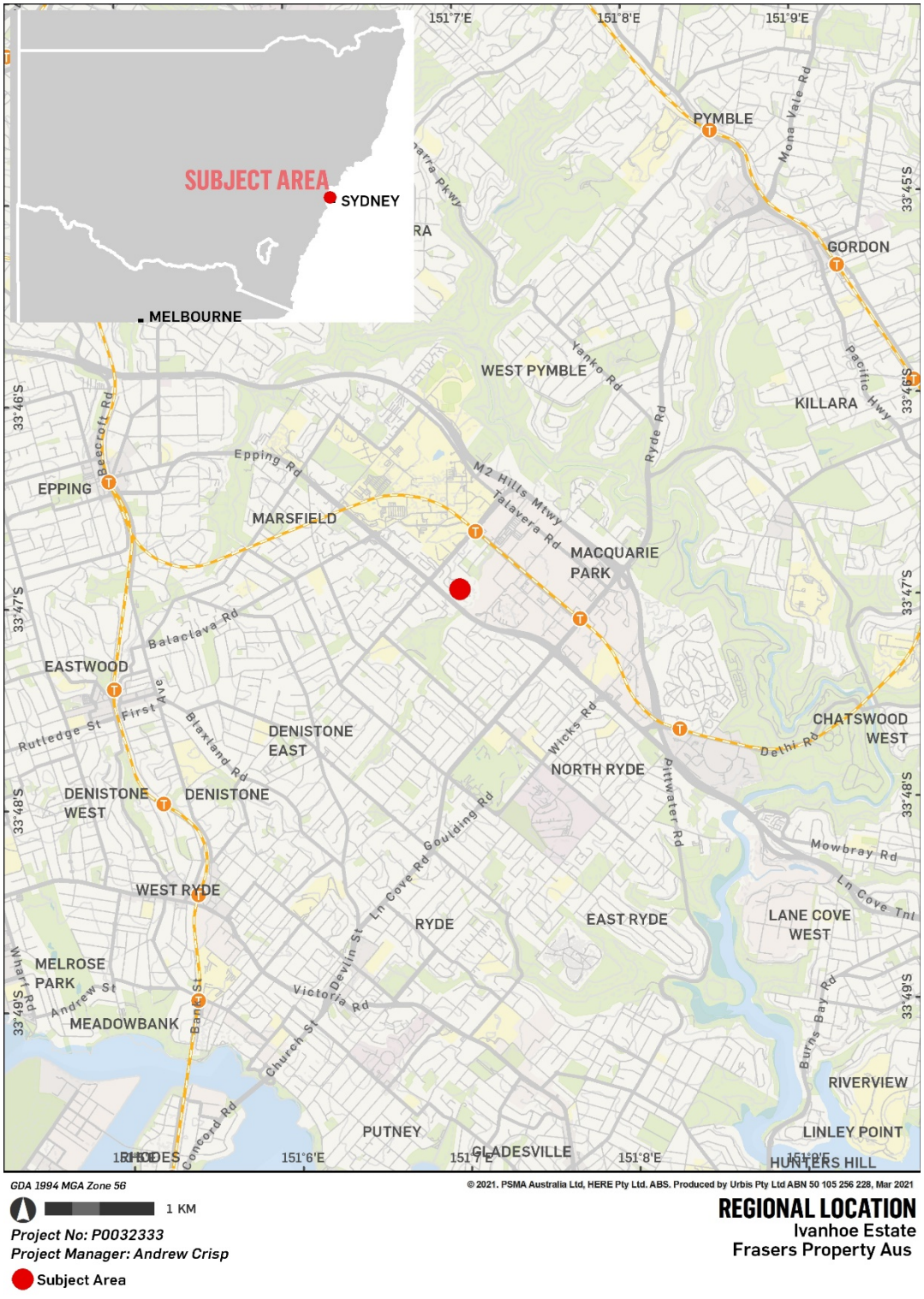

Figure 1 – Regional Location of the subject area



Figure 2 – Location of the subject area

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SYDNEY NSW 2000

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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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Yours sincerely,



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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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Senior Archaeologist
Urbis
Level 8 123 Pitt Street,
Sydney, NSW, 2000
E: acrisp@urbis.com.au

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Yours sincerely,



Andrew Crisp
Senior Consultant
+61 2 8233 7642
acrisp@urbis.com.au

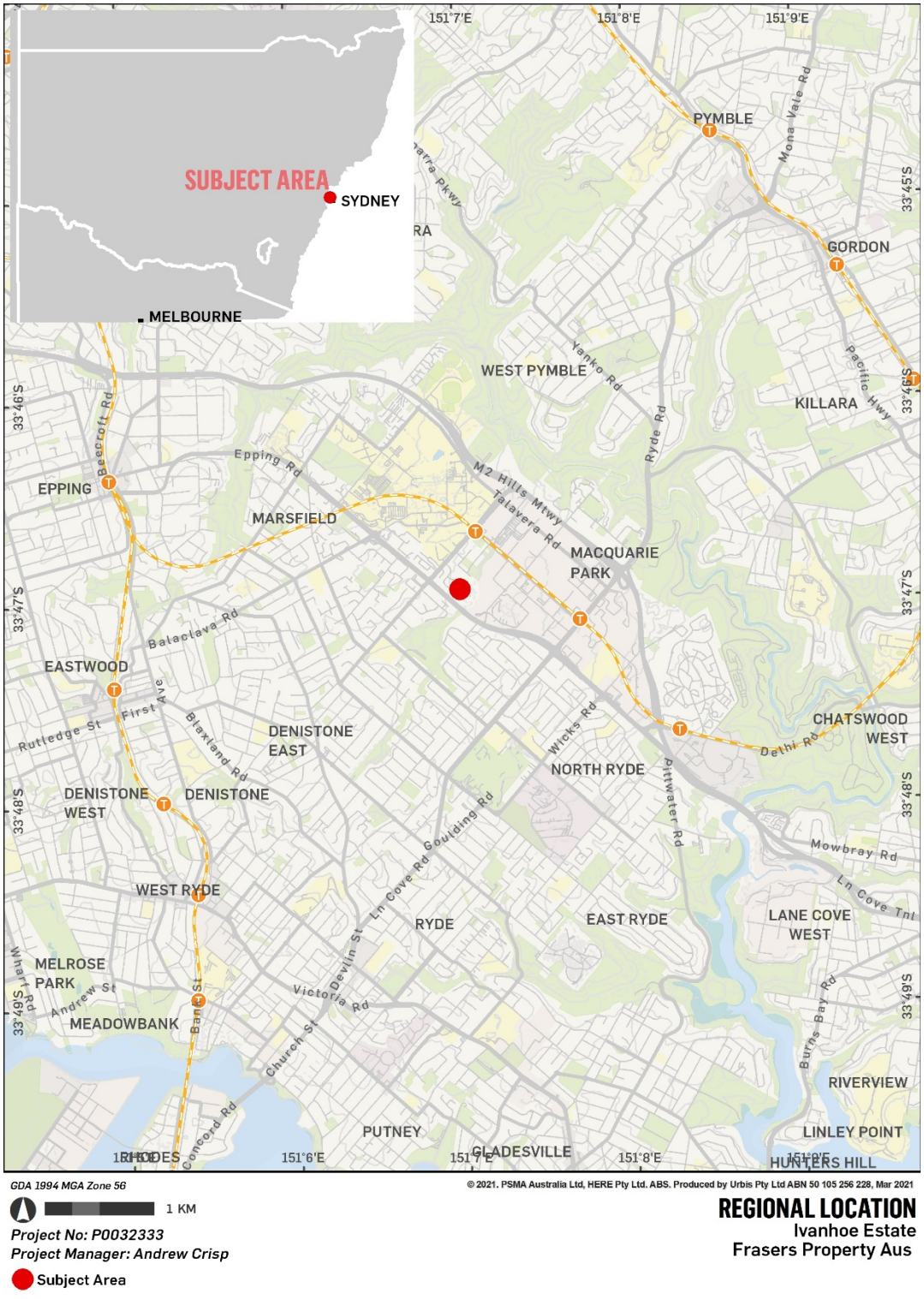

Figure 1 – Regional Location of the subject area



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

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URBIS

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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

CONSULTANT

D +61 2 8233 9957
T +61 2 8233 9900
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ANGEL PLACE
LEVEL 8, 123 PITT STREET
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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

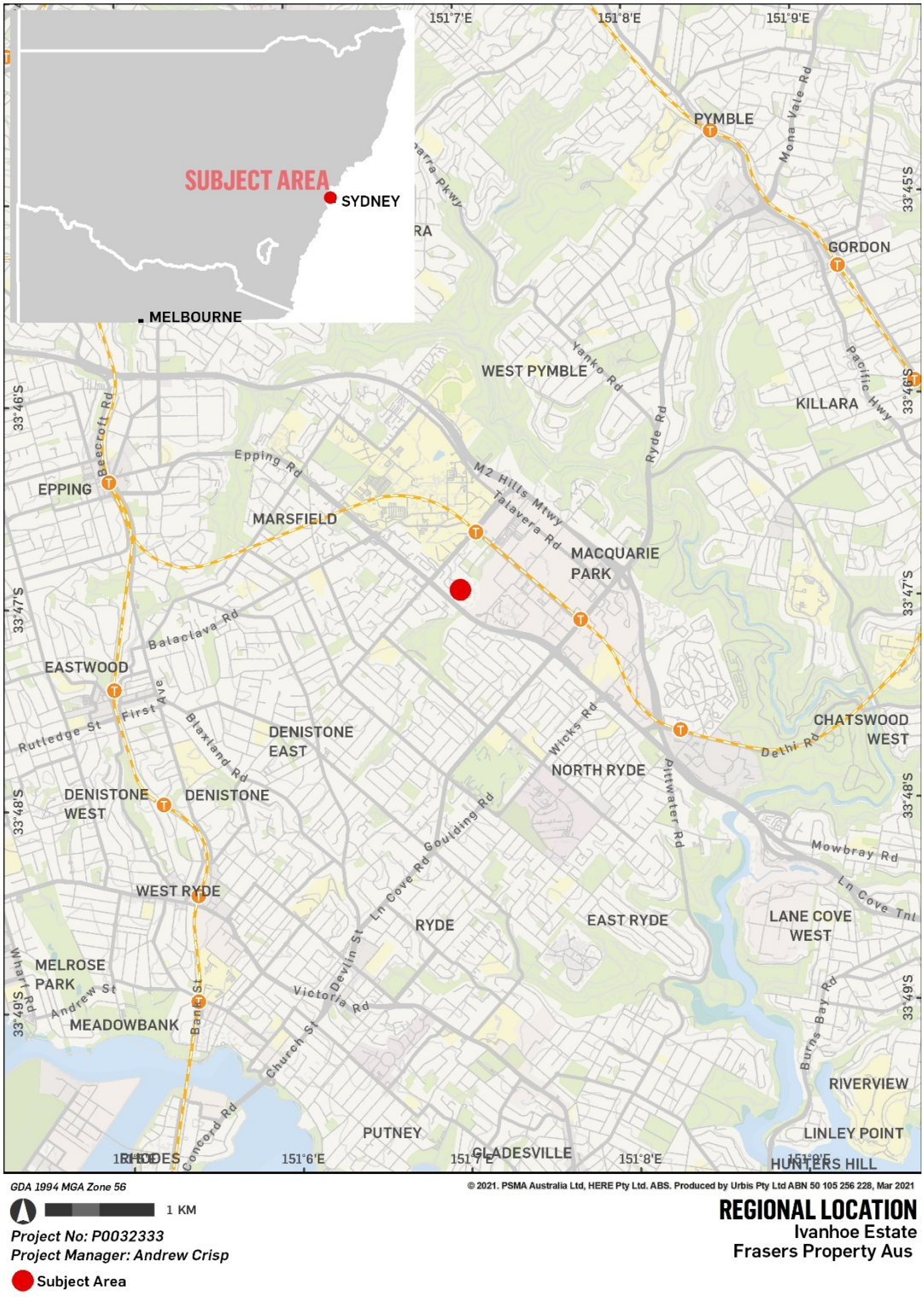


Figure 1 – Regional location



Figure 2 – Location of the subject area



Figure 3 – Ivanhoe Estate Masterplan
Source: Ethos Urban

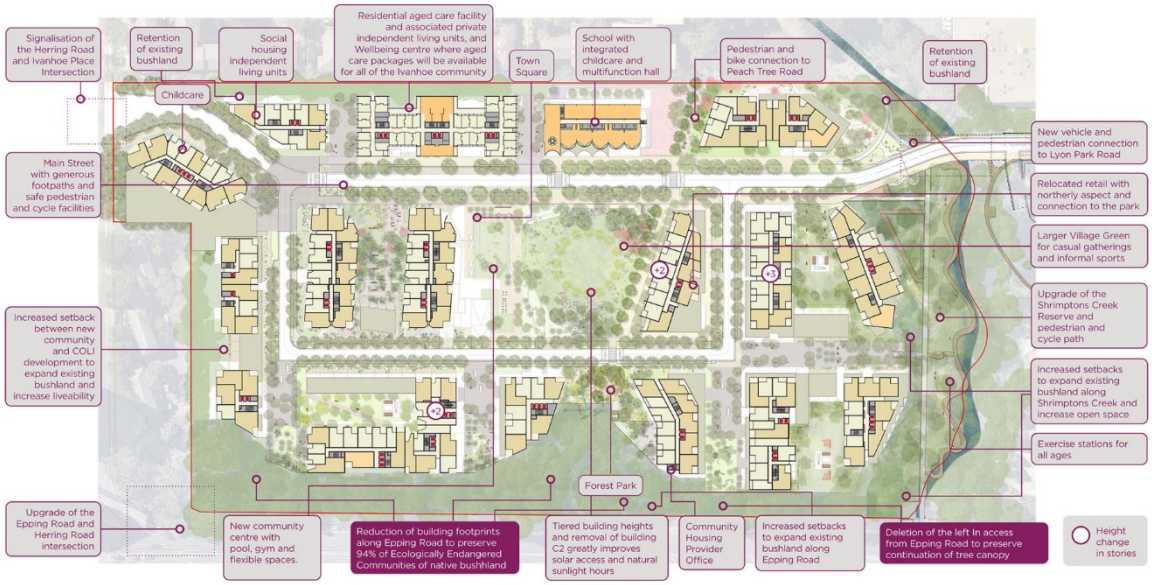


Figure 4 – Ivanhoe Estate Masterplan
Source: Ethos Urban



Figure 5 – Registered Aboriginal sites in extensive search area

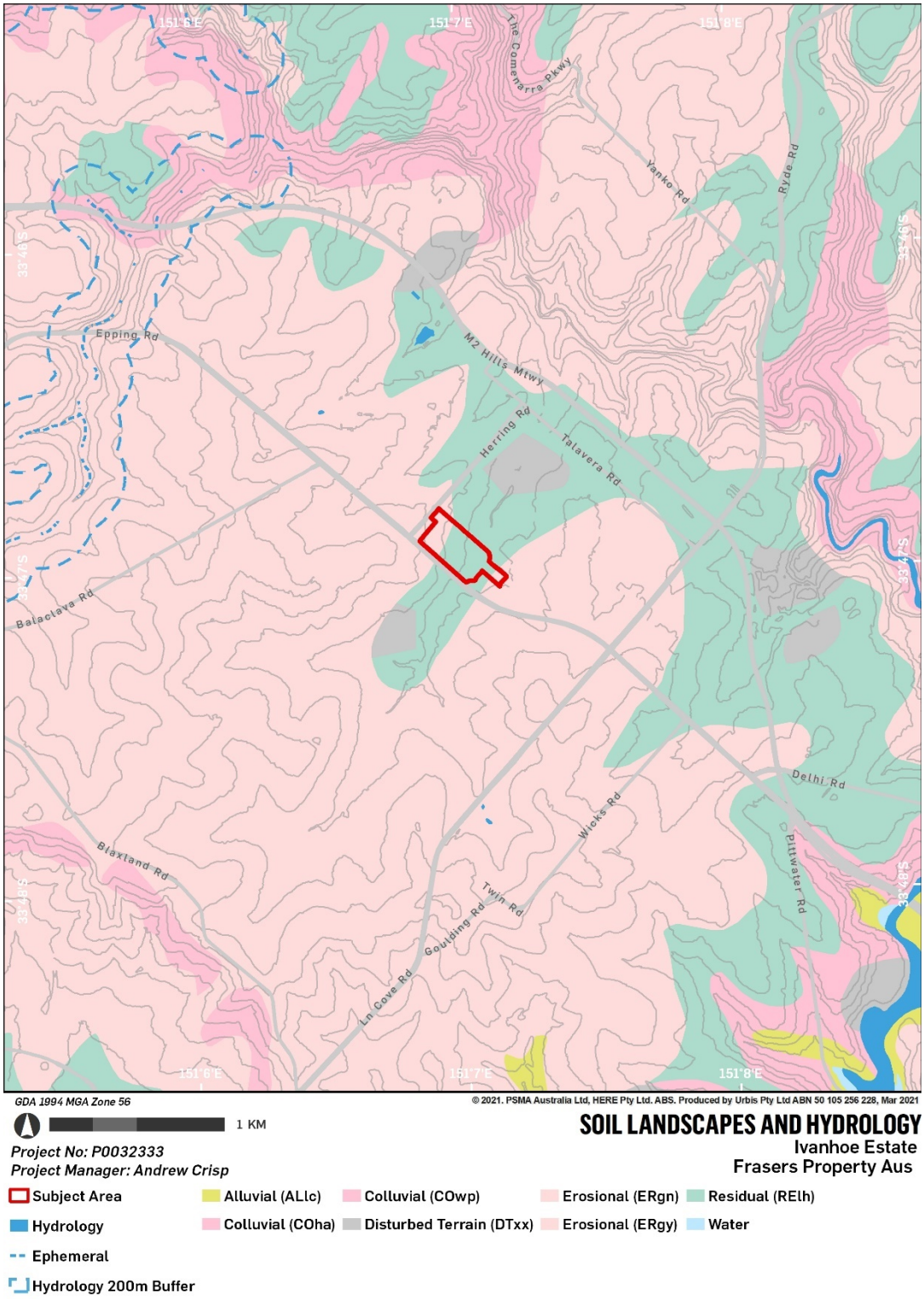


Figure 6 – Soils landscapes and hydrology

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

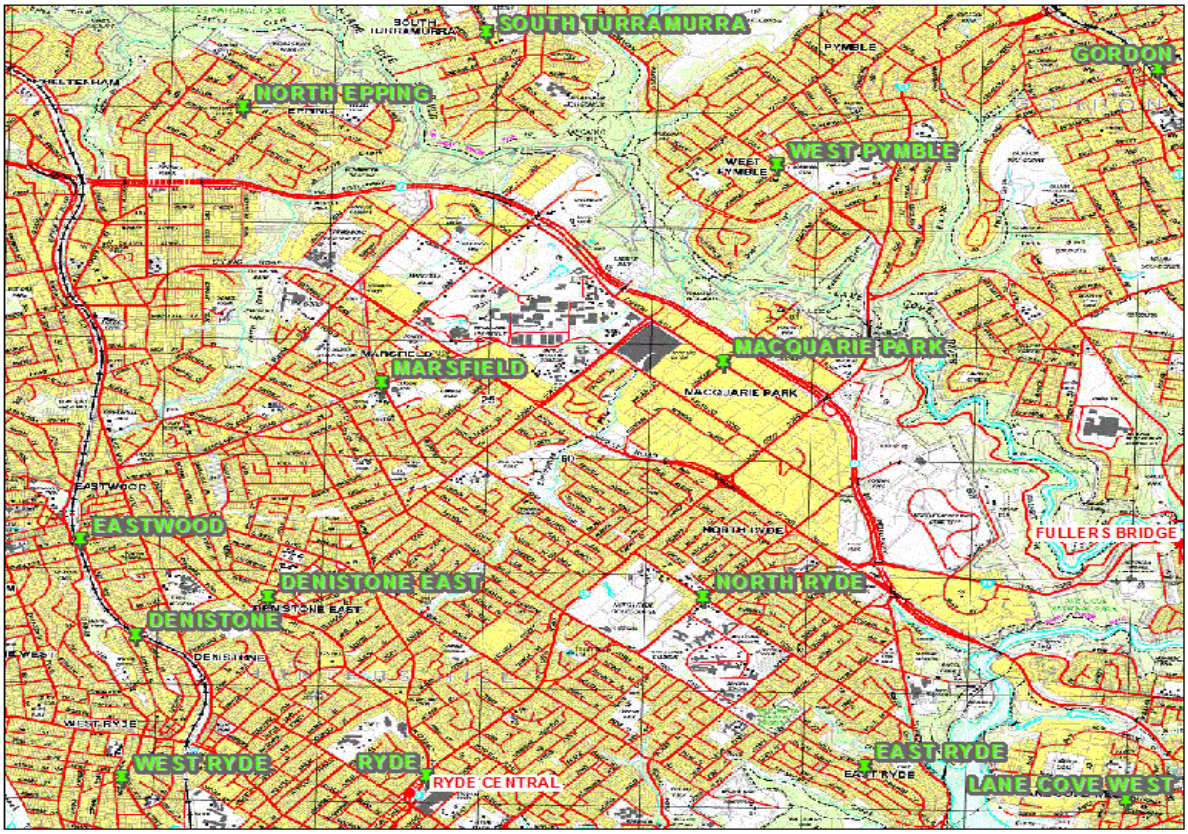
Email: mwalker@urbis.com.au

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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

This information is not guaranteed to be free from error omission. Office of Environment and Heritage (NSW) and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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
	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**		

Report generated by AHIMS Web Service on 05/03/2021 for Meggan Walker for the following area at Datum :GDA, Zone : 56, Eastings : 322157 - 329157, Northings : 6256858 - 6263858 with a Buffer of 0 meters. Additional Info : ACHA. Number of Aboriginal sites and Aboriginal objects found is 81

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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

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:	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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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
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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.

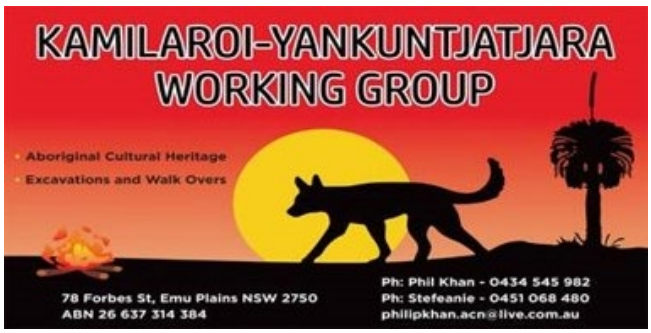
As a senior Aboriginal person for the past 50yrs, I actively participate in the protection of the Aboriginal Cultural Heritage throughout the Sydney Basin, & particularly throughout Western Sydney, on behalf of Kamilaroi Yankuntjatjara Working Group I wish to provide to you my organisation's registration 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
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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

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E aolsen@urbis.com.au

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URBIS

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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

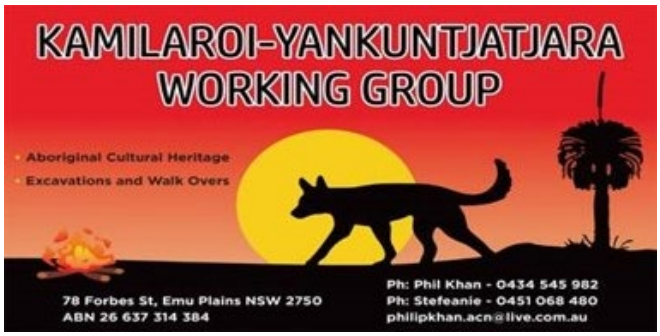
Dear Aaron,

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
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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

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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

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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

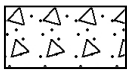
Symbols & Abbreviations

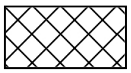
Graphic Symbols for Soil and Rock

General

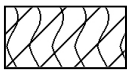

Asphalt

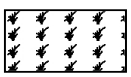

Road base

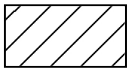

Concrete

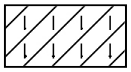

Filling

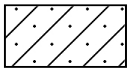
Soils


Topsoil

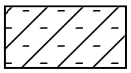

Peat

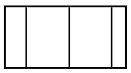

Clay

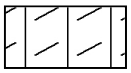

Silty clay

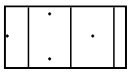

Sandy clay

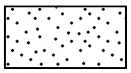

Gravelly clay

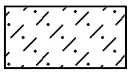

Shaly clay

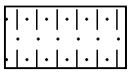

Silt


Clayey silt


Sandy silt

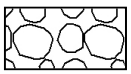

Sand

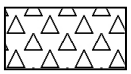

Clayey sand


Silty sand


Gravel

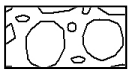

Sandy gravel


Cobbles, boulders

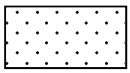

Talus

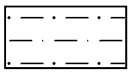
Sedimentary Rocks

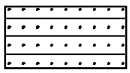

Boulder conglomerate

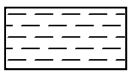

Conglomerate


Conglomeratic sandstone

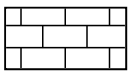

Sandstone


Siltstone

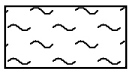

Laminite

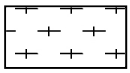

Mudstone, claystone, shale

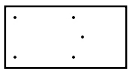

Coal


Limestone

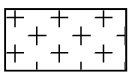
Metamorphic Rocks

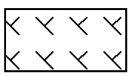

Slate, phyllite, schist

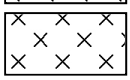

Gneiss

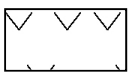

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

URBIS

From: Justin Byrne <JustinB@ryde.nsw.gov.au>
Sent: Monday, 5 February 2024 3:25 PM
To: Mohamed Yaccoub
Cc: Gasan Mohamad
Subject: RE: Building C3 Ivanhoe Estate, DA Condition B35, B36,B37,B38,B39 and B40 of SSD 15822622

Hi Mohamed,

Thank you for providing these documents to Council. They have been distributed to the relevant Council teams who will review and if they have any concerns will contact you directly.

Kind regards,

Justin Byrne
Senior Civil Engineer – Macquarie Park
ENGINEERING & PROJECT DELIVERY
M +61435244219
E JustinB@ryde.nsw.gov.au
W https://ddec1-0-en-ctp.trendmicro.com:443/wis/clicktime/v1/query?url=www.ryde.nsw.gov.au&umid=85abdfda-02b6-42e4-b00d-108c11f11389&auth=85b6e0ad92c778369558f50311e1fc1a4367f0fd-be846689820ec4e88e9e47a902135e8755ee09f3

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 both past, present and emerging, and extend that respect to all Aboriginal and Torres Strait Islander peoples.

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From: Mohamed Yaccoub <mohamed.yaccoub@parkview.com.au>
Sent: Monday, January 29, 2024 5:08 PM
To: City of Ryde <CityofRyde@ryde.nsw.gov.au>; Gasan Mohamad <GasanM@ryde.nsw.gov.au>
Subject: FW: Building C3 Ivanhoe Estate, DA Condition B35, B36,B37,B38,B39 and B40 of SSD 15822622

Hi Gasan,

Please see below and find attached Integrated Management Plan that is required to be reviewed by council. Could you please confirm if Council plan on reviewing or if you believe a review will not be required. Your prompt response would be much appreciated.

Mohamed Yaccoub
Project Engineer

0427 520 238
mohamed.yaccoub@parkview.com.au
Level 7, 60 Union Street, Pyrmont NSW 2009
PO Box R1779 Royal Exchange NSW 1225

www.parkview.com.au

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If you are not the intended addressee please contact the sender and dispose of this email

From: Mohamed Yaccoub
Sent: Monday, January 22, 2024 10:57 AM
To: City of Ryde <cityofryde@ryde.nsw.gov.au>
Subject: Building C3 Ivanhoe Estate, DA Condition B35, B36,B37,B38,B39 and B40 of SSD 15822622

Hi,

Please find attached Integrated management plan , noise and vibration management Plan and Construction Pedestrian and Traffic Management Plan for your reference covering DA conditions listed below.

- B35 Construction Environmental Management Plan
- B36 Construction Pedestrian and Traffic Management Plan
- B37 Construction Noise and Vibration Management Plan
- B38 Air Quality and Outdoor Management Plan
- B39 Construction Waste Management Plan
- B40 Construction Soil and Water Management Plan

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 secured 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.

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 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 minimize 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.

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.

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 odours arising from excavation, stockpiling and removal of contaminated soils including, but not limited to:

(a) staged excavation to limit the surface area of exposed odorous material;

(b) application of odour suppressants;

(c) effective covering of stockpiles and truckloads of excavation spoil; and

(d) expedited removal of odorous material from the development to a facility legally able to accept those wastes.

The AQOMP must include proactive and reactive management strategies, key performance indicators, monitoring measures, record keeping, response mechanisms, contingency and compliance reporting measures.

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:

(a) the estimated volume or weight of materials that will be reused, recycled or removed from the site;

(b) on-site material storage areas during construction;

(c) materials and methods used during construction to minimise waste;

(d) provide details demonstrating compliance with the relevant legislation, particularly with regard to the removal of asbestos and hazardous waste, the method of containment and control of emission of fibres to the air;

(e) nomination of the end location of all waste and recycling generated from a facility authorised to accept the material type for processing or disposal; and

(f) identification within the CWMP of the responsibility for the transferral of waste and recycling bins within the property to the collection point.

All requirements of the approved CWMPs must be implemented during the excavation and construction of the development.

CONSTRUCTION SOIL AND WATER MANAGEMENT PLAN

840. 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.

The CSWMP must be prepared in accordance with the provisions of the "Blue Book" Part 1 (Landcom (2004) Managing Urban Stormwater: Soils and Construction, 4th edition). The CSWMP must consider likely stages of the works and provide for appropriate control of sediment and erosion for each stage and include, but not be limited to:

(a) location and extent of all necessary sediment and erosion control measures for the site;
(b) catchment plan;
(c) sediment basin(s) locations including details showing how runoff from the entire site will be directed to the sediment basin(s). Requirements for sediment basins are specified below;
(d) all relevant details and calculations of the sediment basins including sizes, depths, flocculation, outlet design, all relevant sections, pump out systems, and depths;
(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. Requirements for dewatering are specified below;
(f) identification and management of any stormwater run-on to the site from adjacent sites;
(g) location of any temporary stockpiles (soil, spoil, topsoil or otherwise) and accompanying sediment and erosion control measures;
(h) location and details of all vehicle wash down bays and associated erosion and sediment control measures such as earthen bunds; and
(i) a daily and weekly site inspection checklist consistent with IECA Best Practice Erosion and Sediment Control documents.

A Sediment Basin is required for every catchment discharging from the site as part of any CSWMP. Sediment basin(s) are to be designed as follows:

(a) according to the NSW Blue Book (section 6.3.4 and Appendix E). The calculations of the sediment basin size must be submitted with the CSWMP;
(b) using type D soils (unless otherwise demonstrated by an analysis of site soils by a qualified geotechnical);
(c) for all events up to the peak flow rate from the 1 in 10-year ARI event for the site for the 5-day rainfall event; and
(d) to include a gypsum flocculent to be added to the sediment basin in accordance with Appendix E of the Blue Book.

CHALOUHI
• DEMOLITION • EXCAVATION • CIVIL CONSTRUCTION



INTEGRATED PROJECT MANAGEMENT PLAN

Ivanhoe Estate Midtown Building C3 Macquarie Park

Parkview

Ivanhoe Place Macquarie Park

18 January 2024
Revision 0

Business Name: **Square Civil Pty Ltd**

Trading Name: **Chalouhi**

Document Title: **Integrated Project Management Plan**

Document #: **MAN - 001** **Issue# 1** **Date: 18/01/2024**

Distribution List Controlled copies of this site plan have been issued to the following people

No:	Recipient	Position	Issue Date:	Signature
1	Antonio Screnci	PM	19/01/2024	
2				
3				
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: 18/01/2024

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
B35 a) CEMP – Describe the relevant stage and phases of construction including work program outlining relevant timeframes for each stage/phase;	1.10
B35 b) CEMP – describe all activities to be undertake on the site during site establishment and construction of the development	1.9
B35 c) CEMP **–** include a dust management plan, incorporating the mitigation measure outline in the Air Quality Assessment, Prepared by WSP, dated October 2018	5.4 5.4.2
B35 d) CEMP **–** clearly outline the stages/phases of construction that require ongoing environmental management monitoring and reporting	5.1, 5.6.2, 5.7.6, 5.6.7.5, 5.8.4, 5.8.8, 7.7
B35 e) CEMP **–** 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	1.8
B35 f) CEMP **–** be prepared in consultation with council and include specific consideration of measures to address any requirements of Council during site establishment and construction	See point B35 d) above
B35 g) CEMP **-** describe the roles and responsibilities for all relevant employees involved in the site establishment and construction of the works	1.13
B35 h) CEMP **-** 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	5.1, 5.4, 5.5, 5.7, 5.8, 4.8, 5.6.7, 5.6, 6.0
B35 i) CEMP **-** include measures to ensure adequate groundwater entitlement is sourced in order to account for groundwater flows into the construction excavations, unless any exemption applies;	5.7.4
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B35 k) CEMP **-** 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	Refer to point B35 h) above
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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

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1 INTRODUCTION

1.1 DEVELOPMENT OVERVIEW

The Ivanhoe Estate Macquarie Park C3 project involves bulk excavation for a building basement, civil works and landscape work. This project is multiple residential/commercial developments that will be constructed within the Ivanhoe Estate development. The site is bordered by New Road no 1, Road no 2 and C2 site.

1.2 CIVIL WORK SUB CONTRACTOR

Chalouhi, engaged by Parkview 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;
- Parkview /Parkview 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 Parkview, 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 Parkview 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 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 20,000m3 – 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.
- 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 carryout the stage 1 civil work and expected construction period is 20 weeks from the date of commencement of work at site
- Scheduled commencement work – 29 January 2024
- Completion date – 31 May 2024

1.11 CONSTRUCTION SITE LOCATION

Table 1.11– Construction Site Location

Construction site address	1 Ivanhoe Place, Macquarie Park

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 Parkview /Parkview 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	Neil Mahan	02 97303799
Construction Manager	George Khoury	0412 693 020
Project Manager	Jessica Ji	0423 202 272
Project Engineer	Deen Fiaz	0424 829 819
Site Engineer	TBC	
Chalouhi Project Team (off site)		
Director	Robin Chalouhi	0424 699 299
HSEQ Manager (Return to Work Coordinator)	Rodney Curry	0411 261 130
Parkview 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 Manager: Jessica Ji

- 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 Parkview 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 Manager :Niall Mohan

- 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 Parkview 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 Supervisor: TBC

- 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

OFF SITE

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 Parkview meetings (if required) to address HSEQ matters when required.
-

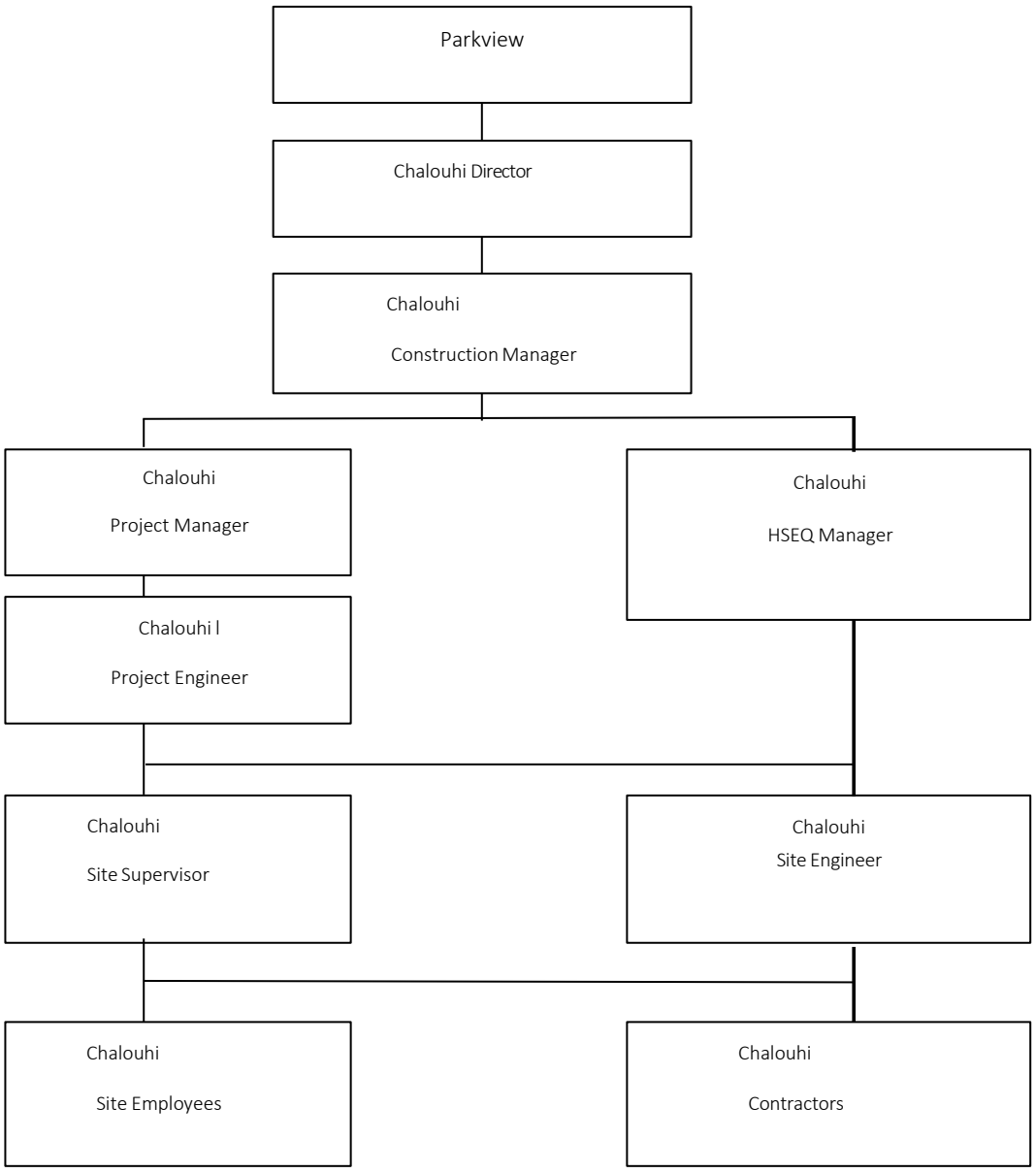
Construction Manager: George Khoury

- 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 Parkview meetings (if required) to address HSEQ matters when required.

1.13.1 PROJECT ORGANISATIONAL CHART

The Chalouhi Organisation Chart has been prepared for the C3 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: 30/06/2024
Name of Insurer	PUBLIC LIABILITY INSURANCE Lloyds Policy No: GLC 23 000001 and 408697AAA Expiry Date: 30/06/2024

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 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 Parkview 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 C3 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 Parkview 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 Parkview 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 Parkview on a monthly basis

3 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 Parkview and neighbouring complaints. 50% annual reduction Parkview and customer complaints	50% annual reduction Parkview 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 Parkview 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, Parkview or Parkview 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 PARKVIEW SUPPLIED PRODUCT & SERVICES

Product supplied by Parkview 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 Parkview is suitably protected and fit for service. If circumstances arise where this is not the case, Parkview 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 Parkview 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 Parkview.

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 Parkview, 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 C3 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 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 Parkview 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.

<u>Disciplinary action associated with drugs and alcohol use at the workplace</u>
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 Parkview.
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 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.

5.1 ENVIRONMENTAL OBJECTIVES AND TARGETS

Table 5.1 Environmental objectives and targets

Environmental Aspect	Objectives	Target
Soil and water control	No sediment and/or contaminated water to enter waterways by implementing environmental controls such as; water monitoring	Nil reportable incidents
Dust	No sustained visual dust observed beyond the boundaries of the construction site (external road ways) as per the CEMP's Dust Management Plan	Nil reportable incidents
Noise and vibration	No complaints from the community regarding noise and vibration during the construction activities as pre the CEMP's Noise (and Vibration) Management Plan	Nil reportable incidents
Hazardous materials	No uncontrolled release of any hazardous chemicals or pollutant from the construction site	Nil reportable incidents
Contaminated materials	To ensure any contaminated material is removed from site and disposed of correctly by an approved licenced and qualified person	Nil reportable incidents
Construction Waste Management	Recycle demolition and construction waste to a licenced waste contractor as per the CEMP's Construction Waste Management Plan	95% of all any demolition and construction waste to be recycled
Complaints	No complaints received from the community, Parkview or the environmental regulator (including on behalf of a local resident)	Nil complaints attributed to Chalouhi's operations

5.2 HERITAGE

Parkview have advised Chalouhi there are no heritage listed zones throughout the Ivanhoe Estate.

5.3 UNEXPECTED FINDS PROTOCOL

Purpose:

The purpose of this procedure is to ensure that the necessary steps are taken to minimise any potential risk caused due to an unexpected find. The below unexpected finds procedure has been put together using a combination of legislation, guidelines and codes of practise, all of which are listed in section 1.8 of this report.

Procedure:

In the case of an unexpected find on a Chalouhi work site, the work in that area is to be stopped immediately and the area is to be barricaded off. Inform the site supervisor of the find.

The Site Supervisor is to contact the Project Manager and, inform them of the unexpected find.

The Project Manager will then inform the Parkview and arrange a meeting with all stakeholders involved with the site.

The Site Environmental Consultant is to be contacted to carry out an inspection to identify the find and decide on the course of action to be taken.

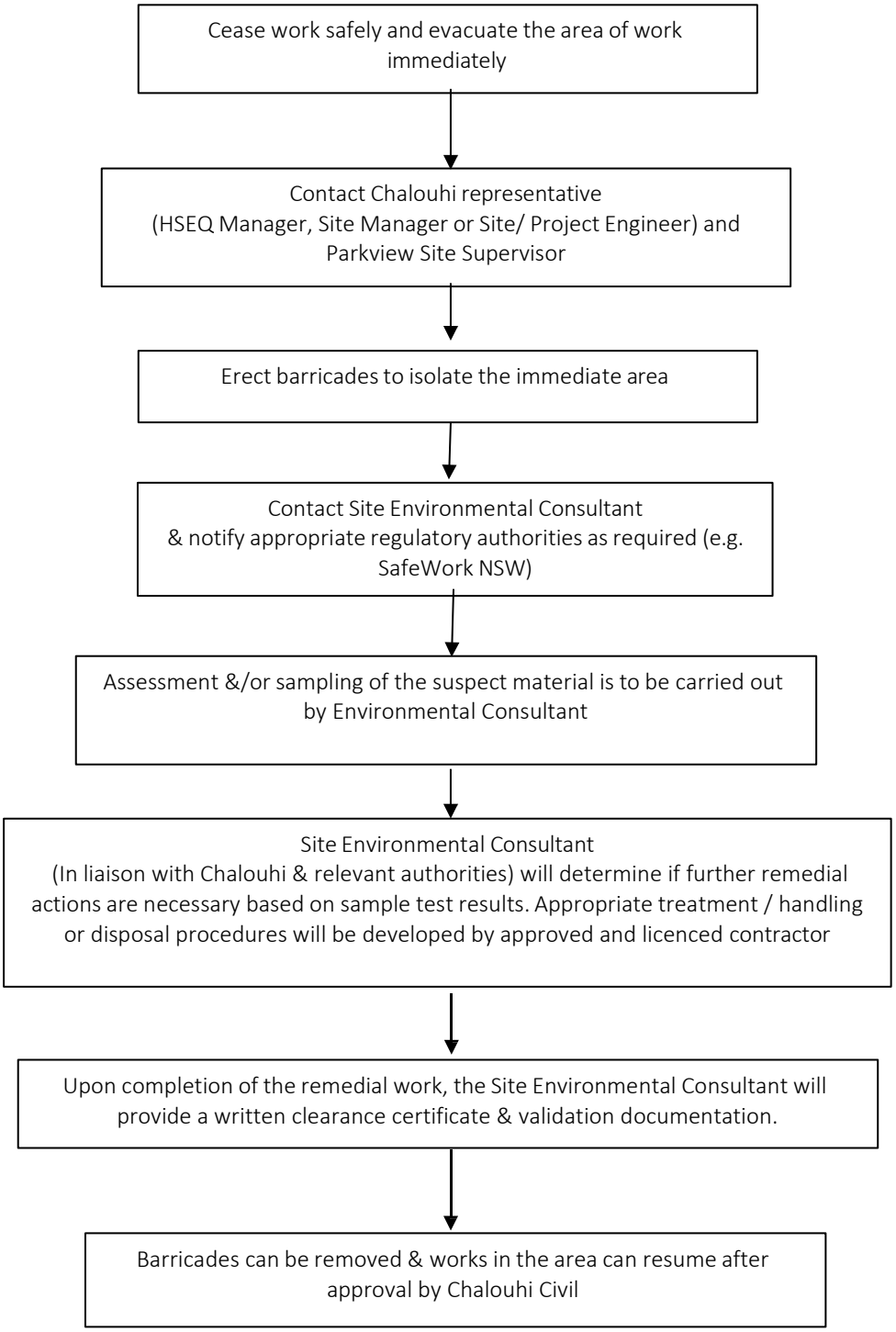
If the contamination source is verified as asbestos, Safe Work NSW will be notified and approval obtained prior to handling and removal of contaminated material from site.

The Site Environmental Consultant is then to determine if any remedial action is required, appropriate treatment/ handling or disposal procedures will be developed by approved and licenced contractor as required.

Remediation is to be undertaken as per the Site Environmental Consultants' instruction, Asbestos Management Plan, Asbestos Removal SWMS in accordance with Protection of the Environment Operations (Waste) Regulation 2014.

Once this has occurred the Site Environmental Consultant is to issue a clearance certificate and validation document for Chalouhi approval so that work can continue on site.

If suspected hazardous/heritage materials are discovered or exposed during construction excavation activities on site believed to be free of hazardous materials, the following protocol must be followed



5.4 DUST MANAGEMENT

This Dust Management Plan (DMP) includes, but not be limited to strategies in which the construction shall:

- Minimise or prevent the emission of dust from the site;
- Ensure that all trafficable areas and vehicle maneuvering areas in or on the premises shall be maintained, at times, in a condition that will minimise the generation, or emission from the premises, or windblown or traffic generated dust;
- Ensure that all vehicles entering and leaving the site and carrying a load that may generate dust are covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times; and
- Ensure that all dust source surfaces are sealed.

The DMP outlines measures to minimise the generation, or emissions from the construction area, or windblown or traffic generated dust, or spoils or debris from the construction activities.

5.4.1 SIGNIFICANT POTENTIAL DUST GENERATING ACTIVITIES

The most significant potential dust generating activities from Ivanhoe Estate have been identified as:

- Site preparation activities, including
  - Earthmoving activities associated with the excavation and handling of soil (contaminated and/or non-contaminated).
  - Tree removal
- Construction activities;
- Material unloading/loading trucks;
- Stock piles of soil/debris;
- Uncovered stockpiles; and/or
- Vehicle movement, uncovered trucks, soil on wheels etc.

5.4.2 DUST AND DEBRIS MITIGATION AND CONTROL 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. The mitigation methods identified below are consequent to the mitigation options noted in the 'Air Quality Assessment', dated October 2018 written by WSP.

<u>Site Traffic Control</u>
Vehicle movement on site can generate substantial amounts of airborne dust. Site traffic control measures that may be used to manage dust produced by the movement of construction traffic include:

- The designation of specific routes for haulage and access
- Set and enforce a maximum speed limit within the site of 10km/hr
- Vehicles carrying loads which have the potential to produce dust may have their load covered at all times accept for loading or unloading.
- Wetting down exposed soil haul routes

<u>Earth Moving Management –</u>
Earthworks and earthmoving activities comprise a substantial portion of this project. Measures that may be undertaken to minimise dust generation during earthworks activities include:

- The use of mist water from gurneys for general site dust suppression and to target dust generating activities
- All site personnel working within the earth moving areas will be required to wear a P2 Mask
- Signage and exclusion zones to indicate silica excavation works area
- Application of mist water from gurneys/hoses to any stockpiled materials
- Observing weather conditions and ceasing earthmoving operations if conditions are unsuitable e.g. extreme wind. Application of mist and dust suppression to construction site during wind conditions.
- Use of a street sweeper to clean pavements and road
- Reduction in drop heights when unloading material
- Loading truck and dogs in a controlled manner and covering loads when entering and exiting site.
- Regular cleaning of hardstands with brooms and shovels
- Plant/equipment fitted service and maintained in accordance with manufacturers specifications and recommendations.

Soil Surface Compaction

Compaction of loose material ensures that soil particles are packed tightly, minimising the likelihood of excessive dust emissions. Compaction of soil will also occur naturally under the loads placed on it by trucks and earthmoving machinery.

Installation of Site Fencing, Hoarding and/or barriers

Maintain existing hoardings/fences and shade cloth in an effort to contain dust and minimise wind across the site. Providing barriers to discourage unwanted vehicle access causing disturbance.

Sediment traps:

Sediment traps are used on site as strategic locations as part of the site drainage system. These structures are in place to capture sediment prior to drainage water entering the primary settling ponds and eventual use in the dust suppression system. As a result, sediment captured in the sediment traps and allowed to dry out, is a potential dust source.

During extreme winds dusty activities may be postponed until more suitable weather is prevalent.

5.4.3 MANAGING EXPOSURE TO SILICA IN THE WORKPLACE

At the workplace, silicon dioxide may occur both in it crystalline form or combined with other minerals or materials. Silica remains an important task factor for respiratory disease. All products intended for workplace use which contain crystalline silica are to be classified as hazardous and include a Safety data sheet available on site.

The safe work Australia code of practice 2012 managing the risk of hazardous chemicals in the workplace details the hierarchy of controls. Those of most importance to workplaces with potential RCS exposure are in order:

Elimination

Often totally impractical when having to work natural products such as sand, concrete, clays, or processes such as tunnelling. Of some importance only if a process can be eliminated completely

Substitution

Extremely advantageous when silica content of the materials being used can be reduced markedly. Examples include substituting ilmenite, garnet or staurolite for sand in abrasive blasting; using aluminium polishing powders instead of silica powders; replacing silica parting powders in foundry casting with non-silica ones. Processes can be substituted (e.g. using prilled solids rather than powders; changing from dry to wet processes; vacuuming rather than sweeping).

Engineering

Containment: Most effective when the process obliges continued use of silica containing material. Has the particular advantage of preventing hazardous silica dusts from entering the workplace atmosphere so that other controls may not be required. May contribute to economic product recovery

Ventilation: Highly effective when silica containing dust clouds cannot be completely contained at source because of the need for worker to work with the materials (e.g. mining, pouring, grinding, polishing, moulding, casting, blasting, fettling, mixing, bagging, crushing, drilling, chasing). Dusts are extracted close to the source. Has the advantage of preventing dusts whose generation cannot be avoided from spreading and contaminating other parts of the workplace. Is very cost effective in long term, particularly for fixed continuous processes where point source extraction can be organised, and in most cases, permits workers to operate freely with adequate levels of protection in the workplace unencumbered by use of respiratory protection.

Ventilation is available in three basic variants:

- Natural ventilation
- Forced dilution ventilation
- Local exhaust ventilation (LEV).

Suppression: Water or fine mist suppression is also employed to control dust clouds which are not always amenable to use of fixed point ventilation. Some foundries utilise such systems. Water suppression is also used effectively in construction for brick, tile, stone and concrete cutting.

Administration

Typically includes housekeeping, warning signage, but may include restricting the time of exposure, rotation of staff away from dusty areas.

Personnel protective equipment

Applicable and useful for short term applications when very expensive ventilation solutions are not warranted. Also very applicable where the source of dusts cannot be fully contained such as tunnelling, outdoors work, abrasive blasting or where particles are imparted with a velocity beyond the capture capability of ventilation systems. Should remain the means of last resort for permanent control of RCS. Applicable in all emergency applications.

All Site personnel exposed to silica will be required to undergo mandatory respiratory FIT test to assess the effectiveness of the respiratory protective equipment (face or dust mask)

5.5 NOISE (AND VIBRATION) MANAGEMENT PLAN

5.5.1 COMPLIANCE REQUIREMENTS

This Noise Management includes noise mitigation for diesel powered machinery, provision of training to ensure that construction workers are aware of the noise created during construction and are appropriately trained to minimise noise where possible. In addition, the construction Noise Management Plan will:

- Identify general activities that will be carried out and associated noise sources;
- Assess construction noise impacts at the relevant receivers;
- Provide details of methods and procedures that will be implemented to control noise during the construction stage;
- Identification of all feasible and reasonable measures to minimise noise and vibration, including but not limited to:
    - Using least noisy construction methods, vehicles, plant and equipment
    - Positioning and orientating noisy plant and equipment so as to minimise noise impacts on noise sensitive receivers;

  - Positioning items of noisy plant and equipment as far apart as it is practicable from each other;
  - Minimising noisy activities by adopting alternative construction measures;
  - Carrying out above ground loading and unloading activities as far away as practicable from noise sensitive receivers'
  - Designing each work site to minimise the need for truck reversing movements;
  - Ensuring all vehicles and self-propelled plant and equipment enter and leave the premises in a forward direction unless unforeseen accidents or other unforeseen circumstances arise that may require reversing movements, in which case minimising any such reversing movements;
  - Taking all practicable steps to avoid reversing movements on the surface within the premises, and where it is impracticable to avoid reversing movements, taking all necessary steps to minimise reversing movements; and
  - Preventing vehicle, plant and equipment queuing and idling outside the hours of construction prescribed by this consent.
- Include a pro-active and reactive strategy for dealing with complaints including achieving the construction noise goals, particularly with regard to verbal and written response;
- Detail noise monitoring, reporting and response procedures consistent with consent requirements;
- Provide for internal audits of compliance of all plant and equipment;
- Indicate site establishment timetabling to minimise noise impacts;
- Include procedures for notifying residents of construction activities likely to affect their noise amenity;

Objective

The main objectives of the plan is to identify and implement controls and procedures for the effective management of construction plant and equipment, and operations to provide clear and specific guidelines for site personnel as to their responsibilities and obligations to minimise noise.

5.5.2 SIGNIFICANT POTENTIAL NOISE GENERATING ACTIVITIES AND PROTECTION OF NOISE

The significant potential noise generating activities from construction activities, including:

- Earthmoving activities associated with the soil cutting, drilling, excavation and cartage

5.5.3 NOISE SOURCES AND MITIGATION METHODS TO PROTECT CONTRUCTION WORKERS

Chalouhi will take all necessary steps to limit noise emissions, which might arise during the preparation of the site and during construction.

5.5.4 VIBRATION

Vibration sources and mitigation methods

It will be necessary to use appropriate methods and equipment to keep ground vibrations at adjacent buildings and structures within acceptable limit. When planning for construction work that may include potential vibrations, all practical efforts to protect adjacent buildings and in ground extensometers.

The construction site is surround by numerous existing multistorey residential and commercial buildings. A full time vibration monitor will be installed at the same location as the noise monitor shown within section 7 of report "*Construction Noise and Vibration Management Plan*" dated 18/11/20/

Table 5.6.3 – Vibration Sources and Mitigation Methods

Activity	Environmental Impact pre-control measures	Control Measures
Excavation	Shoring collapse	- Choosing alternative, lower impact equipment or methods where possible. For example, using less
Site preparation		

Construction	Structural damage to existing site and neighbouring buildings and/or structures	disruptive attachments such as rippers instead of hydraulic breakers, if ground conditions allow - Scheduling the use of vibration causing equipment at the least sensitive time of the day, providing respite periods - Routing, operating or locating high vibration sources as far away from sensitive areas as possible - Sequencing operations so that vibration causing activities do not occur simultaneously - Isolating the equipment causing the vibration - Keeping equipment well maintained - Where practical, position plant 5m away from adjacent property boundaries

5.6 CONSTRUCTION WASTE MANAGEMENT PLAN (CWMP)

5.6.1 GENERAL

This Construction Waste Management Plan provides details of the waste management measure to minimise production and impact of wastes generated at the site including but not limited to:

- Identification of the type and where possible the quantities of waste that would be generated, a description of how the waste would be handed, stored, re-used, recycled, and if necessary, appropriately treated;
- Identification of a designated area for the storage and collection of waste and recyclable materials to be provided on the site'
- Description of how the effectiveness of these measures would be monitored and, if non-compliance detected, actions to be required; and
- Measures to involve and encourage employees and contractors to minimise domestic waste production on site and to reuse/recycle where possible.

5.6.2 REQUIREMENTS FOR MANAGING CONSTRUCTION WASTE TYPES / STEAMS

- All wastes and materials generated on the site during construction (and dual operation) shall be classified in accordance with the EPA's Waste Classification Guidelines prior to being transporting the waste off site and be disposed of to a facility that may lawfully accept the waste.
- Only the hazardous and/or industrial and/or Group A waste listed below may be generated and/or stored at the site:
  - Waste soil/water, hydrocarbons/water mixtures or emulsions; and
  - Grease trap waste

Chalouhi is committed to minimising waste by avoiding unnecessary resource consumption and implementing resource recovery procedures. The details provided in this plan are intended for the management of waste relating to this project.

All excavations required for the Works, include: cuttings, foundation treatments, shallow embankments, and cut to fill transitions and trenches (such as that for drainage pipes or utility conduits).

The types and quantities of each type of material to be excavated from each location are monitored on a daily record of loads chart and recorded in a cartage summary document.

Table 5.6.2 Construction Works Waste Types/Streams and Estimated Quantities

Waste Type	Estimated Volume (m^3)	Destination		
		Reuse and Recycling		Disposal
		On Site (m^3)	Off Site (m^3)	Off Site Landfill Site
Excavation Material (e.g. sand, rock)	20,000 (VENM)	300	19700	
Construction Waste	5	0	0	5

5.6.3 WASTE MANAGEMENT PRINCIPLES APPLIED TO CONSTRUCTION WORKS

- Avoid the use of excess materials and production of waste
- Reduce the amount of waste generated
- Reuse materials on site where possible
- Recycle waste
- Dispose of non-reusable waste at an approved / licenced disposal facility

5.6.4 RECYCLING WASTE

Table 5.7.4 - Recyclable Waste

Waste Type	Description of Waste	Recycling Details
Sand and rock (excavation)	- As part of the works 8000 m^3 of sand will be stockpiled on site and used as piling platform pads for mobile plant - Following this use will be exported to an approved local reusing facility -	Refer to Table 5.7.6
	-	

5.6.5 NON REUSABLE WASTE

Table 5.7.5 – Non Reusable Waste

Waste Type	Waste Description
Commercial e.g. food scraps, wrappers, cleaning waste, paper bags etc.	- Domestic waste will comprise of food waste, packaging and other general household waste. - Waste bins will be provided around the site amenities that will be periodically emptied into a large covered waste bin which will be emptied as needed and taken to land fill. - All site personnel will be regularly instructed to keep their work area clean and inspected daily. It is anticipated that waste bins will be provided by Suez.

5.6.6 RECYCLING AND DISPOSAL FACITILITES

Waste will be classified in accordance with the Waste Classification Guidelines (DECCW 2009) as well as NSW EPA (2014) – *Waste Classification Guidelines – Part 1*: Classifying Waste document. Once classified, waste can then be disposed of at an Environmental Protection Authority (EPA) licensed facility. All waste to be monitored through Chalouhi Cartage summary.

Table 5.6.6a – Recycling and Disposal Facilities

Waste Type	Sort, stockpile, Recycle, or Dispose	Company Name and Contact Details
Sand and rocks (excavation)	Sort, stockpile and export	TBC
Sand and rocks (excavation)	Sort, stockpile and export	DA approved tip locations -TBC

Should there be any unexpected finds discovered, the unexpected finds protocol, described in section 5.3 of this report will be followed. Should the unexpected finds be classified as asbestos, this will disposed at licensed facility who can legally accept asbestos.

The site manager, through consultation with the site management team, and other stakeholders, will be responsible for the transferral of waste and recycling bins within the property to the collection point. The site manager will communicate with site personnel such as plant operators and other supervisors to ensure that each type of waste material is transferred and stockpiled into the correct collection or storage points.

Table 5.6.6b – Personnel Responsible for waste transfer

Waste Type	Personnel Responsible for determining stockpile/collection point	Personnel Responsible for movement of waste to collection points
Sand and rocks	Site Manager/Project Team	Plant operators/Labour

5.6.7 HAZARDOUS WASTE

Any hazardous waste that is identified or generated on the site will be handled in accordance with Chalouhi's HSEQ standards. To ensure that all necessary steps are taken, Chalouhi's unexpected finds protocol, shown in section 5.3 above will be implemented in the event of potential asbestos or hazardous waste material within the site. This will minimise any potential risk caused due to the unexpected find. The collection and transport of any hazardous waste will be carried out in accordance with the statutory requirements, and collection and transport by a licenced operator, and disposal at appropriately licensed disposal facilities.

5.6.7.1 CONTAMINATED SOIL SOURCE, LOCATION, QUANTITY AND CHARACTERISTICS

Prior to excavation works, a preliminary investigation or testing (environmental site assessments/soil sampling) will identify any contaminated materials (whether man-made or naturally occurring) in accordance with the industrial waste resource guidelines- soil sampling.

The source, location, quantity, characteristics and other relevant attributes of any contaminated soil will be recorded in the site cartage summary.

5.6.7.2 TRAINING REQUIREMENTS

All workers will undertake formal contamination awareness training prior to beginning works on site. The training should include

- Definition of what the contamination is, the types of contamination and risks involved;
- Health effects of the contaminated material
- Location of the contaminated material on site and the safety and environmental control measures in place
- PPE and RPE requirements across the site and dry decontamination procedure (if applicable)

5.6.7.3 ON SITE MANAGEMENT

- Engagement of hygienist to undertake fibre air monitoring for the duration of the contaminated works (if required)

- Dust suppression and wetting down of unknown finds/asbestos fibres.

- Site Supervisor to toolbox talk with contractors the risks associated with removal, controls to be put in place during the removal works outline the minimum required PPE requirements

- Set up of works area around the identified impacted area (exclusions zone) with barrier tape and signage. The temporary fencing surrounding the contaminate removal area is to be covered internally with geo-fabric or plastic sheeting to help contain dust

- Black plastic polythene sheeting (200um thickness) on ground surface as access point as drop sheet

- Establish a decontamination area adjacent to the entrance of works

- Removal of contaminated material – Excavator

- Where possible, avoid relocating the contaminated soil/material onsite and load directly from the source into the truck. This will minimise the likelihood of cross contamination of clean soils.

5.6.7.4 MANAGEMENT PRACTICES

During soil disturbance works within the exclusion zone, a water spray pump or water hose shall be available to suppress the dust at the commencement of the activity and at regular intervals during the day, i.e. every 30 minutes, when surface water evaporates or when the generation of dust becomes noticeable. The use of water spray must be monitored carefully to ensure run off does not occur or controls must be implemented to capture any runoff. If run off does occur, the possible spread of contaminated soil may require investigation.

Should suspected contaminated mater be identified outside of the currently identified ACM area, the unidentified finds protocol will apply.

5.6.7.5 WASTE TRACKING

A suitably qualified consultant with appropriate experience should be present on site during soil loading and removal works, to record waste tracking information (i.e. registration plates, time leaving site, and approximate volume being disposed).

Delivery dockets from the receiving landfill should also be collected, to reconcile with the information recorded on site, to ensure that all material is disposed of appropriately to a licenced waste facility.

5.6.7.6 MONITORING

An Independent Environmental consultant will be engaged to undertake representative air monitoring for the disturbance and movement of contaminated-impacted soil within the exclusion zone/s, as outlined above. Air monitor filters shall be replaced at the end of each work day where potential contaminated-impacted soil was disturbed.

All airborne fibre monitoring will be conducted in accordance with the Guidance Note on the Membrane Filter Method for Estimating Airborne Asbestos Dust [NOHSCH:3003(2005)] and analysed at a NATA-accredited laboratory

5.6.7.7 CLEARANCE INSPECTION

The standards for clearance inspections will be determined by visual inspection of the work areas, ensuring that the work has been completed satisfactorily and that there is no visual evidence of contaminated material.

5.7 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.

5.7.1 POTENTIAL FOR ACID SULPHATES SOILS (PASS)

The potential for acid sulphate Parkview 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.

5.7.2 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

5.7.3 TEMPORARY SEDIMENT BASIN

A temporary sediment basin has been 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 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

5.7.4 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.

5.7.5 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).

5.7.5.1 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.

5.7.6 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	Work Health and Safety Regulation 2017 s.57	Y	N	N/A
Risk assessment / hazard register for any new chemicals on site (request HSE Coordinator to assist)				
PH and turbidity readings recorded as required (form 121) prior to discharge				
Silt socks and geofab covering covering storm water drains in good condition				
Site water runoff diverted away from unstable slopes				
Sediment fence does not cause flow/diversion bypass				
Proper arrangements in place for collecting/disposing waste				
Cattle grid has been installed and maintained correctly				
Mud is not being discharged onto roads				
Dust controls in place such as watering of paths and during excavation				

Figure 5.7.6a – Weekly environmental site inspection checklist

In conjunction with the above figure 5.7.6a, 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.

5.8 AIR QUAILITY AND ODOUR MANAGEMENT PLAN

Air quality and odour management plan (AQOMP) is developed to minimise and manage air quality and any potential odours that may arise during excavation works. The following measures will be implemented to mitigate potential odorous materials released and minimise impact on air quality.

5.8.1 Sequence of Works and Staging

Sequencing and staging of works will be geared to minimise the area of excavated surfaces open concurrently for extended periods of time and therefore minimise the impact of potential odours. The construction of internal roads will commence from the south eastern side of the site and progressively move towards Herring road. The existing roads will be maintained for truck access, remaining sealed up until the point of excavation. Any potential odours/contamination sources will be minimised as they will be contained to small work faces as the excavation progresses.

5.8.2 Material Classification and Odour Suppressants

In the event odours are detected, the environmental consultant will be notified and area isolated until the source of contamination/odour is determined (refer to 5.3 unexpected finds protocol). The environmental consultant will provide advice regarding suitable odour suppressing products and their effective application in consideration to all public receivers. Chalouhi will establish odour suppressant control measures as per environmental consultant's advice whilst the material is tested and waste classification is provided. Once waste classification for the odorous material is obtained, the material will be removed and transported to a facility licenced to accept the waste. The two typical methods that could be used to suppress and control odours would be either natural odour neutralisation via surface treatment, by the integration of enzymes, or chemical neutralisation, where molecules permanently eliminate the odorous air. A misting system can be introduced which uses essential oils and organic plant compounds to neutralise odours.

5.8.3 Stockpile Management and Cartage Control

Effective handling of excavated material and stockpiles onsite are integral to minimising potential odours and dust impacts on air quality. Minimising the transfer of excavated material within the site and loading from the source of the excavation is ideal however when this is not possible and stockpiles are generated they will be limited to 2m in height. If there is a requirement to go higher due to space/loading requirements, material stockpiles will need to wetted during the day and covered overnight Dust control and suppression to be implemented in the form of wetting work areas and stockpiles. All trucks carting material off site will cover their loads prior to leaving the site.

5.8.4 Onsite Monitoring and Recording

Onsite dust monitors will be installed near construction work faces and monitored monthly. As the work faces progress, the monitors will also need to be reinstalled at the relevant locations. Results will be recorded on the dust monitoring register and available at the site office for review.

5.8.5 Proactive/Reactive Management Strategies & Response Mechanisms

Air Quality Indicator	Proactive	Reactive
Dust	Dust suppression techniques, wetting down of stockpiles and any loose excavation material, covering stockpiles	Seize works if excessive dust noticeable. Conduct investigation into source of dust if there is a complaint received. Regular site management meetings to review environmental controls.
Odour	-	Follow unexpected finds process immediately. If odour generating material is known, either remove or treat with odour suppressants. If unknown, investigate where odour is coming from. Conduct investigation into source of odour if there is a complaint received. Regular site management meetings to review environmental controls.
Asbestos (Unknown Finds)	All monitoring results for the project below a fibre count determined by hygienist	Cease works and follow unexpected finds process. Follow asbestos management plan and control measures.
Plant	Use of well-maintained and service plant. Plant operators to conduct daily plant pre start checklists to ensure plant are in well working order with no excessive smoke.	Cease using the plant and consult plant mechanic, Remove or replace machine.

Table 5.8.5: Management Strategies and Response Mechanisms

Air Quality Indicator	KPI	Recording/Monitoring
Dust	No dust to be visible leaving the site boundaries	Weekly Site environmental inspection
	No complaints received over the duration of the project	Complaints Register
	Dust deposition levels below 4g/m2/month per NSW guidelines (Test method as per AS3580.10.1	Monthly Report
Odour	Non detectable odour at boundary	Weekly Site environmental inspection
	No complaints received over the duration of the project	Complaints Register
Asbestos (Unknown Finds)	All monitoring results for the project below a fibre count determined by hygienist	Asbestos Air Monitoring Register
Plant	No excessive smoke	Daily Plant Pre Start Inspections & weekly inspections
	All Plaint Maintained as per manufacturers specification	Plant maintenance records and service history

Table 5.8.6: Key Performance Indicators

5.8.7 Compliance Protocol

Compliance of Air Quality will be measured against the set KPIs that have been outlined in the above Table 5.8.6 Key Performance Indicators. If any of the reactive control measures fail and a noncompliance occurs, the reactive measures will be implemented. All compliances will be reflected in the monthly dust monitoring reports and weekly site environmental inspections.

5.8.8 Contingency Management Strategies

In the event that there is an exceedance of dust depositions obtained within the dust monitoring testing and/or all other air quality and odour influences, the below contingency management strategies will be implemented as part of the AQOMP.

Air Quality Indicator	KPI	Management Strategy
Dust	No dust to be visible leaving the site boundaries	Introduce further dust suppression techniques, wetting down of stockpiles and any loose excavation material, covering stockpiles
	No complaints received over the duration of the project	Conduct investigation into source of dust if there is a complaint received. Site management meeting to review environmental controls.
	Dust deposition levels below 4g/2m2/month per NSW guidelines	Implement further dust suppression techniques and cover stockpiles
Odour	Non detectable odour at boundary	Follow unexpected finds process immediately. If odour generating material is known, either remove of treat with odour suppressants. If unknown, investigate where odour is coming from.
	No complaints received over the duration of the project	Conduct investigation into source of odour if there is a complaint received. Regular site management meetings to review environmental controls.
Asbestos (Unknown Finds)	All monitoring results for the project below a fibre count determined by hygienist	Cease works and review asbestos management plan and control measures.
Plant	No excessive smoke	Cease using the plant and consult plant mechanic, Remove or replace machine.
	All Plant Maintained as per manufacturers specification	Remove the piece of plant from operation until mechanic services/performs maintenances as per manufacturer's guidelines.

Table 5.8.8: Contingency Management Strategies

6 TRAFFIC MANAGEMENT PLAN (TMP)

Through a consultative approach between Chalouhi and The Traffic Planner Pty Ltd, (Traffic Consultant) this plan details what is considered the best way to manage traffic issues associated with the construction activities. This plan should be read in conjunction with the Traffic Planners CTMP dated 27 November 2020.

Compliance requirements

The purpose of the Traffic Management Plan is to ensure that the construction works adhere to and comply with the General Conditions of the Contract and for control of the movement of construction vehicles, including plant and equipment, around the construction site and adjacent transport corridors. Specifically, this plan will recognise, be consistent with and comply with the traffic configuration of the local road network as it exists at varying stages, during the project. The construction activities for Parkview include earthworks, road works and the like.

This Traffic Management Plan includes, but not be limited to mitigation measures identified in the EIS (Environmental Impact Statement) such as:

- Identification of preferred haulage routes;
- Access routes and, signage and access arrangements on site;
- Measures to limit the impact on Foreshore Road and Botany Road;
- Need for restrictions on delivery hours and/or routes;
- Ensure all vehicles entering and leaving the site and carrying a load that may generate dust are covered at all times, except during loading and unloaded. Any such vehicles shall be covered or enclosed in a manner that will prevent emissions of dust from the vehicle at all times; and
- Ensure that all dust source surfaces are sealed.

In addition to the above, this TMP must also comply with:

- The requirements of Parkview and relevant authorities, including RMS, Police and State Emergency Services;
- Road Act 1993 (NSW) and all other legislative requirements;
- Certificates, licences, consents, permits and approvals, including in respect of working hours.

Objective

The objective of the plan is to ensure that the traffic movements of both plant and equipment, and vehicles are managed with minimal minimise the impact on residents and/or commercial enterprises on traffic routes.

Scope

The main element of the work with respect to the traffic management is:

- Traffic Management while construction vehicles are entering and exiting the work zone.
- Control of movement of vehicles carrying construction plant/equipment, parking and adjacent traffic corridors.
- The plan must recognise, be consistent with and comply with the traffic configuration of the local road network as it exists at varying stages, during the project.

Staging plans and proposed traffic control sequence of the construction activities

The Work Area listed below, itemises the on-site construction activity and its relationship to traffic management.

Table 6.0 – Traffic Sources and Mitigation Methods

Activity	Environmental Impact pre-control measures	Control Measures
Access to and egress from the construction site	Disruption to public traffic flow	- All site access and egress will require traffic control in accordance with the Roads and Traffic Authority Guideline Traffic Control at Work Sites, and Australian Standards 1742.3 Manual of Uniform Traffic Control Devices, Part 3: Traffic Control Devices for works on Roads - Assessment by Commercial Traffic Control Pty Ltd, (Traffic Consultant) reported the movement of trucks to and from the construction site is expected to have no negative impact to the public - Site induction includes the restricted hours (refer to section 2.2), and provide strict instruction to all vehicle drivers - Pre-shift toolbox talks – the Site Manager will routinely review the strict TMP instructions - Modification to existing traffic patterns providing safe access for all vehicles (refer to figure 1.10) - Traffic controllers to monitor and report precinct traffic tailback and any general congestion or disruption to the public. - Designated muster point for trucks prior to coming to site - Weekly meetings will be held by Chalouhi's site management to resolve and mitigate any identified issues - Construction vehicles will enter/exit the construction site solely via the construction gate known as the Chalouhi site gate - There will be no need for traffic diversions - No heavy vehicle will be permitted to queue on public roads - Routinely monitor traffic conditions (Site Manager) - If needed, Chalouhi will liaise with Parkview resolve any traffic issues - Chalouhi's HSEQ package to be issued to each contractor
Emergency services access to the construction site	Delayed response due to unfamiliar site entry	- Ensure appropriate notification to local emergency services - In the event of an emergency refer to Appendix D – Emergency Management
Volume of trucks entering / leaving the construction site	Traffic disruptions	- Estimated volume of construction vehicles is expected to vary with the work sequence activities. At peak, it is estimated there will be approximately 75 to 100 movements per day - Trucks are not to lay over in or around any surrounding roadways - Designated muster point for trucks prior to coming to site

Trucks carting material from site	Dust emissions and debris falling from vehicles	- Haulage contractors to be provided with Chalouhi HSE documentation including traffic control plan and haulage muster points prior to entering site includes follow designated routes and deliveries made within the restricted hours - inducted to the construction site - All trucks entering and leaving the site and carrying a load will be covered all times, except during loading and unloaded
		- Routinely inspect external roadways for dust / debris and if required arrange a road sweeper - Ensure all dust source surfaces are sealed and/or the generation of dust minimised (refer to section 5.5, Dust Management Plan)
Delivery of materials / equipment to the construction site	Accessing the construction site incorrectly as unfamiliar with the location	- Haulage contractors to be provided with Chalouhi HSE documentation including traffic control plan and haulage muster points prior to entering site includes follow designated routes and deliveries made within the restricted hours - Chalouhi's HSEQ package to be issued to each supplier / delivery subcontractor - There will not be a dedicated works zone with all deliveries being loaded and unloaded entirely from within the work site - All construction works and deliveries will be taken from within the construction site boundaries
Construction vehicle breakdown along one-way access roadway to the construction site (considered unlikely)	Block construction vehicles from accessing / egressing the construction site	- The stalled vehicle will be towed from the construction site by an emergency response/recovery vehicle

7 HEAVY VEHICLE MANAGEMENT

Introduction:

Chalouhi is committed to addressing the obligations aligned in the Chain of Responsibility in the day to day operations of the business. The heavy vehicle Management Plan, defines Chalouhis intended processes, communicates the content and business structure and is in parallel with the standards of ISO 9001 (Quality) AS/NZS ISO 45001 (Safety) and ISO 14001 (Environmental).

The concept of chain of responsibility is to hold all parties with any control or influence over the transport task responsible for their actions or inactions where they have control or influence over the transport task

Key definitions:

Chain of Responsibility: A policy concept used in Australian transport legislation to place legal obligations on all parties in the transport supply chain.

Consignee- the receiver of goods

Consignor: the sender of goods

Heavy vehicles: Any vehicle over 4.5 tonnes gross vehicle mass (GVM) required to operate on public roads

Loader: A Worker who loads or unloads a road transport vehicle

Loading Manager: A Worker who supervises loading/unloading, or manages the premises where this occurs

7.1 LEGAL AND OTHER REQUIREMENTS

Chalouhi have appointed a HSEQ National Manager to ensure inclusion of legislative reference in Heavy Vehicle Management System, Safe Work and Environmental Methods Statements (SWEMS) and Standard Operation Procedures (SOP's). Changes to legislation are incorporated in HSEQ documentation in consultation with Site Supervisors, Senior Management, Resource Manager and Subcontractors. These changes are communicated to employees and subcontractors through; revised Safe Work and Environmental Method Statements (SWEMS), tool-box discussions and staff training on Heavy Vehicle compliance and subcontractor audits.

This management system sets out processes and procedures to allow the user to comply with the following Acts, Regulations and nationally accredited schemes:

(a) Heavy Vehicle National Law 2013
(b) Road Transport (General) Regulation 2013
(c) Heavy Vehicle (Fatigue Management) National Regulation (NSW)
(d) National Heavy Vehicle Accreditation Scheme modules
- Mass Management
- Maintenance Management
- Basic Fatigue Management

The heavy vehicles law includes:
- Mass, dimensions and load restraint
- Speed and fatigue
- Heavy vehicle standards
- Dangerous goods

7.2 ROLES AND RESPONSIBILITIES

For effective implementation of the HVMS, experienced members of the Chalouhi team will be assigned roles for the management of safety, environmental and quality. All Managers and Site Supervisors will be responsible and accountable for the effective implementation of the WHSEQ aspects and as such the defined responsibilities are:

General Manager:

- Ensure the business operations are conducted as per the statutory obligations of the applicable laws and legislative requirements of the position
- The business activities are conducted with knowledge of all known risks and other risks that may be controlled through a formal reporting process.

Construction Manager:

- Engage staff and contractors to ensure they are aware of the required compliance obligations to be suitably selected to perform the task either permanent or full time
- The implementation of all administration processes and approved staffing levels reflective of the needs
- Identification of system verification requirements and allocation of human, technical and financial resources adequate to meet those needs
- Ensuring that safe working and fatigue practices and procedures are implemented and adhered to as per the policy and HVNL

National HSEQ Manager

- Review the management practices to measure the required outcomes as determined and required for the business to maintain financial stability and fulfil all obligations.
- Ensure risk management principles are applied to all areas of works within the business
- Approve all internal and system documented changes and assign responsibilities to deliver
- Ensure the business operations are conducted with the requirements under Chain of
- Responsibility and all staff and workers have the opportunity to undergo training and increase their skills
- Acquiring and disseminating WHS&R and fatigue information to advise staff and workers

Project Manager:

- All records (such as cartage and tip dockets) are kept and secured with all records of business related activity.
- Delays that are encountered during a trip process, loading and unloading is assessed and alternate arrangements are made and communicated as required.
- Vehicles and equipment are not overloaded through process, workers are appropriately managed and safety is a key focus In every task and system process
- Conducts meetings with Project Site Team and Systems Manager/Coordinator and all other site personnel at separate but

HSEQ Manager:

- Records are kept and secured and all records of business related activity, purchasing, maintenance repairs, work related or driving (including rest times) are recorded and reviewed.
- Vehicles and equipment are not overloaded through process, workers are appropriately managed and safety is a key focus In every task and system process
- Periodic reviews and audits of the business activities are conducted and any reoccurrence of incidents are known and controls applied.
- Encouraging reporting of all incidents, accidents and personal injuries, ensure the appropriate forms are completed and the investigation is concluded when requires

- Ensuring that the Driver Fatigue Management Plan is fully implemented and reviewed on an ongoing basis
- Investigating incidents and accidents and initiating corrective (preventative) actions

Resource Manager:

- Holding regular meetings with the contractors to discuss transport compliance
- Ensuring and overseeing all sections of the HVNL are complied with
- Delays that are encountered during a trip process, loading and unloading is assessed and alternate arrangements are made and communicated as required.
- Ensuring that the Driver Fatigue Management Plan is fully implemented and reviewed on an ongoing basis
- Investigating incidents and accidents and initiating corrective (preventative) actions

Site Supervisor/ Receiver

- Vehicles send equipment do not exceed mass or dimension limits when scheduling loads or travelling on vehicle specific routes.
- Vehicles and equipment are not overloaded through process, workers are appropriately managed and safety is a key focus in every task and system process
- Investigating incidents and accidents and initiating corrective (preventative) actions
- 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
- Engage suitable suppliers engaged to perform any service are suitable, competent and legally able to perform the task as required, with consideration to Fatigue and other influences
- Do not exceed vehicle dimension limits and goods provided are prepared with consideration of the loading and movement
- Do not exceed vehicle mass limits, when in control of the loading process
- Goods and material are appropriately secured to the vehicle when in control
- A suitable safe area is provided to allow any worker, persons of other to conduct the work safely and with consideration of the environment
- Information about the Goods or materials is provided as required to ensure conformance

Worker (heavy Vehicle Person) or driver

Must ensure that all reasonable steps have been taken or applied to:

• Your Fit for Duty, competent, have been provided training, information and resources that is required to perform the task safely

• Your vehicle or equipment does not exceed mass limits and verification must be conducted prior to accessing any public roadway or operated

• Your vehicle, equipment and loads do not exceed dimension limits and the control of loading is your responsibility and instruction as provided

• Your load is appropriately restrained, equipment and other resources are suitable and fit for use

• Conduct a Pre-trip inspection of the vehicle and record this process, more than once per shift and report any required repairs or faults required through the process

• Operate the vehicle and trailing unit/s as per manufactures instruction and knowledge of safe operation

• Part take in training and provide feedback of any workplace issue that may have impact negatively on the business and/or individuals.

Loaders (Operators)

Ensure that a vehicle's load, part there of or placement of any items:

• Do not exceed vehicle dimension limits and goods provided are prepared with consideration of the loading and movement

* Being familiar with axle combination and gross weight of vehicles always whilst operating within our supply chain.

• Does not exceed vehicle mass limits when placing goods or materials

• Is placed in a way that it does not become unstable, move or fall off the vehicle

• Documents about the vehicle's load is not false or misleading and are provided as evidence

• Any loaded materials do not cause the gross weight or safety approval rating to be exceeded

• Loading is conducted with safety considered as a priority

7.3 TRAINING AND COMPETENCIES

All people are to be made aware of this management system's objective and undertake specific training in the duties that they are to be responsible. Directors will ensure only appropriate people undertake duties of responsibility and only after competence in those duties has been fully demonstrated.

Consultants
Our company will seek and obtain advice on road transport compliance only from consultants who have suitable and appropriate experience.

Staff
All Chalouhi staff involved in heavy vehicle activity will undergo an induction program prior to the commencement of an assigned duty. The induction will include training in:

- The contents, objective, and general intent of this management system
- Their specific responsible duties

Refresher Training and driver assessment
It is expected that drivers are to undergo regular ongoing training with their company. This includes refresher training which will include training in specific duties and general system training. Upon training is successfully completed, Training Records are to be made available for Systems Audits from Chalouhi.

7.4 MANAGING SUBCONTRACTORS (HEAVY VEHICLES)

Prior to Chalouhi contracting a transport company (in accordance with Chalouhi's Heavy Vehicle Service Agreement) they will need to become prequalified to show that they comply with the HVNL and have the capability of servicing Chalouhi Pty Ltd construction sites. This will be.

The prequalification will include but not limited to submitting documented evidence such as:

- A safety management system

- A fatigue management policy

- Maintenance records for any trucks supplied to Chalouhi

- Insurances for the trucks supplied to Chalouhi Pty Ltd

- Copies of drivers licences.

The subcontractors Cartage SWMS's are requested prior to works for all high-risk activity and are reviewed and evaluated by the site engineer prior to commencement of works. The site engineer will use the HSE *Form HSE-131 Subcontractor SWMS Review Checklist* to carry out this review and evaluation for their effectiveness and that they comply with Chalouhi's (HIRAC) processes.

Drivers are required to read and sign the Heavy Vehicle HSE Induction (provided in the Heavy Vehicle Service agreement) which outlines drives site responsibilities and compliance with Chalouhi Site rules. This will be inspected as part of Chalouhis bi-annual contractor audit.

7.5 PENALTIES FOR BREACHES OF HEAVY VEHICLE LAW?

If you are in breach if the HVMS a number of actions or penalties may be taken against you, depending on the severity of your breach. You may, for example be subject to:

- Warnings/education
- Improvement notices
- Infringement/expiation notices
- Court imposed fines
- Supervisory invention orders
- Road compensation orders
- Commercial benefits orders
- Prohibition orders
- Licencing and registration sanctions

7.6 FATIGUE MANAGEMENT:

Chalouhi are committed to providing a safe place of work for all staff and workers, subcontractors and visitors under our control. Chalouhi will ensure that it abides by the regulations and obligations related to proper performance, as per the statutory requirements of the relative laws.

AIMS AND OBJECTIVES

• The elimination of risks and unsafe work practices caused by impaired or fatigued workers

• Compliance with the Workplace Health and Safety Act 2011, Heavy Vehicle National Law and including Fatigue Laws and regulations

• Ensure all shifts and rosters and working hours are consistently reviewed with knowledge and awareness of risks associated with fatigue in the work place

Chalouhi recognises that the overall responsibility to provide a safe workplace, rests with management who will be accountable for the implementation of this Fatigue policy and business processes. These responsibilities include –

• Ensuring fatigue related information is communicated and implemented

• Establishing measurable objectives and targets to ensure continued improvement aimed at the elimination of work-related fatigue risks

• Providing adequate resources to meet these WHS commitments.

Workers also have responsibilities, which will include –

• Ensuring their actions do not affect the safety of all other workers or persons.

• Their fitness for duty is maintained at all times and fatigue is to be considered as a priority.

• Comply with all safe work instructions, provided either verbally or formally.

• Participate in the controls applied to risks in the workplace to reduce the risk of fatigue related incidents.

• Participate in training and communicate regularly if any fatigue related issues could affect your work.

7.7 SPEEDING MANAGEMENT:

Chalouhi is committed to ensuring that vehicles and or assets purchased or contracted are to be controlled with the latest on-board technologies when applied to assist in speed management. Therefore, part of the Chalouhi Pty Ltd obligation is the commitment to the provision of a safe workplace for its drivers, staff and importantly the public. Management has a duty that extends to protecting all stakeholders from unnecessary risks, that can have controls applied and therefore decreased the risks.

AIMS AND OBJECTIVES

Chalouhi Pty Ltd endeavours to achieve the following-

• Purchase vehicles and assets that are fitted with new technology aligned with Speed Limiting devices

Driving schedules are prepared with regard to the following:

• Ensuring that speed compliance is included always and as part of any contractual requirement.
• Legislative requirements for maximum work hours is considered for required routes to be used.
• Consultation with drivers to confirm they are able to safely complete the work allocated without speeding.
• Planning for unexpected delays to complete journeys without speeding and consideration of delays.
• Sufficient rest breaks, including personal activities such as hygiene, eating meals and travelling to or from the depot or site.

The company will investigate instances of worker's detected speeding through electronic or reported process. Workers are educated about not speeding and reporting speed related issues such as faults with equipment, Infringements or Non-Conformance. Workers are provided with regular reminders about the importance of working together to ensure compliance with these new laws, including toolbox sessions and internal staff training.

HEAVY VEHICLE RISK REGISTER

Description of hazard	Consequence	Likelihood	control measures	Residual likelihood	Responsible person
individual/ vehicle struck by truck	death, disability, hospitalisation of worker	Possible	- Truck ingress and egress according to traffic management plan - Any reversing vehicles must have spotter, trucks to follow one-way direction with turn circle - The loading platform must be clear of personnel before the truck enters the site. - The loading platform is a no-go area for personnel during load out. - The traffic controllers shall set up temporary barriers on either side of the driveway to stop pedestrians on footpath whilst the truck enters site as per traffic control plan and traffic control instructions -At all times during truck ingress, traffic controllers shall maintain a watchful eye for vehicles, plant, workers or pedestrians that may move into the path of the truck. - Use jersey kerbs to control flow of pedestrians and direct them to cross in safe designated area. - Use 2 way radio to ensure adequate communication for controlling trucks and pedestrians in shared areas. - Ensure truck ingress complies with approved traffic control plan - Site vehicles not to exceed 5km/hr on site	unlikely	professional driver, spotter, site supervisor
Speed	Traffic accident or speed breach	Possible	. Drive to the road conditions and always obey advisory signs. - Speed signs are to be adhered too. Drivers to wear seatbelt fitted - Consistently visually inspect instruments and operate vehicle as per manufactures manual	Unlikely	professional driver
Fatigue	Driver fatigue-accident	Possible	- Director or scheduler has knowledge and understanding of fatigue laws, which allow distribution of workload across other workers. - Share early starts across workers, to allow longer periods of rest. - Minimise shift changing to allow continuous patterns of shift work. - Regular contact with workers, assess signs of fatigue in each worker individually. - The scheduler controls professional drivers operating under standard and bfm hours. - Training provided and list of various fatigue symptoms known to workers.	Unlikely	professional driver director or scheduler

Manually loading/unloading material from vehicles	injury to back or other muscle damage	Possible	-Practice safe lifting measures and techniques at all times. - All drivers to undergo manual handling training.	Unlikely	plant operator, site supervisor and all site personnel
Working at heights (unloading of materials)	severe injury or fatality	Possible	• always maintain 3 points of contact, all times during the process • check the ground conditions prior to entering or exiting the vehicle or equipment • take extra care in wet conditions as the steps, foot landing areas may be slippery • wear appropriate footwear and ensure this is fitted correctly • do not twist to look around whilst entering or exiting from the vehicle • only use approved hand and foot holds/steps and never jump from any point during the process	Unlikely	professional driver
site traffic management	death or disability of worker	Possible	• 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.	Unlikely	site supervisor all site personnel
unauthorised vehicles entering site	death or disability of worker being struck be vehicles	Possible	• signage to be displayed at site entrance 'do not enter-authorised personnel only' • truck vehicles registrations are to be issued from Chalouhi resource manager to site supervisor daily • All vehicles are to park in designed muster point prior to entrance to site. a Chalouhi site rep is sent to the muster point to control the traffic flow of trucks into site and confirm registrations • all drivers are to maintain communication with traffic control and site supervisor- radio channel 24 • Traffic control to monitor all vehicles entering site by registration. • Any unauthorised vehicles that enter the site are to immediately remove the vehicles off site with the assistance of traffic controllers. Vehicles is to continue along the one-way road system and turning circle and avoid reversing if possible. • site vehicles not to exceed 5km/hr on site	Unlikely	site supervisor/ traffic controller

vehicle tipping from uneven load overloading	death or disability of worker damage to vehicles	POSSIBLE	• truck weight to monitored through excavator weight scales • site supervisor to arrange truck and dogs to commute to designated weigh bridges to confirm mass of load and required number of buckets to fill truck and dog on a daily basis • vehicle to be positioned on level surface when loading • loading of the truck and dog from front-to –back must meet allowable gross weight limitations of vehicle • if the truck is overloaded, the supervisor is to be informed and the truck will be permitted to unload at a designated unloading zone • unloading zone to be supervised during task with exclusion zone installed with barricades	rare	site supervisor all site personnel
site emergency evacuation	possible	Death or disability of worker	In the event of a site evacuation all site personnel (including heavy vehicle drivers) will be required to exit their vehicles and switch of any plant or vehicles. they are then to follow the instruction of the nominated chief fire warden to the nearest site emergency meeting point	rare	site supervisor all site personnel
Dust from vehicles moving around site.	possible	Air born dust polluting the air. damage to lungs, eye irritation, eye damage	• suppress dust plumes using a water cart or gernie • • • • • Task specific ppe such as dust masks to be worn when required. • Regular noise monitoring to be carried out. • appropriate eye protection, face shield or goggles as required • works only to be carried out during designated work hours	unlikely	site supervisor all site personnel
chemical spills	possible	oil running into drains and waterways	• spill kits to be maintained and readily available on-site at all times • Fuel cage must have a base tray with a capacity greater than the volume being stored (120% of max capacity). • fuel is to be kept in sealed containers and clearly labelled and placed on an even surface • Fuel cages are to be accessed by authorized personnel and adequately secured. • appropriate warning signs to be displayed on fuel cages at all times • All grated drains are covered and protected to prevent entry of fuel spills. • fire extinguish funnels to be used when refueling and be securely placed in the plant/equipment prior to refueling • funnels and spill kits are to be maintained and readily available at all times • all trucks fuel trucks exiting site are to exit through designated wash bay zone with water	rare	site supervisor all site personnel

			gerni, cleaning any debris from wheels • sds and risk assessment for all hazardous chemicals to be stored • certified first aid office available on site at all times • Plant and float are to be maintained as per manufacturer's specifications. • commencing		
mudding of public carriageway	possible	soiling of public road / footpath runoff of water from work zone unfit for discharge into public stormwater system	• trucks to enter/exit site over asphalt road to minimise dust • truck wheels to be hosed down prior to existing site if required • do not cart out if prevailing weather conditions may saturate material to the itp of leaking from trucks and dribbling onto the public carriageway. • while there are gaps in between the loading of trucks and at the end of the loading operation, the loading area and street (if required) is to be cleaned up by means of shovels and brooms/ water gernie or street sweeper. • trucks to cover loads before moving off. sediment sock to line edges of each stormwater drain around work site as per control plan	unlikely	site supervisor all site personnel
noise from vehicles & plant moving around site	possible	hearing loss, noise disturbance	• noise levels to be regularly monitored and personnel are to wear class iv or better ear plugs if levels exceed 85dba • regular noise monitoring to be carried out. • works only to be carried out during designated work hours noise from plant to kept within 85db when being operated near residential buildings or sensitive receivers	unlikely	site supervisor all site personnel

8 APPENDICES

8.1 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

8.2 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				

8.4 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 Parkview .
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 Parkview 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

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.

8.5 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

Memorandum

To:	Parkview Constructions Pty Ltd	Date:	22 February 2024
Attention:	Mohamed Yaccoub	Project No.:	86043.23
Email:	mohamed.yaccoub@parkview.com.au	Reference:	R.006.Rev0
Subject:	Review of Foundation Impacts: Building C3, Ivanhoe Estate, Macquarie Park		

As requested by Parkview Constructions Pty Ltd (Parkview), Douglas Partners Pty Ltd (Douglas) have prepared this letter to assess the impacts of the excavation for Building C3 on the foundations of the neighbouring buildings. We understand that the following letter will support Parkview's CC1 submission to City of Ryde Council.

In an email issued on 23 January 2024 by Mohamed Yaccoub of Parkview, Douglas have been requested to comment on the geotechnical items listed below, as in Condition B41:

"Certification that the civil and structural details of all subsurface structures are designed to:

- *Provide appropriate support and retention to neighbouring property;*
- *Ensure there will be no ground settlement or movement during excavation or after construction (whether by the act of excavation or dewatering of the excavation) sufficient to cause an adverse impact to adjoining property or public infrastructure; and*
- *Ensure that the treatment and drainage of groundwater will be undertaken in a manner which maintains the pre-developed groundwater regime, so as to limit seepage to the public drainage network and structural impacts that may arise from alteration and of the pre-developed groundwater table."*

Based on the supplied drawings[1] for the C3 development, Douglas understand the following:

- Reference to drawings provided by TTW. It is understood that proposed bulk excavation level (BEL) is about RL 39 m to RL 40 m, with respect to the Australian Height Datum (AHD). It is understood that maximum excavation depths, of approximately 12 m below the original ground level is expected. Based on the survey drawing provided[2], the site has been partially stripped down by about 1 m to 1.5 m depth

[1] Job number 211086, Revision 1 dated 21/02/2024, prepared by TTW - "***Shoring and Footing Plan***", Drawing number S1001; "***Shoring Wall Elevations and Sections***", Drawings numbered S1011, S1012, and S1016.

[2] "***C2/C3 Plot Contour and Detail Survey Plan***", Number 9054 dated 6/10/2023, prepared by Total Surveying Solutions

with weathered rock present at surface towards the southwestern end. The basement is shallower at RL 42 at the northeastern end, requiring a maximum depth of cut of about 6 m; and

- It is expected that the excavation will generally be unsupported through the medium strength or better sandstone bedrock. Temporary dowels and shotcrete support (subject to services in the road) are proposed in the soils and weathered rock above the free-standing medium strength sandstone in the short-term with the building providing support in the long-term.

The neighbouring properties relevant to this assessment are:

- The C2 site is located immediately adjacent to Building C3. Construction for Building C2 has not commenced. Reference to the provided drawings[3] indicates the bulk excavation level at the C2 site will be approximately RL 48.5 m, relative to Australian Height Datum (AHD). The C2 site will consist of relatively minor structures within the zone of influence of the C3 building, including an inground pool and landscaped area;
- Building C4 is located to the south-east of Road No.2. Road 2 divides the C3 and C4 buildings. Based on the civil drawings, the C4 is approximately 15 m from the C3 basement and is considered outside the zone of influence;
- The D3/D4 development is approximately 16 m south-west of the C3 excavation. The excavation depth along this area is understood be approximately 12 m below existing surface levels and is considered outside the zone of influence;
- The B2 development to the north-east of the Road 1 is considered to be outside the zone of influence and there not expected to be impacted by the development; and
- The existing roads (Road No. 1 and Road No. 2) and footpaths (i.e., future 'public' areas) adjoining the C3 Building boundaries, are where rock is generally at shallow depth below the existing surface areas. No concentrated loads are understood to be present in these areas. Excavation for the Building C3 basement is up to approximately 12 m below these ground levels.

In responding to the items listed above, DP note that:

- All foundations for each neighbouring building is understood to be taken down to footings bearing on sandstone bedrock, of at least medium strength;
- Temporary retention of the adjacent soils and weathered rock during excavation for the Building C3 basement include dowels and shotcrete in the short-term, with the building providing support in the long-term. The structure is understood to permanently support these faces; and
- The permanent water table is considered to be within bedrock at the Building C3 site, and from observations during site inspections (during bulk excavation of the C1 development). The impact of the development has been outlined in the Dewatering Management Plan (DMP) which is understood to have been approved by Water NSW.

[3] "***Basement Plan A***", Project number 2041, Drawing number A-CD-101 Revision N (70% Tender Issue), dated 3/8/2023, prepared by CHROFI

Monitoring, treatment and drainage management of the groundwater will be carried out in accordance with the Douglas GMP and the DMP.

Given the above, from a geotechnical perspective it is considered that:

- The proposed temporary support and retention (shoring) has been designed to minimise the impact to neighbouring property;
- Building C3 has been designed to not adversely impact the neighbouring properties through subsidence or changes to the water table;
- The final Building C3 structure does not impose loads on the structure of any adjoining property, or any additional hazards given the current adjoining property use;
- Monitoring, treatment and drainage management of the groundwater will be carried out in accordance with the Dewatering Management Plan (DMP). The DMP is understood to have been approved by Water NSW; and
- It is noted that the dowels used during temporary shoring of the Building C3 basement will remain in-ground below the adjacent, future public areas. These will be designed so they do not create any hazard for the existing adjoining property use but may need to be considered in the planning and design of future works on that site.

We trust this meets your current requirements.

Regards,

Douglas Partners Pty Ltd



David Smith
Associate / Senior Geotechnical Engineer

Reviewed by



Joel Huang
Senior Associate
PRE00000428



Hugh Burbidge
Principal

Limitations:

Douglas Partners (Douglas) has prepared this report for this project at Building C3, Ivanhoe Place, Macquarie Park in accordance with Douglas' proposal dated 30 November 2023 and acceptance received from Antonio Screnci. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Parkview Constructions 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.

Douglas' advice is based upon the conditions encountered during previous investigations and inspections carried out within the site. The accuracy of the advice provided by Douglas 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 / environmental / 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. 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.

Attachments: About this report
Structural Drawings

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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Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: NOTES SHEET		**Drawing Number:** S-S0001		
Rev	**Date** dd.mm.yy	**Description**	**DP Full Name**	**Reg No**
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

IVANHOE STAGE 2 BUILDING C3

This drawing is copyright and is the property of TTW and must not be used without authorisation.

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING NO. S0001

GENERAL NOTES

1. These drawings are for structural purposes only and are to be read in conjunction with the specification, architectural drawings, other contract documentation and the requirements of the relevant authorities.
2. Verify all setting out dimensions with the Architect.
3. Do not obtain dimensions by scaling the structural elements.
4. Should any ambiguity, error, omission, discrepancy, inconsistency or other fault exist or seem to exist in the contract documents, immediately notify in writing to the Superintendent.
5. Maintain the structure in a stable condition during construction. Temporary bracing/shoring shall be provided by the contractor to keep the structure and excavations stable at all times, ensuring that no part of the documented structure becomes overstressed. For all temporary batters obtain geotechnical engineer's recommendations.
6. All workmanship and materials shall be in accordance with the requirements of current Standards Australia codes and the bylaws, ordinances or other requirements of the relevant building authorities.
7. All proprietary items are to be installed and fixed in accordance with the manufacturers specifications and instructions.
8. All work is to be carried out in accordance with all Workcover requirements and occupational health and safety act regulations
9. Construction using these drawings shall not commence until a Construction Certificate is issued by the Principal Certifying Authority.

DESIGN LOADS:

Floor loads : REFER TO LOADING DIAGRAMS

Wind Loads : Vᴿ = 45 Where R = 500 years
Region = A2
Terrain Category = TC3

Earthquake Loads:

Design Category	=	III
Site Sub-soil class	=	B
Hazard Factor Z	=	0.08
Probability Factor kp	=	1.0
Importance Level	=	2

SAFETY IN DESIGN

TTW operates under Safe Work Australia's Code of Conduct for the Safe Design of Structures.
These drawings shall be read in conjunction with the TTW Transfer of Information Letter and Structural Risk and Solutions Register.
Under the Code of Conduct it is the Client's responsibility to provide a copy of the Structural Risk and Solutions Register to the Principal Contractor.
It is the Principal Contractor's responsibility to review the hazards and risks identified during the design process to ensure a safe workplace is maintained for the construction, maintenance and eventual demolition of the structure.

FOOTING NOTES

1. Foundations have been designed for:
   Allowable Bearing Pressure - 3.5 MPa
2. Foundation material is to be inspected and approved by the geotechnical engineer before casting footings.
3. Refer to geotechnical report No. 86043.06 dated May 2021 by Douglas Partners
4. Locate all pipes, retaining walls and excavation outside a 1:2 (vertical:horizontal) zone of influence from the bottom edge of the footing.
5. Where side shear is required to be developed, clean and roughen the sides of the excavation to the satisfaction of the geotechnical engineer.
6. Footings shall be located centrally under walls and columns unless noted otherwise.
7. Footings to be constructed and backfilled as soon as possible following excavation to avoid softening or drying out by exposure.
8. Contractor is to allow for cost of geotechnical inspections and any required certification.

RETAINING WALL NOTES

1. Drainage shall be provided as shown on the drainage drawings.
2. Backfilling shall be carried out after grout or concrete has reached a minimum strength of 0.85 f'c.
   Backfilling shall be approved granular material compacted in layers not exceeding 200mm to 95% Standard compaction unless noted otherwise.
3. Provide waterproofing to back of walls as specified or noted.
4. Where retaining walls rely on connecting structural elements for stability, do not backfill against the wall unless it is adequately propped or the elements have been constructed and have sufficient strength to withstand the loads.
5. For all temporary batters obtain geotechnical engineers recommendations.

SHORING WALL NOTES

1. The design, supply, installation and tensioning of bolts and nails shall be carried out in compliance with the relevant Australian Standards and the Geotechnical Report.
   Anchorage lengths and curing times shall be determined by the Geotechnical Engineer.
2. Bolts and nail holes should be thoroughly cleaned and the bond grout should be allowed to cure before proof stressing.
3. Grouting shall conform to the requirements of AS 3600 and The Concrete Institute of Australia "Recommended Practice Z3 - Grouting of Prestressing Ducts 2007.
4. For proof stressing loads refer to the Geotech Report.
5. Records of all test loadings are to be submitted to the Geotechnical Engineer for review.
6. Modifications to the arrangement shown on the drawings will require recalculation of the required working loads and shall be notified to the Geotechnical Engineer for approval.
7. Safe Working load shown is the force required after all losses of prestress, including draw in.
8. Bolts and nails shall be located so as to avoid all services and pits etc. The contractor is to determine the location of all services etc prior to installation of anchors.
9. Any variation in location or inclination of nails and bolts shall be submitted to the Geotechnical Engineer for approval.
10. For ratio of ultimate load capacity of anchor to safe working load refer to the Specification.
11. For temporary and semi-permanent anchors the length of tendon protruding beyond wedge grip is not to be less than 600mm to enable monitoring.
12. For corrosion protection requirements refer to the Geotechnical Report.
13. Do not destress temporary or semi-permanent anchors until the Geotechnical Engineer's approval has been obtained.

PNEUMATICALLY APPLIED CONCRETE

1. Concrete to shoring walls to be pneumatically applied in one continuous operation. Concrete to be proportioned to achieve a batch target strength of 32MPa.
2. The pneumatically applied concrete shall be cured by keeping continuously wet over a period of not less than 7 days after placement or by other approved means.
3. Pneumatically applied concrete is to be placed by an experienced operator.
4. Pneumatically applied concrete shall conform to the requirements of the Concrete Institute of Australia Recommended Practice Z5 - Shotcreting in Australia 2020.

CONSTRUCTION SEQUENCE

1. Excavate down to first row or anchor.
   Install anchor as per geotechnical specification.
2. Place shotcrete wall as per the drawings.
3. Stress the ground anchors to Design Loads after concrete is a minimum of 4 days old.
4. Continue second stage as above.
   The 2nd and 3rd drop should be on hit and miss panel sequence (refer to Concept Design 86043.23.R.005.Rev1)
5. For anchor specifications (length, diameter of hole, bar type and diameter, inclination from the horizonal, etc.)
   Refer to Geotechnical report 86043.23.R.005.REV1
6. Typical anchor setouts shown indicatively. Geotechnical engineer to confirm retained height and the requirement for the 2 or 3 rows of anchors.
7. Geotechnical Engineer to confirm retained height and the requirement for the 1 or 2 rows of anchors. Where additional row is required the spacing will be staggered. Refer to Concept Design 86043.23.R.005.Rev1.

CONCRETE NOTES

EXPOSURE CLASSIFICATION : External - B1
Internal - A1
Surface of members in contact with ground - A1

CONCRETE
Place concrete of the following characteristic compressive strength f'c as defined in AS 1379.

Location	f'c MPa at 28 days
Piles	S50
Pile Caps, Footing Beams, Pad Footings	S50
Slabs on Ground	S32
Suspended Slabs and Bands	S40
Walls	Refer Schedule
Dincel and/or AFS Walls	Refer Schedule
Columns	Refer Schedule
Stairs	S40

1. Use Type 'GP' cement, unless otherwise specified.
2. All concrete shall be subject to project assessment and testing to AS 1379.
3. Consolidate by mechanical vibration. Cure all concrete surfaces as directed in the Specification.
4. For all falls in slab, drip grooves, reglets, chamfers etc. refer to the architect's drawings and specifications.
5. Unless shown on the drawings, the location of all construction joints shall be submitted to engineer for review.
6. No holes or chases shall be made in the slab without the approval of the Engineer.
7. Conduits and pipes are to be fixed to the underside of the top reinforcement layer.
8. Slurry used to lubricate concrete pump lines is not to be used in any structural members.
9. All slabs cast on ground require sand blinding with a Concrete Underlay
10. ⟨175⟩ Indicates slab or band thickness

FORMWORK

1. The design, certification, construction and performance of the formwork, falsework and backpropping is the responsibility of the contractor.
2. The proposed method of installation and removal of formwork is to be submitted to the Superintendent for comment prior to work being carried out.

SLAB ON GROUND NOTES

Refer to Geotechnical Report No. 86043.06 dated May 2021 by Douglas Partners for all subgrade and subbase/basecourse requirements and unless directed otherwise the following requirements apply.

1. Strip all topsoil from the construction area and remove from the site.

2. Before placing fill, proof roll exposed subgrade with 6 passes of a 10 tonne minimum roller to test subgrade and then remove soft spots (areas with more than 3mm movement under roller). Soft spots to be replaced with select fill as per table:

SELECT FILL

Sieve Aperture (mm) to AS1152	Percentage passed (by mass)
75.0	100
9.50	100 to 50
2.36	100 to 30
0.60	50 to 15
0.075	<25

- Plasticity index to be > or = 2% and < or = 15%
- Non dispersive (a rating of nil as defined by the "dispersion" test AS1289.3.8.1) Submit proposed select fill for Engineers approval.

3. Compact fill areas and subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.

4. All basecourse material to be crushed hard rock or crushed natural gravel capable of being compacted to an even stable surface and complying with the grading and properties listed in the tables below and compacted to minimum 98% modified standard dry density in accordance with AS 1289 5.2.1

NON-FREE DRAINING BASECOURSE

Sieve aperture (mm) to AS1152	Percentage passed (by mass)
26.5	100
19.0	95 to 100
13.2	75 to 90
9.50	60 to 90
4.75	42 to 76
2.36	28 to 60
0.425	10 to 28
0.075	2 to 10

- Plasticity Index: Not greater than 10%
- Liquid Limit: Not greater than 25%
- California Bearing Ratio: Not less than 35%
- Unsound rock: Not greater than 20%
- Nondispersive (a rating of nil as defined by the dispersion test AS1289.3.8.1)
- Submit proposed basecourse for Engineers approval.

FREE DRAINING BASECOURSE

Sieve aperture (mm) to AS1152	Percentage passed (by mass)
9.50	100
6.70	95 to 98
4.75	58 to 78
2.36	37 to 50
1.38	22 to 30
0.425	10 to 17
0.075	2 to 10

- Plasticity Index: Not greater than 3%
- Liquid Limit: Not greater than 25%
- Coefficient of permeability: Not less than 0.1mm/sec
- Nondispersive (a rating of nil as defined by the 'dispersion test' AS1289.3.8.1)
- Submit proposed basecourse for Engineers approval.

5. Place sand blinding to areas where Concrete Underlays are required.

POST-TENSIONED CONCRETE NOTES

GENERAL

1. Submit all test certificates, theoretical extensions, calculations and shop drawing to the Superintendent as required by the specification prior to construction.
2. All reactions from post-tensioning shall be supplied to the formwork contractor for formwork design.
3. Stressing contractor is to pay particular attention to concrete compaction where ducts cross columns and at all tendon anchors and ensure that pump lines are adequately chaired and restrained so as to be kept separate from tendons and reinforcement.
4. Provide mesh over bands where band depth exceeds 350mm or as required by Workcover.
5. Holes cored through post-tensioned slabs must be approved by the structural engineer in writing.

TENDONS

1. All Strands shall be 7 wire ordinary strands with Class 2 relaxation in accordance with AS 4672.1 and AS 4672.2 unless noted otherwise.
2. Bar shall be high-tensile alloy steel bars in accordance with AS 4672.1 and AS 4672.2 with a nominal tensile strength of 1030 MPa unless noted otherwise.
3. Locate and fix tendons and reinforcement as shown on the contractors drawings and co-ordinate with cast in bolts, conduits and penetrations etc. Tendon profiles shall be parabolic unless noted otherwise.
4. Ducting for slab tendons shall be galvanised steel:
   - 70 x 19 for 5 x 12.7dia strand tendons
   - 90 x 19 for 5 x 15.2dia strand tendons
5. Seal off all ducts and securely tape joints to prevent ingress of mortar during concreting.
6. The performance of the post tensioning anchorages is the responsibility of the stressing contractor and they shall provide any additional bursting reinforcement needed to meet the requirements of their post tensioning system.

TENSIONING AND GROUTING

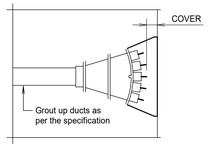
1. Tendons shall be stressed to jacking forces as per the contractors drawings.
2. The first stage of stressing is for 25% of the jacking force to be applied between 18 and 36 hours after concrete placement (f_{cp} = 9 MPa minimum) followed by the remainder of the jacking force at f_{cp} = 22 MPa unless noted otherwise below. Each individual strand or bar shall be tensioned during the first stage unless noted otherwise.
3. 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 cutting of tendons and grouting the ducts.
4. All tendons to be grouted in accordance with the specification.
5. Post-tensioning anchorage pockets shall be fully grouted with a polymer modified repair mortar. Minimum cover to any tendons or anchorage plate shall be as for the element in which they are located.
6. Concrete test cylinders used for assessing strength for tensioning are to be site cured in similar conditions to the concrete element being stressed.

ANCHORAGE RECESS GROUTING
NOT EXPOSED TO WEATHER (INTERNAL)
Exposure Class A1 as per AS3600

1. After final stressing and approval of extensions by the engineer, cut off strands to give 30mm minimum cover to ends of strands.
2. Provide records of measured cover at each anchor recess for the engineer to inspect and provide the opportunity for the engineer to inspect recesses.
3. Thoroughly clean anchorage pocket (use high pressure water jet if necessary) to remove all laitance, polystyrene etc.
4. Prime all concrete surfaces with 'Nitobond EP' or approved equivalent.
5. Grout up recess with 3:1 Sand: Cement grout mix or 'Renderoc HB'. Infill is to be finished flush with surrounding concrete surface.
6. The contractor shall provide records that demonstrate steps 3,4 & 5 have been satisfactorily completed at each anchor recess.

ANCHORAGE RECESS GROUTING
EXPOSED TO WEATHER (EXTERNAL)
Exposure Class B1 as per AS3600 - Near Coastal/Industrial
Exposure Class B2 as per AS3600 - Within 1km of coastline

1. After final stressing and approval of extensions by the engineer, cut off strands to give 30mm minimum cover to ends of strands.
2. Provide records of measured cover at each anchor recess for the engineer to inspect and provide the opportunity for the engineer to inspect recesses.
3. Thoroughly clean anchorage recess (use high pressure water jet if necessary) to remove all laitance, polystyrene etc.
4. Prime all metal surfaces with 'Nitoprime Zincrich' or approved equivalent.
5. Prime all concrete surfaces with 'Nitobond EP' or approved equivalent.
6. Grout up recess with 'Renderoc HB40' - applied as per manufacturers instructions. Infill is to be finished flush with surrounding concrete surface to the Superintendents requirements. A test sample is to be submitted for approval and used for acceptance/rejection criteria.
7. The contractor shall provide records that demonstrate steps 3,4,5 & 6 have been satisfactorily completed at each anchor recess.
8. Alternative products may be used as follows:
   SikaTop 110 in lieu of Nitoprime Zincrich and Nitobond EP Sika MonoTop 615 in lieu of Renderoc HB40



REINFORCEMENT NOTES

1. Fix reinforcement as shown on drawings. The type and grade is indicated by a symbol as shown below. On the drawings this is followed by a numeral which indicates the size in millimetres of the reinforcement.

N	Hot rolled ribbed bar	grade D500N
R	Plain round bar	grade R250N
SL	Square mesh	grade 500L
RL	Rectangular mesh	grade 500L

2. Provide bar supports or spacers to give the following concrete cover to all reinforcement unless otherwise noted on drawings.

Footings	-	50 top, 75 bottom, 75 sides.
Slabs	-	25 top, 25 bottom, 25 sides.
	-	30 when exposed to weather or ground.
Beams	-	25 bottom, 25 sides, 25 top to ties.
	-	30 when exposed to weather or ground.
Columns	-	30 to ties and spirals.
	-	30 when exposed to weather or ground.
Walls	-	20 generally.
	-	30 when cast in forms but later exposed to weather or ground.
	-	30 when cast directly in contact with ground.

3. Cover to reinforcement ends to be 50 mm UNO.
4. Provide N12-450 support bars to top reinforcement as required.
   Tension Lap UNO
5. Maintain cover to all pipes, conduits, reglets, drip grooves etc.
6. All cogs to be standard cogs unless noted otherwise.
7. Fabric end and side laps are to be placed strictly in accordance with the manufacturers requirements to achieve a full tensile lap. Fabric shall be laid so that there is a maximum of 3 layers at any location.

FABRIC LAPS

8. Laps in reinforcement shall be made only where shown on the drawings unless otherwise approved. Refer to Reinforcement Lap table below. Gap between lapped bars to be no more than 3 bar diameters as per AS3600 clause 13.2

TENSION LAPS

BAR SIZE	32 MPa CONCRETE: TOP BARS IN BANDS AND BEAMS	HORIZONTAL BARS IN WALLS & TOP BARS IN SLABS > 330 THICK	ALL OTHER BARS
N12	580	620	480
N16	800	920	700
N20	1130	1240	950
N24	1480	1590	1230
N28	1850	1940	1490
N32	2250	2300	1780
N36	2690	2700	2080
N40	3130	3130	2420

BAR SIZE	40 MPa CONCRETE: TOP BARS IN BANDS AND BEAMS	HORIZONTAL BARS IN WALLS & TOP BARS IN SLABS > 330 THICK	ALL OTHER BARS
N12	580	590	480
N16	770	870	670
N20	1050	1150	890
N24	1370	1440	1100
N28	1700	1740	1340
N32	2070	2070	1590
N36	2420	2420	1870
N40	2800	2800	2150

BAR SIZE	50 MPa CONCRETE: TOP BARS IN BANDS AND BEAMS	HORIZONTAL BARS IN WALLS & TOP BARS IN SLABS > 330 THICK	ALL OTHER BARS
N12	580	580	480
N16	770	780	640
N20	950	1040	800
N24	1230	1290	990
N28	1530	1550	1200
N32	1850	1850	1430
N36	2170	2170	1670
N40	2500	2500	1930

COMPRESSION LAPS

BAR SIZE	LAP
N16	640
N20	800
N24	960
N28	1120
N32	1280
N36	1440
N40	1600

Rev	Description	Eng	Draft	Date
1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
NOTES SHEET

Client
PARKVIEW FRASERS PROPERTY

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Scale : A1	Drawn	Authorised
1 : 1	EGB	KPB

Job No	Drawing No	Revision
211086	S0001	1

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FOR CONSTRUCTION

S0001 1
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Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING AND FOOTING PLAN		**Drawing Number:** S-S1001		

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

NOTE:
PAD FOOTINGS AND RETAINING WALLS ARE NOT PART OF CC1 ISSUE

FOOTING PLAN

Scale: 1 : 100

1. TOP OF FOOTINGS TO BE DETERMINED BY THE CONTRACTOR.
2. REFER TO ARCHITECTURAL DRAWINGS FOR LOCATION AND SETOUT OF ALL COLUMNS AND WALLS.
3. ALL LIFT PIT BASES AND WALLS BELOW GROUND LEVEL ARE TO HAVE XYPEX ADMIXTURE.
4. ALLOW ADDITIONAL CLEARANCE TO TOP OF FOOTINGS FOR HYDRAULIC SERVICES WHERE REQUIRED.
5. CONTRACTOR TO ALLOW FOR GEOTECHNICAL ENGINEER TO INSPECT AND CERTIFY THAT THE REQUIRED BEARING CAPACITIES HAVE BEEN ACHIEVED BEFORE CASTING FOOTINGS.
6. ⌖ DENOTES BOREHOLE LOCATIONS.
   REFER TO GEOTECHNICAL REPORT No. 86043.06 BY DOUGLAS PARTERS DATED MAY 2021.
7. FOR SHOTCRETE RETAINING WALL DESIGN REFER TO GEOTECHNICAL REPORT NO. 86043.23 REFERENCE No. R.005.REV1 DATED FEBRUARY 5 2024 BY DOUGLAS PARTNERS

NOTE:
FOR ANCHOR SPECIFICATIONS (LENGTH, DIAMETER OF HOLE, BAR TYPE AND DIAMETER, INCLINATION FROM THE HORIZONTAL, ETC)
REFER TO GEOTECNICAL REPORT 86043.23.R.005.REV1

WALL LEGEND

DENOTES 200 SHOTCRETE WALL AND SOIL NAIL AT 1500 CTS
TO BE INSTALLED DURING EXCAVATION PHASE
REFER TO GEOTECHNICAL REPORT FOR SOIL NAIL DETAILS.
EXTENT TO CONFIRMED AS EXVATION PROGRESSES IN 1.5m DROPS.



Rev	Description	Eng	Draft	Date
1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING AND FOOTING PLAN

Client
PARKVIEW FRASERS PROPERTY

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Job No	Drawing No	Revision
211086	S1001	1

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Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING WALL ELEVATIONS - SHEET 1		**Drawing Number:** S-S1011		

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

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NOTE:
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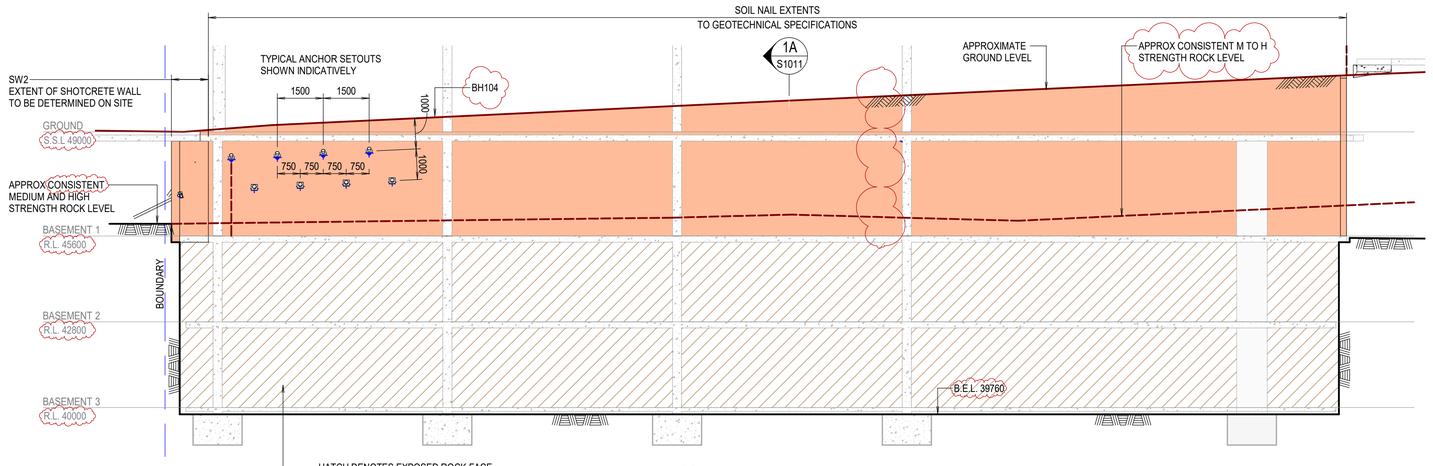

NOTE:
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EXTENT TO CONFIRMED AS EXVATION PROGRESSES IN 1.5m DROPS.

GEOTECHNICAL ENGINEER TO CONFIRM RETAINED HEIGHT AND THE REQUIREMENT FOR THE 1 OR 2 ROWS OF ANCHORS. WHERE 1 ROW IS REQUIRED THE SPACING WILL BE STAGGERED.
REFER TO CONCEPT DESIGN 86043.23.R.005.REV1.

2A
S1011

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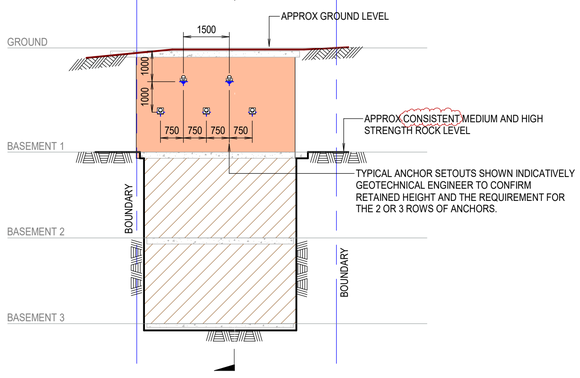

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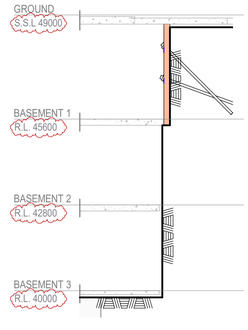

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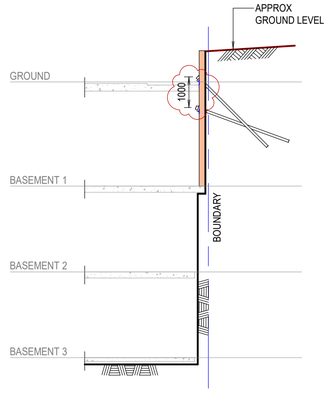

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Rev	Description	Eng	Draft	Date
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AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING WALL
ELEVATIONS - SHEET 1

Client
PARKVIEW FRASERS PROPERTY

Architect
TEAM2 ARCHITECTS
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Scale : A1	Drawn	Authorised
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Job No	Drawing No	Revision
211086	S1011	1

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S1011 1
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Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING WALL ELEVATIONS - SHEET 2		**Drawing Number:** S-S1012		

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1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

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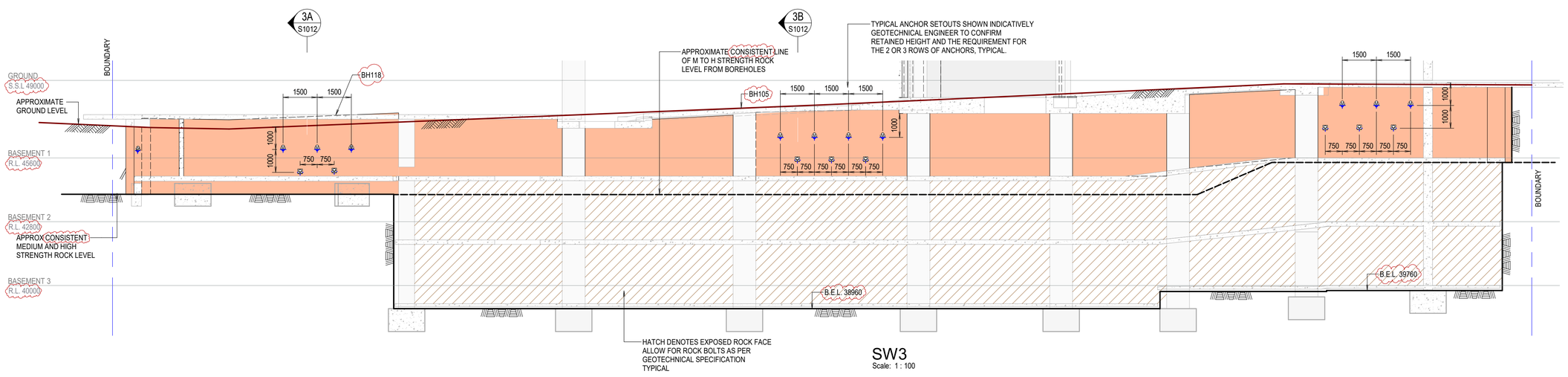

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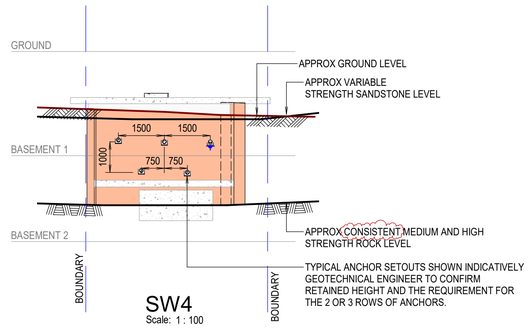

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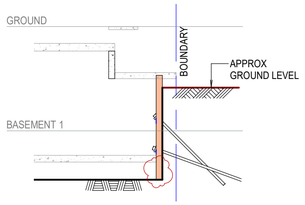

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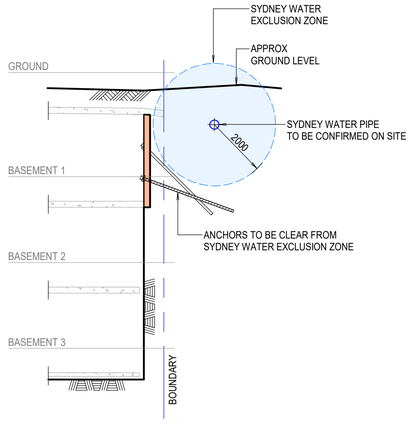

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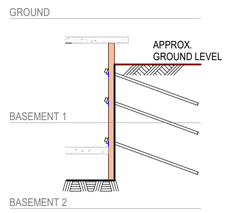

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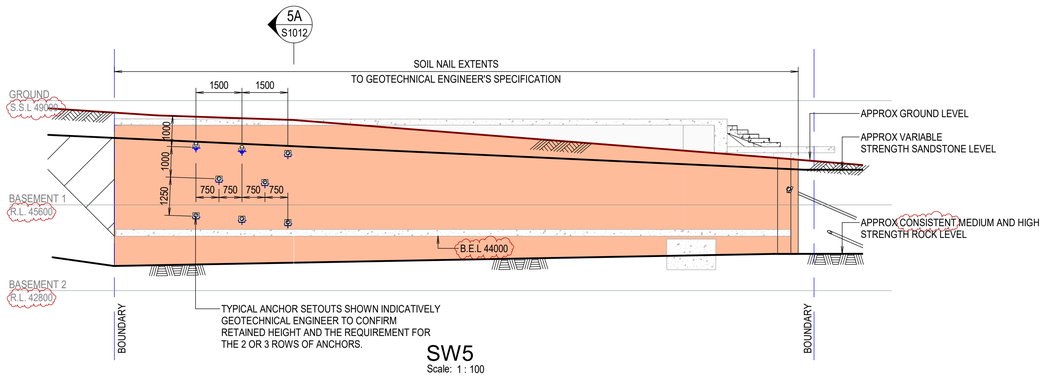

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NOTE:
FOR ANCHOR SPECIFICATIONS (LENGTH, DIAMETER OF HOLE, BAR TYPE AND DIAMETER, INCLINATION FROM THE HORIZONTAL, ETC)
REFER TO GEOTECNICAL REPORT 86043.23.R.005.REV1

WALL LEGEND

DENOTES 200 SHOTCRETE WALL AND SOIL NAIL AT 1500 CTS
TO BE INSTALLED DURING EXCAVATION PHASE
REFER TO GEOTECHNICAL REPORT FOR SOIL NAIL DETAILS.
EXTENT TO CONFIRMED AS EXVATION PROGRESSES IN 1.5m DROPS.

GEOTECHNICAL ENGINEER TO CONFIRM RETAINED HEIGHT AND THE REQUIREMENT FOR THE 1 OR 2 ROWS OF ANCHORS. WHERE 1 ROW IS REQUIRED THE SPACING WILL BE STAGGERED.
REFER TO CONCEPT DESIGN 86043.23.R.005.REV1.

1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24
Rev	**Description**	**Eng**	**Draft**	**Date**

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING WALL
ELEVATIONS - SHEET 2

Client
PARKVIEW FRASERS PROPERTY

Architect
TEAM2 ARCHITECTS
www.team2.com.au

Structural Engineer
TTW Structural Civil Traffic Façade
+61 2 9439 7288 | L6 73 Miller Street North Sydney NSW 2065

Scale : A1	Drawn	Authorised
1 : 100	EGB	KPB

Job No	Drawing No	Revision
211086	S1012	1

FOR CONSTRUCTION
NOT TO BE USED FOR CONSTRUCTION
21/02/2024 12:55:10 PM

S1012 1
Printed : 21/02/2024 12:55:10 PM by Rajan MISTRY

TO BE PRINTED IN COLOUR

A1 0 1 2 3 4 5 6 7 8 9 10

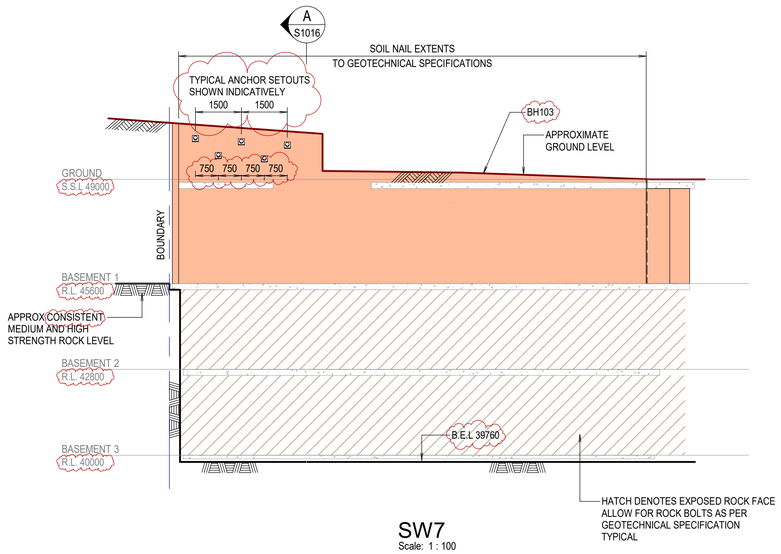
Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING WALL ELEVATIONS - SHEET 3		**Drawing Number:** S-S1016		

Rev	Date dd.mm.yy	Description	DP Full Name	Reg No
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336

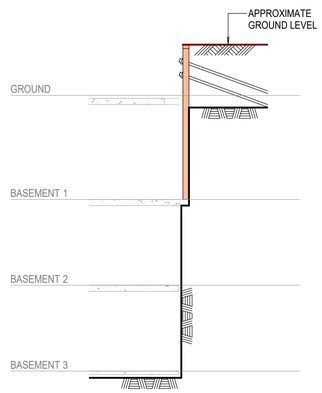
This drawing is copyright and is the property of TTW and must not be used without authorisation.

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING NO. S0001

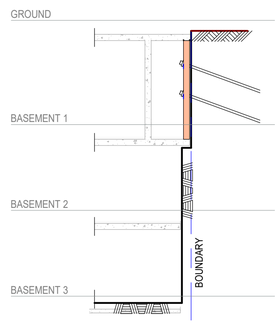
NOTE:
PAD FOOTINGS AND RETAINING WALLS ARE NOT PART OF CC1 ISSUE



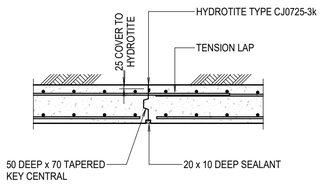
SW7
Scale: 1 : 100



SECTION A
Scale 1 : 100
S1016

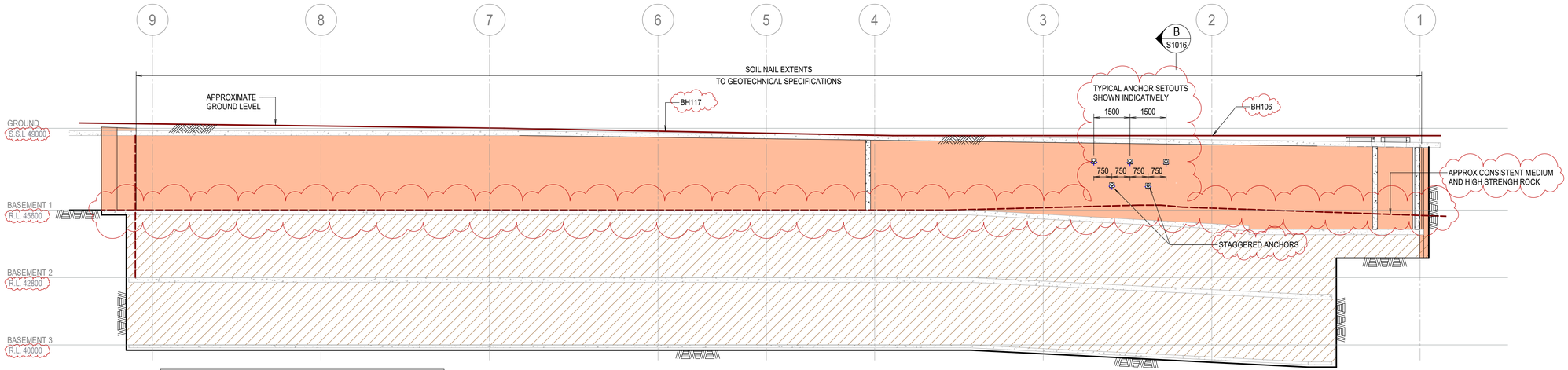


SECTION B
Scale 1 : 100
S1016



CJ - CONSTRUCTION JOINT
SCALE 1:20

NOTES:
1. REFER PLANS AND ELEVATIONS FOR LOCATIONS OF JOINTS. WPJ AND CJ MAY BE INTERCHANGED AT ANY LOCATIONS.
2. WATERSTOPS & SEALANTS (WITH BOND BREAKERS) TO BE INSTALLED IN ACCORDANCE WITH THE SPECIFICATION AND THE MANUFACTURERS INSTRUCTIONS.
3. CJ TO BE AT 8000 MAX CTS. EJ TO BE AT 30m MAX CTS
4. SEALANTS TO HAVE A MINIMUM FIRE RATING EQUIVALENT TO WALL.



SW6
Scale: 1 : 100

NOTE:
FOR ANCHOR SPECIFICATIONS (LENGTH, DIAMETER OF HOLE, BAR TYPE AND DIAMETER, INCLINATION FROM THE HORIZONTAL, ETC)
REFER TO GEOTECNICAL REPORT 86043.23.R.005.REV1

WALL LEGEND

DENOTES 200 SHOTCRETE WALL AND SOIL NAIL AT 1500 CTS
TO BE INSTALLED DURING EXCAVATION PHASE
REFER TO GEOTECHNICAL REPORT FOR SOIL NAIL DETAILS.
EXTENT TO CONFIRMED AS EXVATION PROGRESSES IN 1.5m DROPS.

GEOTECHNICAL ENGINEER TO CONFIRM RETAINED HEIGHT AND THE REQUIREMENT FOR THE 1 OR 2 ROWS OF ANCHORS. WHERE 1 ROW IS REQUIRED THE SPACING WILL BE STAGGERED.
REFER TO CONCEPT DESIGN 86043.23.R.005.REV1.

Rev	Description	Eng	Draft	Date
1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING WALL
ELEVATIONS - SHEET 3

Client
PARKVIEW FRASERS PROPERTY

Architect
TEAM ARCHITECTS
www.team2.com.au

Structural Engineer
TTW Structural Civil Traffic Façade
+61 2 9439 7288 | L6 73 Miller Street North Sydney NSW 2065

Scale : A1	Drawn	Authorised
As indicated	EGB	KPB

Job No	Drawing No	Revision
211086	S1016	1

21/02/2024 12:55:12 PM

FOR CONSTRUCTION

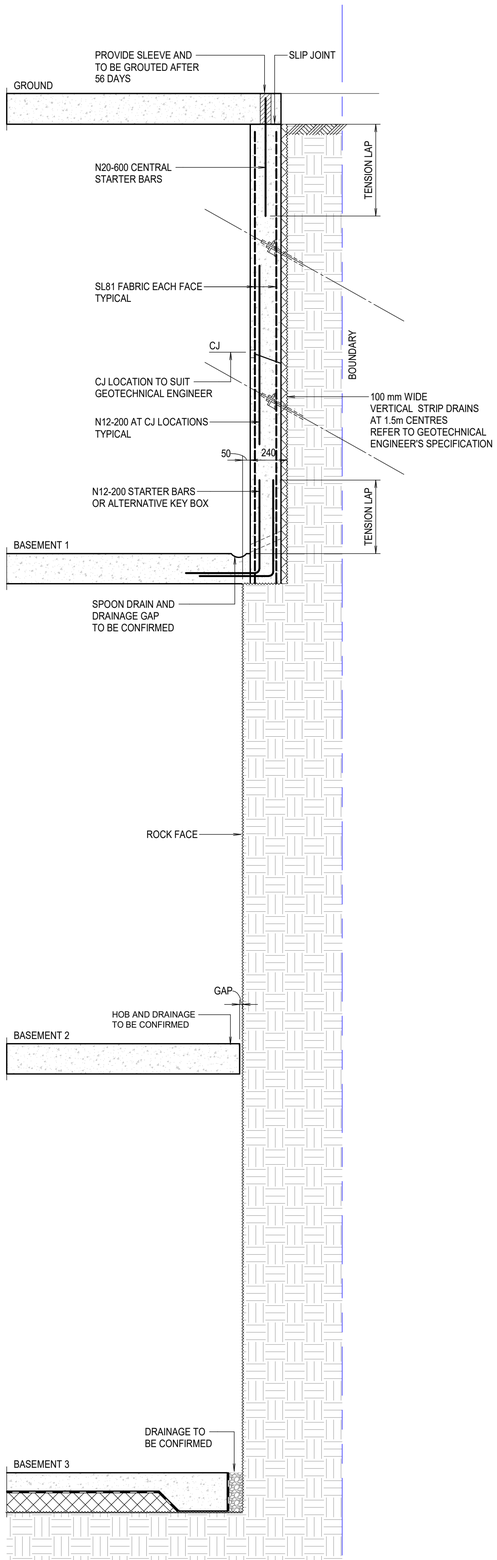
S1016 1
Printed : 21/02/2024 12:55:12 PM by Rajan MISTRY

TO BE PRINTED IN COLOUR
A1 0 1 2 3 4 5 6 7 8 9 10

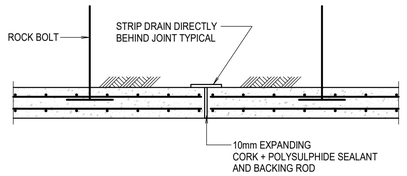
This drawing is copyright and is the property of TTW and must not be used without authorisation.

THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING NO. S0001

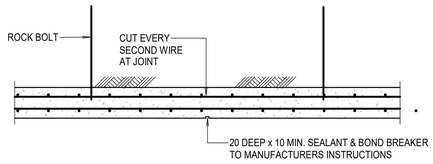
Regulated Design Record				
Project Address:				
Project Title	IVANHOE STAGE 2 BUILDING C3			
Consent No:	DA 2019/00096 S4.55 MOD 2020/0364	**Body Corporate Reg No:**	DEP0000532	
Drawing Title: SHORING DETAILS - SHEET 1		**Drawing Number:** S-S1031		
Rev	**Date** dd.mm.yy	**Description**	**DP Full Name**	**Reg No**
1	16.02.24	ISSUED FOR CONSTRUCTION	KEVIN BERRY	DEP0001336



TYPICAL SHOTCRETE WALL SECTION
Scale: 1 : 20



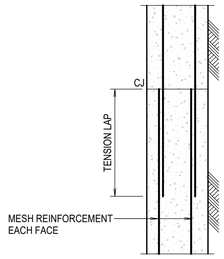
EJ - EXPANSION JOINT



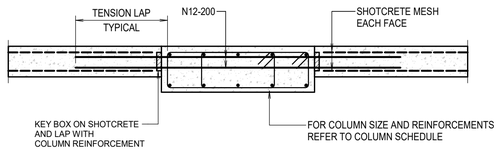
WPJ - WEAKENED PLANE JOINT

TYPICAL WALL JOINT DETAILS

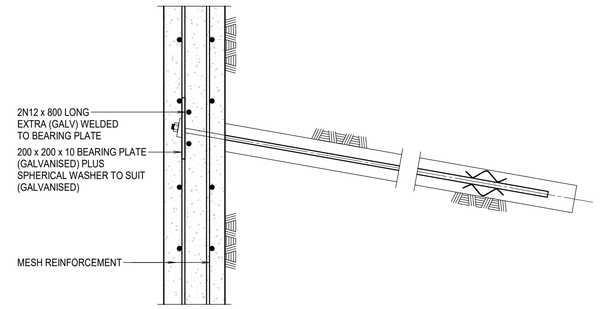
SCALE 1:20
NOTES:
1. REFER TO TYPICAL ROCK BOLT WALL ELEVATION NOTES FOR LOCATIONS OF JOINTS.



TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL
SCALE 1:10



TYPICAL WALL JOINT AT COLUMN
Scale: 1 : 20



TYPICAL ROCK BOLT DETAIL
SCALE 1:10

Rev	Description	Eng	Draft	Date
1	ISSUED FOR CONSTRUCTION	HN	EGB	21.02.24
AA	ISSUED FOR APPROVAL	HN	EGB	06.02.24

Project
IVANHOE STAGE 2
BUILDING C3

Sheet Subject
SHORING DETAILS - SHEET 1

Client
PARKVIEW FRASERS PROPERTY

Architect
TEAM ARCHITECTS
www.team2.com.au

Structural Engineer
TTW Structural Civil Traffic Façade
+61 2 9439 7288 | L6 73 Miller Street North Sydney NSW 2065

Scale : A1	Drawn	Authorised
As indicated	EGB	KPB

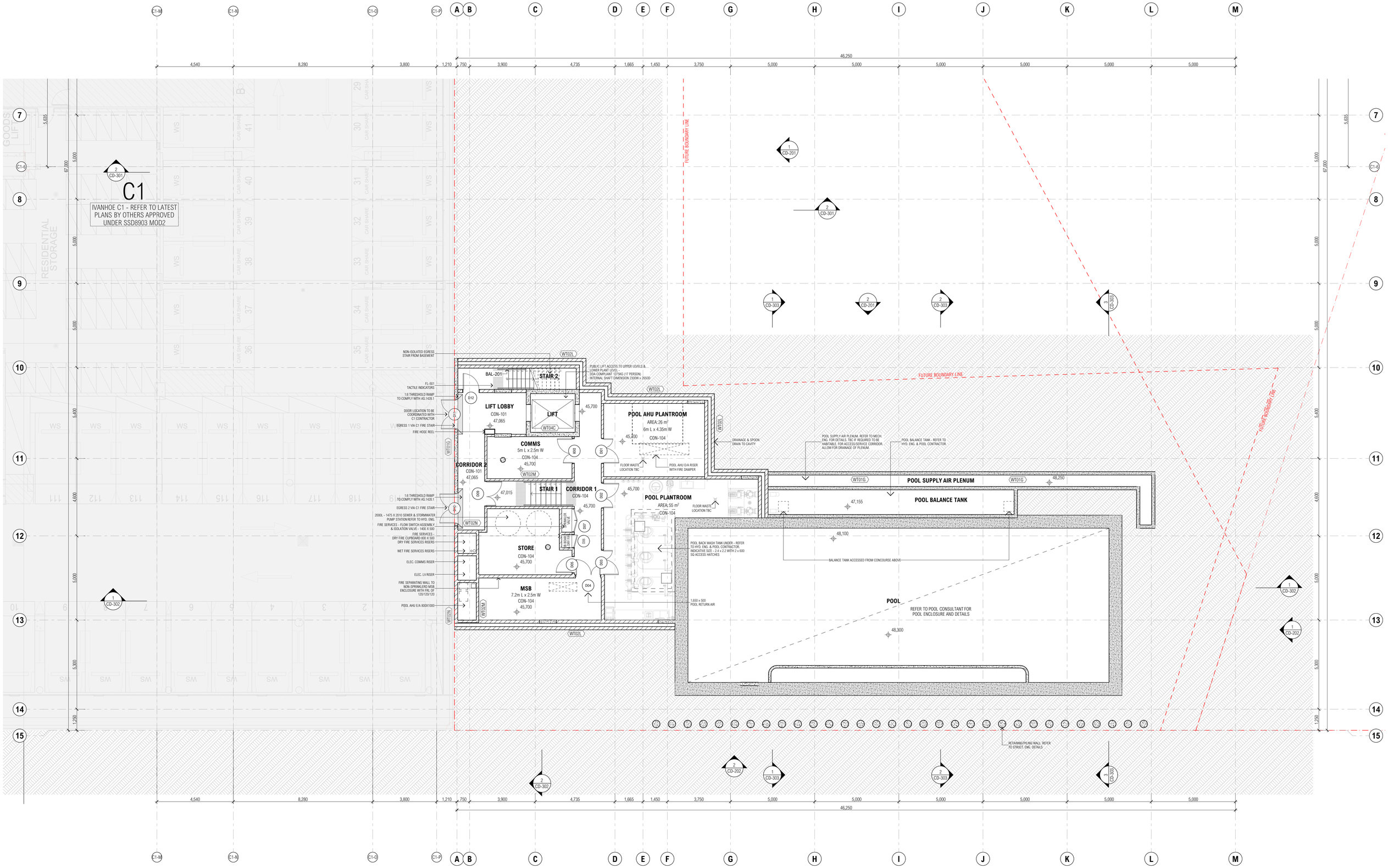
Job No	Drawing No	Revision
211086	S1031	1

21/02/2024 12:55:13 PM

FOR CONSTRUCTION

S1031 1
Printed : 21/02/2024 12:55:13 PM by Rajan MISTRY

TO BE PRINTED IN COLOUR
A1 0 1 2 3 4 5 6 7 8 9 10



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

GENERAL NOTES:
Do not scale from drawings. Use marked dimensions. To be read in conjunction with all other consultant's drawings. Immediately notify architect of any discrepancies. Copyright of this drawing to be retained by architect.

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.

REV	DATE	ISSUE
A	23/02/22	PRELIMINARY GA ISSUE
B	22/03/22	ISSUE FOR CO-ORDINATION
C	14/04/22	ISSUE FOR CO-ORDINATION
D	06/05/22	ISSUE FOR CO-ORDINATION
E	20/05/22	50% CO-ORDINATION ISSUE
F	11/06/22	ISSUE FOR CO-ORDINATION
G	17/06/22	ISSUE FOR CO-ORDINATION
H	01/07/22	70% TENDER ISSUE
I	16/05/23	ISSUE FOR CO-ORDINATION
L	15/06/23	50% TENDER ISSUE
M	15/07/23	70% TENDER ISSUE
N	03/08/23	70% TENDER ISSUE

PROJECT

IVANHOE VIILLAGE GREEN & COMMUNITY CENTRE

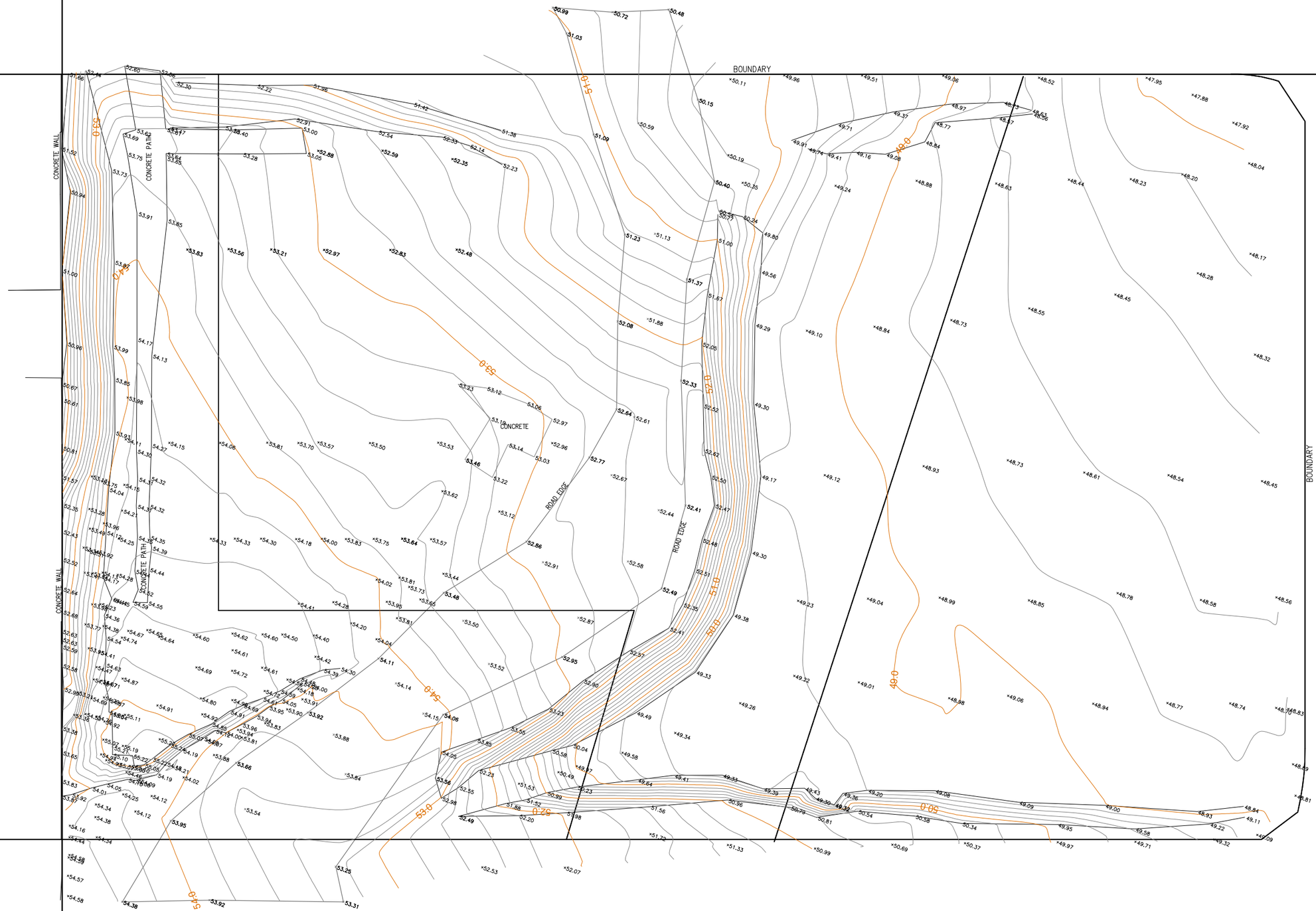
1 IVANHOE PLACE, MACQUARIE PARK NSW 2113

PROJECT NUMBER	PLOT DATE	DRAWN	CHECKED	SHEET SCALE	SHEET SIZE	NORTH
2041	03/08/23	LH	HR	1:100	A1	

DRAWING TITLE

BASEMENT PLAN A

DRAWING NUMBER	REVISION
A-CD-101	N



NOTE:

BOUNDARIES HAVE NOT BEEN DETERMINED BY SURVEY. BOUNDARIES SHOWN FROM PROVIDED DRAWING **C2 C3 Boundaries**.dwg.

PRIOR TO ANY CONSTRUCTION WORK, SURVEY MARKS SHOULD BE PLACED TO DEFINE THE PROPERTY BOUNDARIES.

NO SERVICES HAVE BEEN LOCATED AS PART OF THIS SURVEY.

ONLY GROUND LEVELS, CONCRETE, AND CHANGES OF GRADIENT HAVE BEEN SURVEYED.

LIMITED INFORMATION HAS BEEN GATHERED WHERE SITE SHEDS ARE PRESENT.

LEVELS ARE BASED ON AUSTRALIAN HEIGHT DATUM (AHD) USING PM50023 WITH RL 80.776 (AHD).

CONTOURS SHOWN DEPICT THE TOPOGRAPHY. EXCEPT AT SPOT LEVELS SHOWN THEY DO NOT REPRESENT THE EXACT LEVEL AT ANY PARTICULAR POINT. THE SPOT LEVELS ARE TRUE FOR THEIR POSITION, AND ARE INTENDED TO BE USEFUL TO REPRESENT THE GENERAL TERRAIN. CARE SHOULD BE TAKEN IF EXTRAPOLATING.

TSS TOTAL SURVEYING SOLUTIONS
ARTARMON | CAMDEN | MANLY VALE

DRAWING TITLE
C2/C3 PLOT
CONTOUR AND DETAIL
SURVEY PLAN

CLIENT: CHRISTIE CIVIL
PROJECT: IVANHOE
MACQUARIE PARK
220337

PLAN No.: 9054
DATE: 06/10/23 SCALE: NTS
DRAWN: IM
CHK:
CONT. INT.: 0.2m

DATUM: AHD
ORIGIN PM50023
MGA 94

DATE	REV	COMMENTS
06/10/23	0	FOR INFORMATION



PARKVIEW

MAIL TYPE	MAIL NUMBER	REFERENCE NUMBER
General Correspondence	Parkview-GCOR-008849	AustResi-GCOR-005800

CC1 Condition B44 utilities Services

From	Mr Mohamed Yaccoub - Parkview Constructions
To (2)	Mr Chris Michaels - City Plan Services
	Mr Safwat Abdelfattah - City Plan Services
Cc (5)	Mr Daniel Leaf - Frasers Property Australia - Residential
	Mr Joe Avgoustis - Frasers Property Australia - Residential
	Mr Antonio Screnci - Parkview Constructions
	Mr Warwick Davidson - Parkview Constructions
	Mr Roben Naamo - Parkview Constructions
Sent	Thursday, 8 February 2024

MESSAGE

Hi Saf/Chris,

I realised you still have condition B44 showing as outstanding on your RL. I was under the impression that the attached certified design and WAE drawings are sufficient in closing the condition out. Please confirm.

Regards,

Mohamed Yaccoub
Project Engineer

+61 427 520 238
Mohamed.yaccoub@parkview.com.au

Level 7, 60 Union Street, Pyrmont NSW 2009
PO Box R1779 Royal Exchange NSW 1225

www.parkview.com.au

From: D Leaf
Sent: 24/01/2024 10:26:34 AM AEDT (GMT +11:00)
To: Safwat Abdelfattah, Daniel Leaf
Cc: Chris Michaels, Joe Avgoustis, Arturo Liceralde, Warwick Davidson, Antonio Screnci, Mohamed Yaccoub
Mail Number: AustResi-GCOR-006277
Subject: Re: Building C3 - Construction Certificates RL List / Certifier Thread - C22, B43 and B44

Saf - just to also add - I have extracted the signed WAE drawing for the external HV supplying the site by surveyor and current certified designs internally and externally.

Apologies I am getting my projects mixed up.

Thanks,

Daniel Leaf
Project Manager - Development
Frasers Property Australia

Mob: +61 423 300 698 Tel: +61 2 9767 2922

From: D Leaf
Sent: 24/01/2024 10:13:44 AM AEDT (GMT +11:00)
To: Safwat Abdelfattah
Cc: Chris Michaels, Joe Avgoustis, Warwick Davidson, Antonio Screnci, Mohamed Yaccoub
Mail Number: AustResi-GCOR-006276
Subject: Re: Building C3 - Construction Certificates RL List / Certifier Thread - C22, B43 and B44

Thanks Saf - in relation to B44 we have certified designs for the external HV and LV servicing the site - but PKV will not have certified designs for the substations and internal site works for a couple of months, so I assume this is OK.

For the telecommunications - much the same and I have attached FiberCorp (Midtown telecomm provider) statement. Moey - if this doesn;t suffice can you seek a statement from Fibercorp please while they work on A1.

Thanks,

Daniel Leaf
Project Manager - Development
Frasers Property Australia

Mob: +61 423 300 698 Tel: +61 2 9767 2922

From: S Abdelfattah
Sent: 24/01/2024 9:58:48 AM AEDT (GMT +11:00)
To: Daniel Leaf
Cc: Chris Michaels, Joe Avgoustis, Warwick Davidson, Antonio Screnci, Mohamed Yaccoub
Mail Number: CPS-GCOR-000017
Subject: Re: Building C3 - Construction Certificates RL List / Certifier Thread - C22, B43 and B44

Hi Daniel,

I will send you an amended RL prior to our meeting at 11am.

Most items in your email have been closed out except for Condition B44. To close the item we will either require a statement from the authority itself or a statement from services consultant involved that this condition has been satisfied.

Kind Regards,

SAF ABDELFATTAH
Building Regulations Consultant

BUILDING | HERITAGE | ACCESS | PLANNING

Level 6,120 Sussex St Sydney NSW 2000
Tel: +61 2 8270 3500
www.cityplan.com.au

SYDNEY | BRISBANE | CENTRAL COAST | GOLD COAST

From: D Leaf
Sent: 18/01/2024 10:31:11 AM AEDT (GMT +11:00)
To: Safwat Abdelfattah, Daniel Leaf
Cc: Chris Michaels, Joe Avgoustis, Warwick Davidson, Antonio Screnci, Mohamed Yaccoub
Mail Number: AustResi-GCOR-006246
Subject: Building C3 - Construction Certificates RL List / Certifier Thread - C22, B43 and B44

Team,

See below and related attachments from our discussion yesterday

C22 - Aboriginal Cultural Heritage - submit copy of report - refer attached
B43 - Utility Services - refer attached Christie Civils WAE drawings (in project mail AustResi-GCOR-006096) for the Christies Civils works completed (Saf for context refer attached drone photos of the site and works completed at the C3 end of site). This includes executed works on behalf of utility providers.
B44 - Utility Services - as per attached and above B44
B34 - Road Occupancy Licence - I can confirm that the roads within Midtown that PKV will be operating on have not been handed over to authorities and remain in FPA management. As a result ROL currently is not applicable.

If I've missed any for us to work through please let me know

Saf - can we please have an updated register to run through next week

Thanks,

Daniel Leaf
Project Manager - Development
Frasers Property Australia

Mob: +61 423 300 698 Tel: +61 2 9767 2922

From: D Leaf
Sent: 17/01/2024 11:19:29 AM AEDT (GMT +11:00)
To: Safwat Abdelfattah
Cc: Chris Michaels, Joe Avgoustis, Warwick Davidson, Antonio Screnci, Mohamed Yaccoub
Mail Number: AustResi-GCOR-006244
Subject: Fwd: Building C3 - Construction Certificates RL List / Certifier Thread - Frasers

Hey Saf

FYI

Thanks,

Daniel Leaf
Project Manager - Development
Frasers Property Australia

Mob: +61 423 300 698 Tel: +61 2 9767 2922

From: D Leaf
Sent: 25/10/2023 11:28:45 AM AEDT (GMT +11:00)
To: Santi Mantarro
Cc: Chris Michaels, Mario Patrus, Joe Avgoustis, Antonio Screnci
Mail Number: AustResi-GCOR-005851
Subject: Re: Building C3 - Construction Certificates RL List / Certifier Thread - Frasers

Hey Santi,

B66 - relates to contaminated groundwater and is Contractor responsibility per matrix. Let me know if anything further needed.

B67 - please see attached Water Access License provided to us by our Development Team.

Thanks,

Daniel Leaf
Project Manager - Development
Frasers Property Australia

Mob: +61 423 300 698 Tel: +61 2 9767 2922

From: S Mantarro
Sent: 24/10/2023 3:44:19 PM AEDT (GMT +11:00)
To: Daniel Leaf
Cc: Chris Michaels, Mario Patrus, Joe Avgoustis, Jason Kerley, Antonio Screnci
Mail Number: Parkview-GCOR-008204
Subject: Re: Building C3 - Construction Certificates RL List / Certifier Thread - Frasers

Hi Daniel,

Thank you for the below.

I just realized didn't include, in my previous correspondence, the following DA conditions as part of the documentation that would be required from you for CC1.

Development Consent

- Groundwater design, B66 & B.67 - Approved design by NRAR;

Your comments below are noted.

Thank you.

Best Regards,

Santi Mantarro
Pre Construction Design Manager

0438 090 916
santi.mantarro@parkview.com.au

Level 7, 60 Union Street, Pyrmont NSW 2009
PO Box R1779 Royal Exchange NSW 1225
www.parkview.com.au

From: D Leaf
Sent: 24/10/2023 3:29:55 PM AEDT (GMT +11:00)
To: Santi Mantarro
Cc: Chris Michaels, Mario Patrus, Joe Avgoustis, Jason Kerley, Antonio Screnci
Mail Number: AustResi-GCOR-005844
Subject: Re: Building C3 - Construction Certificates RL List / Certifier Thread - Frasers

Santi - see below responses in blue for now, will confirm remaining in next few days.

Thanks,

Daniel Leaf
Project Manager - Development
Frasers Property Australia

Mob: +61 423 300 698 Tel: +61 2 9767 2922

From: S Mantarro
Sent: 24/10/2023 2:54:37 PM AEDT (GMT +11:00)
To: Daniel Leaf
Cc: Chris Michaels, Mario Patrus, Joe Avgoustis, Jason Kerley, Antonio Screnci
Mail Number: Parkview-GCOR-008202
Subject: Re: Building C3 - Construction Certificates RL List / Certifier Thread - Frasers

Hi Daniel,
Thank you for the below.
As mentioned, I'm going through the CC1 Stage 1 requirements for shoring and excavation and after a quick review of the CC checklist & the DA Cond. provided, there are some items that would require to be provided by you to satisfy the PCA request.
Refer to below list for your reference.

PCA CC checklist

- 11.1 - Sydney Water BPA;
- 15.1 - Planning agreement ; Planning Agreement - SSD15822622 - Development Consent in AustResi-GCOR-005800 provided

Development Consent

- A.2 - Approved plans; Transmitted on AustResi-TRANSMIT-000383 - please note this are uploaed already onto the document register under Building C3 for future reference.
- B.49 - Sydney Water Sect.73 NOR.

Would be appreciated if you could provide copy of the above documentation to satisfy & close-out the relevant DA cond. & PCA items.

Further to the above, can you also provide the DA Responsibility Matrix as well the PCA CC Requirements List in excel format so I can combine the documentation so can keep track of the CC status. Converted PCA req List & DA Resp Matrix attached.
Best Regards,

Santi Mantarro
Pre Construction Design Manager

0438 090 916
santi.mantarro@parkview.com.au

Level 7, 60 Union Street, Pyrmont NSW 2009
PO Box R1779 Royal Exchange NSW 1225
www.parkview.com.au

From: D Leaf
Sent: 17/10/2023 10:50:01 AM AEDT (GMT +11:00)
To: Chris Michaels, Mario Patrus, Antonio Screnci
Cc: Joe Avgoustis
Mail Number: AustResi-GCOR-005800
Subject: Building C3 - Construction Certificates RL List / Certifier Thread

Antonio, Chris,

In relation to C3 - just opening up a CC thread when the time comes to start progressing and lodging documentation.

I have attached previously issued City Plan RL list and the current consent conditions FYI.

Thanks,

Daniel Leaf
Project Manager - Development
Frasers Property Australia

Mob: +61 423 300 698 Tel: +61 2 9767 2922

Sydney WATER Tap in

Services | Dashboard | Complete a connection | Account details | Help | Log out

Section 73 application

Your details ✓ — Application ✓ — Submit order ✓ — 4 Confirmation

Order confirmation

✔ Thank you for your order

Your payment of **$1,053.81** has been received and your receipt number is: **3696649589**

A copy of your order confirmation has been emailed to **antonio.screnci@parkview.com.au**

The reference for your application is **1831136**

Next steps

Once your application has been received by the Developer Direct team, a Case Manager will be assigned and contact you directly within **3 business days**.

Your case manager will discuss and advise what is required for the next steps.

Application for order #SW-02275959

Lot 26 DP1294659

Section 73 application

Application: 1831136

We have received your application

Your application has been sent to our Developer Direct team for assessment. One of our case managers will be in touch within a few days to discuss your application further.

Next steps

We'll notify you via email as soon as your order is complete.You can also track your order(s), print invoices and view diagrams from the dashboard page at any time.

Applications are usually processed by our Developer Direct team within **3 business days** from the time your application was submitted.We may need to contact you if we need more information.

Have a question?

Call us on **1300 082 746**
or
email us at **developerdirect@sydneywater.com.au**

✔ Paid invoices

Invoice #AAB-666062770 — **Total paid $1,053.81** (Incl. GST) $72.59

1. Section 73 application and certificate fee Manual Assessment	$234.65 (Incl. GST) $0.00
2. Building plan application fee Manual Assessment	$20.70 (Incl. GST) $0.00
3. Section 73 assessment fee Manual Assessment	$798.46 (Incl. GST) $72.59
4. Sewer Service Diagram Manual Assessment	$0.00 (Incl. GST) $0.00

Print invoice

Documents

Date	File name	Description	Uploaded by
21-02-2024	A-100-003_T6 100 Site Plans Site Plan.pdf	Building/development plan	Customer
21-02-2024	SSDA-Treehouse.pdf	Development Approval(DA) or Council consent	Customer

Transaction Summary

Tax invoice: **AAB-666062770**

Date requested 21 Feb 2024
Date paid 21 Feb 2024

Sydney Water Corporation
PO Box 399 Parramatta NSW 2124
A.B.N 49 776 225 038

Applicant details

Antonio Screnci
60 Union St,Pyrmont,2009

Transaction Details

Lot 26 DP1294659

Order number: **SW-02275959**

Section 73

Application number: **1831136**

Building plan application fee Manual Assessment	$20.70 (incl. GST) $0.00
Section 73 assessment fee Manual Assessment	$798.46 (incl. GST) $72.59
Sewer Service Diagram Manual Assessment	$0.00 (incl. GST) $0.00
Section 73 application and certificate fee Manual Assessment	$234.65 (incl. GST) $0.00

Transaction total **$1,053.81**

(incl. GST) $72.59

BOX 1W
(AT105792)

NEW SOUTH WALES

CERTIFICATE OF TITLE

WATER MANAGEMENT ACT, 2000

WAL TITLE REFERENCE	
WAL44843	
EDITION	DATE OF ISSUE
1	21/6/2023
CERTIFICATE AUTHENTICATION CODE	
KQQC-LJ-F7VJ	

This certificate is issued under s87B of the Water Management Act, 2000.

ANY ATTEMPT TO ALTER THIS CERTIFICATE COULD RESULT IN HEAVY FINES OR IMPRISONMENT (S.141 REAL PROPERTY ACT).

WARNING NOTE: INFORMATION ON THIS REGISTER IS NOT GUARANTEED

TENURE TYPE: CONTINUING

HOLDER(S)

FRASERS PROPERTY IVANHOE PTY LIMITED

ENCUMBRANCES
---
1. TERM TRANSFER: NIL

ACCESS LICENCE DETAILS

CATEGORY: AQUIFER

SHARE COMPONENT:
SHARE - 40 UNITS
WATER SOURCE - SYDNEY BASIN CENTRAL GROUNDWATER SOURCE
WATER SHARING PLAN - GREATER METROPOLITAN REGION GROUNDWATER SOURCES 2011

EXTRACTION COMPONENT:
TIMES/RATES/CIRCUMSTANCES - SUBJECT TO THE CONDITIONS OF THE WATER ACCESS LICENCE
EXTRACTION FROM - AQUIFER
EXTRACTION ZONE - WHOLE WATER SOURCE

NOMINATED WORKS:
WORK APPROVAL NUMBER(S) - NIL
INTERSTATE TAGGING ZONE - NIL

CONDITIONS

LICENCE CONDITIONS FORM A PART OF THIS LICENCE AND AFFECT THE SHARE AND EXTRACTION COMPONENTS. CONDITION STATEMENTS ARE AVAILABLE FROM WATERNSW

NOTES

A WATER LICENCE INFORMATION SHEET IS AVAILABLE FROM THE WATERNSW WEBSITE AND SHOULD BE REFERRED TO IN INTERPRETING THIS LICENCE.
WATERNSW PHONE 1300 662 077, EMAIL CUSTOMER.HELPDESK@WATERNSW.COM.AU
LICENCE REFERENCE NUMBER: 10AL124847

**** END OF CERTIFICATE ****

Ref: BMY/LF 300001(C3)

6th December 2023

Parkview
Level 7, 60 Union Street
PYRMONT NSW 2011

Attention: Santi Mantarro

Dear Santi,

MIDTOWN MAC PARK – BUILDING C3 FLOOD LETTER

With reference to condition B79 of SSD 15822622, we hereby certify that the C3 building site is located wholly above the 1% AEP flood level and therefore the requirements of condition B79 are not applicable to project.

This certification is based upon an approximate proposed ground floor FFL of 47.5 and the flood levels contained within the flood report approved under the SSD approval (PMF level RL 46.14).

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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Australia
PO Box 1181, Broadway NSW 2007

Tel: +61 2 8960 7755
Fax: +61 2 8960 7745

ABN 54 010 830 421

www.bmt.org

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".

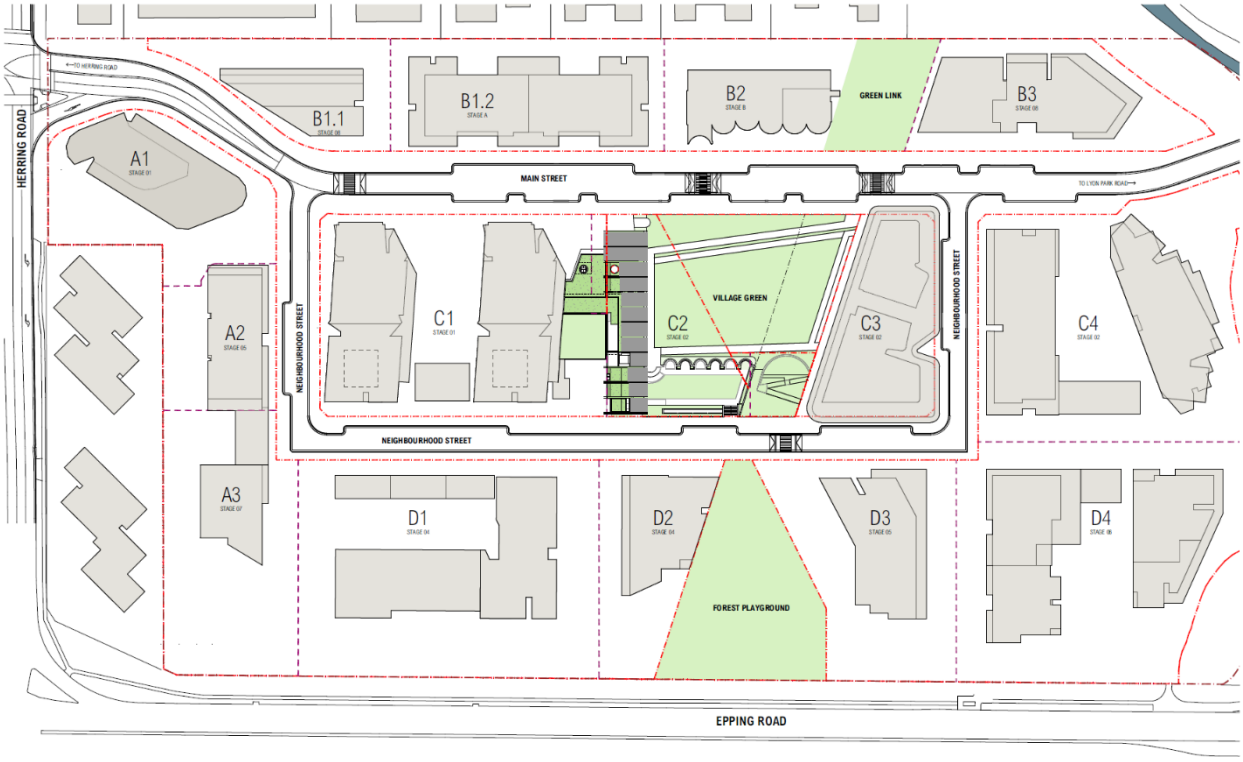


Figure 1 Midtown Stage 2 – Block C2 Village Green and Community Centre (CHROFI, Drawing Number A-A-002 Rev 02 issued 22/6/2021)

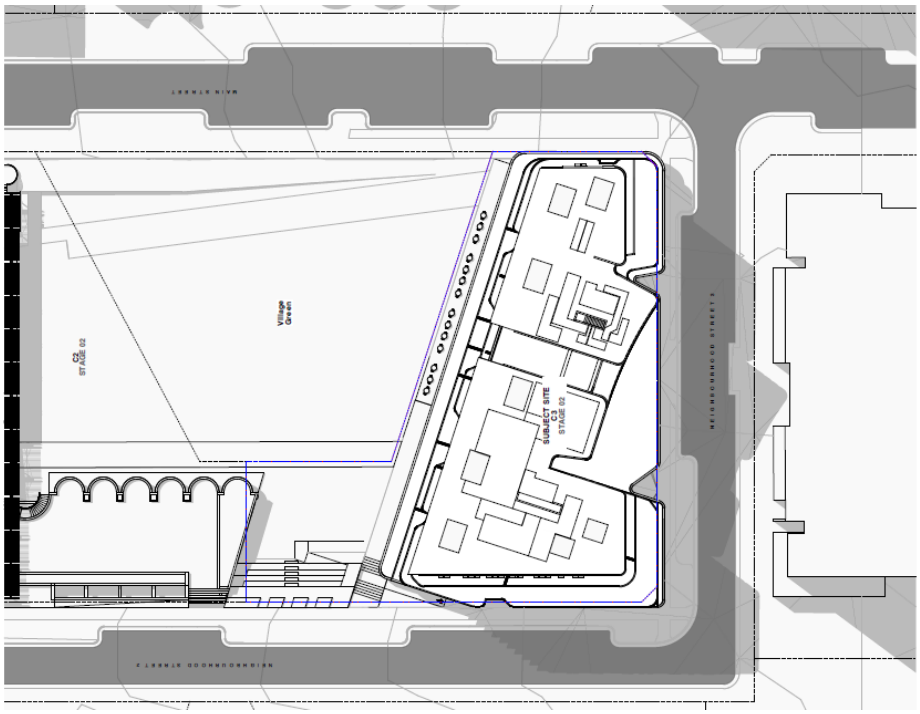


Figure 2 Midtown Stage 2 – Block C3 Residential and Retail (Fox Johnston, Drawing Number A-A-100-P3 Rev 003 issued 11/6/2021)

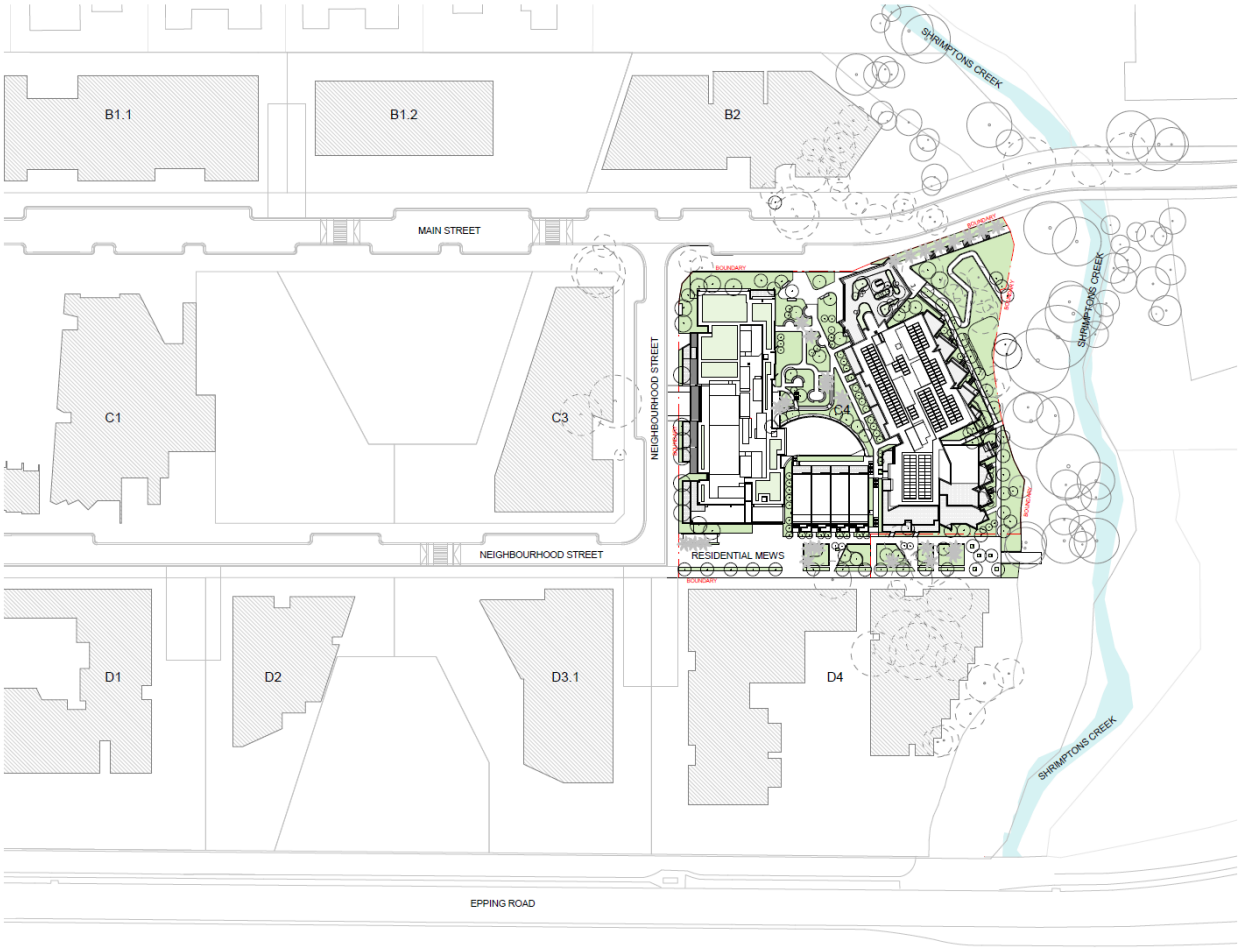


Figure 3 Midtown Stage 2 – Block C4 Residential and Social (Cox Architecture, Drawing Number A-DA-1100 Rev D issued 25/6/2021)

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)			

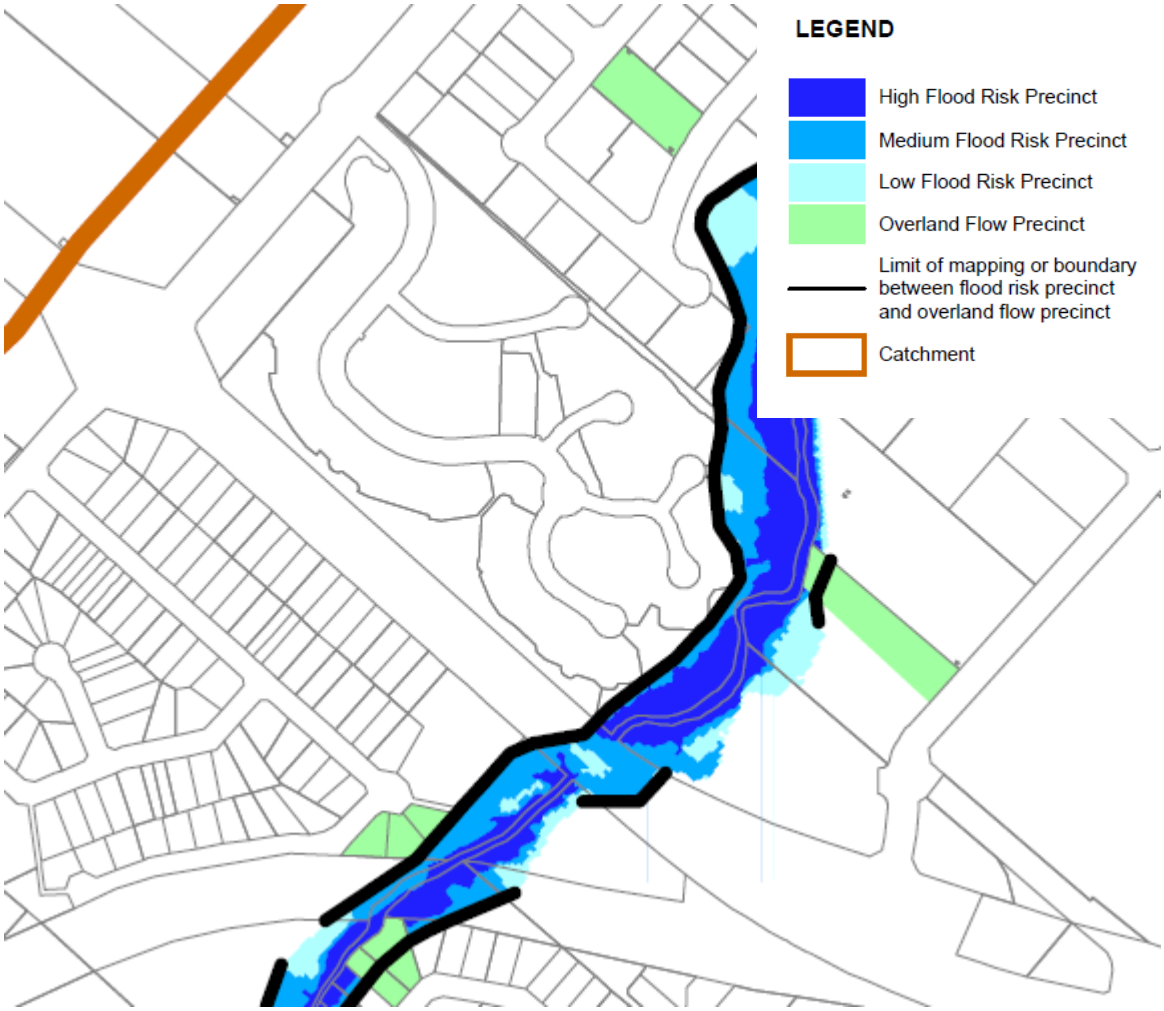


Figure 4 Flood Risk and Overland Flow Precincts based on Macquarie Park Floodplain Risk Management Study and Plan Final Report (Bewsher, 2011)

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.

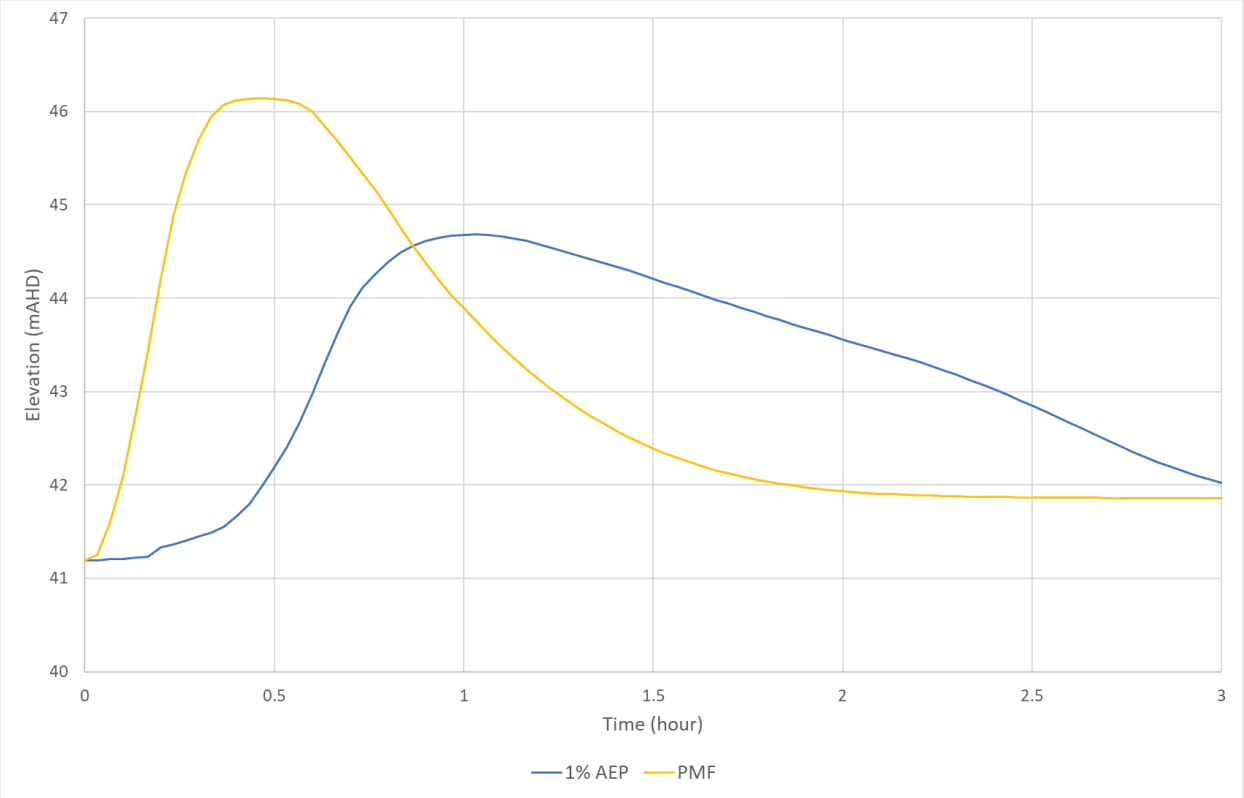


Figure 5 Shrimptons Creek Water Level Rise over Time

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

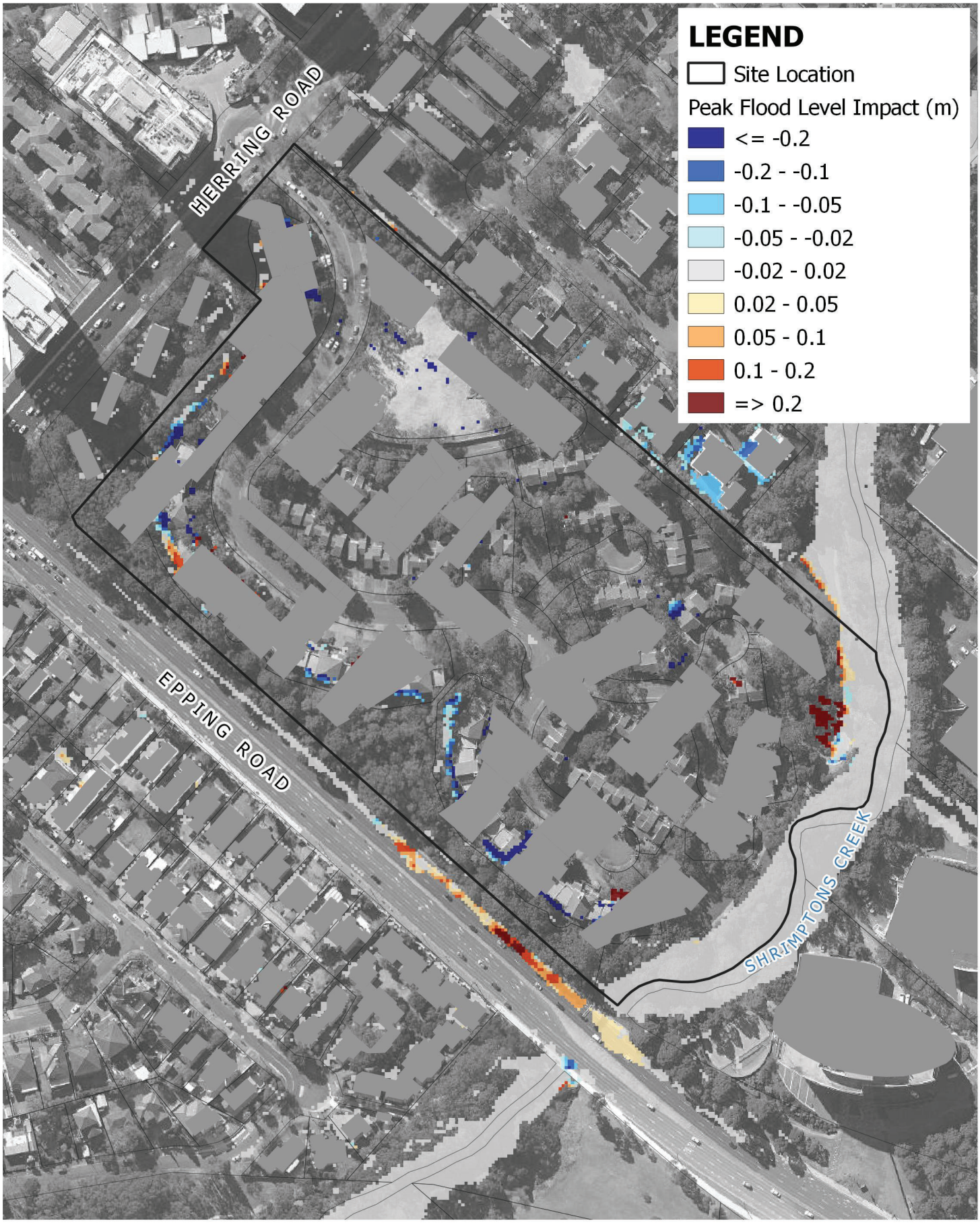


Nathan Cheah
Associate Principal Engineer
BMT

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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BMT

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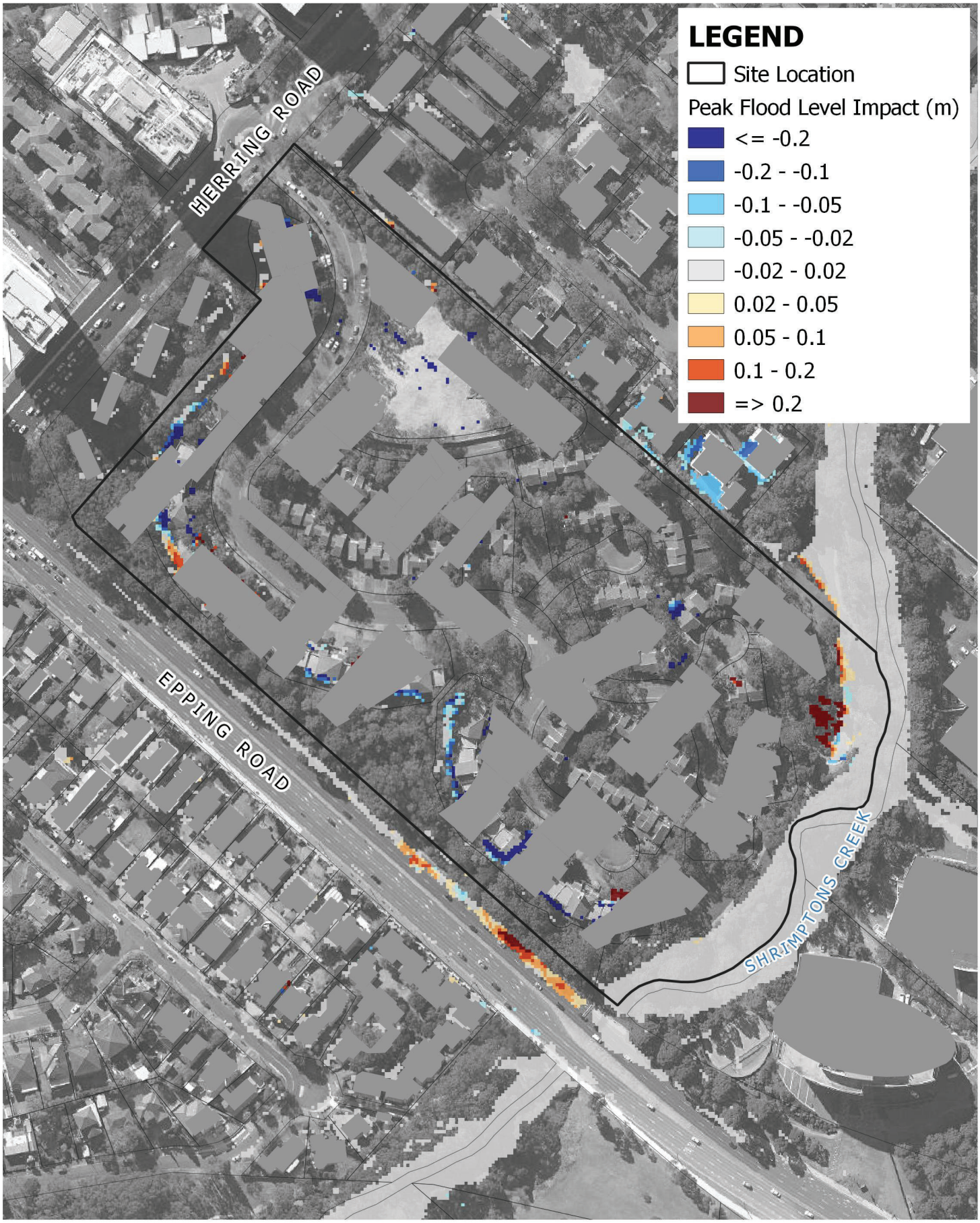

Title:

Peak Flood Level Impact
5% AEP Event - Blockage Scenario

Figure: 2

Rev: A

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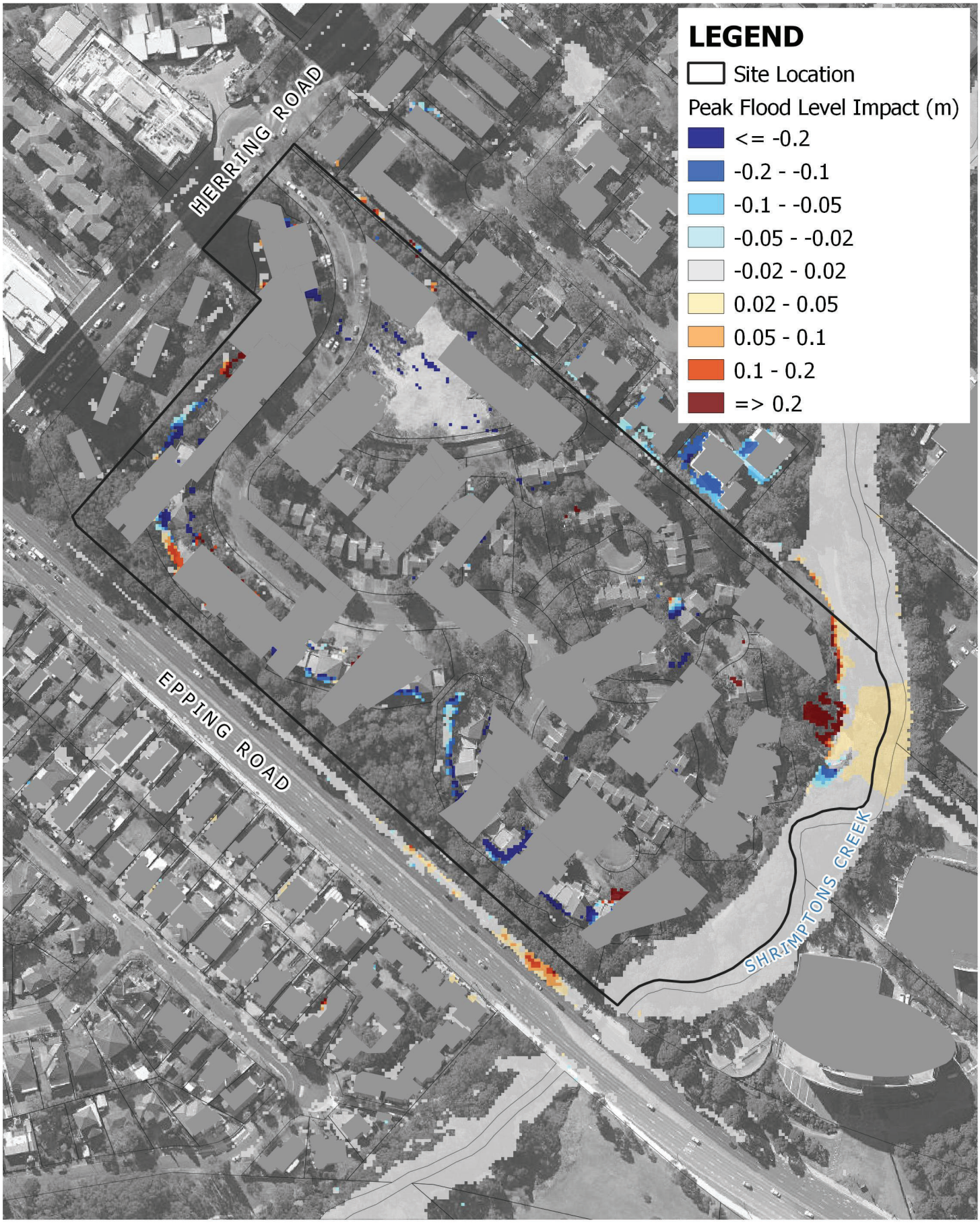

Title:

Peak Flood Level Impact
1% AEP Event - No Blockage Scenario

Figure: 3

Rev: A

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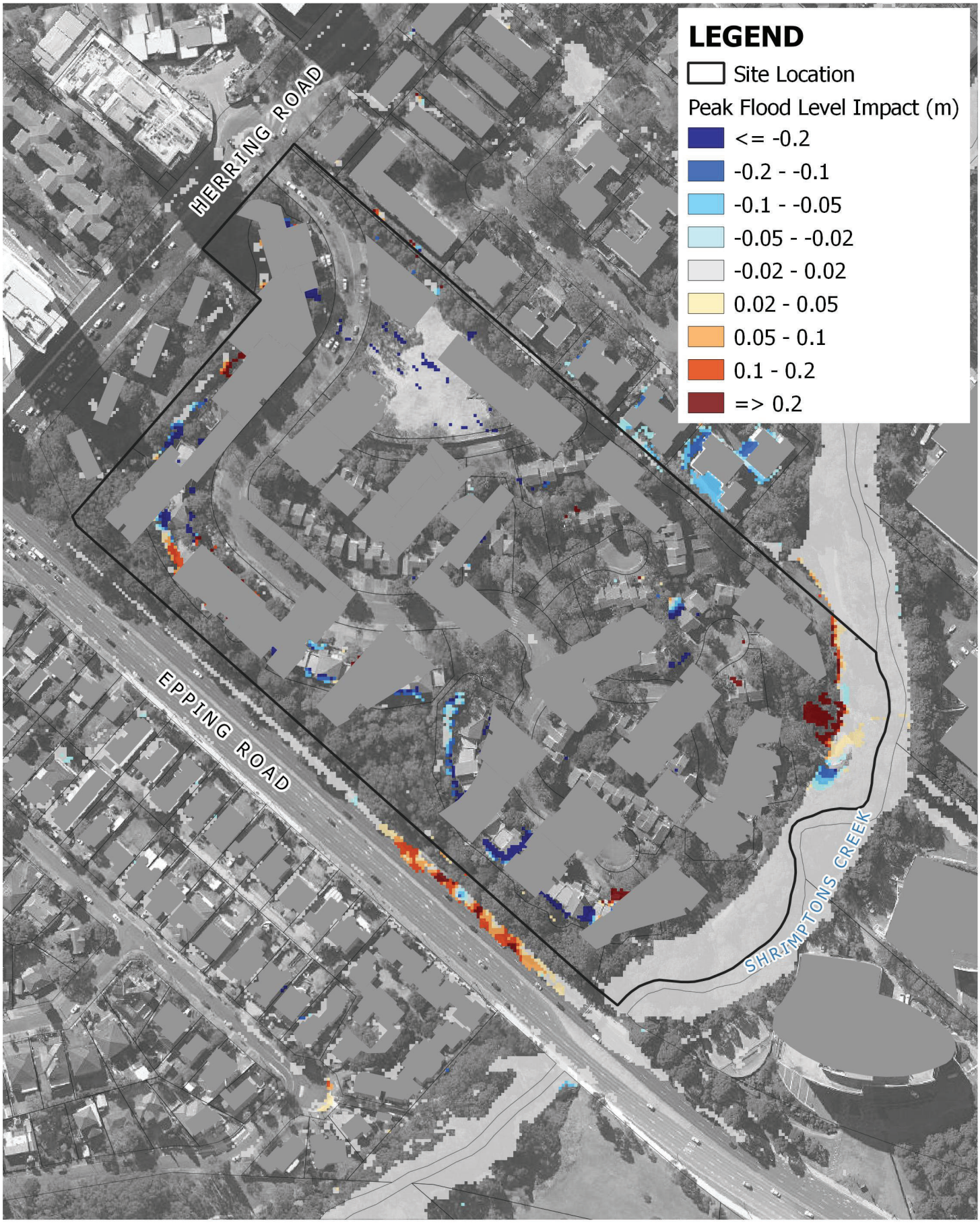

Title:

Peak Flood Level Impact
1% AEP Event - Blockage Scenario

Figure: 4

Rev: A

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BMT

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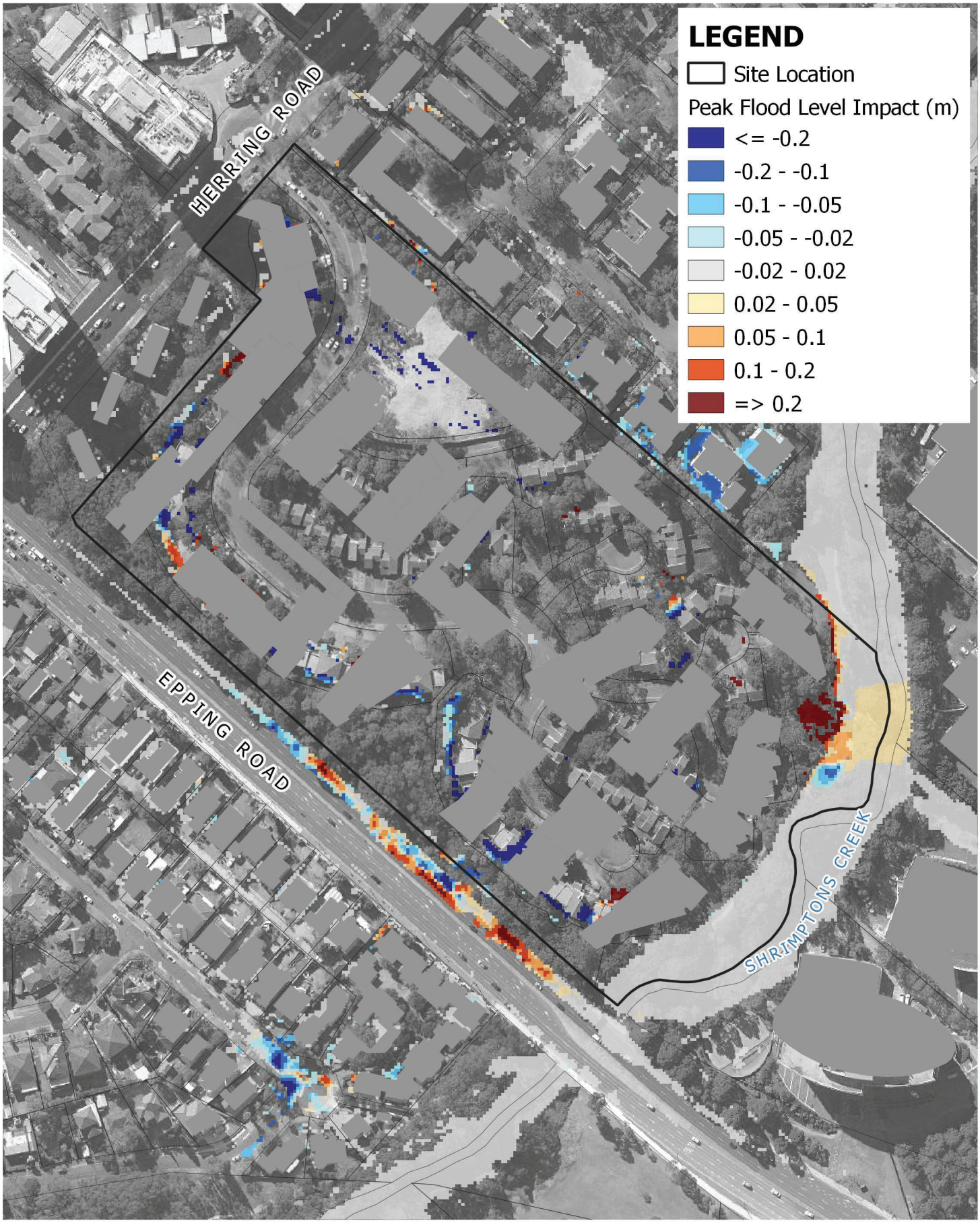

Title:

Peak Flood Level Impact
1% AEP with Climate Change - No Blockage Scenario

Figure: 5

Rev: A

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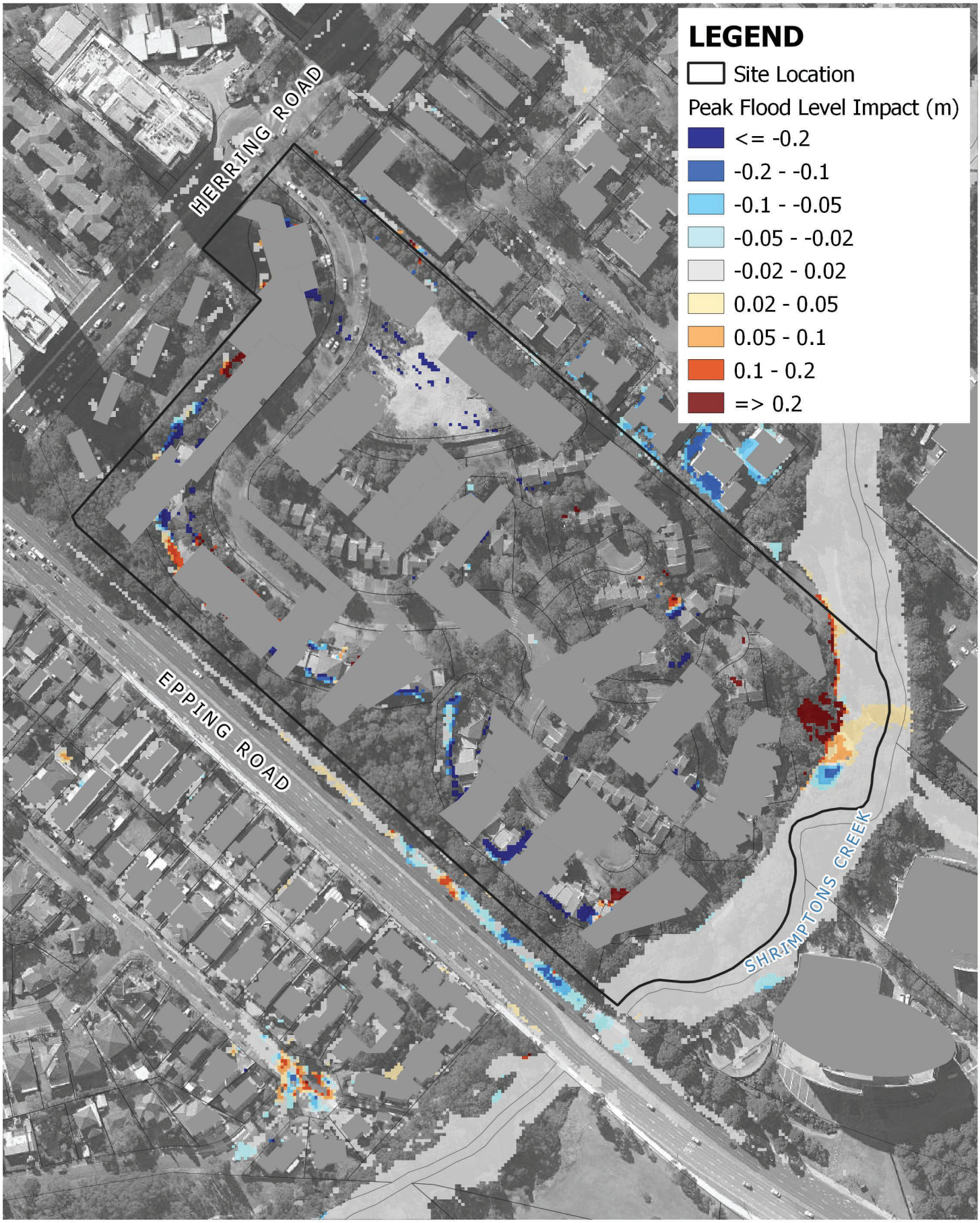

Title:

Peak Flood Level Impact
1% AEP with Climate Change - Blockage Scenario

Figure: 6

Rev: A

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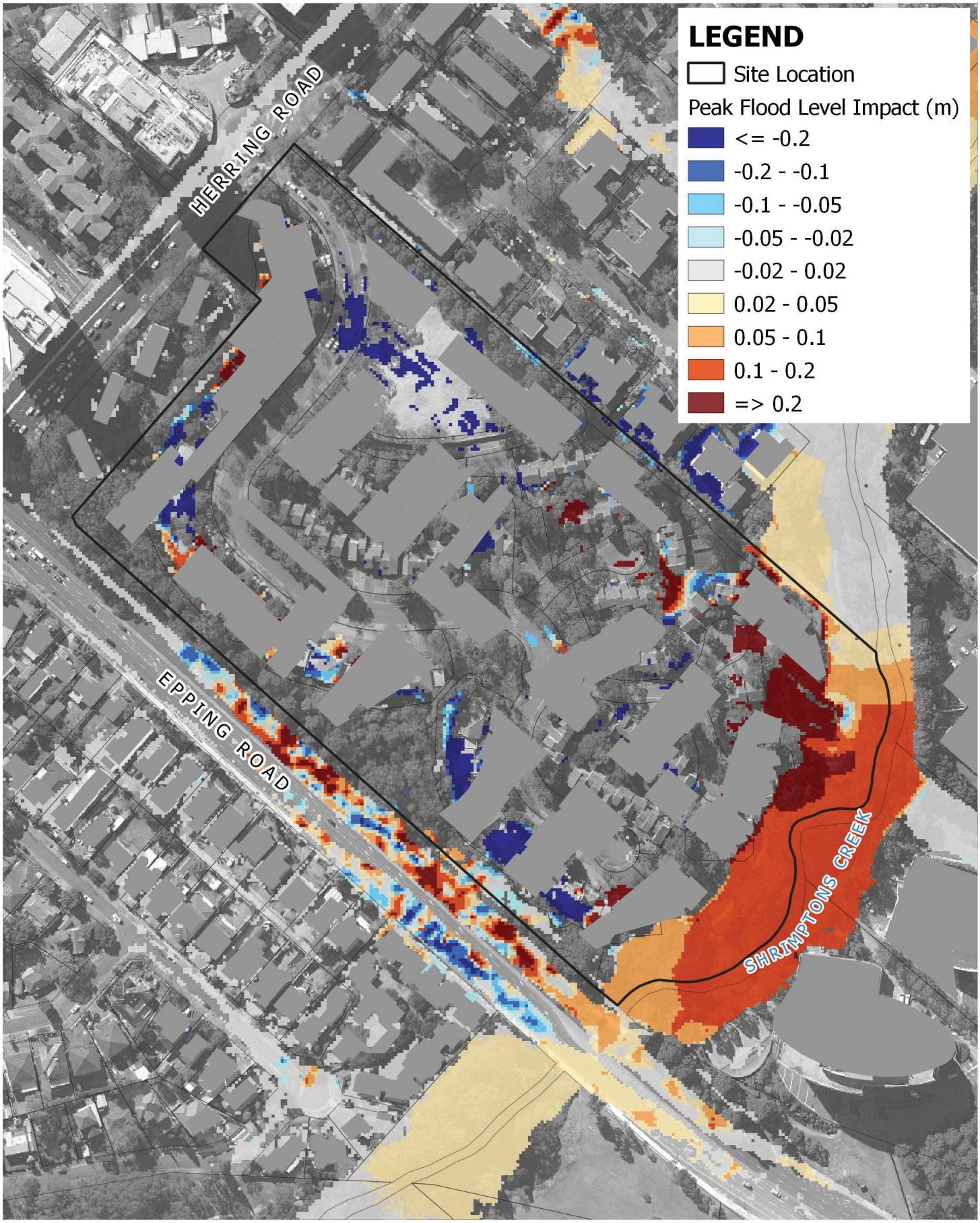

Title:

Peak Flood Level Impact
PMF Event

Figure: 7

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URBIS

ABORIGINAL CULTURAL HERITAGE ASSESSMENT

IVANHOE ESTATE,
MACQUARIE PARK

Prepared for
FRASERS PROPERTY AUSTRALIA
6 August 2021

URBIS STAFF RESPONSIBLE FOR THIS REPORT WERE:

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Project Code	P0032333
Report Number	D01 – Issued 8th July 2021
	F01 – Issued 6th August 2021

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We acknowledge, in each of our offices the Traditional Owners on whose land we stand.

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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).

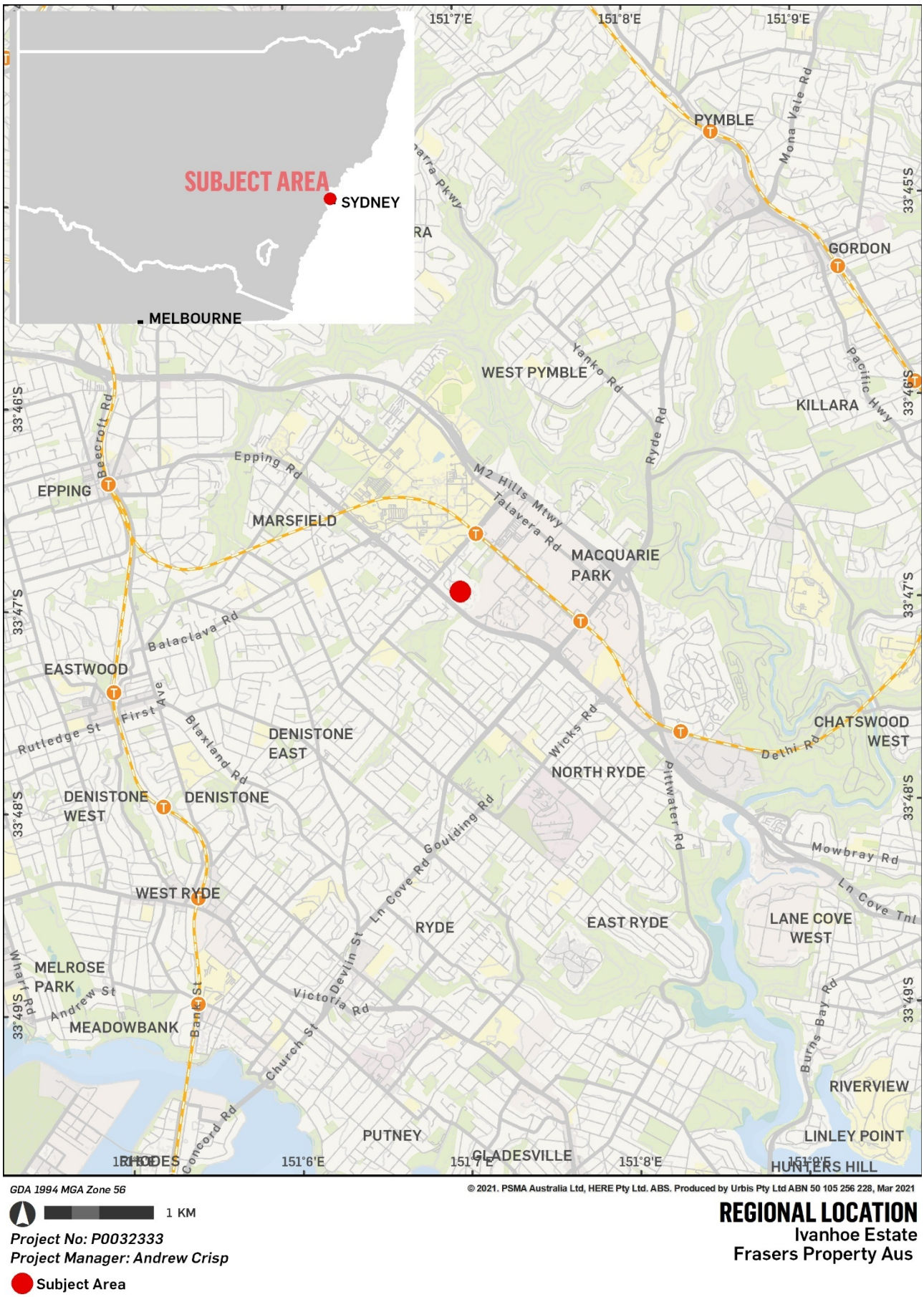

Figure 1 – Regional location



Figure 2 – Location of the subject area

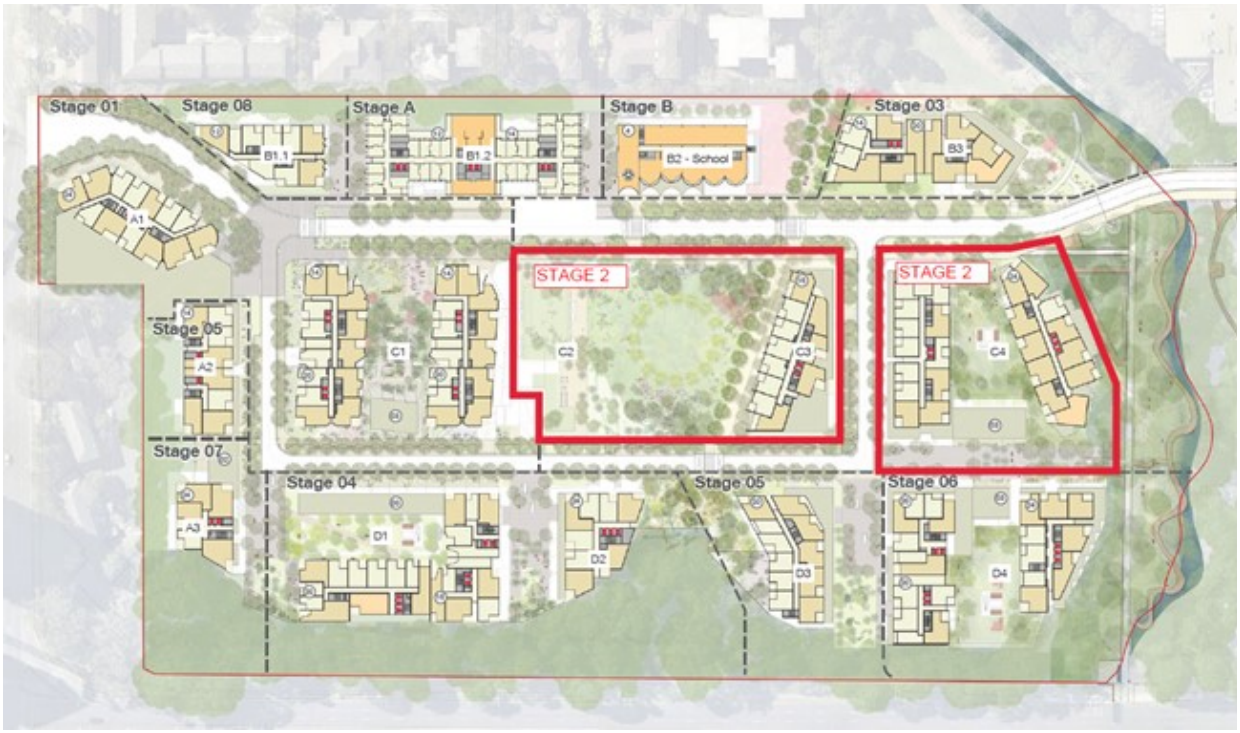

Figure 3 – Ivanhoe Masterplan
Source: Ethos Urban

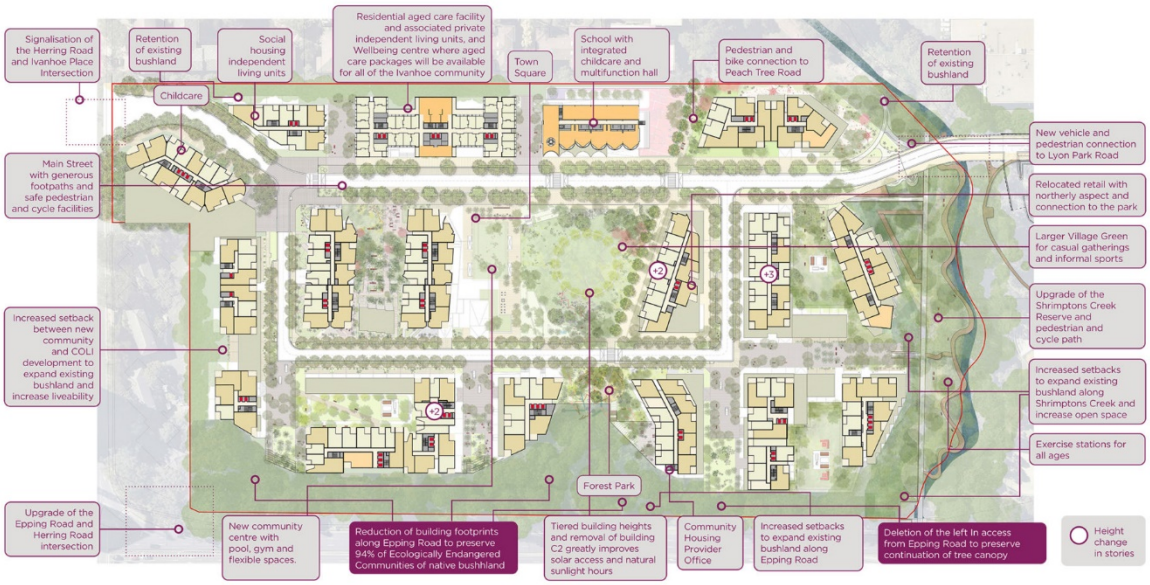

Figure 4 – Ivanhoe Masterplan
Source: Ethos Urban

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%**

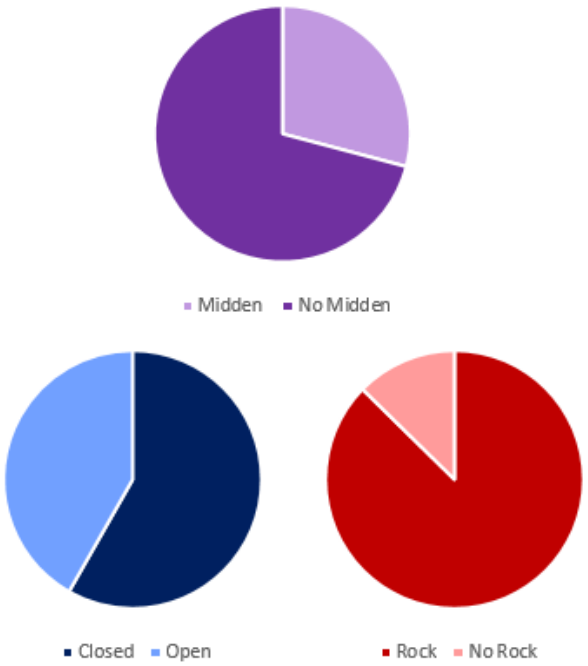

Figure 6 – Analysis of AHIMS search results (Client Service ID: 574117)

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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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

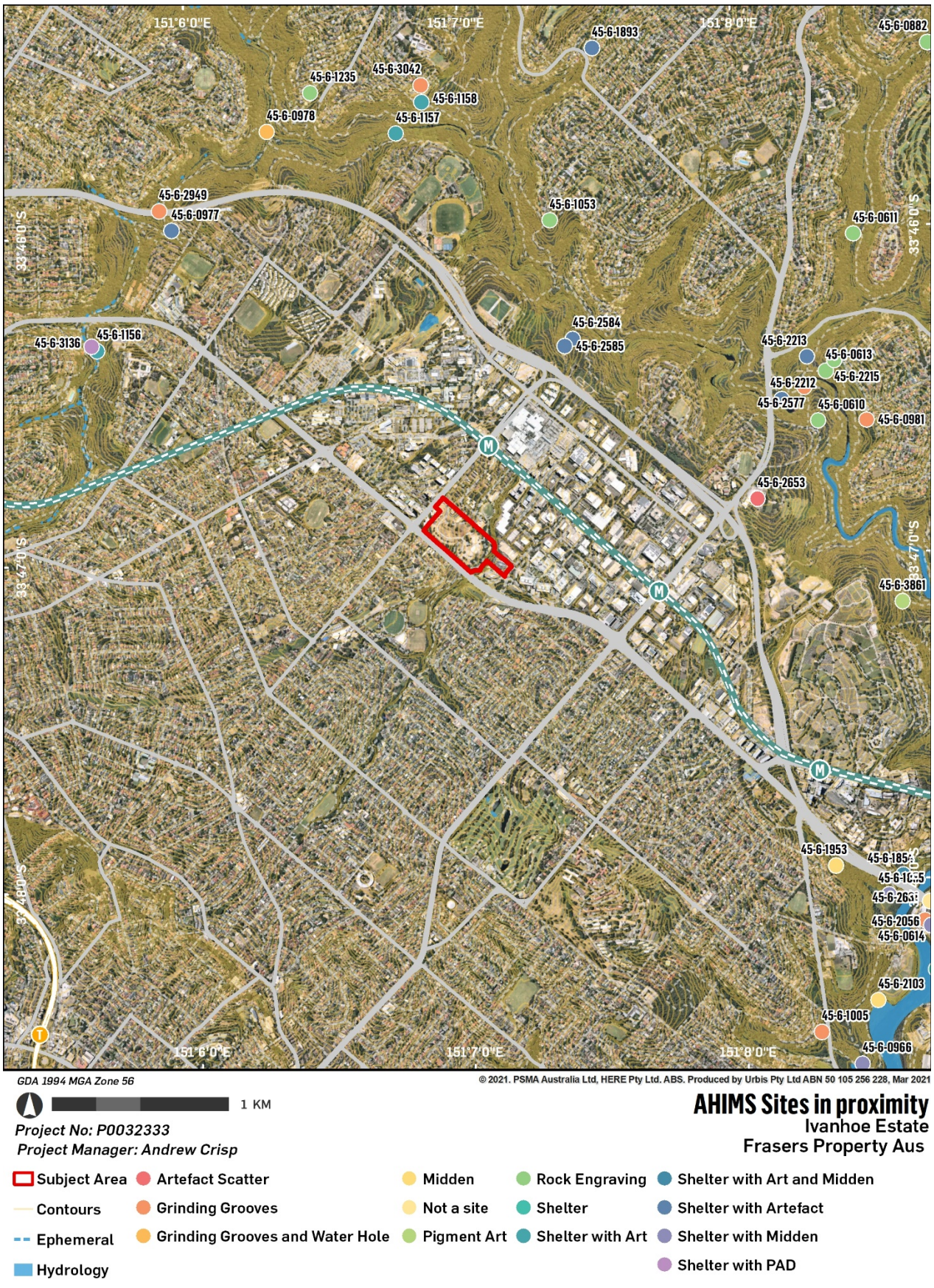


Figure 8 – Registered Aboriginal sites within proximity to the subject area

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

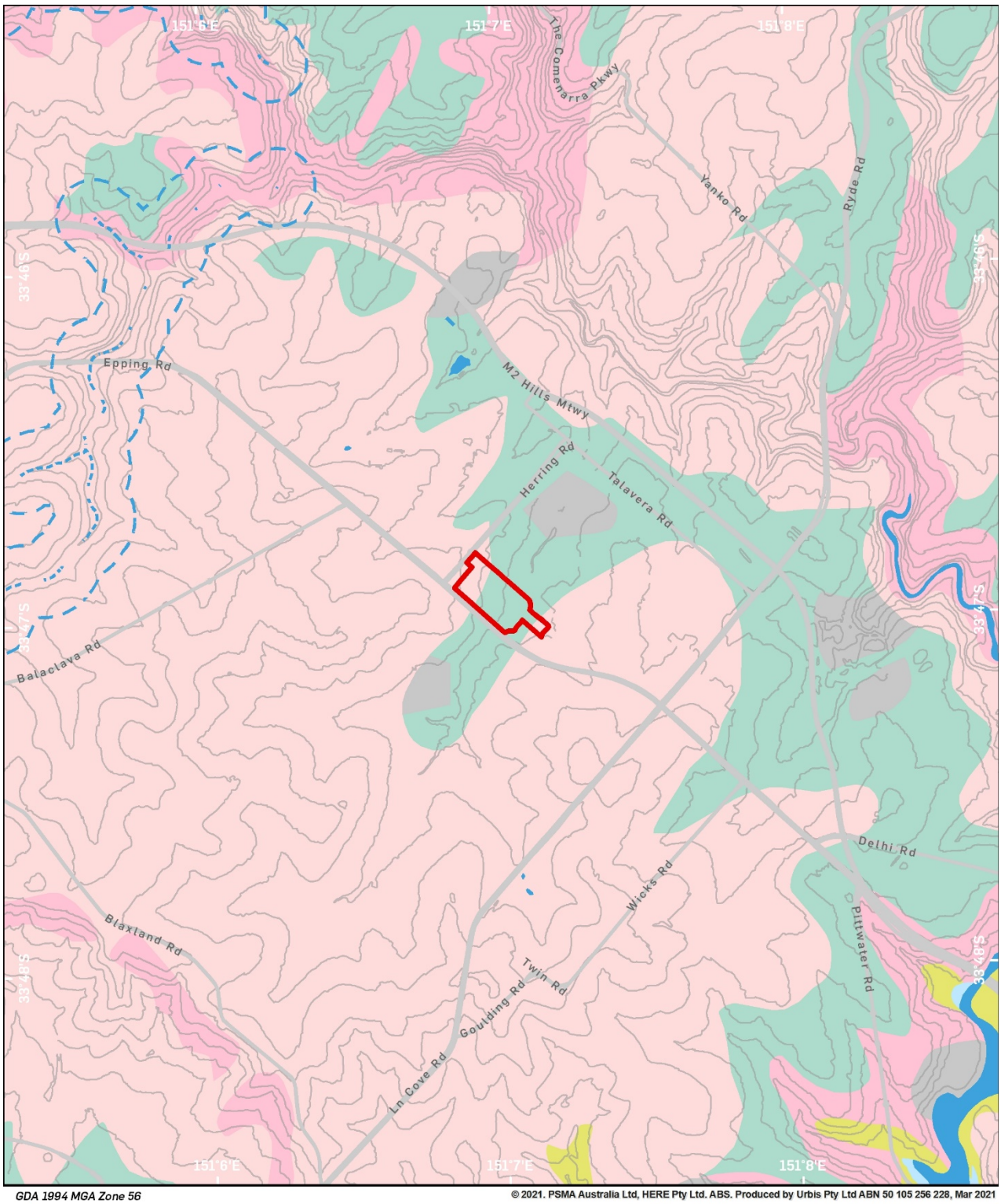
Certain soil landscapes and geological features are associated with greater archaeological potential for Aboriginal objects and places. For example, sand dune systems are associated with the potential presence of burials and sandstone outcrops are associated with the potential presence of grinding grooves 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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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.

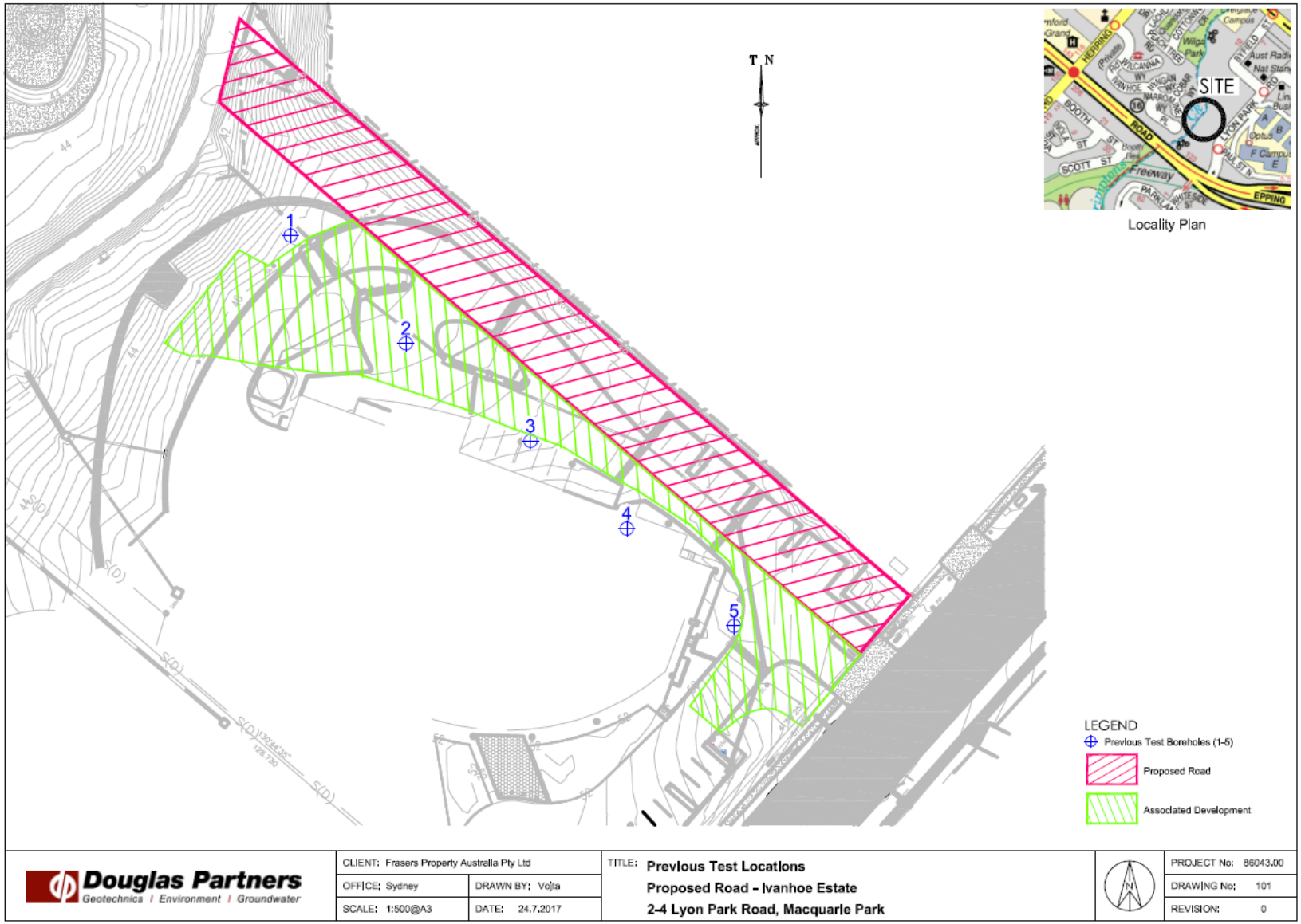

Figure 10 – Borehole locations
Source: Douglas Partners

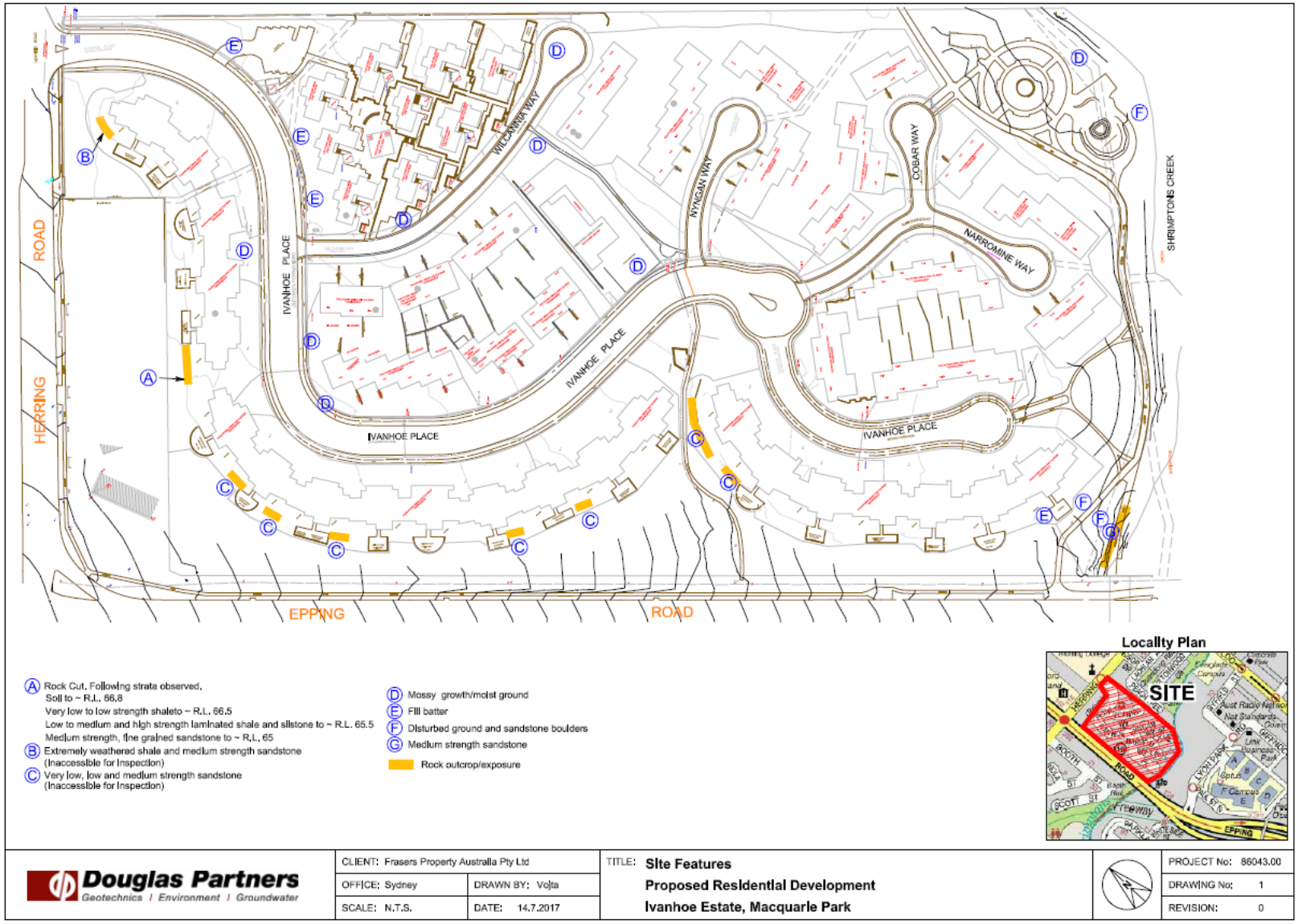

Figure 11 – Subject area features
Source: Douglas Partners

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).

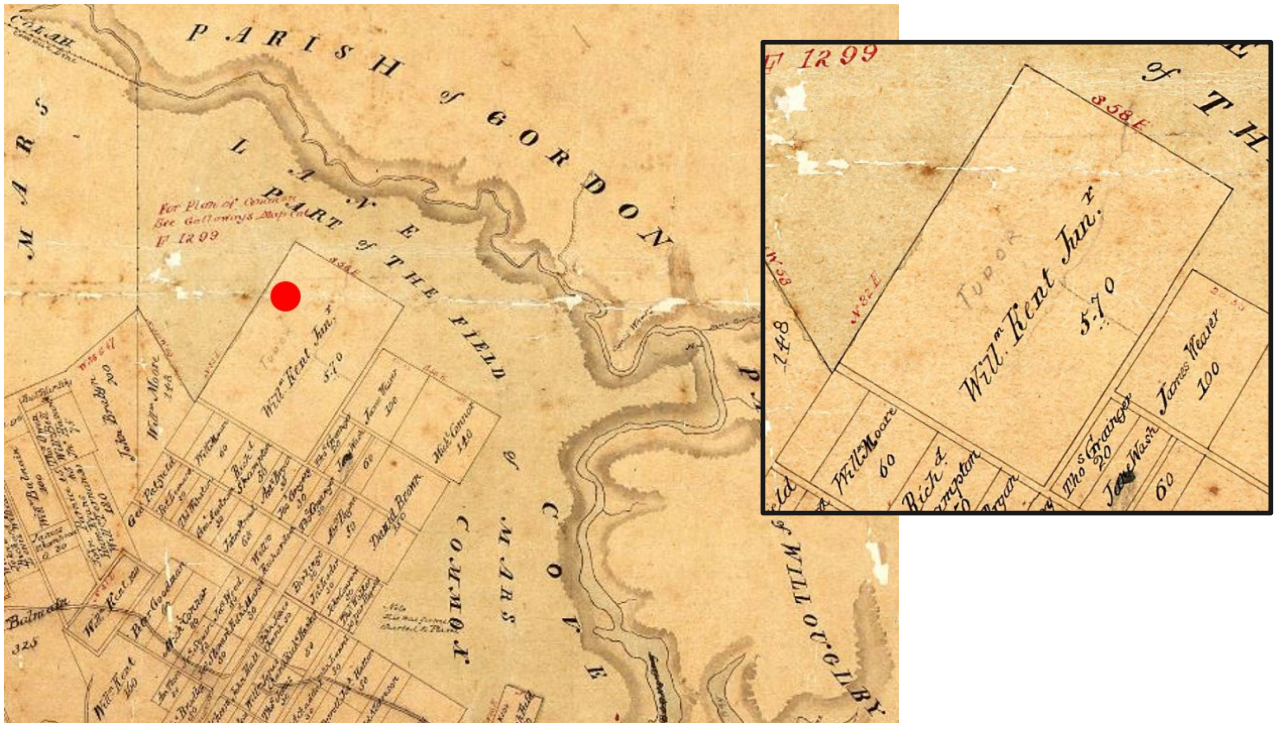

Figure 12 – Parish map of Hunters Hill, c. 1860s; red dot indicates approximate location of subject area in "Tudor" farm
Source: NSWLRS

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

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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

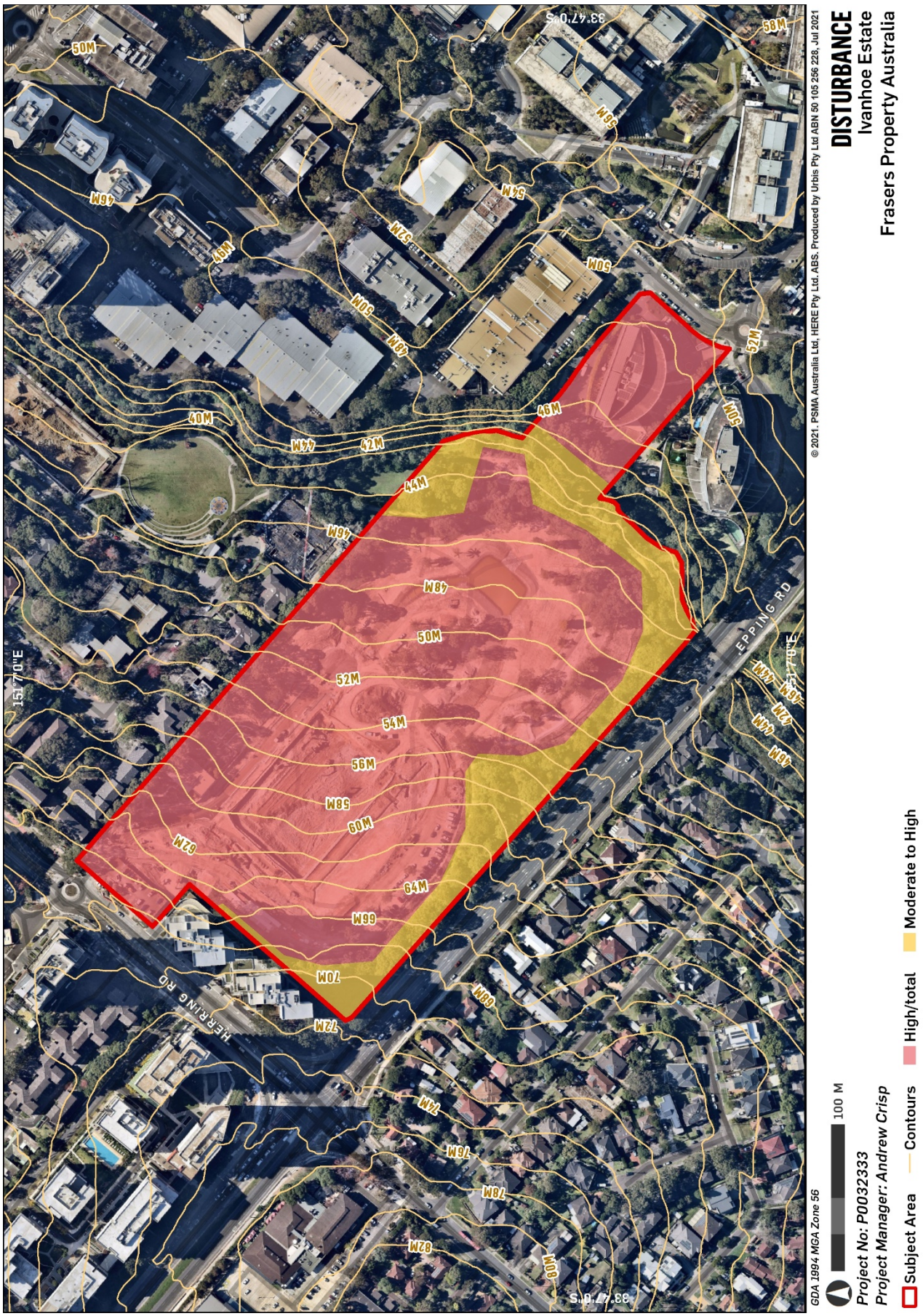

Figure 16 – Disturbance within the Subject Area

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.

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DISCLAIMER

This report is dated 6 August 2021 and incorporates information and events up to that date only and excludes any information arising, or event occurring, after that date which may affect the validity of Urbis Pty Ltd **(Urbis)** opinion in this report. Urbis prepared this report on the instructions, and for the benefit only, of FRASERS PROPERTY AUSTRALIA **(Instructing Party)** for the purpose of an Aboriginal Cultural Heritage Assessment **(Purpose)** and not for any other purpose or use. To the extent permitted by applicable law, Urbis expressly disclaims all liability, whether direct or indirect, to the Instructing Party which relies or purports to rely on this report for any purpose other than the Purpose, and to any other person which relies or purports to rely on this report for any purpose whatsoever (including the Purpose).

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

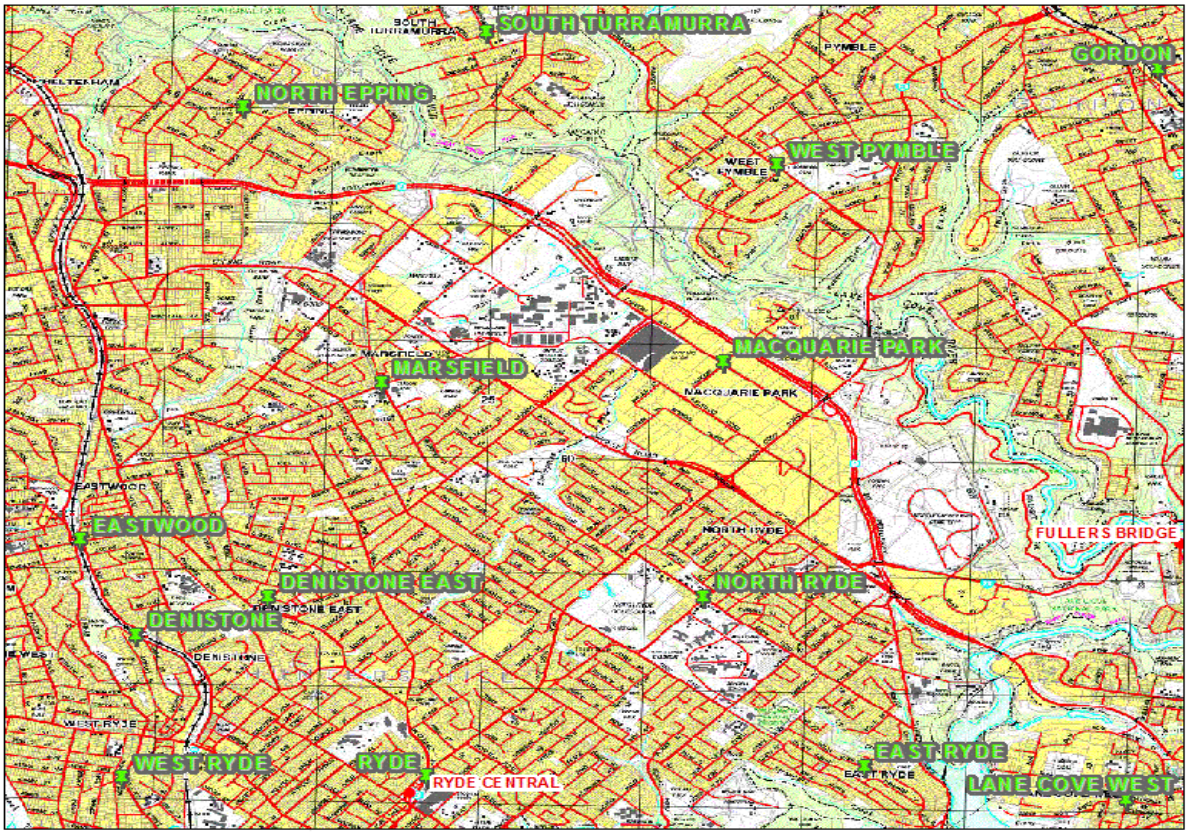
Email: mwalker@urbis.com.au

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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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 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

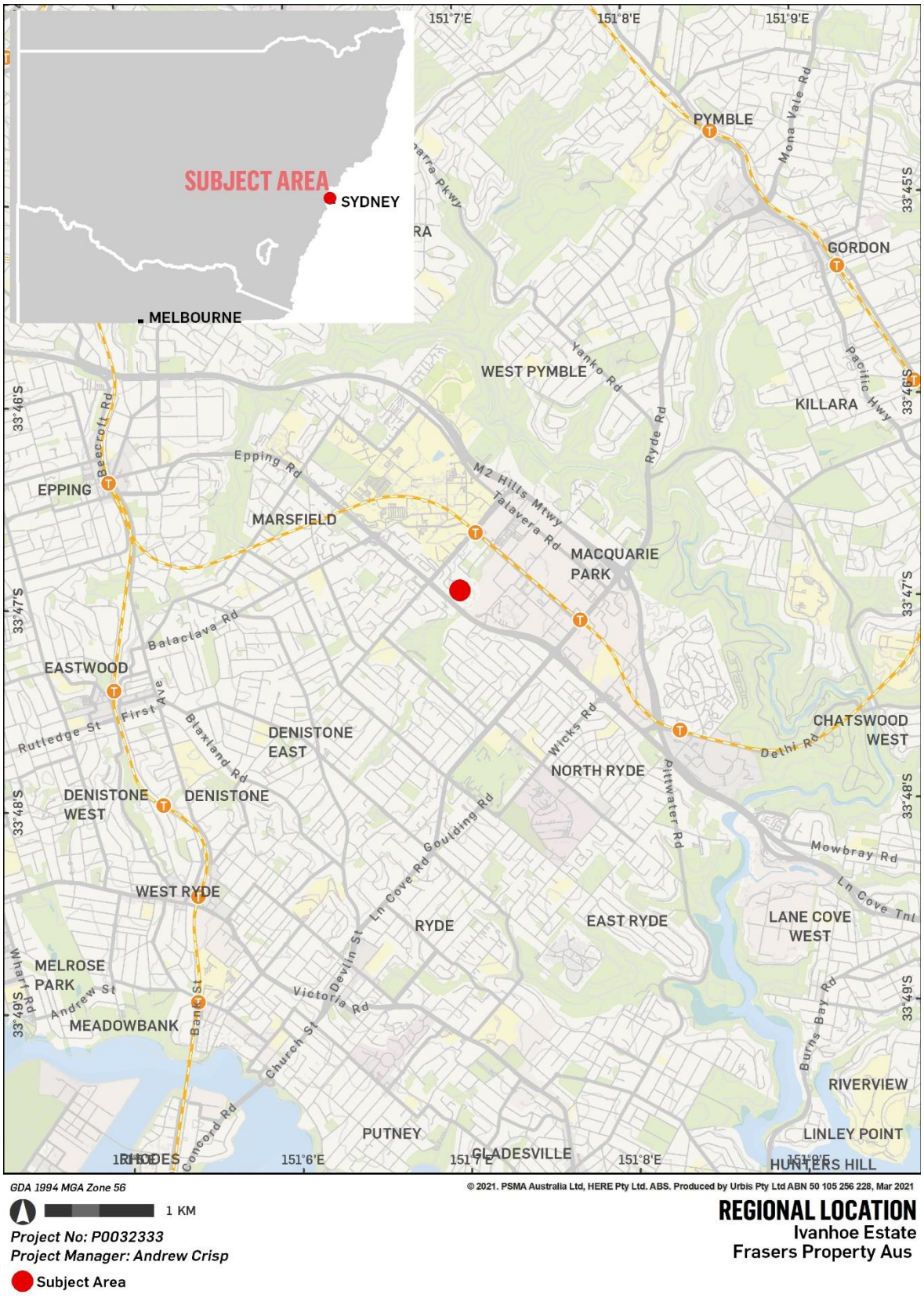

Figure 1 – Regional location



Figure 2 – Location of the subject area



Figure 3 - Ivanhoe Estate Concept Masterplan

Source: Ethos Urban

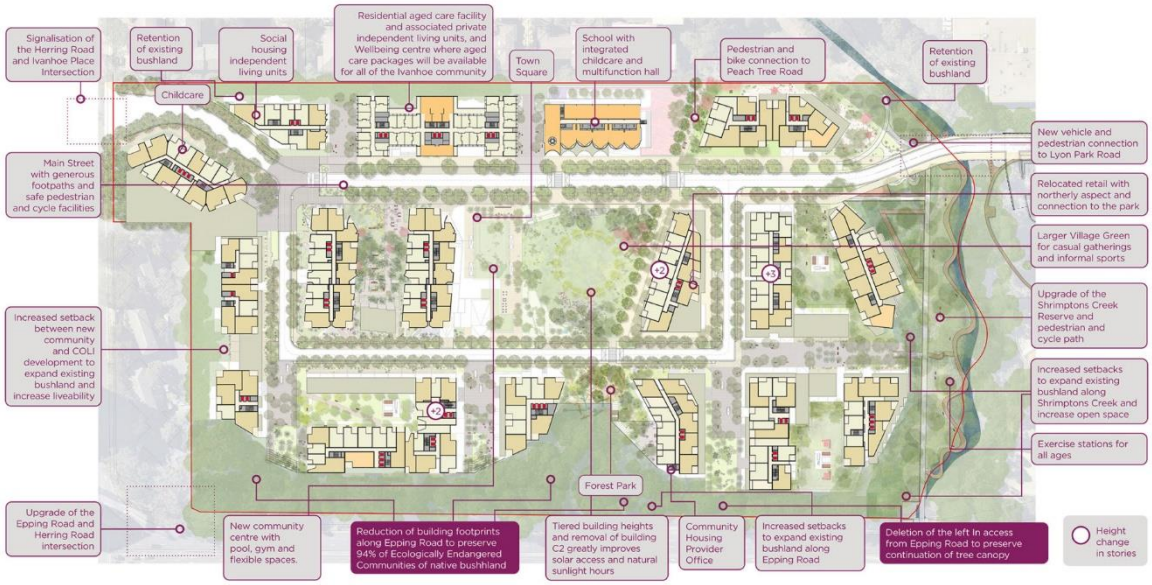

Figure 4 – Ivanhoe Estate Concept Masterplan - details

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.

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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.

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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

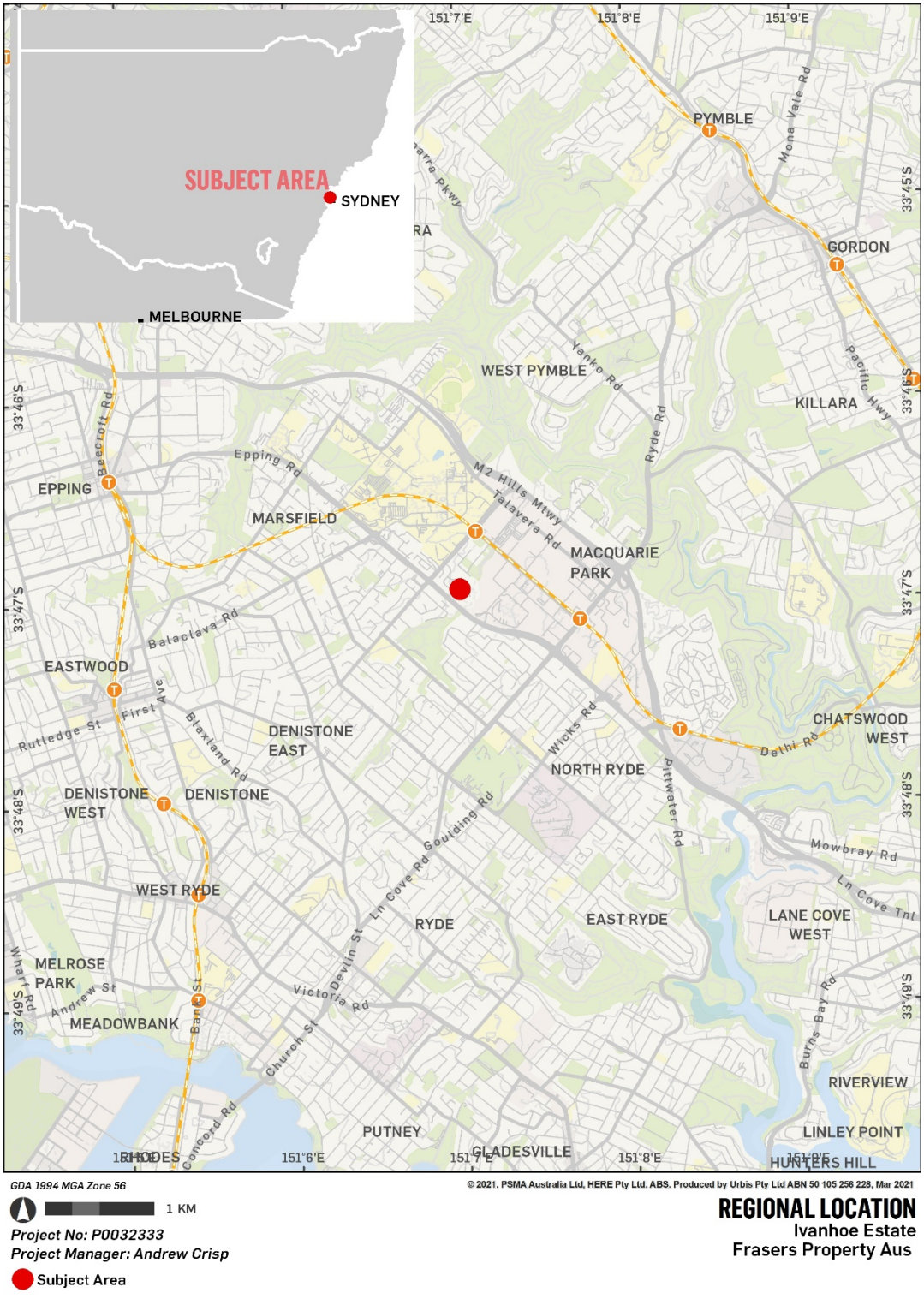

Figure 1 – Regional Location of the subject area



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.

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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.

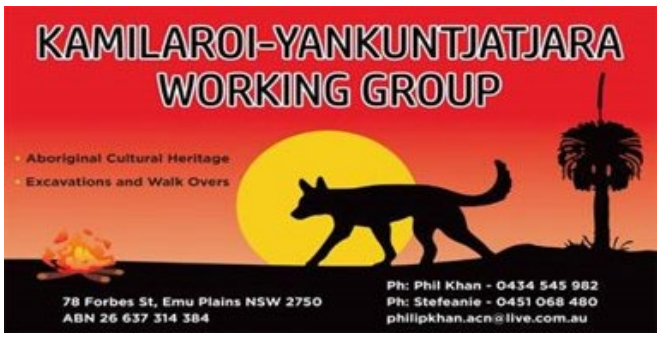
As a senior Aboriginal person for the past 50yrs, I actively participate in the protection of the Aboriginal Cultural Heritage throughout the Sydney Basin, & particularly throughout Western Sydney, on behalf of Kamilaroi Yankuntjatjara Working Group I wish to provide to you my organisation's registration 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.
>
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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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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.
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AARON OLSEN
CONSULTANT

D +61 2 8233 9957
T +61 2 8233 9900
E aolsen@urbis.com.au

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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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--
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

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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.

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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.

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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

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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

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Yours sincerely,



Andrew Crisp
Senior Consultant
+61 2 8233 7642
acrisp@urbis.com.au

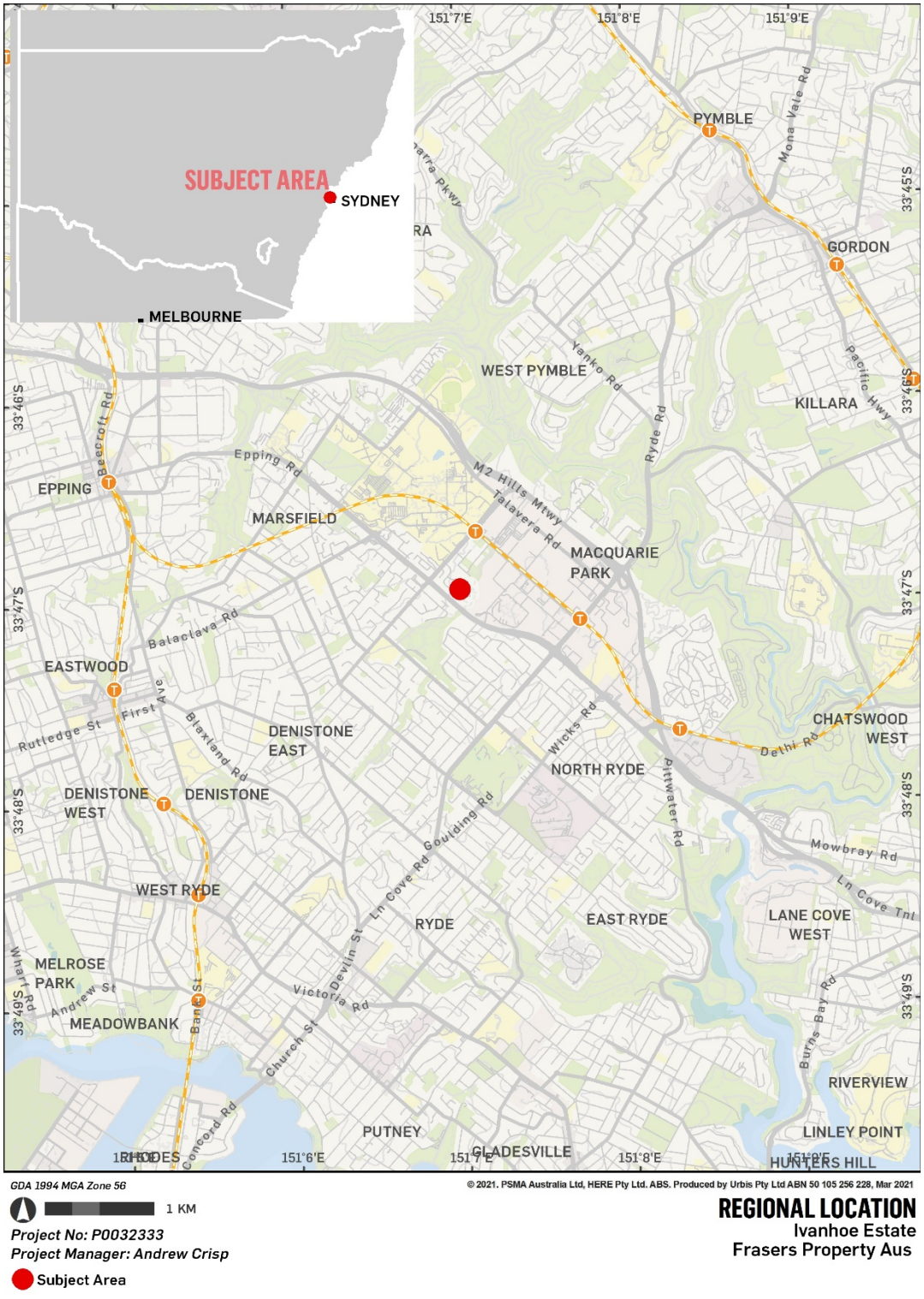

Figure 1 – Regional Location of the subject area



Figure 2 – Location of the subject area

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ANGEL PLACE
LEVEL 8, 123 PITT STREET
SYDNEY NSW 2000

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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.

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).

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

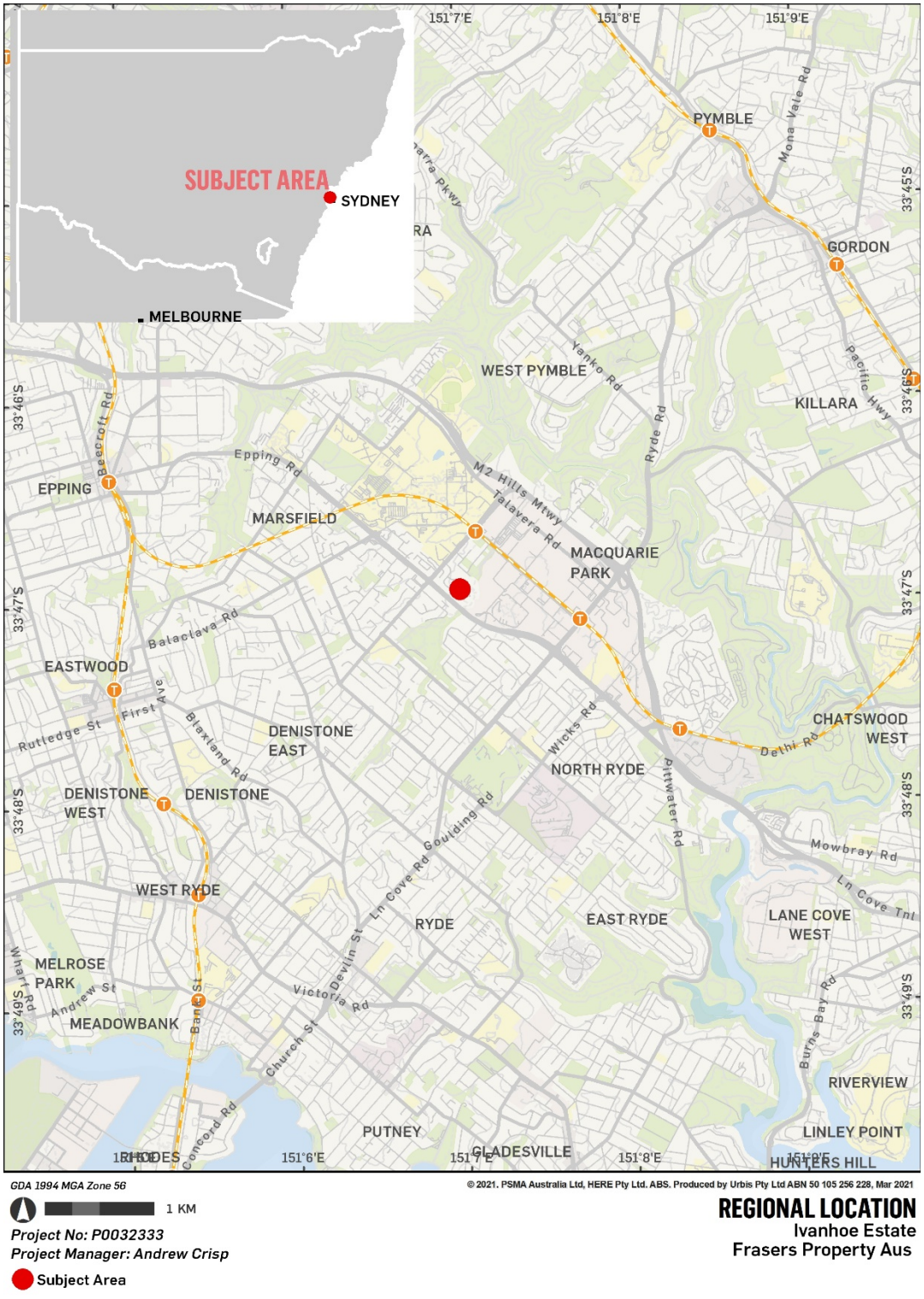

Figure 1 – Regional Location of the subject area



Figure 2 – Location of the subject area

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

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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

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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

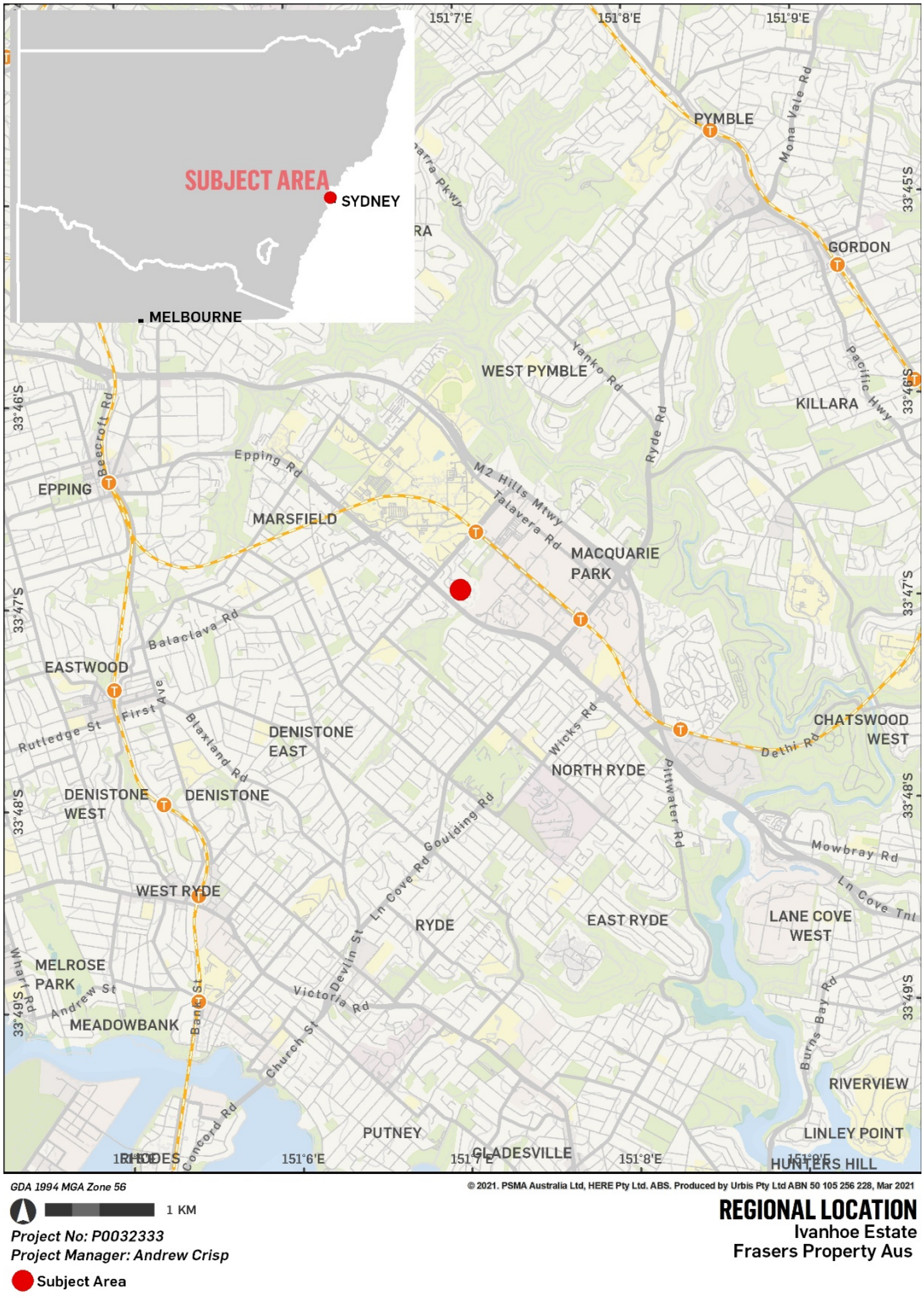


Figure 1 – Regional location



Figure 2 – Location of the subject area



Figure 3 – Ivanhoe Estate Masterplan
Source: Ethos Urban

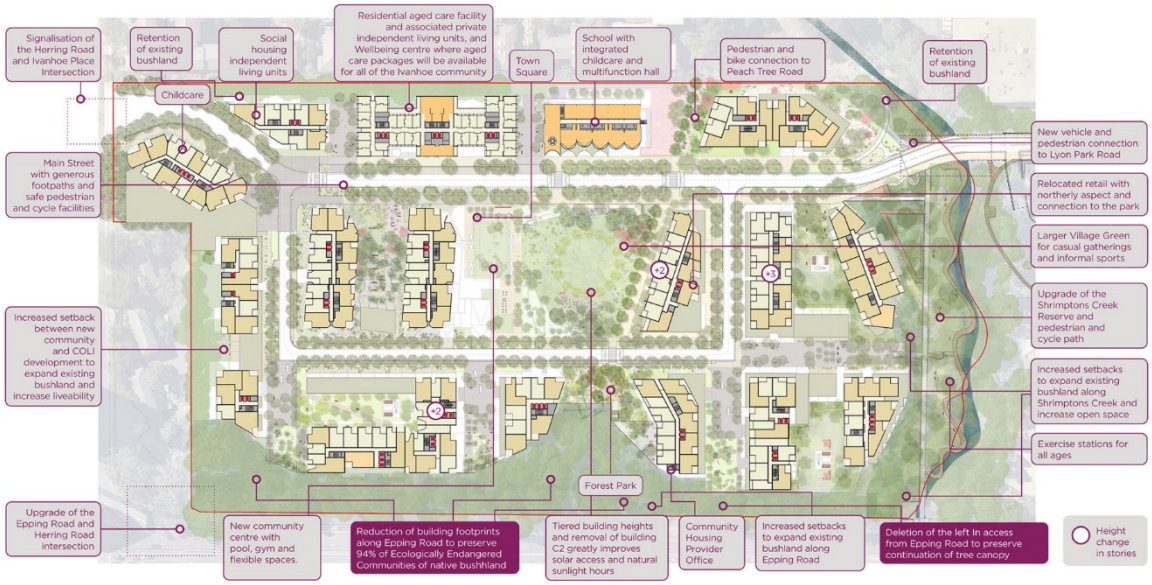


Figure 4 – Ivanhoe Estate Masterplan
Source: Ethos Urban



Figure 5 – Registered Aboriginal sites in extensive search area

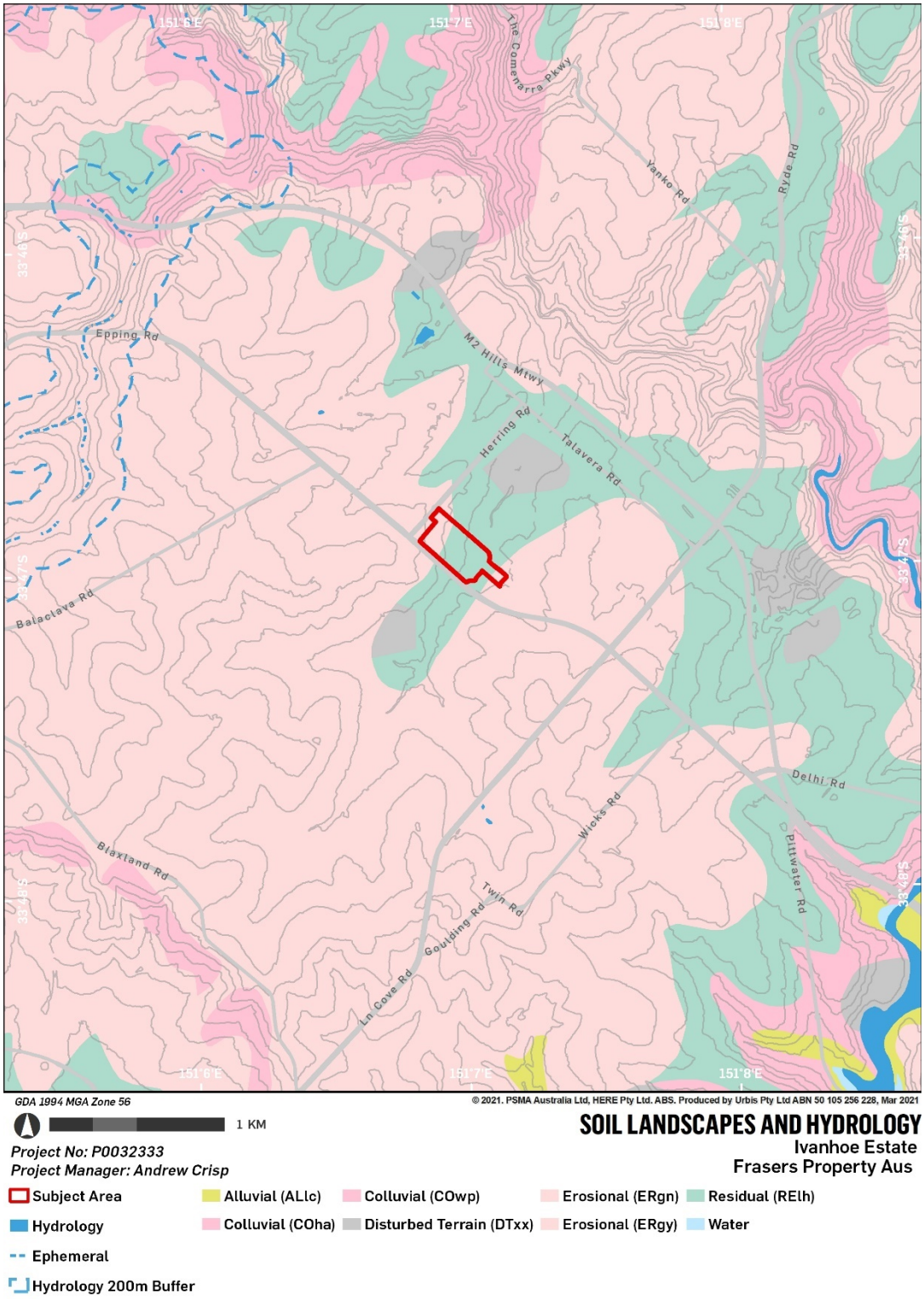


Figure 6 – Soils landscapes and hydrology

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

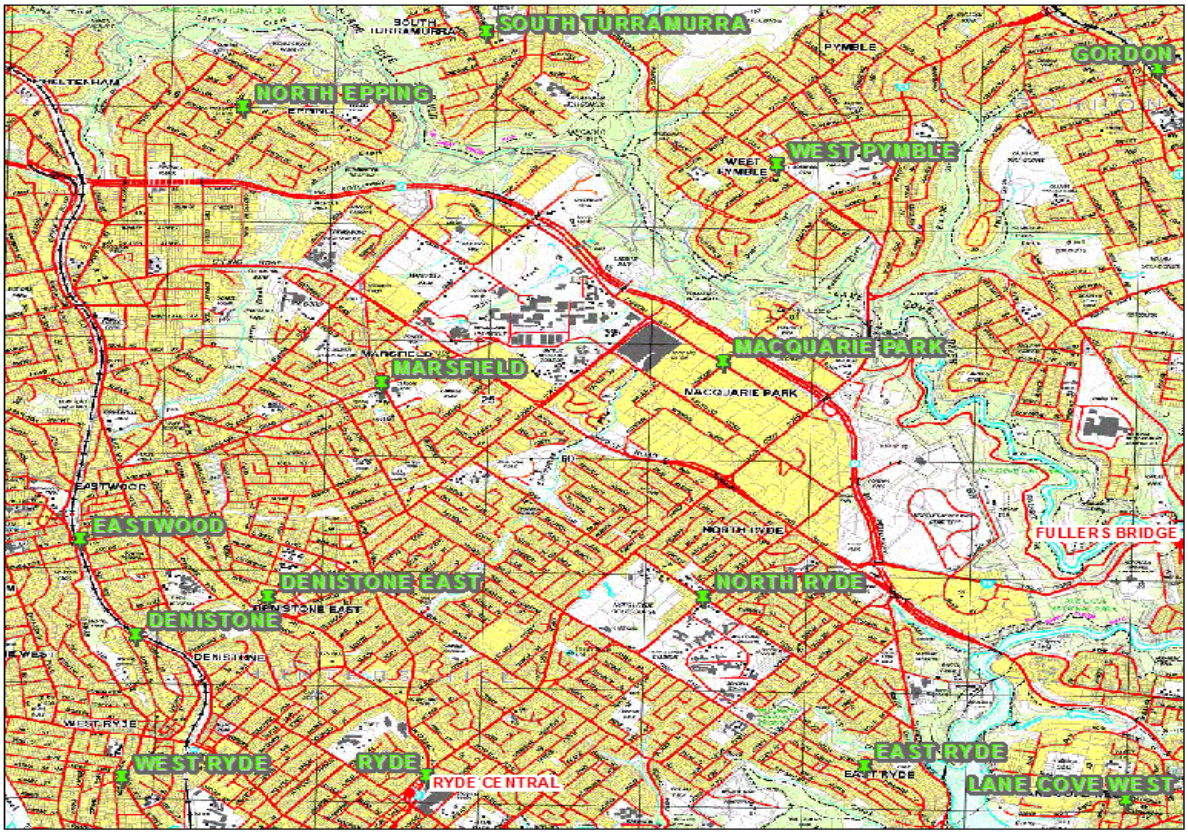
Email: mwalker@urbis.com.au

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
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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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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

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
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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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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.

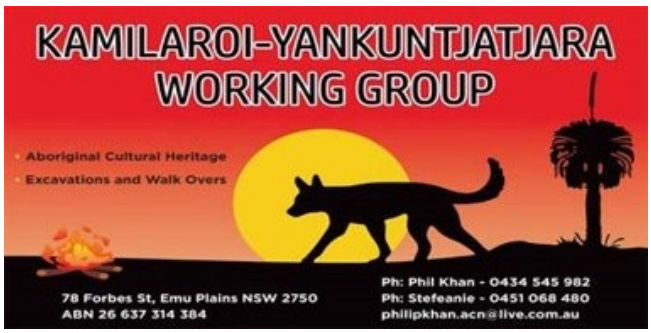
As a senior Aboriginal person for the past 50yrs, I actively participate in the protection of the Aboriginal Cultural Heritage throughout the Sydney Basin, & particularly throughout Western Sydney, on behalf of Kamilaroi Yankuntjatjara Working Group I wish to provide to you my organisation's registration 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

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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

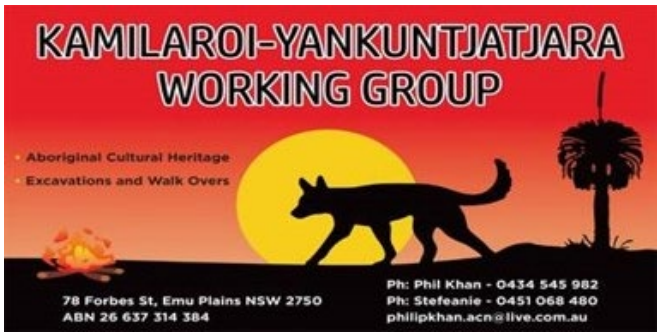
Dear Aaron,

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

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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
Geotechnics · Environment · Groundwater

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

Douglas Partners
Geotechnics • Environment • Groundwater

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

Douglas Partners

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

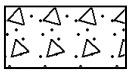
Symbols & Abbreviations

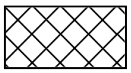
Graphic Symbols for Soil and Rock

General

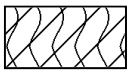

Asphalt

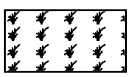

Road base

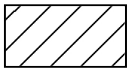

Concrete

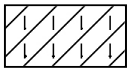

Filling

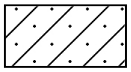
Soils


Topsoil

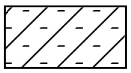

Peat

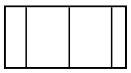

Clay

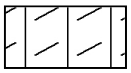

Silty clay

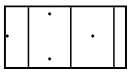

Sandy clay

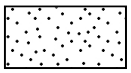

Gravelly clay

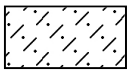

Shaly clay

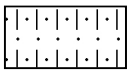

Silt


Clayey silt


Sandy silt

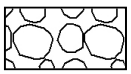

Sand

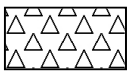

Clayey sand


Silty sand


Gravel

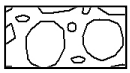

Sandy gravel


Cobbles, boulders

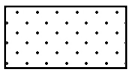

Talus

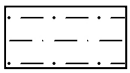
Sedimentary Rocks

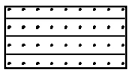

Boulder conglomerate

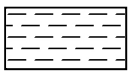

Conglomerate


Conglomeratic sandstone

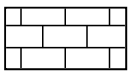

Sandstone


Siltstone

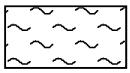

Laminite

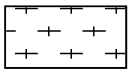

Mudstone, claystone, shale

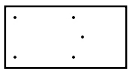

Coal


Limestone

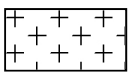
Metamorphic Rocks

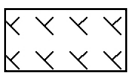

Slate, phyllite, schist

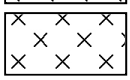

Gneiss

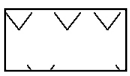

Quartzite

Igneous Rocks


Granite


Dolerite, basalt, andesite


Dacite, epidote


Tuff, breccia


Porphyry

URBIS



Douglas PARTNERS | GROUNDED EXPERTISE

Parkview Constructions Pty Ltd

Attention: Roben Naamo

Email: roben.namoo@parkview.com.au

Project 86043.23

12 January 2024

R.004.Rev0

CAS/SP

Report on Geotechnical Monitoring Plan
C3 Site
Ivanhoe Estate, Macquarie Park

1. Introduction

This Geotechnical Monitoring Plan (GMP) sets out the proposed geotechnical monitoring requirements during basement excavation works for the proposed C3 Building of the Ivanhoe Estate at Ivanhoe Place, Macquarie Park. This GMP has been prepared to address condition B41(b) of the Development Consent by the Minister for Planning (Ref: SSD 15822622 dated 2022).

The proposed bulk excavation level (BEL) is about RL 39 to RL 40 m AHD, which would require a maximum depth of cut of about 12 m below the original ground level, which, it is understood, has since been partially stripped down by about 1 to 1.5 m depth with rock present at surface towards the southwest end. The basement is shallower at RL 42 at the northeast end, requiring a maximum depth of cut of about 6 m.

It is expected that the excavation will generally be unsupported through sandstone bedrock, except for localised rockbolting (as required). Dowels and shotcrete support (subject to services in the road) is proposed at the northeastern face (SW5), the eastern face (SW4) and up to half-way along the southeastern face (SW3), depending on the ground conditions encountered during excavation. Temporary batters are proposed along the northwestern boundary (RTW2).

A geotechnical investigation was previously carried out by Douglas Partners (DP) at the site for Stage 2 of the development comprising C2, C3 and C4 sites (Ref: 86043.06.R.002.Rev2.C3 dated 4 August 2021). At C3 site, the investigation comprised six rock-cored boreholes to a maximum depth of 17.1 m. As mentioned above, the original ground level has since been lowered which should be taken into account when considering the ground profile information.

The proposed basement footprint is located well inside the Ivanhoe site boundaries, approximately 40 m away from neighbouring structures, and about 80 m from Epping Road to the south-west. Within the site, the nearest structure is C2 building about 60 m to the northwest.

Note that this monitoring plan is a live document and may require updating as the works progress. Also note that Principal Contractor and Builder are used interchangeably and essentially mean the same entity. The term geotechnical engineers means a suitably experienced geotechnical engineer or engineering geologist.

2. Objectives

The objectives of the GMP are to provide a sequence for geotechnical monitoring activities expected during excavation and construction, showing the responsible parties, as well as hold points to manage the geotechnical aspects of the construction processes.

The plan has been separated into the following three sections:

- **Geotechnical** – movement or settlement of temporary and permanent works and structures, excavation support, and adequacy of foundation materials.
- **Hydrogeological** - potential changes of the groundwater;
- **Vibration** – vibration generated by excavation works.

The Principal Contractor for the proposed development is responsible for implementing the measures outlined in this plan. The contractor shall engage the services of suitably qualified and experienced professionals for the required monitoring activities.

3. Geotechnical Monitoring

The key geotechnical aspects which require monitoring on this project are as follows:

- stability of excavations;
- groundwater;
- stability of adjacent existing buildings; and,
- adequacy of the foundation materials to provide support to footings.

The impact of the excavation of any adjacent structures is dependent on the stability of the proposed basement excavation. At this site, there are no adjacent structures within 40 m of the proposed basement footprint.

For monitoring stability of the excavation, visual inspections by a suitably qualified and experienced geotechnical engineer will be carried out at regular intervals, as construction progresses, together with regular instrumented survey of the excavation faces (if required). Following the inspections and/or review of the survey data, installation of temporary or permanent rock face support, comprising rockbolts/anchors, may be required to stabilise potentially unstable blocks of rock (wedges or feather edges) formed at the intersection of joints or of a joint with the excavation face.

The geotechnical engineer is to inspect the excavated base of footings to confirm the bearing capacity of the rock.

3.1 Geotechnical Monitoring Procedure

The steps shown in Table 1 are recommended, with Hold Points identified where information should be provided to the structural or geotechnical engineers prior to continuing with the works. Provided no new structures are built within 15 m of the excavation footprint prior to or during the

course of the basement construction, survey monitoring of the cut faces to measure stress-relief movement in the sandstone is considered unnecessary.

Table 1: Summary of Geotechnical Monitoring Activities

Step	Description	Hold Point
G1. Prior to Commencement of Works		
G1.1	The Principal Contractor and any relevant subcontractors should familiarise themselves with the structural engineer's drawings, the geotechnical reports and this monitoring plan.	
G2. During Excavation		
G2.1	Inspection of 20% (distributed evenly around site) of the shoring system (expected to be dowels and shotcrete in hit and miss panels) by a geotechnical engineer to check ground conditions are as per design assumptions and installation as per design.	Hold Point
G2.2	Builder to carry out daily visual inspections of the excavation crest and faces to check for any signs of ground movement/instability/loose material.	
G2.3	At maximum 1.5 m depth intervals – progressive inspection of cut faces by a geotechnical engineer to identify any adversely inclined geological structures (e.g., joints) or previously undetected conditions and features, which may require support. If the geotechnical engineer considers that additional stabilisation measures are required, then these measures should be implemented to the satisfaction of the geotechnical engineer prior to continuing with the next drop.	Hold Point
G3. After Excavation		
G3.1	Inspection of the base of the excavation at bulk level by the geotechnical engineer to assess the ground conditions prior to detailed excavation.	Hold Point
G3.2	Inspection of the base of all footing excavations by a geotechnical engineer to confirm that the bearing capacity meets the requirements of the design, including spoon testing of the footings (requiring 50 mm diameter core holes to be drilled by the contractor through the base of the footings 24 hours ahead of inspections to 1.5 x the footing width), to check defect spacing and confirm the rock classification. The frequency of spoon testing will be dependent on the design bearing pressure adopted.	Hold Point

3.2 Trigger Levels/Contingency Plans

There are no trigger levels relevant to the monitoring activities in Table 1 other than those described.

If the subsurface conditions encountered during the excavation are different to those indicated in the geotechnical report, both the geotechnical and structural engineers must be immediately informed. The geotechnical and structural engineers should then inspect the site and re-design the excavation support (i.e., shoring), foundations or another feature, as required.

Contingency measures for adverse movement at the excavation crest and the rock face will depend on the nature and extent of the movement. Measures could include backfilling against the shoring wall/rock face, installation of additional anchors, and installation of internal props/bracing.

4. Groundwater

Reference should be made to the overall Stage 2 Dewatering Management Plan (DP Report 86043.06.R.008.Rev0 dated May 2022) for background on groundwater monitoring requirements for Stage 2 development.

Based on the available information, the pre-excavation level of the permanent groundwater table in the vicinity of C3 reduces from approximately RL 45 m AHD up-slope to approximately RL 42 m AHD downslope. Subsequent monitoring at Ivanhoe Estate suggests that these levels may be impacted by more recent basement dewatering at sites external to Ivanhoe Estate.

Note that as part of the dowel and shotcrete support for the upper layers, vertical strip drains should be installed behind the shoring to collect all seepage that may occur and to direct the seepage to the subfloor drainage system, from where it can be removed using "sump-and-pump" methods.

Suitable protection of the wells to be provided by the Builder to ensure safe and continuous access to wells for monitoring and water sampling and reduce the risk of malicious or accidental interference. If it is not possible to access the groundwater monitoring wells, or they are damaged or destroyed during the works or cannot be used for some reason, then the monitoring wells must be replaced within one (1) week. Provided that detailed excavation has been completed for at least one month, then replacement of a monitoring well may not be required if the data already collected indicates no significant groundwater impact.

Table 2 shows the steps recommended, with Hold Points identified, where information should be provided to the structural or geotechnical engineer prior to continuing with the works.

Table 2: Summary of Hydrogeological (Groundwater) Monitoring Activities

Step	Description	Hold Point	Ref
H1. Prior to Excavation below RL 46 m AHD			
H1.1	Builder to obtain a copy of the written permission to discharge into the stormwater system/Shrimpton's Creek from the relevant controlling authority, including any requirements of the controlling body. This information must be provided to the geotechnical engineer for reference purposes.	Hold Point	SSD B65/6
H1.2	Builder to obtain a copy of the Water Access Licence for the Stage 2 site, and written statement of the entitlements available for the C3 basement excavation, based on sub-allocation of the entitlements by Frasers. This information must be provided to the geotechnical engineer for reference purposes.	Hold Point	SSD B67
H1.3	Builder to install three groundwater monitoring wells outside of the basement perimeter extending to at least 3 m below basement level or to the base of any local excavations for measurement of water levels. One well to be installed upslope and two wells downslope at locations to allow triangulation of water flow across the site. Additional wells to be installed if adequate triangulation is not achievable with 3 locations.	Hold Point	DMP

Step	Description	Hold Point	Ref
H1.4	Groundwater sampling on a suitable number of samples from wells, and laboratory testing of samples to evaluate hydrochemistry for potential dewatered groundwater against the requirements of the controlling body (as provided in H1.1). A report to be prepared by the geotechnical engineer nominating likely treatment requirements/exceedances.	Hold Point	SSD C36
H1.5	Groundwater treatment methodology to be prepared by Builder (or their treatment subcontractor) to address actual or potential groundwater discharge treatment requirements, including a schedule of sampling and testing to be undertaken and recorded by the builder. Preliminary monitoring requirements are given in the DMP. Methodology to include daily quality monitoring for first week of groundwater discharge then weekly until the completion of works, and appropriate record keeping.	Hold Point	C37q DMP
H1.6	Methodology, monitoring and recording requirements of H1.4 to be reviewed by the treatment subcontractor or geotechnical engineer, to confirm general suitability.	Hold Point	C37q
H1.7	At least three weeks of daily readings at all wells and geotechnical engineer to establish pre-excavation baseline levels in the wells.	Hold Point	DMP
H1.8	Installation of a rain gauge at a fixed point at the site which is not overshadowed by existing structure or topography. Daily rainfall measurements to be provided to geotechnical engineer as required.	Hold Point	DMP
H2. Excavation below RL 46 m AHD to Bulk and Detailed Level			
H2.1	Daily measurement of water levels in monitoring wells using a datalogger. Data to be uploaded and reviewed by the geotechnical engineer weekly. Monthly reporting by the geotechnical engineer.		C37
H2.2	Daily monitoring of water quality for the first week requiring groundwater discharge to stormwater, then weekly thereafter, in accordance with the monitoring and reporting established by item H1.4.	Hold Point	C37
H2.3	Builder to carry out daily inspection of well surrounds to ensure continuous access and damage free.		
H2.4	Builder to maintain written daily record of: • rainfall (see H1.8); • excavation level; • excavation extent; • location of water pump-out sumps; • time and date of record; and, • estimated inflow, from inflow to sumps of pre-determined size, or collection to secondary tanks using a calibrated flowmeter. The above information to be provided to the geotechnical engineer on a weekly basis.	Hold Point	DMP
H2.5	Both daily and weekly record of volume of discharge to stormwater to be maintained by the Builder using a calibrated flowmeter. Measurements to be recorded in accordance with reporting requirements of the Water Access Licence (WAL). Records to include flowmeter numbers and calibration certificates.		DMP

Step	Description	Hold Point	Ref
H2.6	The discharge volume information from H2.5 is to be provided to Frasers on a monthly basis to meet their reporting obligations for the Stage 2 WAL.	Hold Point	WAL
H2.7	The discharge volume information from H2.5 is to be provided to geotechnical engineer on a weekly basis, together with item H2.3.	Hold Point	B41
H3. Following Completion of Excavation and Commencement of Building Construction			
H3.1	Measurement, monitoring and reporting to continue in line with Step H2, unless otherwise notified in writing by the geotechnical engineer.		
H3.2	Evaluation of information obtained from Steps H1 and H2 by the geotechnical engineer, to determine ongoing frequency of monitoring and reporting given in H1 and H2.	Hold Point	DMP
H3.3	Builder to advise geotechnical engineer when stormwater system effectively separates stormwater collection from groundwater inflow collection.		
H4. Prior to Handover/OCC			
H4.1	Re-evaluation by geotechnical engineer of predicted long term groundwater inflows to basement, based on ongoing records during construction.	Hold Point	DMP
H4.2	Re-evaluation by geotechnical engineer of groundwater inflow quality and treatment, based on long-term inflow quality.	Hold Point	DMP
H4.3	Builder to prepare documentation confirming their compliance with the monitoring and reporting requirements required by this GMP.	Hold Point	
H4.4	Builder to confirm that the as-built groundwater management system includes suitable measures to allow for the long-term groundwater treatment, quality evaluation and volume discharge requirements of the permanent groundwater management system.	Hold Point	DMP

4.1 Trigger Levels/Contingency Plans

4.1.1 Water Quality

If the results of groundwater quality measurements indicate an impact on existing groundwater conditions, or on disposal requirements for the pumped water, a plan must be developed to mitigate any impacts on existing groundwater conditions, and to provide treatment to meet the appropriate groundwater disposal requirements.

4.1.2 Water Level Outside the Basement

Previous groundwater monitoring indicates a natural groundwater fluctuation of approximately 1 m in this area. Groundwater levels that fall by more than 0.5 m below initial levels (taking into fluctuation into account) should trigger an assessment of the records of pumped groundwater volumes, records of pumped groundwater/seepage volumes and weather/climatic factors. A plan may need to be developed to reduce groundwater take if the drawdown is considered to be due to the excavation. This may include localised grouting/sealing such as polymer based emulsion grout etc.).

4.1.3 Groundwater Inflow

If groundwater inflow is assessed as excessive relative to the predicted or allocated inflow (refer DMP Report DP86043.06.R.008.Rev0), reanalysis or re-allocation of the overall Water Access Licence allocation may need to be required to reduce groundwater inflow. This may also include localised grouting/sealing such as polymer-based emulsion grout etc.) as above.

5. Vibration Monitoring

A review of the site features indicated that the nearest existing buildings are not "sensitive structures" and are located at least 60 m away (within the site) or 40 m away (on adjacent properties) from the proposed excavation footprint. Therefore, an allowable vibration limit of 8 mm/s Vector Sum Peak Particle Velocity (VSPPV) at the foundation level of nearby buildings is suggested. The proposed allowable vibration limit at the foundation level of adjacent buildings is also adequate to reduce the risk of structural damage to buildings and road assets on the adjacent properties, including buried services. However, vibration sensitivity of the services should be confirmed with the asset owners prior to excavation. The limit may need to be adjusted to reflect the asset requirements, response of neighbouring structures during excavation and vibration dosage once the neighbouring building is occupied.

The proposed limit takes into account both structural damage and human comfort criteria given in relevant Standards (e.g., ISOAS 2670, EPA guidelines, German DIN4150 Standard and Australian Standard AS 2187-2 (2006)).

A vibration trial may be required to size equipment at the commencement of excavation into rock. The trial may indicate that minimum offset distances are required for the preferred plant, or that alternative excavation methods are required.

5.1 Monitoring Procedures

For this site, due to the distances from existing structures or infrastructure, it is suggested that vibration monitoring be limited to carrying out an initial trial of excavation equipment. If the trial indicates that the vibration limits could be exceeded, then the contractor is to install a permanent monitoring system which will allow 'self-management' of vibration.

If required, geophones should be installed on or near the base of the walls of the neighbouring buildings. The geophones should be firmly attached to the building's structure or footings and should be connected to a data monitor, which is capable of measuring vibrations to 0.5 mm/sec PPVi or less. The monitor shall be set up to record all vibrations which exceed 5 mm/sec. A warning light or sound signal shall be attached to the monitor, which is configured with an alarm threshold of 8 mm/sec PPVi to warn the excavation contractor of vibration exceedances. The system should also automatically send a text message to the site superintendent should an exceedance occur, for the superintendent to investigate.

Table 3 shows the steps recommended, with Hold Points identified, where information should be provided to the structural or geotechnical engineer prior to continuing with the works.

Table 3: Summary of Vibration Monitoring Activities.

Step	Description	Hold Point
V1. Prior to Commencement of Bulk Excavation Works		
V1.1	When excavation encounters medium strength rock, undertake a vibration trial using the largest machine of each equipment category (e.g., rock breaker, bulldozer with ripping tyne, rock saw) to be used in order to determine the minimum buffer distances to neighbouring structures for each equipment type. Geotechnical engineer to advise on whether proposed equipment is likely to exceed allowable vibration levels and whether continuous monitoring is required.	Hold Point
V1.2	If the vibration trial indicates that vibration limits may be exceeded by the proposed works, then geophones and monitors are to be installed and configured to undertake continuous unattended monitoring of vibration. Install geophone at the base of the neighbouring structure closest to the excavation works. Connect geophone to data monitor and install a flashing light or sound warning signal and enable automatic text messaging to the site superintendent. Set warning light to trigger at 8 mm/s VSPPV.	Hold Point
V2. During Excavation		
V2.1	If continuous monitoring is required (see Step 1 above) – data from the monitor is to be uploaded weekly, with direct feedback to site personnel of the number of recorded events exceeding the Allowed Limit. Reports should include a tabulation of times and levels of any events exceeding a recording threshold of 8 mm/s VSPPV, for correlation with site activity records. The weekly vibration monitoring reports should be forwarded to the geotechnical engineer for review.	
V2.2	If the number of exceedances on any day is more than 10 then the respective excavation works shall stop, and the geotechnical engineer shall be notified. The geotechnical engineer will investigate the causes of the exceedances and provide advice on measures to avoid further vibration exceedances.	Hold Point

5.2 Trigger Levels/Contingency Plans

If the vibration trials indicate that continuous monitoring is required, then the monitor shall be configured such that either an SMS message is sent automatically to nominated mobile phones (including the monitoring entity and the site superintendent), or a flashing light or sound signal is triggered when the vibration at the base of the neighbouring structure exceed 8 mm/s VSPPV. If the SMS message is sent or the warning signal is triggered, then the machinery operator should reduce the force generated by his equipment or move further away from the neighbouring structure.

Occasional exceedances may be allowed, however, if a sustained exceedance occurs, an inspection by the structural and geotechnical engineers should be made of the potentially affected building and excavation should only resume if no vibration-induced damage can be seen.

If the warning light is being triggered frequently (e.g., >10 times/day), excavation works are to stop, the geotechnical engineer is to be notified and a site visit carried out by the geotechnical engineer to investigate the cause of the exceedances. A change in excavation method may be recommended as a result of the inspection, or on the basis of recorded vibration data.

6. Limitations

Douglas Partners (Douglas) has prepared this report for this project at Ivanhoe Estate, Macquarie Park in accordance with Douglas' proposal dated 30 November 2023 and acceptance received from Antonio Screnci. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Parkview Constructions 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 DP for any loss or damage. In preparing this report Douglas 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 Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas 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 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. 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.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully

Douglas Partners Pty Ltd

Reviewed by



Craig Stemp/Sally Peacock
Associate/Senior Associate



Hugh Burbidge
Principal

Attachments: 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.

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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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Douglas PARTNERS | GROUNDED EXPERTISE

Parkview Constructions Pty Ltd
Level 7, 60 Union Street, Pyrmont
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Attention: Mohamed Yaccoub
Email: mohamed.yaccoub@parkview.com.au

Project 86043.23
21 February 2024
R.008.Rev0
CL:de

Report on Groundwater Quality for Dewatering Ivanhoe Estate Stage 2 - Building C3 Midtown, Macquarie Park NSW

1. Introduction

This letter report presents the results of sampling and testing from groundwater monitoring wells carried out at Midtown, Macquarie Park for the Ivanhoe Estate (Stage 2) Building C3 (the 'site') Project. The investigation was commissioned in an email dated 29 January 2024 by Mohamed Yaccoub of Parkview Constructions Pty Ltd (Parkview) and was undertaken in accordance with Douglas Partners (Douglas)' proposal 86043.23.P.004.Rev0, dated 25 January 2024.

It is understood that the proposed development includes the construction of a high rise, mixed use building with a four-level basement. The deepest basement level is shown to have a floor level at Reduced Level (RL) 39 m, with respect to the Australian Height Datum (AHD). The basement is shallower at RL at the north-east end, requiring a maximum depth of cut of about 6 m.

Douglas has previously prepared a Dewatering Management Plan (DMP) for the Stage 2 Midtown, which encompassed the C3 Building site, reference 86043.06.R.008.Rev0 dated 4 May 2022 (Douglas, 2022). As part of the monitoring requirements of the DMP, Douglas installed three groundwater monitoring wells BH301 to BH303 between 30 January 2024 and 1 February 2024 around the outside of the proposed basement area, refer to attached Drawing 1. The DMP should be referred when considering the results of the current investigation.

It is understood that this letter report is required for Construction Certificate (CC1) submission, to meet Condition C36 in the Development Consent – Key Sites, Section 4.38 of the Environmental Planning and Assessment 1979.

2. Site Description

The greater Midtown area is in Macquarie Park near the corner of Epping Road and Herring Road, within the Ryde Local Government Area. The greater Midtown area occupies an area of approximately 8.2 hectares. The approximate location of the proposed C3 development site, with respect to other Stage 2 sites (C2 and C4) and the greater Midtown area, is shown in Figure 1.

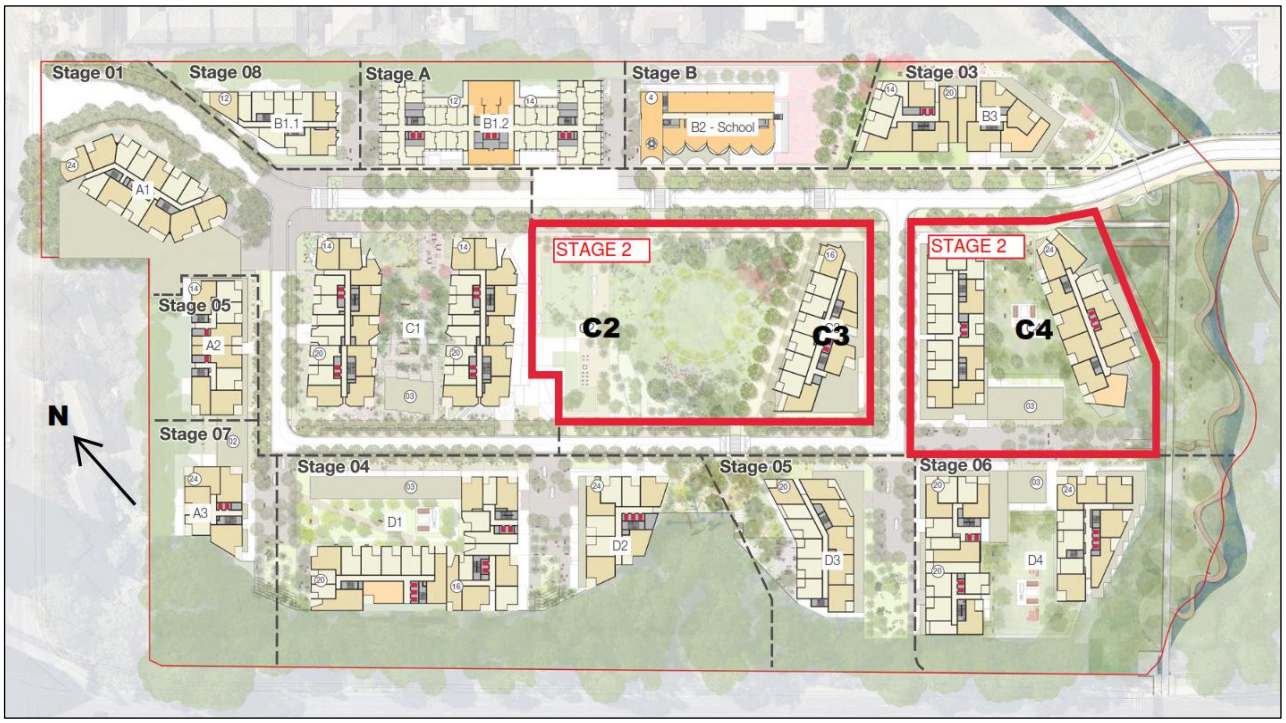

Figure 1: Location of the C3 development area, relative to Stage 2 development areas (bold red), relative to the greater Midtown area (light red) (provided by Client).



Figure 2: Approximate C3 boundary (refer to Drawing 1 for full legend).

Topographically, the Midtown site is located on a side slope, with ground surface levels falling from approximately RL 71 near Herring Road (north-western site boundary), to approximately RL 42 at Shrimpton's Creek (adjacent to south-eastern site boundary).

Ground surface levels at the C3 development area typically fall from approximately RL 53 to RL 49, towards the east, though local variation was also present due to earthworks for haul roads, sedimentation controls (including swales and a sedimentation basin), and due to temporary stockpiles. While the typical ground surface levels within the C3 site, are similar to those prior to earthworks at the site, these levels were elevated relative to swales excavated at the north-east and south-west of the site, as part of sedimentation control measures for the Midtown earthworks (see also Figure 1).

3. Site Assessment Criteria

The Site Assessment Criteria (SAC) and groundwater investigation levels (GIL) used for interpretation of the groundwater data (as a Tier 1 assessment) have been selected based on the potential risks posed from contamination sourced from the site to receptors at or down-gradient of the site.

The groundwater appears to flow south and south-east into Shrimpton's Creek (freshwater), which feeds into the Lane Cove River (freshwater) based on the (Douglas, 2022). As such, freshwater GIL have been adopted for reference as the discharge point is in freshwater. The adopted GIL, as are shown in the attached Table A1 and have been derived from *Australian and New Zealand Guidelines for Fresh and Marine Water Quality* (ANZG, 2018). For groundwater quality comparison purposes Douglas has adopted the 95% levels of protection (LOP) for species in aquatic ecosystems which exhibit slightly to moderately disturbed conditions.

No beneficial re-use of the water for drinking water or recreational purposes has been assumed and no comparison has been made with the associated guidelines.

4. Methodology and Field Observations

4.1 Monitoring Well Installation

Groundwater monitoring wells BH301, BH302 and BH303 were installed between 30 January 2024 and 1 February 2024. Monitoring wells are constructed using class 18 uPVC machine slotted screen and blank sections with screw threaded joints. The screened section of each well is backfilled with a washed sand filter pack to approximately 0.5 m above the screened interval.

4.2 Monitoring Well Development

Groundwater monitoring wells are developed as soon as practicable following well installation. The purpose of well development is to remove sediments and / or drilling fluid introduced to the well during drilling and to facilitate connection of the monitoring well to the aquifer. The wells were developed by pumping to remove a minimum of three well volumes, or until dry.

4.3 Groundwater Sampling

Groundwater sampling was carried out in accordance with Douglas'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 methods are described as follows:

- Measure the static water level using an electronic interface probe and record the thickness of any LNAPL (if encountered);
- Decontaminate the interface probe and cable between monitoring wells by rinsing in a diluted Liquinox solution and then rinsing in demineralised water;
- Peristaltic Pump:
  - Lower the well-dedicated tubing into the well then clamped at a level estimated to be 1 m below the top of the water column (provided the depth of the pump is within the screened section) or to the approximate mid-point of the well screen;
  - Set the pump at the lowest rate possible to minimise drawdown of the water column;
  - Measure physical parameters by continuously passing the purged water through a flow cell and record a stabilised reading (if possible) after stagnant water has been removed from the well; and
  - Following stabilisation of the field parameters, collect samples in laboratory-prepared bottles minimising headspace within the sample bottle and cap immediately.

The general groundwater sample handling and management procedures comprise:

- Collect 10% replicate samples for Quality Control (QC) purposes;
- Label sample containers with individual and unique identification details, including project number and sample location;
- Place the sample jars into a cooled, insulated and sealed container for transport to the laboratory; and
- Use chain of custody documentation.

4.4 Field Observations

The collection of groundwater samples from each of the three wells was carried out in accordance with the methodology as set out in the Douglas *Field Procedures Manual*, as above. Groundwater sampling was undertaken on 6 February 2024, using a peristaltic pump. The samples were collected after stable field readings were obtained (where possible) for pH, conductivity, temperature, and redox and dissolved oxygen.

No phase separated hydrocarbons were noted in the groundwater collected in all wells sampled. Groundwater samples in all three wells were observed to be clear with no sediment. No odour was observed in any groundwater samples or from the wells.

5. Groundwater Results

5.1 Field Testing Results

Groundwater levels were measured prior to sampling from the wells. The measured levels are summarised in Table 1, below.

Table 1: Groundwater Levels

Monitoring Well ID	Date	Ground Level (m AHD)	Groundwater Level (m bgl)	Groundwater Level (m AHD)
BH301 Up-gradient	6 February 2024	49.31	6.2	43.11
BH302 Down-gradient	6 February 2024	48.11	3.25	44.86
BH303 Mid-gradient	6 February 2024	49.20	5.95	43.25

Groundwater samples in BH301 to BH303 were taken after stable readings were obtained for pH, conductivity, temperature, redox, and dissolved oxygen. Final stabilised readings are presented in Table 2 below and complete readings in the attached field sheets.

Table 2: Groundwater Quality - Field Parameter Readings

Monitoring Well ID	Temperature (°C)	Dissolved Oxygen (mg/L)	Conductivity (µS/cm)	pH	Redox (mV)
BH301	19.4	4.3	1931	**3.68**	62.7
BH302	22	8.71	1552	6.96	57.1
BH303	19.9	1.87	781	**3.85**	62.7
Criteria for Lowland Rivers				6.5-8	-

Notes: **Bold** Outside of the criteria

5.2 Laboratory Results

The laboratory results are shown in Table A1, attached. The field and laboratory data quality assurance (QA) and quality control (QC) results for the samples have been reviewed and are considered to be acceptable as attached. The laboratory certificate of analysis and associated documentation are also attached.

6. Discussion

Groundwater results, and relevant adopted screening criteria, are shown in Table A1, attached. It should be noted that the disposal criteria may vary depending on the receiving water body and / or the requirements of relevant authorities.

The results of the groundwater quality monitoring indicate that the chemical concentrations in all samples tested are within the SAC for all analytes tested, except the following:

Total metals:

- The concentration of total chromium in all three primary samples tested at 5 µg/L, 12 µg/L and 4 µg/L respectively exceeded the 95% LOP for fresh water of 1 µg/L;
- The concentration of copper in all three primary samples tested at 18 µg/L, 16 µg/L and 84 µg/L respectively exceeded the 95% LOP for fresh water of 1 .4 µg/L;
- The concentration of lead in BH301 at 41 µg/L and in BH303 at 7 µg/L exceeded the 95% LOP for freshwater of 3.4 µg/L;
- The concentration of nickel in BH301 at 19 µg/L and in BH303 at 32 µg/L exceeded the 95% LOP for freshwater of 11 µg/L;
- The concentration of zinc in all three primary samples tested at 150 µg/L, 22 µg/L, 50 µg/L respectively exceeded the 95% LOP for freshwater of 8 µg/L.

Dissolved metals:

- The concentration of total chromium (dissolved) in BH302 at 14 µg/Land BH303 at 3 µg/L exceeded the 95% LOP for fresh water of 1 µg/L;
- The concentration of copper in all three samples at 16 µg/L, 15 µg/L and 63 µg/L respectively exceeded the 95% LOP for fresh water of 1 .4 µg/L;
- The concentration of lead in BH301 at 30 µg/L and in BH303 at 5 µg/L exceeded the 95% LOP for freshwater of 3.4 µg/L;
- The concentration of nickel in BH301 at 14 µg/L and in BH303 at 22 µg/L exceeded the 95% LOP for freshwater of 11 µg/L;
- The concentration of zinc in BH301 at 130 µg/L and in BH303 at 120 µg/L exceeded the 95% LOP for freshwater of 8 µg/L;

The exceedances of metals mentioned above are consistent with those identified in the DMP (Douglas 2022). Elevated iron and total suspended solids (TSS) were also detected in the current investigation which would also need to be addressed.

It is noted that the laboratory adopted Practical Quantitation Limit (PQL) for some chemicals including anthracene in the category of PAH, OCP, OPP and PCB exceeded the adopted SAC as shown on Table A1. The SAC exceedances for those chemicals mentioned above are not considered to be of concern since all results were below the PQL. However, further testing should be conducted prior to dewatering and if any exceedances are detected before and during the course of dewatering, treatment prior to disposal may be required.

PFOS in was detected in BH302 at 0.04 µg/L exceeded the 99%LOP of 0.00023 µg/L, but within the adopted 95%LOP of 0.13 µg/L.

Groundwater will require treatment prior to disposal to stormwater (i.e., Shrimptons Creek) however, based on the current results, the required quality levels should be able to be achieved through conventional industry (treatment) 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 of the DMP (Douglas 2022).

7. References

ANZECC. (2000). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Australia and New Zealand Environment and Conservation Council.

ANZG. (2018). *Australian and New Zealand Guidelines for Fresh and Marine Water Quality*. Canberra, ACT: Australian and New Zealand Governments and Australian state and territory governments.

Douglas. (2022). *Dewatering Management Plan, Stage 2 - Midtown, Herring Road, Macquarie Park*. ref: 86043.06.R.008.Rev0, dated: 04 May 2022.

8. Limitations

Douglas Partners (Douglas) has prepared this report for Building C3 at Midtown, Macquarie Park NSW in accordance with Douglas' proposal dated 25 January 2024 and acceptance received from Mohamed Yaccoub dated 29 January 2024. The work was carried out under Douglas' Engagement Terms. This report is provided for the exclusive use of Parkview Constructions 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.

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 Douglas' field testing has been completed.

Douglas' advice is based upon the conditions encountered during this investigation. The accuracy of the advice provided by Douglas 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, environmental 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. 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.

Please contact the undersigned if you have any questions on this matter.

Yours faithfully

Douglas Partners Pty Ltd



Cathy Li
Environmental Scientist

Reviewed by



p.p. **Mike Nash**
Principal

Attachments:
About this Report
Summary Table A1
Table QA1 – QA3
Laboratory Test Results
Field Notes
Drawing 3: Test Location Plant

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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Table A1: Summary of Laboratory Results

				ANZG (2018) 95% LOP	HEPA (2020) 95% LOP Fresh			
Sample ID						BH301	BH302	BH303
Sample Date		PQL	Units			06/02/24	06/02/24	06/02/24
Metals - Total	Total Arsenic	1	µg/L	13		**1**	**2**	<1
	Cadmium	0.1	µg/L	0.2		**0.2**	<0.1	<0.1
	Total Chromium	1	µg/L	1		**5**	**12**	**4**
	Copper	1	µg/L	1.4		**18**	**16**	**84**
	Lead	1	µg/L	3.4		**41**	**2**	**7**
	Mercury (inorganic)	0.05	µg/L	0.06		<0.05	<0.05	<0.05
	Nickel	1	µg/L	11		**19**	**9**	**32**
	Zinc	1	µg/L	8		**150**	**22**	**150**
Metals - Dissolved	Total Arsenic	1	µg/L	13		<1	**1**	<1
	Cadmium	0.1	µg/L	0.2		**0.1**	<0.1	<0.1
	Total Chromium	1	µg/L	1		<1	**14**	**3**
	Copper	1	µg/L	1.4		**16**	**15**	**63**
	Iron	10	µg/L			**130**	**40**	**2,700**
	Lead	1	µg/L	3.4		**30**	<1	**5**
	Mercury (inorganic)	0.05	µg/L	0.06		<0.05	<0.05	<0.05
	Nickel	1	µg/L	11		**14**	**4**	**22**
	Zinc	1	µg/L	8		**130**	**3**	**120**
TRH	F1 ((C6-C10)-BTEX)	10	µg/L			<10	<10	<10
	F2 (>C10-C16 less Naphthalene)	50	µg/L			<50	<50	<50
	F3 (>C16-C34)	100	µg/L			<100	**140**	<100
	F4 (>C34-C40)	100	µg/L			<100	<100	<100
BTEX	Benzene	1	µg/L	950		<1	<1	<1
	Toluene	1	µg/L	180		<1	<1	<1
	Ethylbenzene	1	µg/L	80		<1	<1	<1
	o-Xylene	1	µg/L	350		<1	<1	<1
	m+p-Xylene	2	µg/L	75		<2	<2	<2
	Total Xylenes	1	µg/L			<1	<1	<1
PAH	Acenaphthene	0.1	µg/L			<0.1	<0.1	<0.1
	Acenaphthylene	0.1	µg/L			<0.1	<0.1	<0.1
	Anthracene*	0.1	µg/L	0.01		<0.1	<0.1	<0.1
	Benzo(a)anthracene	0.1	µg/L			<0.1	<0.1	<0.1
	Naphthalene	1	µg/L	16		<1	<1	<1
	Benzo(a)pyrene (B(a)P)	0.1	µg/L	0.1		<0.1	<0.1	<0.1
	Benzo(b,j+k)fluoranthene	0.2	µg/L			<0.2	<0.2	<0.2
	Benzo(g,h,i)perylene	0.1	µg/L			<0.1	<0.1	<0.1
	Chrysene	0.1	µg/L			<0.1	<0.1	<0.1
	Dibenzo(a,h)anthracene	0.1	µg/L			<0.1	<0.1	<0.1
	Fluoranthene	0.1	µg/L	1		<0.1	<0.1	<0.1
	Fluorene	0.1	µg/L			<0.1	<0.1	<0.1
	Indeno(1,2,3-c,d)pyrene	0.1	µg/L			<0.1	<0.1	<0.1
	Phenanthrene	0.1	µg/L	0.6		<0.1	<0.1	<0.1
	Pyrene	0.1	µg/L			<0.1	<0.1	<0.1
	Sum of detected PAH	0.1	µg/L			<0.1	<0.1	<0.1

Table A1: Summary of Laboratory Results

				ANZG (2018) 95%	HEPA (2020) 95% LOP Fresh			
Sample ID						BH301	BH302	BH303
Sample Date		PQL	Units	LOP		06/02/24	06/02/24	06/02/24
OCP	DDE	0.2	µg/L			<0.2	<0.2	<0.2
	DDT*	0.2	µg/L	0.006		<0.2	<0.2	<0.2
	DDD	0.2	µg/L			<0.2	<0.2	<0.2
	Aldrin	0.2	µg/L	0.001		<0.2	<0.2	<0.2
	Dieldrin	0.2	µg/L	0.01		<0.2	<0.2	<0.2
	Aldrin + Dieldrin (calculated)	0.2	µg/L			<0.2	<0.2	<0.2
	alpha-chlordane	0.2	µg/L			<0.2	<0.2	<0.2
	gamma-Chlordane	0.2	µg/L			<0.2	<0.2	<0.2
	Endosulfan I	0.2	µg/L			<0.2	<0.2	<0.2
	Endosulfan II	0.2	µg/L			<0.2	<0.2	<0.2
	Endosulfan Sulphate	0.2	µg/L			<0.2	<0.2	<0.2
	Endrin*	0.2	µg/L	0.01		<0.2	<0.2	<0.2
	Endrin Aldehyde	0.2	µg/L			<0.2	<0.2	<0.2
	Heptachlor*	0.2	µg/L	0.01		<0.2	<0.2	<0.2
	Heptachlor Epoxide	0.2	µg/L			<0.2	<0.2	<0.2
	Hexachlorobenzene	0.2	µg/L	0.1		<0.2	<0.2	<0.2
	Methoxychlor	0.2	µg/L	0.005		<0.2	<0.2	<0.2
	Mirex	0.2	µg/L	0.04		<0.2	<0.2	<0.2
	alpha-BHC	0.2	µg/L			<0.2	<0.2	<0.2
	beta-BHC	0.2	µg/L			<0.2	<0.2	<0.2
	delta-BHC	0.2	µg/L			<0.2	<0.2	<0.2
	Lindane	0.2	µg/L	0.2		<0.2	<0.2	<0.2
	Sum of detected OCP	0.2	µg/L			<0.2	<0.2	<0.2
OPP	Azinphos methyl (Guthion)	0.2	µg/L	0.02		<0.2	<0.2	<0.2
	Bromophos-ethyl	0.2	µg/L			<0.2	<0.2	<0.2
	Chlorpyriphos	0.2	µg/L	0.00004		<0.2	<0.2	<0.2
	Chlorpyriphos-methyl	0.2	µg/L			<0.2	<0.2	<0.2
	Diazinon	0.2	µg/L	0.01		<0.2	<0.2	<0.2
	Dichlorvos	0.2	µg/L			<0.2	<0.2	<0.2
	Dimethoate	0.2	µg/L	0.15		<0.2	<0.2	<0.2
	Ethion	0.2	µg/L			<0.2	<0.2	<0.2
	Ronnel (fenchlorphos)	0.2	µg/L			<0.2	<0.2	<0.2
	Fenitrothion	0.2	µg/L	0.2		<0.2	<0.2	<0.2
	Fenthion	0.2	µg/L			<0.2	<0.2	<0.2
	Malathion	0.2	µg/L	0.05		<0.2	<0.2	<0.2
	Parathion	0.2	µg/L	0.004		<0.2	<0.2	<0.2
	Parathion-methyl	0.2	µg/L			<0.2	<0.2	<0.2
	Methidathion	0.2	µg/L			<0.2	<0.2	<0.2
	Fenamiphos	0.2	µg/L			<0.2	<0.2	<0.2
	Sum of detected OPP	0.2	µg/L			<0.2	<0.2	<0.2

Table A1: Summary of Laboratory Results

				ANZG (2018) 95% LOP	HEPA (2020) 95% LOP Fresh			
Sample ID						BH301	BH302	BH303
Sample Date		PQL	Units			06/02/24	06/02/24	06/02/24
PCB	Arochlor 1016	2	µg/L			<2	<2	<2
	Arochlor 1221	2	µg/L			<2	<2	<2
	Arochlor 1232	2	µg/L			<2	<2	<2
	Arochlor 1242*	2	µg/L	0.3		<2	<2	<2
	Arochlor 1248	2	µg/L			<2	<2	<2
	Arochlor 1254*	2	µg/L	0.01		<2	<2	<2
	Aroclor 1260	2	µg/L			<2	<2	<2
	Sum of detected PCB	2	µg/L			<2	<2	<2
PFAS	PFOS	0.01	µg/L		0.13	<0.01	**0.04**	<0.01
	PFOA	0.01	µg/L		220	<0.01	**0.04**	**0.02**
	PFHxS	0.01	µg/L			<0.01	<0.01	<0.01
	6:2 FTS	0.01	µg/L			<0.01	<0.01	<0.01
	8:2 FTS	0.02	µg/L			<0.02	<0.02	<0.02
	Sum of detected PFAS	0.01	µg/L			<0.01	**0.08**	**0.02**
Miscellaneous Inorganics	Ferrous Iron	50	µg/L			**120**	**70**	**2,600**
	Ferric Iron	50	µg/L			<50	<50	<50
Other	Disulfoton	0.2	µg/L			<0.2	<0.2	<0.2
	Mevinphos	0.2	µg/L			<0.2	<0.2	<0.2
Physical Parameters	Total dissolved solids	5,000	µg/L			**680,000**	**1,300,000**	**550,000**
	Total Suspended Solids	5,000	µg/L			**240.000**	**110.000**	**18.000**
Anions & Cations	Chloride	1000	µg/L			**250,000**	**39,000**	**95,000**
	Sulphate	1000	µg/L			**41,000**	**580,000**	**160,000**

Notes:

-	No criterion / not defined / not tested / not applicable
*	99% LOP adopted as recommended due to potential for bioaccumulation
NL	Not limiting
PQL	Practical quantitation limit
	Shaded cell is exceedance of guideline value
	Where one or more guideline value is exceeded, the cell is shaded to the colour of the highest guideline value exceeded
	ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, 95% level of protection of species for Fresh aquatic ecosystems [NB: 99% level of protection adopted for bioaccumulative chemicals]
	HEPA (2018) PFAS National Environmental Management Plan, Version 2 99% level of protection for Fresh water aquatic ecosystems
	NHMRC (2018) Australian Drinking Water Guidelines 6 2011, drinking water aesthetic-based criteria
	NHMRC (2008) Guidelines for Managing Risk in Recreational Water
	ANZG (2018) Australian and New Zealand Guidelines for Fresh and Marine Water Quality, orange text is 'unknown' level of protection
	Underlining of ANZG (2018) criteria indicates a criteria with an 'unknown' level of protection.
	ANZG (2018) DGV adopted for most conservative species of following analytes: DGV for xylene (m) adopted for xylene (m+p); DGV for CrVI adopted for total chromium; DGV for AsV adopted for total arsenic
	ANZG (2018) DGV adopted for aluminium in freshwater is for receiving waters with pH >6.5. For receiving waters with pH <6.5 suitability of the more conservative, low reliability DGV of unknown LOP should be considered
	ANZG (2018) Ammonia DGV is pH and temperature dependant. DGV for a pH of 8 provided in table.

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Table QA1: Relative Percentage Difference Results – Water Sampling

Lab Report No		343215	343215		
Sample ID		BH301	BD1/20240206		
Sample Date		06/02/24	06/02/24	Difference	RPD
Sample Type		Water	Water		
Units		µg/L	µg/L	µg/L	%
Metals - Dissol	Total Arsenic	<1	<1	0	0%
	Cadmium	0.1	0.2	0.1	0%
	Total Chromium	<1	<1	0	0%
	Copper	16	14	2	13%
	Lead	30	33	3	10%
	Mercury (inorganic)	<0.05	<0.05	0	0%
	Nickel	14	15	1	7%
	Zinc	130	130	0	0%
TRH	F1 ((C6-C10)-BTEX)	<10	<10	0	0%
	F2 (>C10-C16 less Naphthalene)	<50	<50	0	0%
	F3 (>C16-C34)	<100	<100	0	0%
	F4 (>C34-C40)	<100	<100	0	0%
BTEX	Benzene	<1	<1	0	0%
	Toluene	<1	<1	0	0%
	Ethylbenzene	<1	<1	0	0%
	o-Xylene	<1	<1	0	0%
	m+p-Xylene	<2	<2	0	0%
	Total Xylenes	<1	<1	0	0%
PAH	Acenaphthene	<0.1	<0.1	0	0%
	Acenaphthylene	<0.1	<0.1	0	0%
	Anthracene	<0.1	<0.1	0	0%
	Benzo(a)anthracene	<0.1	<0.1	0	0%
	Naphthalene	<1	<1	0	0%
	Benzo(a)pyrene (B(a)P)	<0.1	<0.1	0	0%
	Benzo(b,j+k)fluoranthene	<0.2	<0.2	0	0%
	Benzo(g,h,i)perylene	<0.1	<0.1	0	0%
	Chrysene	<0.1	<0.1	0	0%
	Dibenzo(a,h)anthracene	<0.1	<0.1	0	0%
	Fluoranthene	<0.1	<0.1	0	0%
	Fluorene	<0.1	<0.1	0	0%
	Indeno(1,2,3-c,d)pyrene	<0.1	<0.1	0	0%
	Phenanthrene	<0.1	<0.1	0	0%
	Pyrene	<0.1	<0.1	0	0%
	Sum of detected PAH	<0.1	<0.1	0	0%

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Table QA2: Trip Blank Results - Water Sampling

Sample ID		Trip Blank
Sample Date		06/02/24
Media Being Sampled		Water
Sample Type		Water
Units		µg/L
BTEX	Benzene	<1
	Toluene	<1
	Ethylbenzene	<1
	o-Xylene	<1
	m+p-Xylene	<2
	Total Xylenes	<1

Table QA3: Trip Spike Results – Water Sampling (% Recovery)

Lab Report No		343215
Sample ID		Trip Spike
Sample Date		06/02/24
Media Being Sampled		Water
Sample Type		Water
BTEX	Benzene	100
	Toluene	102
	Ethylbenzene	101
	o-Xylene	101
	m+p-Xylene	99

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CERTIFICATE OF ANALYSIS 343215

Client Details

Client	Douglas Partners Pty Ltd
Attention	David Smith
Address	96 Hermitage Rd, West Ryde, NSW, 2114

Sample Details

Your Reference	**86043.23 Macquarie Park**
Number of Samples	6 Water
Date samples received	06/02/2024
Date completed instructions received	06/02/2024

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	13/02/2024
Date of Issue	13/02/2024

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vTRH(C6-C10)/BTEXN in Water						
Our Reference		343215-1	343215-2	343215-3	343215-4	343215-5
Your Reference	UNITS	BH301	BH302	BH303	BD1/20240206	Trip Spike
Date Sampled		06/02/2024	06/02/2024	06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water	Water	Water
Date extracted	-	07/02/2024	07/02/2024	07/02/2024	07/02/2024	09/02/2024
Date analysed	-	08/02/2024	08/02/2024	08/02/2024	08/02/2024	12/02/2024
TRH C_6 - C_9	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10}	µg/L	<10	<10	<10	<10	[NA]
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10	<10	<10	<10	[NA]
Benzene	µg/L	<1	<1	<1	<1	100%
Toluene	µg/L	<1	<1	<1	<1	102%
Ethylbenzene	µg/L	<1	<1	<1	<1	101%
m+p-xylene	µg/L	<2	<2	<2	<2	99%
o-xylene	µg/L	<1	<1	<1	<1	101%
Naphthalene	µg/L	<1	<1	<1	<1	[NA]
Surrogate Dibromofluoromethane	%	101	102	103	102	101
Surrogate Toluene-d8	%	100	101	100	101	99
Surrogate 4-Bromofluorobenzene	%	100	97	100	100	98

vTRH(C6-C10)/BTEXN in Water		
Our Reference		343215-6
Your Reference	UNITS	Trip Blank
Date Sampled		06/02/2024
Type of sample		Water
Date extracted	-	07/02/2024
Date analysed	-	08/02/2024
TRH C_6 - C_9	µg/L	<10
TRH C_6 - C_{10}	µg/L	<10
TRH C_6 - C_{10} less BTEX (F1)	µg/L	<10
Benzene	µg/L	<1
Toluene	µg/L	<1
Ethylbenzene	µg/L	<1
m+p-xylene	µg/L	<2
o-xylene	µg/L	<1
Naphthalene	µg/L	<1
Surrogate Dibromofluoromethane	%	100
Surrogate Toluene-d8	%	100
Surrogate 4-Bromofluorobenzene	%	99

svTRH (C10-C40) in Water					
Our Reference		343215-1	343215-2	343215-3	343215-4
Your Reference	UNITS	BH301	BH302	BH303	BD1/20240206
Date Sampled		06/02/2024	06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Date analysed	-	07/02/2024	07/02/2024	07/02/2024	07/02/2024
TRH C_{10} - C_{14}	µg/L	<50	<50	<50	<50
TRH C_{15} - C_{28}	µg/L	<100	120	<100	<100
TRH C_{29} - C_{36}	µg/L	<100	<100	<100	<100
Total +ve TRH (C10-C36)	µg/L	<50	120	<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	140	<100	<100
TRH >C_{34} - C_{40}	µg/L	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	µg/L	<50	140	<50	<50
Surrogate o-Terphenyl	%	92	93	87	92

PAHs in Water					
Our Reference	UNITS	343215-1	343215-2	343215-3	343215-4
Your Reference		BH301	BH302	BH303	BD1/20240206
Date Sampled		06/02/2024	06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water	Water
Date extracted	-	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Date analysed	-	07/02/2024	07/02/2024	07/02/2024	07/02/2024
Naphthalene	µg/L	<0.1	<0.1	<0.1	<0.1
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	%	95	94	85	78

Organochlorine Pesticides in Water				
Our Reference		343215-1	343215-2	343215-3
Your Reference	UNITS	BH301	BH302	BH303
Date Sampled		06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water
Date extracted	-	07/02/2024	07/02/2024	07/02/2024
Date analysed	-	07/02/2024	07/02/2024	07/02/2024
alpha-BHC	µg/L	<0.2	<0.2	<0.2
HCB	µg/L	<0.2	<0.2	<0.2
beta-BHC	µg/L	<0.2	<0.2	<0.2
gamma-BHC	µg/L	<0.2	<0.2	<0.2
Heptachlor	µg/L	<0.2	<0.2	<0.2
delta-BHC	µg/L	<0.2	<0.2	<0.2
Aldrin	µg/L	<0.2	<0.2	<0.2
Heptachlor Epoxide	µg/L	<0.2	<0.2	<0.2
gamma-Chlordane	µg/L	<0.2	<0.2	<0.2
alpha-Chlordane	µg/L	<0.2	<0.2	<0.2
Endosulfan I	µg/L	<0.2	<0.2	<0.2
pp-DDE	µg/L	<0.2	<0.2	<0.2
Dieldrin	µg/L	<0.2	<0.2	<0.2
Endrin	µg/L	<0.2	<0.2	<0.2
Endosulfan II	µg/L	<0.2	<0.2	<0.2
pp-DDD	µg/L	<0.2	<0.2	<0.2
Endrin Aldehyde	µg/L	<0.2	<0.2	<0.2
pp-DDT	µg/L	<0.2	<0.2	<0.2
Endosulfan Sulphate	µg/L	<0.2	<0.2	<0.2
Methoxychlor	µg/L	<0.2	<0.2	<0.2
Mirex	ug/L	<0.2	<0.2	<0.2
Surrogate 4-Chloro-3-NBTF	%	89	80	90

OP Pesticides in Water				
Our Reference		343215-1	343215-2	343215-3
Your Reference	UNITS	BH301	BH302	BH303
Date Sampled		06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water
Date extracted	-	07/02/2024	07/02/2024	07/02/2024
Date analysed	-	07/02/2024	07/02/2024	07/02/2024
Dichlorvos	µg/L	<0.2	<0.2	<0.2
Mevinphos	µg/L	<0.2	<0.2	<0.2
Phorate	µg/L	<0.2	<0.2	<0.2
Dimethoate	µg/L	<0.2	<0.2	<0.2
Diazinon	µg/L	<0.2	<0.2	<0.2
Disulfoton	µg/L	<0.2	<0.2	<0.2
Chlorpyriphos-methyl	µg/L	<0.2	<0.2	<0.2
Parathion-Methyl	µg/L	<0.2	<0.2	<0.2
Ronnel	µg/L	<0.2	<0.2	<0.2
Fenitrothion	µg/L	<0.2	<0.2	<0.2
Malathion	µg/L	<0.2	<0.2	<0.2
Chlorpyriphos	µg/L	<0.2	<0.2	<0.2
Fenthion	µg/L	<0.2	<0.2	<0.2
Parathion	µg/L	<0.2	<0.2	<0.2
Bromophos ethyl	µg/L	<0.2	<0.2	<0.2
Methidathion	µg/L	<0.2	<0.2	<0.2
Fenamiphos	µg/L	<0.2	<0.2	<0.2
Ethion	µg/L	<0.2	<0.2	<0.2
Phosalone	µg/L	<0.2	<0.2	<0.2
Azinphos-methyl (Guthion)	µg/L	<0.2	<0.2	<0.2
Coumaphos	µg/L	<0.2	<0.2	<0.2
Surrogate 4-Chloro-3-NBTF	%	89	80	90

PCBs in Water				
Our Reference		343215-1	343215-2	343215-3
Your Reference	UNITS	BH301	BH302	BH303
Date Sampled		06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water
Date extracted	-	07/02/2024	07/02/2024	07/02/2024
Date analysed	-	07/02/2024	07/02/2024	07/02/2024
Aroclor 1016	µg/L	<2	<2	<2
Aroclor 1221	µg/L	<2	<2	<2
Aroclor 1232	µg/L	<2	<2	<2
Aroclor 1242	µg/L	<2	<2	<2
Aroclor 1248	µg/L	<2	<2	<2
Aroclor 1254	µg/L	<2	<2	<2
Aroclor 1260	µg/L	<2	<2	<2
Surrogate 2-Fluorobiphenyl	%	102	89	98

Total Phenolics in Water				
Our Reference		343215-1	343215-2	343215-3
Your Reference	UNITS	BH301	BH302	BH303
Date Sampled		06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water
Date extracted	-	07/02/2024	07/02/2024	07/02/2024
Date analysed	-	07/02/2024	07/02/2024	07/02/2024
Total Phenolics (as Phenol)	mg/L	<0.05	<0.05	<0.05

HM in water - dissolved					
Our Reference		343215-1	343215-2	343215-3	343215-4
Your Reference	UNITS	BH301	BH302	BH303	BD1/20240206
Date Sampled		06/02/2024	06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water	Water
Date prepared	-	08/02/2024	08/02/2024	08/02/2024	08/02/2024
Date analysed	-	08/02/2024	08/02/2024	08/02/2024	08/02/2024
Arsenic-Dissolved	µg/L	<1	1	<1	<1
Cadmium-Dissolved	µg/L	0.1	<0.1	<0.1	0.2
Chromium-Dissolved	µg/L	<1	14	3	<1
Copper-Dissolved	µg/L	16	15	63	14
Lead-Dissolved	µg/L	30	<1	5	33
Mercury-Dissolved	µg/L	<0.05	<0.05	<0.05	<0.05
Nickel-Dissolved	µg/L	14	4	22	15
Zinc-Dissolved	µg/L	130	3	120	130
Iron-Dissolved	µg/L	130	40	2,700	[NA]

HM in water - total				
Our Reference		343215-1	343215-2	343215-3
Your Reference	UNITS	BH301	BH302	BH303
Date Sampled		06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water
Date prepared	-	07/02/2024	07/02/2024	07/02/2024
Date analysed	-	07/02/2024	07/02/2024	07/02/2024
Arsenic-Total	µg/L	1	2	<1
Cadmium-Total	µg/L	0.2	<0.1	<0.1
Chromium-Total	µg/L	5	12	4
Copper-Total	µg/L	18	16	84
Lead-Total	µg/L	41	2	7
Mercury-Total	µg/L	<0.05	<0.05	<0.05
Nickel-Total	µg/L	19	9	32
Zinc-Total	µg/L	150	22	150

Miscellaneous Inorganics				
Our Reference	UNITS	343215-1	343215-2	343215-3
Your Reference		BH301	BH302	BH303
Date Sampled		06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water
Date prepared	-	06/02/2024	06/02/2024	06/02/2024
Date analysed	-	06/02/2024	06/02/2024	06/02/2024
pH	pH Units	3.8	7.0	4.1
Electrical Conductivity	µS/cm	1,100	1,500	750
Total Suspended Solids	mg/L	240	110	18
Total Dissolved Solids (grav)	mg/L	680	1,300	550
Oil & Grease (LLE)	mg/L	<5	[NA]	[NA]
Chloride, Cl	mg/L	250	39	95
Sulphate, SO4	mg/L	41	580	160
Ferrous Iron	mg/L	0.12	0.07	2.6
Ferric Iron (by calculation)	mg/L	<0.05	<0.05	<0.05

PFAS in Waters Short				
Our Reference		343215-1	343215-2	343215-3
Your Reference	UNITS	BH301	BH302	BH303
Date Sampled		06/02/2024	06/02/2024	06/02/2024
Type of sample		Water	Water	Water
Date prepared	-	07/02/2024	07/02/2024	07/02/2024
Date analysed	-	07/02/2024	07/02/2024	07/02/2024
Perfluorohexanesulfonic acid - PFHxS	µg/L	<0.01	<0.01	<0.01
Perfluorooctanesulfonic acid PFOS	µg/L	<0.01	0.04	<0.01
Perfluorooctanoic acid PFOA	µg/L	<0.01	0.04	0.02
6:2 FTS	µg/L	<0.01	<0.01	<0.01
8:2 FTS	µg/L	<0.02	<0.02	<0.02
Surrogate $^{13}C_8$ *PFOS*	%	97	104	100
Surrogate $^{13}C_2$ *PFOA*	%	97	98	99
Extracted ISTD $^{18}O_2$ *PFHxS*	%	99	100	100
Extracted ISTD $^{13}C_4$ *PFOS*	%	104	99	102
Extracted ISTD $^{13}C_4$ *PFOA*	%	110	107	104
Extracted ISTD $^{13}C_2$ *6:2FTS*	%	117	106	105
Extracted ISTD $^{13}C_2$ *8:2FTS*	%	125	120	121
Total Positive PFHxS & PFOS	µg/L	<0.01	0.04	<0.01
Total Positive PFOA & PFOS	µg/L	<0.01	0.08	0.02
Total Positive PFAS	µg/L	<0.01	0.08	0.02

Method ID	Methodology Summary
Inorg-001	pH - Measured using pH meter and electrode in accordance with APHA latest edition, 4500-H+. Please note that the results for water analyses are indicative only, as analysis outside of the APHA storage times.
Inorg-002	Conductivity and Salinity - measured using a conductivity cell at 25°C in accordance with APHA latest edition 2510 and Rayment & Lyons.
Inorg-003	Oil & Grease - determine gravimetrically following extraction with Hexane, in accordance with APHA latest edition, 5520-B.
Inorg-018	Total Dissolved Solids - determined gravimetrically. The solids are dried at 180+/-10°C. NOTE: Where the EC of the sample is <100µS/cm, the TDS will typically be below 70mg/L (as the sample is very likely to be at least drinking water quality). Therefore to ensure data quality for TDS, the TDS is typically calculated as per the equation below:- TDS = EC * 0.6
Inorg-019	Suspended Solids - determined gravimetricially by filtration of the sample. The samples are dried at 104+/-5°C.
Inorg-031	Total Phenolics by segmented flow analyser (in line distillation with colourimetric finish). Solids are extracted in a caustic media prior to analysis.
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-021	Determination of Mercury by Cold Vapour AAS.
Metals-022	Determination of various metals by ICP-MS. Please note for Bromine and Iodine, any forms of these elements that are present are included together in the one result reported for each of these two elements. Salt forms (e.g. FeO, PbO, ZnO) are determinined stoichiometrically from the base metal concentration.
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.

Method ID	Methodology Summary
Org-021/022/025	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD and/or GC-MS/GC-MSMS. Note, the Total +ve PCBs PQL is reflective of the lowest individual PQL and is therefore" Total +ve PCBs" is simply a sum of the positive individual PCBs.
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.
Org-029	Soil samples are extracted with basified Methanol. Waters and soil extracts are directly injected and/or concentrated/extracted using SPE. TCLPs/ASLP leachates are centrifuged, the supernatant is then analysed (including amendment with solvent) - as per the option in AS4439.3. Analysis is undertaken with LC-MS/MS. PFAS results include the sum of branched and linear isomers where applicable. Please note that PFAS results are corrected for Extracted Internal Standards (QSM 5.4 Table B-15 terminology), which are mass labelled analytes added prior to sample preparation to assess matrix effects and verify processing of the sample. PFAS analytes without a commercially available mass labelled analogue are corrected vs a closely eluting mass labelled PFAS compound. Surrogates are also reported, in this context they are mass labelled PFAS compounds added prior to extraction but are used as monitoring compounds only (not used for result correction). Envicarb (or similar) is used discretionally to remove interfering matrix components. Please contact the laboratory if estimates of Measurement Uncertainty are required as per WA DER.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	[NT]
Date extracted	-			07/02/2024	1	07/02/2024	09/02/2024		07/02/2024	[NT]
Date analysed	-			08/02/2024	1	08/02/2024	12/02/2024		08/02/2024	[NT]
TRH C_6 - C_9	µg/L	10	Org-023	<10	1	<10	<10	0	107	[NT]
TRH C_6 - C_{10}	µg/L	10	Org-023	<10	1	<10	<10	0	107	[NT]
Benzene	µg/L	1	Org-023	<1	1	<1	<1	0	100	[NT]
Toluene	µg/L	1	Org-023	<1	1	<1	<1	0	116	[NT]
Ethylbenzene	µg/L	1	Org-023	<1	1	<1	<1	0	103	[NT]
m+p-xylene	µg/L	2	Org-023	<2	1	<2	<2	0	109	[NT]
o-xylene	µg/L	1	Org-023	<1	1	<1	<1	0	108	[NT]
Naphthalene	µg/L	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate Dibromofluoromethane	%		Org-023	101	1	101	103	2	98	[NT]
Surrogate Toluene-d8	%		Org-023	99	1	100	100	0	101	[NT]
Surrogate 4-Bromofluorobenzene	%		Org-023	101	1	100	96	4	103	[NT]

QUALITY CONTROL: svTRH (C10-C40) in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	343215-2
Date extracted	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Date analysed	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
TRH C_{10} - C_{14}	µg/L	50	Org-020	<50	1	<50	<50	0	106	99
TRH C_{15} - C_{28}	µg/L	100	Org-020	<100	1	<100	<100	0	101	103
TRH C_{29} - C_{36}	µg/L	100	Org-020	<100	1	<100	<100	0	114	92
TRH >C_{10} - C_{16}	µg/L	50	Org-020	<50	1	<50	<50	0	106	99
TRH >C_{16} - C_{34}	µg/L	100	Org-020	<100	1	<100	<100	0	101	103
TRH >C_{34} - C_{40}	µg/L	100	Org-020	<100	1	<100	<100	0	114	92
Surrogate o-Terphenyl	%		Org-020	101	1	92	84	9	103	95

QUALITY CONTROL: PAHs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	343215-2
Date extracted	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Date analysed	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Naphthalene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	113
Acenaphthylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	77	103
Fluorene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	78	83
Phenanthrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	85
Anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	99
Pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	89
Benzo(a)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	75	83
Benzo(b,j+k)fluoranthene	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	115
Indeno(1,2,3-c,d)pyrene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	µg/L	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	86	1	95	97	2	74	80

QUALITY CONTROL: Organochlorine Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	343215-2
Date extracted	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Date analysed	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
alpha-BHC	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	75	85
HCB	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
beta-BHC	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	70	76
gamma-BHC	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Heptachlor	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	90	94
delta-BHC	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Aldrin	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	93	115
Heptachlor Epoxide	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	100	127
gamma-Chlordane	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
alpha-Chlordane	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan I	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDE	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	100	120
Dieldrin	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	98	132
Endrin	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	80	109
Endosulfan II	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDD	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	86	111
Endrin Aldehyde	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
pp-DDT	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Endosulfan Sulphate	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	79	105
Methoxychlor	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Mirex	ug/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	94	1	89	79	12	80	84

QUALITY CONTROL: OP Pesticides in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	343215-2
Date extracted	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Date analysed	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Dichlorvos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	130	137
Mevinphos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Phorate	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Dimethoate	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Diazinon	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Disulfoton	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Chlorpyriphos-methyl	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Parathion-Methyl	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Ronnel	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	82	102
Fenitrothion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	102	127
Malathion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	104	136
Chlorpyriphos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	95	118
Fenthion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Parathion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	97	122
Bromophos ethyl	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Methidathion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Fenamiphos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Ethion	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	85	125
Phosalone	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Azinphos-methyl (Guthion)	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Coumaphos	µg/L	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Surrogate 4-Chloro-3-NBTF	%		Org-022/025	94	1	89	79	12	80	84

QUALITY CONTROL: PCBs in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	343215-2
Date extracted	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Date analysed	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Aroclor 1016	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1221	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1232	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1242	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1248	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Aroclor 1254	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	84	106
Aroclor 1260	µg/L	2	Org-021/022/025	<2	1	<2	<2	0	[NT]	[NT]
Surrogate 2-Fluorobiphenyl	%		Org-021/022/025	103	1	102	87	16	67	96

QUALITY CONTROL: Total Phenolics in Water						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date extracted	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	[NT]
Date analysed	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	[NT]
Total Phenolics (as Phenol)	mg/L	0.05	Inorg-031	<0.05	1	<0.05	<0.05	0	114	[NT]

QUALITY CONTROL: HM in water - dissolved						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			08/02/2024	1	08/02/2024	08/02/2024		08/02/2024	[NT]
Date analysed	-			08/02/2024	1	08/02/2024	08/02/2024		08/02/2024	[NT]
Arsenic-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		98	[NT]
Cadmium-Dissolved	µg/L	0.1	Metals-022	<0.1	1	0.1	[NT]		98	[NT]
Chromium-Dissolved	µg/L	1	Metals-022	<1	1	<1	[NT]		92	[NT]
Copper-Dissolved	µg/L	1	Metals-022	<1	1	16	[NT]		94	[NT]
Lead-Dissolved	µg/L	1	Metals-022	<1	1	30	[NT]		96	[NT]
Mercury-Dissolved	µg/L	0.05	Metals-021	<0.05	1	<0.05	<0.05	0	95	[NT]
Nickel-Dissolved	µg/L	1	Metals-022	<1	1	14	[NT]		90	[NT]
Zinc-Dissolved	µg/L	1	Metals-022	<1	1	130	[NT]		92	[NT]
Iron-Dissolved	µg/L	10	Metals-022	<10	1	130	[NT]		93	[NT]

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W2	343215-2
Date prepared	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Date analysed	-			07/02/2024	1	07/02/2024	07/02/2024		07/02/2024	07/02/2024
Arsenic-Total	µg/L	1	Metals-022	<1	1	1	1	0	108	114
Cadmium-Total	µg/L	0.1	Metals-022	<0.1	1	0.2	0.2	0	101	107
Chromium-Total	µg/L	1	Metals-022	<1	1	5	4	22	104	112
Copper-Total	µg/L	1	Metals-022	<1	1	18	16	12	109	114
Lead-Total	µg/L	1	Metals-022	<1	1	41	39	5	105	104
Mercury-Total	µg/L	0.05	Metals-021	<0.05	1	<0.05	[NT]		99	94
Nickel-Total	µg/L	1	Metals-022	<1	1	19	19	0	108	111
Zinc-Total	µg/L	1	Metals-022	<1	1	150	150	0	100	104

QUALITY CONTROL: HM in water - total						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	3	07/02/2024	07/02/2024		[NT]	[NT]
Date analysed	-			[NT]	3	07/02/2024	07/02/2024		[NT]	[NT]
Arsenic-Total	µg/L	1	Metals-022	[NT]	3	<1	[NT]		[NT]	[NT]
Cadmium-Total	µg/L	0.1	Metals-022	[NT]	3	<0.1	[NT]		[NT]	[NT]
Chromium-Total	µg/L	1	Metals-022	[NT]	3	4	[NT]		[NT]	[NT]
Copper-Total	µg/L	1	Metals-022	[NT]	3	84	[NT]		[NT]	[NT]
Lead-Total	µg/L	1	Metals-022	[NT]	3	7	[NT]		[NT]	[NT]
Mercury-Total	µg/L	0.05	Metals-021	[NT]	3	<0.05	<0.05	0	[NT]	[NT]
Nickel-Total	µg/L	1	Metals-022	[NT]	3	32	[NT]		[NT]	[NT]
Zinc-Total	µg/L	1	Metals-022	[NT]	3	150	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			06/02/2024	1	06/02/2024	06/02/2024		06/02/2024	[NT]
Date analysed	-			06/02/2024	1	06/02/2024	06/02/2024		06/02/2024	[NT]
pH	pH Units		Inorg-001	[NT]	1	3.8	[NT]		101	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	<1	1	1100	[NT]		102	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	<5	1	240	[NT]		100	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	<5	1	680	[NT]		112	[NT]
Oil & Grease (LLE)	mg/L	5	Inorg-003	<5	1	<5	[NT]		99	[NT]
Chloride, Cl	mg/L	1	Inorg-081	<1	1	250	[NT]		91	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	<1	1	41	[NT]		100	[NT]
Ferrous Iron	mg/L	0.05	Inorg-076	<0.05	1	0.12	0.12	0	114	[NT]
Ferric Iron (by calculation)	mg/L	0.05		<0.05	1	<0.05	[NT]		[NT]	[NT]

QUALITY CONTROL: Miscellaneous Inorganics						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date prepared	-			[NT]	2	06/02/2024	06/02/2024		[NT]	[NT]
Date analysed	-			[NT]	2	06/02/2024	06/02/2024		[NT]	[NT]
pH	pH Units		Inorg-001	[NT]	2	7.0	[NT]		[NT]	[NT]
Electrical Conductivity	µS/cm	1	Inorg-002	[NT]	2	1500	[NT]		[NT]	[NT]
Total Suspended Solids	mg/L	5	Inorg-019	[NT]	2	110	110	0	[NT]	[NT]
Total Dissolved Solids (grav)	mg/L	5	Inorg-018	[NT]	2	1300	[NT]		[NT]	[NT]
Chloride, Cl	mg/L	1	Inorg-081	[NT]	2	39	[NT]		[NT]	[NT]
Sulphate, SO4	mg/L	1	Inorg-081	[NT]	2	580	[NT]		[NT]	[NT]
Ferrous Iron	mg/L	0.05	Inorg-076	[NT]	2	0.07	[NT]		[NT]	[NT]
Ferric Iron (by calculation)	mg/L	0.05		[NT]	2	<0.05	[NT]		[NT]	[NT]

QUALITY CONTROL: PFAS in Waters Short						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-W1	[NT]
Date prepared	-			07/02/2024	[NT]	[NT]	[NT]	[NT]	07/02/2024	[NT]
Date analysed	-			07/02/2024	[NT]	[NT]	[NT]	[NT]	07/02/2024	[NT]
Perfluorohexanesulfonic acid - PFHxS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	104	[NT]
Perfluorooctanesulfonic acid PFOS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	100	[NT]
Perfluorooctanoic acid PFOA	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	96	[NT]
6:2 FTS	µg/L	0.01	Org-029	<0.01	[NT]	[NT]	[NT]	[NT]	107	[NT]
8:2 FTS	µg/L	0.02	Org-029	<0.02	[NT]	[NT]	[NT]	[NT]	99	[NT]
Surrogate $^{13}C_8$ *PFOS*	%		Org-029	102	[NT]	[NT]	[NT]	[NT]	97	[NT]
Surrogate $^{13}C_2$ *PFOA*	%		Org-029	97	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD $^{18}O_2$ *PFHxS*	%		Org-029	100	[NT]	[NT]	[NT]	[NT]	97	[NT]
Extracted ISTD $^{13}C_4$ *PFOS*	%		Org-029	98	[NT]	[NT]	[NT]	[NT]	99	[NT]
Extracted ISTD $^{13}C_4$ *PFOA*	%		Org-029	104	[NT]	[NT]	[NT]	[NT]	100	[NT]
Extracted ISTD $^{13}C_2$ *6:2FTS*	%		Org-029	111	[NT]	[NT]	[NT]	[NT]	101	[NT]
Extracted ISTD $^{13}C_2$ *8:2FTS*	%		Org-029	118	[NT]	[NT]	[NT]	[NT]	111	[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.

Where matrix spike recoveries fall below the lower limit of the acceptance criteria (e.g. for non-labile or standard Organics <60%), positive result(s) in the parent sample will subsequently have a higher than typical estimated uncertainty (MU estimates supplied on request) and in these circumstances the sample result is likely biased significantly low.

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

Total metals: no unfiltered, preserved sample was received, therefore analysis was conducted from the unpreserved sample bottle.
Note: there is a possibility some elements may be underestimated.

Dissolved Metals: no filtered, preserved sample was received for #4, therefore the unpreserved sample was filtered through 0.45µm filter at the lab.
Note: there is a possibility some elements may be underestimated.

CHAIN OF CUSTODY DESPATCH SHEET

Douglas PARTNERS

Project No:	86043.23	**Suburb:**	Macquarie Park	**To:**	Envirolab Services
Project Manager:	David Smith	**Order Number:**		**Sampler:**	ECB
					12 Ashley St, Chatswood NSW 2067
Email:	david.smith@douglaspartners.com.au			**Attn:**	Sample Receipt
Turnaround time:	☑ Standard ☐ 72 hour ☐ 48 hour ☐ 24 hour ☐ Same day				(02) 9910 6200 samplereceipt@envirolab.com
Prior Storage:	☐ Fridge ☐ Freezer ☑ Esky ☐ Shelf	**Do samples contain 'potential' HBM?**	☑ No	☐ Yes (If YES, handle, transport, 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 M - Material	Container Type: G - glass P - plastic	Analytes: Combo 8 (dissolved and total)	PFAS- Short Suite	TDS/TSS	Oil &Grease	Ferrous Iron	Ferric Iron	Combo 3	BTEX	pH, EC, chloride and sulphates			Notes/ Preservation/ Additional Requirements
1	BH301			6.02.24	W	G/P	X	X	X	X	X	X			X			
2	BH302			6.02.24	W	G/P	X	X	X		X	X			X			
3	BH303			6.02.24	W	G/P	X	X	X		X	X			X			
4	BD1/20240206			6.02.24	W	G/P							X					
5	Trip Spike													X				
6	Trip Blank													X				

ENVIROLAB group
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: 343215.
Date Received: 6/2/24.
Time Received: 1640
Received By: GW
Temp: Cool/Ambient 20·C.
Cooling: Ice/Icepack
Security: Intact/Broken/None

Metals to analyse:

Number of samples in container:		**Transported to laboratory by:**	ECB
Send results to:	Douglas Partners Pty Ltd		
Address:	96 Hermitage Road, West Ryde NSW 211	**Phone:**	(02) 9809 0666
Relinquished by:	ECB	**Date:**	6.02.2024
		Signed:	

LAB RECEIPT

Lab Ref. No:	343215.
Received by:	GW/LW
Date & Time	6/2/24 1640
Signed:	GW.

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater (GW) Field Sheet

Project and Bore Installation Details						
Project Name / Site Location	MacPark				Project Number	86043.23
Well Construction Details	Well ID	BH301	Drilling Method		Hole Diameter (m)~	96mm
	Well Depth (m bgl)	12.55	Screened (m bgl)	6-12.55	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**	60	L
Appearance/Comments	pumped dry				

Sampling Details					
Date / Time / Weather Conditions	6.2.24 Cloudy/Windy			Sampled By	ECB
Sampling Method / Equipment	Peripump				
WQM Model	**Hire WQM**		WQM Calibration Date	**Hire WQM**	
Product observed / Thickness		mm	Confirmed with Bailer? (Y / N)		
GW Level (pre-micropurge)	6.2	m bgl	Observed Well Depth	12.55	m bgl
Height of Water Column	6.35	m bgl	Estimated Bore Volume*	23	L
GW Level (post sample)	6.45	m bgl	Total Volume of Micro-Purged	4	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%
	0	20.2	5.41	10.73	3.55	58.9	
	0.5	19.6	4.71	1059	3.6	57.2	
	1	19.5	4.56	1054	3.62	56.9	
	1.5	19.5	4.06	1049	3.65	57.4	
	2	19.4	4.29	1036	3.67	59.4	
	2.5	19,3	4,41	1936	3,67	60.5	
	3	19.4	4.46	1032	3.68	62	
	3.5	19,4	4,3	1931	3,68	62.7	

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	m bgl,				
Sample Observations (e.g. colour, sediment, sheen, odour)	clear, no odour					
Sample ID						
QAQC Samples	Replicate	Yes	Triplicate		Other	
Sample Containers Quantity / Preservation / Filtration	Amber glass		Plastic		PFAS (no teflon)	
	Metals (F/UF) (HNO3)		Phenols/COD/NH3 (H2SO4)		Vials (HCl)	
	Ferrous/Ferric Iron (HCl)		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

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater (GW) Field Sheet

Project and Bore Installation Details						
Project Name / Site Location	MacPark				Project Number	86043.23
Well Construction Details	Well ID	BH302	Drilling Method		Hole Diameter (m)¯	96mm
	Well Depth (m bgl)	11.5	Screened (m bgl)	6.0-11.5	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	ECB
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**	120	L
Appearance/Comments					

Sampling Details					
Date / Time / Weather Conditions	6.2.24 Cloudy/Windy			Sampled By	ECB
Sampling Method / Equipment	Peripump				
WQM Model	**Hire WQM**		WQM Calibration Date	**Hire WQM**	
Product observed / Thickness		mm	Confirmed with Bailer? (Y / N)		
GW Level (pre-micropurge)	3.25	m bgl	Observed Well Depth	11.35	m bgl
Height of Water Column	8.1	m bgl	Estimated Bore Volume*	30	L
GW Level (post sample)	3.35	m bgl	Total Volume of Micro-Purged	3	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%
	0	23	8.87	1562	6.84	54.2	
	0.5	22.2	8.93	1560	6.93	53.8	
	1	22.2	8.77	1559	6.96	54.6	
	1.5	22.1	8.73	1554	6.96	56	
	2	22	8.71	1552	6.96	57.1	
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)	4	m bgl,				
Sample Observations (e.g. colour, sediment, sheen, odour)	clear, no odour					
Sample ID						
QAQC Samples	Replicate		Triplicate		Other	
Sample Containers / Preservation / Filtration — Quantity	Amber glass		Plastic		PFAS (no teflon)	
	Metals (F/UF) (HNO3)		Phenols/COD/NH3 (H2SO4)		Vials (HCl)	
	Ferrous/Ferric Iron (HCl)		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

Douglas Partners
Geotechnics / Environment / Groundwater

Groundwater (GW) Field Sheet

Project and Bore Installation Details						
Project Name / Site Location	MacPark				Project Number	86043.23
Well Construction Details	Well ID	BH303	Drilling Method		Hole Diameter (m)¯	96mm
	Well Depth (m bgl)	12.6	Screened (m bgl)	6.0-12.6	Stick Up (m)	
Survey Information	Easting		Northing		Elevation RL	
GW Level During Drilling		m bgl				
Contaminants/Comments						

Well Development Details					
Date / Time / Weather Conditions	Cloudy			Purged By	ECB
Purge Method / Equipment	Twister pump				
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**	40	L
Appearance/Comments	Pumped dry				

Sampling Details					
Date / Time / Weather Conditions	6.2.24 Cloudy/Windy			Sampled By	ECB
Sampling Method / Equipment	Peripump				
WQM Model	**Hire WQM**		WQM Calibration Date	**Hire WQM**	
Product observed / Thickness		mm	Confirmed with Bailer? (Y / N)		
GW Level (pre-micropurge)	5.95	m bgl	Observed Well Depth	12.58	m bgl
Height of Water Column	6.63	m bgl	Estimated Bore Volume*	25	L
GW Level (post sample)	6.53	m bgl	Total Volume of Micro-Purged	4	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%
	0	20.6	2.12	743	3.873	54.3	
	0.5	20	2.12	716	3.73	56.3	
	1	20	1.99	720	3.82	57.5	
	1.5	19.9	1.78	778	3.83	58.8	
	2	19,9	1,81	781	3,84	60.2	
	2.5	19.9	1.87	781	3.84	61.6	
	3	19.9	1.87	781	3.85	62.7	

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)		m bgl,				
Sample Observations (e.g. colour, sediment, sheen, odour)	clear, no odour					
Sample ID						
QAQC Samples	Replicate		Triplicate		Other	
Sample Containers / Preservation / Filtration Quantity	Amber glass		Plastic		PFAS (no teflon)	
	Metals (F/UF) (HNO3)		Phenols/COD/NH3 (H2SO4)		Vials (HCl)	
	Ferrous/Ferric Iron (HCl)		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



REV	DESCRIPTION/COMMENT	DATE	DRAWN BY
0	INITIAL ISSUE	21.02.2024	EC

SCALE: 0 5 10 15 20 m
1:400 @ A3

Douglas PARTNERS
OFFICE: SYDNEY
96-98 Hermitage Rd, West Ryde NSW 2114
(02)9809 0666

CLIENT: **Parkview Constructions Pty Ltd**

NOTE:
1: Basemap from Metromap (Dated 19.11.2023)

COORDINATE REFERENCE SYSTEM: GDA2020 / MGA zone 56

PROJECT NAME: **C3 Site**

PROJECT ADRESS: **Midtown, Macquarie Park**

DRAWING TITLE: **TEST LOCATION PLAN**

PROJECT NO: **86043.23**

DRAWING NO: 1

REVISION: **0**

From: no-reply@majorprojects.planning.nsw.gov.au
Sent: Thursday, 15 February 2024 9:06 AM
To: Sarah Martin
Cc: Robert Cauchi
Subject: Ivanhoe Estate Redevelopment - Stage 2 - Post Approval Document Received - (SSD-15822622-PA-2)
Attachments: Post Approval Form_20240214220519.pdf

You don't often get email from no-reply@majorprojects.planning.nsw.gov.au. Learn why this is important

EXTERNAL EMAIL: Do not click links or open attachments unless you recognise the sender and know the content is safe.

Dear sarah ,

Thank-you, your post approval document in relation to the Ivanhoe Estate Redevelopment - Stage 2 has been received by the Department. Details of this document are below and in the attachment.

Date Lodged
15/02/2024

Document Name
Pre-construction Compliance Report C3

Description of Document
Please find attached the Pre-construction Compliance Report for works relating to Building C3 at Ivanhoe. This report has been prepared in accordance with conditions B6 & B7 of the Stage 2 Consent.

Applicable Conditions

Schedule	Condition
B	6
B	7

To sign in to your account click here or visit the Major Projects Website.
Please do not reply to this email.

Kind regards

The Department of Planning and Environment

NSW GOVERNMENT

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