John Holman

Site Contamination Assessment: 16 Wyatt Ave, Belrose, NSW

P2108187JR01V01
July 2022

ENVIRONMENTAL

WATER

WASTEWATER

GEOTECHNICAL

CIVIL

PROJECT MANAGEMENT

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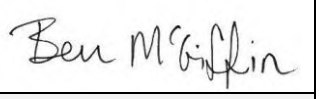
Ben McGiffin		Nathan Foster		Ben McGiffin			
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General Abbreviations

AASS	Actual acid sulfate soil
ABC	Ambient background concentrations
ACM	Asbestos containing material
AEC	Area of environmental concern
AF	Asbestos fines
AMP	Asbestos Management Plan
ANZECC	Australia and New Zealand Environment Conservation Council
ANZG	Australian and New Zealand Governments
ASC NEPM	National Environmental Protection (Assessment of Site Contamination) Measure (2013)
ASS	Acid sulfate soil
ASSMAC	Acid Sulfate Soils Management Advisory Committee
AST	Above ground storage tank
BGL	Below ground level
BH	Borehole
BTEXN	Benzene, toluene, ethylbenzene, xylene, naphthalene
CEMP	Construction Environmental Management Plan
COC	Chain of custody
COPC	Contaminants of potential concern
DA	Development application
DBT	Dibutyltin
DEC	Department of Environment and Conservation
DECC	Department of Environment and Climate Change
DNAPL	Dense non aqueous phase liquid
DP	Deposited Plan
DPI	NSW Department of Primary Industry
DPIW	NSW Department of Primary Industry – Water
DQI	Data quality indicators
DQO	Data quality objectives
DSI	Detailed Site Investigation
EAC	Ecological assessment criteria
EIL	Ecological investigation level
EMP	Environmental Management Plan
EPA	NSW Environmental Protection Authority
EQL	Estimated quantitation limit (interchangeable with PQL and LOR)
ESA	Environmental Site Assessment
ESL	Ecological screening level
FA	Fibrous asbestos
GIL	Groundwater investigation level
HIL	Health investigation level
HM	Heavy metals
HSL	Health screening level
IA	Investigation area
ISQG	Interim Sediment Quality Guideline
ITP	Inspection Testing Plan
LGA	Local government area
LNAPL	Light non aqueous phase liquid
LOR	Limit of reporting (interchangeable with EQL and PQL)
MA	Martens & Associates Pty Ltd
mAHD	Metres, Australian Height Datum
mbgl	Metres below ground level

MBT	Monobutyltin
MNA	Monitored natural attenuation
MPE	Multi phase extraction
NAPL	Non aqueous phase liquid
NATA	National Association of Testing Authorities
ND	No data
NEPC	National Environment Protection Council
NEPM	National Environment Protection Measure
OCP	Organochloride pesticides
OEH	NSW Office of Environment and Heritage
OPP	Organophosphorus pesticides
PACM	Potential asbestos containing material
PAH	Polycyclic aromatic hydrocarbons
PASS	Potential acid sulfate soil
PCB	Polychlorinated biphenyl
PCEMP	Post Construction Environmental Management Plan
PESA	Preliminary Environmental Site Assessment
PFAS	Per and polyfluoroalkyl substances
PID	Photoionisation detector
ppb	Parts per billion
ppm	Parts per million
PQL	Practical quantitative limit (interchangeable with EQL and LOR)
PSI	Preliminary Site Investigation
QA/QC	Quality assurance / quality control
RAC	Remediation acceptance criteria
RAP	Remedial Action Plan
HHRA	Human Health Risk Assessment
RPD	Relative percentage difference
SAC	Site assessment criteria
SAQP	Sampling and Analysis Quality Plan
SEPP	State Environmental Planning Policy
SIL	Soil investigation level
SOP	Standard operating procedure
SWL	Standing water level
SWMS	Safe Work Method Statement
TB	Trip blank
TBT	Tributyl tin
TCLP	Toxicity characteristics leaching procedure
TEQ	Toxic equivalency factor
TP	Test pit
TPH	Total petroleum hydrocarbons
TRH	Total recoverable hydrocarbons
TS	Trip spike
UCL	Upper confidence limit
UPSS	Underground petroleum storage system
UST	Underground storage tank
VHC	Volatile halogenated compounds
VOC	Volatile organic compounds
WHS	Work health and safety
WHSP	Work Health and Safety Plan

1 Introduction

1.1 Overview and Proposed Development

This report prepared by Martens and Associates (MA) documents a Site Contamination Assessment (SCA) completed for John Holman (the Client) at 16 Wyatt Ave, Belrose NSW (the site). The SCA was completed to support a development application (DA) for a boarding house development at the site.

Based on Client provided information, we understand that the proposed development will involve the demolition of existing structures, followed by construction of two separate boarding room buildings ('upper' and 'lower' buildings) which will consist of a total of 55 boarding rooms. Site regrading and excavations works will also be undertaken to construct a single level basement, internal private access driveways, associated services and stormwater infrastructure.

The site location is shown in Map 01 in Attachment A, with supplied development plans provided in Attachment C.

1.2 Objectives

The objectives of the investigation where:

- To identify historical and current potentially contaminating site activities.
- Evaluate areas of environmental concern (AEC) and associated contaminants of potential concern (COPC) within the site (if present).
- Undertake a preliminary soil sampling program.
- Provide commentary on the contamination status of the site and potential contamination risks posed to site receptors associated with the future site development.

1.3 Project Scope

The scope of works for the investigation included:

- A walkover inspection to observe current land use, identify any potential contaminating activities, and make observations of neighbouring land uses.
- A site history review using historical aerial photographs and available historical council records.
- Review of publicly available contaminated land and environmental protection licence registers.
- An intrusive soil investigation and sampling.
- Preparation of a report in accordance with the relevant sections of ASC NEPM (2013), EPA (2017) and NSW EPA (2020).

1.4 Reference Documents

- NEPC (1999, amended 2013) National Environmental Protection (Assessment of Site Contamination) Measure. Referred to as ASC NEPM (2013).
- NSW EPA (2017) *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme*.
- NSW EPA (2020) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Land*.

2 Site Description

2.1 Site Details

Site information is summarised in Table 1, and site location and general surrounds shown in Attachment A.

Table 1: Site background information.

Item	Description / Detail
Site address	16 Wyatt Avenue, Belrose NSW
Legal Identifier	Lot 2566 DP752038
Approximate area	9,345 m^2
Local Government Area	Northan Beaches Council
Current zoning and land use	Residential
Proposed land use	Boarding house development
Site description	Currently a semi-rural residential property with a dwelling located in the southern section of the site. The central and norther portions of the site are predominantly grassed and contain several horses. A horse dressage area has been established in the central portion of the site, covering an area of approximately 2,100 m^2.
Surrounding land uses	Immediate surrounding land use is generally residential.
Topography	Maximum topographical elevations are present in the south-east of the site, with prevailing site slope declining generally to the north-west. Site relief is approximately 30 m. The central portion of the site is generally flat, and accommodates the established horse dressage area. Topographical information is provided in Map 04 in Attachment A
Expected geology	The Sydney 1:100,000 Geological Sheet indicates the site is underlain by Hawkesbury Sandstone, which is described as medium to course-grained quartz sandstone with very minor shale and laminite lenses
Surface hydrology	Based on prevailing site topography, surface water is expected to drain towards Fireclay Gully, located to the north of the site.

2.2 Hydrogeology

Review of WaterNSW Real-time Water Database, indicated that one groundwater bores was located within 500 m of the site (as shown in Map 05 in Attachment A). No available information regarding well construction or depth of encountered groundwater (if any) was available.

Given the site location, site elevation and the inferred subsurface profile, it is considered unlikely that the proposed development will intercept the permanent groundwater table. However, ephemeral perched

groundwater may be encountered within the soil profile and / or at the soil / bedrock interface originating from infiltration of surface water during prolonged or intense rainfall events.

Should further information on permanent site groundwater conditions be required, an additional assessment would need to be carried out (i.e. installation of groundwater monitoring bores / ongoing groundwater monitoring).

3 Site Contamination Assessment

3.1 Council Historical Site Records

A review of available historic council development application records for the site was completed and findings are summarised in Table 2.

Table 2: Available Council records.

Year	Record Number	Description
2000	DA2000/5177	Construction of 'self care' accommodation. DA is noted as being refused.
2003	DA2003/0984	Additions and extension of existing balcony.
2015	DA2015/0116	Removal / Pruning of 3 – 5 Tress
2021	DA2021/1039	Demolition and development of a boarding house development

3.2 NSW EPA Records and Department of Defence Records

A review of NSW EPA and Department of Defence records was completed for the investigation, and included the following:

- Records relating to contaminated land under Section 58 of the Contaminated Land Management (CLM) Act 1997.
- Records relating to sites notified in accordance with the NSW EPA (2015) Guidelines on the Duty to Report Contamination under Section 60 of the CLM Act 1997
- Records relating to licensed activities under the Protection of the Environment Operation (POEO) Act 1997.
- Records relating to sites listed under the NSW EPA per-and polyfluoroalkyl substances (PFAS) investigation program.
- Records relating to site being investigated and or managed by Department of Defence for PFAS contamination.

A summary of available information from review of the above records is provided in **Table 3:** NSW EPA and Department of Defence Records.

Records	Onsite	Offiste
Section 58 of the CLM Act 1997	None	None within 500 m
Duty to Report Contamination under Section 60 of the CLM Act 1997	None	None within 500 m
Licences under the POEO Act 1997	None	None within 500 m
NSW EPA PFAS investigation program	None	None within 500 m
Department of Defence PFAS management and investigation program	None	None within 500 m

below.

Table 3: NSW EPA and Department of Defence Records.

Records	Onsite	Offiste
Section 58 of the CLM Act 1997	None	None within 500 m
Duty to Report Contamination under Section 60 of the CLM Act 1997	None	None within 500 m
Licences under the POEO Act 1997	None	None within 500 m
NSW EPA PFAS investigation program	None	None within 500 m
Department of Defence PFAS management and investigation program	None	None within 500 m

3.3 External Potentially Contaminating Activities

The following potentially contaminating activities were identified within 500 m of the site.

- TransGrid Belrose Substation, located approximately 300 m to the south-west of the site.

In addition to the above, a number of potentially contaminating activities were identified at distances slightly greater than 500 m from the site. These included:

- Cleanaway Berlese Resource Recovery Centre – Located approximately 700 m to the north of the site.
- Benedict Recycling Belrose – Located approximately 700 m to the north of the site.
- Belrose Rural Fire Service – Located approximately 750 m to north east of the site.

The above-mentioned activities are not considered to pose a contamination risk to the site given their distance and topographical location relative to that of the site.

Of note, the Belrose TransGrid substation is not listed on any contaminated land registers (See Section 3.2), and does not currently hold a licence under the POEO Act (1997), further supporting a low risk for contamination potentially impacting the site.

3.4 Aerial Photograph Review

Historical aerial photographs taken of the site between 1951 and 2021 were reviewed to investigate historical site land uses (Table 4). Copies of the aerial photographs used in the review are provided in Attachment B (Map 07 – Map 16).

Table 4: Aerial photograph observations from 1951 to 2021.

Year (Source)	Site Activity	Surrounding Land Use
1947 (HAPE)[1]	The entire site comprises bushland vegetation. An access track is present in the north-western corner of the site.	Surrounding land is also bushland vegetation.
1961 (HAPE)[1]	A dwelling has been constructed in southern portion of the site, adjacent to the now formed Wyatt Avenue. The remainder of the site contains bushland vegetation which appears to have matured in the period since 1947.	Several residential dwellings have been constructed to the west. Some vegetation clearing is also evident to the east of the site.
1971 (HAPE)	Little to no change from previous image.	Little to no change from previous image.

Year (Source)	Site Activity	Surrounding Land Use
1981 (HAPE)	A new dwelling and pool have been established, along with several sheds adjacent to the eastern boundary, and north of the emplaced pool. Vegetation clearing has been conducted in the northern portion of the site.	Further residential development exists to the west, south and east of the site.
1998[1] (HAPE)	The horse dressage area in the centre of the site has been established.	Little to no change from previous image.
2010 (Nearmap)	Additional vegetation clearing has been conducted in the northern portion of the site.	Further residential development to the south, east and west
2015 (Nearmap)	Little to no change from previous image.	Little to no change from previous image.
2022 (Nearmap)	Little to no change from previous image.	Little to no change from previous image.

Notes
[1.] Denotes poor image quality.

Observations compiled from review of historical aerial photography indicates that land use has been primarily residential since at least 1961 with minimal changes to present day.

3.5 Site Walkover Inspection

Observations compiled during the site walkover inspection completed on 24 June 2022, are as follows:

- A single brick residential dwellings was located in the southern portion of the site near Wyatt Ave. A pool was located directly north of the dwelling. Access inside the dwelling was not available at the time of inspection.

- The site was found to have a <10% slope, trending from Wyatt Ave in the south toward the site's northern boundary. Rock outcropping was observed across the site, however was most prominent in the site's northern portion and immediately north of the site's swimming pool.

- Two sheds were located onsite. The shed located along the eastern boundary (constructed with galvanised metal) of the site was used for horse stabling and housing of chickens. The second shed (constructed with vinyl clad sheeting) , located north-east of the pool, was not internally accessible at the time of inspection. However, observations made from a shed window found no indication of bulk fuel or chemical storage inside the shed.

- The central portion of the site contained a horse dressage area covering an approximate area of 2,100 m^2. This location was generally flat, in comparison to areas elsewhere on site, indicating potential importation and levelling of fill material within this area of the site.

- Beyond potential importation and use of fill material within the horse dressage area, no observations were made to suggest that current or historical activities had or were occurring onsite which may have introduced wide spread land contamination.

- Surrounding land use consisted primarily of low-density residential land, with large lots present to the east and west. Small lot residential land use is located immediately to the south and Wyatt Reserve (athletic fields and tennis courts) is located to the south-east.

4 Site Conceptual Model

4.1 Areas of Environmental Concern / Contaminants of Potential Concern

Our assessment of site AEC and COPC (Table 5) for the site was made based on available site history, review of available site records, aerial photograph interpretation and observation made during the site walkover. A figure showing the location of identified AECs, is provided in Attachment A.

Table 5: Areas of environmental concern and contaminants of potential concern.

AEC	Potential for Contamination	COPC
AEC A Current and former site dwellings including 2 - 5 m curtilage	Pesticides and heavy metals may have been used underneath dwelling for pest control. Building construction may include PACM, zinc treated (galvanised) metals, and lead based paints.	HM, OCP / OPP and asbestos
AEC B Site sheds including 2 - 5 m curtilage	Pesticides and heavy metals may have been used underneath existing and past sheds for pest control. Building construction may include PACM, zinc treated (galvanised) metals, and lead based paints.	HM, OCP / OPP and asbestos
AEC C Potential fill importation	Fill material may have been imported to site to establish the horse dressage area. Fill from unknown sources has the potential to include contamination, such as hydrocarbons, heavy metals, pesticides and asbestos.	HM, TRH, BTEXN, PAH, OCP / OPP and asbestos

4.2 Potential Receptors and Pathways

A conceptual site model has been prepared based on potential exposure pathways (including potentially affected media) between contamination sources (AEC) and expected future IA receptors. These linkages are outlined in Table 6 below.

Table 6: Conceptual site model.

Affected Media and Contamination Transport Mechanisms	Soil has been identified as potentially affected media. The main mechanisms for potential soil contamination are considered to be: o Pesticides, heavy metals and hazardous material used underneath and for the construction of the current and former dwelling and exiting sheds. o Introduction of asbestos, hydrocarbons, pesticides and heavy metals in fill material imported to the site.
Potential Receptors	Potential onsite human receptors include current and future site users, as well as construction and maintenance workers. Potential ecological receptors include site soil biota and vegetation present in landscaped areas. .
Potential Exposure Pathways	Potential exposure pathways include ingestion, dermal absorption, and inhalation of dust (for all contaminants) and vapours (for volatile hydrocarbons).

5 Sampling, Analytical and Quality Plan

The CSM (Section 4) has identified several AECs which require further assessment.

Due to existing site structures, AEC A and AEC B cannot currently be assessed due to access restrictions and remain as data gaps in the current investigation. Discussion relating to these AECs and investigation data gaps are further discussed in Section 8.

AEC C (potential areas of filling) is currently accessible and a soil sampling program was undertaken as part of this assessment.

A Sampling Analytical and Quality Plan (SAQP) was developed to ensure that data collected for as part of the sampling program is representative and provides a robust basis for site assessment decisions. Preparation of the SAQP was completed in general accordance with ASC NEPM (2013) methodology and includes:

- Data quality objectives (DQO).
- Data quality indicators (DQI).
- Sampling methodologies and procedures.
- Sample handling, preservation and storage procedures.
- Analytical QA / QC.

The following sections summarise the DQO, DQI and QA / QC.

5.1 Data Quality Objectives

DQO were prepared as statements specifying qualitative and quantitative data required to support project decisions. DQO were prepared in general accordance with NSW EPA (2017), EPA (2014) and NEPM (2013) guidelines, and are presented in Table 7.

Table 7: Data quality objectives.

Step 1 **Stating the Problem**	A site contamination assessment (SCA) is required to assess the contaminated status of the site. Review of site conditions identified a potential area of filling, currently used as a horse dressage area, that might be accessible to sensitive site receptors during construction and future land use at the site. A soil sampling program is required to assess risk posed by COPC in the identified AEC to receptors.
Step 2 **Identifying the Decision(s)**	To assess the suitability of the site for the proposed development, decisions are to be made based on the following questions: o What is the contaminant exposure pathway? o Has the importation of fill material (if present) introduced site contamination that may pose a risk to humans or the environment? o Does the fill material (if present) require remediation or management prior to constructing the proposed development?
Step 3 **Identification of Inputs to the Decision**	The inputs to the assessment include: o Proposed land use and development plans. o Information compiled from the review of site history and associated records. o The CSM developed for the site. o Soil sampling at nominated locations across the horse dressage area. o Laboratory analytical results for relevant COPC. o Assessment of analytical results against site suitability guidelines.
Step 4 **Study Boundary Definitions**	Study boundaries are as follows: o Lateral – Lateral boundary of the assessment is defined by the AEC boundary outlined in Attachment A. o Vertical – Vertical boundary is governed by the maximum depth reached during subsurface investigations. o Temporal – the results obtained on the date of investigation sampling works completed.
Step 5 **Development of Decision Rules**	The decision rule for this investigation is as follows: o If the concentration of contaminants exceeds the adopted assessment criteria, a risk assessment is required. o Should the risk be unacceptable, further investigations to remediate and / or manage the onsite impacts, in relation to the proposed development, will be undertaken.
Step 6 **Specification of Limits on Decision Errors**	Guidance found in ASC NEPM (2013) Schedule B2 regarding 95% upper confidence limit (UCL) states that the 95% UCL of the arithmetic mean provides a 95% confidence level that the true population mean will be less than or equal to this value. Therefore a decision can be made based on a probability that 95% of the data collected will satisfy the site acceptance criteria. A limit on decision error will be 5% that a conclusive statement may be incorrect.
Step 7 **Optimisation of Sampling Design**	Considering the questions outlined in Step 2, a gridded soil sampling program was undertaken across the horse dressage area to provide even coverage. The sampling methodology adopted is outlined in Section 5.3.

5.2 Data Quality Indicators

In accordance with NSW EPA (2017), the investigation data set has been compared with DQI outlined in Table 8 to ensure that collected data meets the project needs and that DQO has been met.

Table 8: Data quality indicators.

Assessment Measure (DQI)	Comment
Precision – A measure of the variability (or reproducibility) of data.	Precision is assessed by calculating the relative percent difference (RPD) between blind field duplicates and primary samples. Data precision is deemed acceptable where results are: o 0 - 10 x EQL, or o RPDs <50% (10 - 30 x EQL) or o <30% (>30 x EQL) Exceedance of this range may still be considered acceptable where heterogeneous materials such as fill are sampled.
Accuracy – A measure of the closeness of reported data to the "true value".	Data accuracy is assessed by: o Laboratory control samples.
Representativeness – The confidence that data are representative of each media present on the site.	To ensure data representativeness, the following field and laboratory procedures are followed: o Ensure that the design and implementation of the sampling program have been completed in accordance with MA standard operating procedures (SOP). o Ensure that all laboratory hold times are met and that sample handling and transport are completed in accordance with the MA SOP.
Completeness – A measure of the amount of usable data from a data collection activity.	To ensure data set completeness, the following is required: o Confirmation that all sampling methodology was completed in general accordance with the MA SOP. o COC and receipt forms. o Results from all laboratory QA / QC samples. o NATA accreditation stamp on all laboratory reports.
Comparability - The confidence that data may be considered to be equivalent for each sampling and analytical event.	Data comparability is maintained by ensuring that: o All site sampling events are undertaken following methodologies outlined in MA SOP and published guidelines. o NATA accredited laboratory methodologies shall be followed on all laboratory analysis.

5.3 Sampling Methodology and Quality Assurance / Quality Control

Site investigation and soil sampling methodology as shown in Table 9, was completed to meet the project DQO.

Table 9: Investigation and sampling methodology.

Activity	Detail / Comments
Sampling rationale	Subsurface soil investigations were completed on 24 June 2022 involved: o Excavation of 9 shallow boreholes (BH101 – BH109) using mechanical hand auguring equipment (post hole digger) to a maximum depth of 0.5 mbgl. o The sampling was completed to target the horse dressage area and the sampling density meets the requirements of the NSW EPA (1995) *Sampling Design Guidelines.* o Collection and analysis of representative soil samples. o Collection of QA / QC samples for laboratory analysis. Soil sampling locations are shown in Attachment A. Test logs are provided in Attachment D
Soil sampling	Soil sampling was completed by the MA environmental consultant using a clean pair of nitrile gloves for collection of each sample directly from the auger. Each sample was placed into a laboratory supplied, 250 mL glass jar with no headspace to limit volatile loss and labelled with a unique identification number.
Decontamination Procedures	Sampling equipment was decontaminated between sampling locations using a metal bush and dilute solution of Decon and potable water, followed by rinsing with potable water.
QA / QC sampling	QA samples were collected for the initial investigation as follows: o One soil duplicate sample was collected for intra-laboratory analysis for the investigation. o One soil trip blank and one trip spike pair were used during soil sampling handling and transport to the analytical laboratory.
Sample handling and transport	Sample collection, storage and transport were conducted according to MA SOP. Soil samples were placed immediately into an ice chilled cooler box upon collection. Samples were dispatched to NATA accredited laboratories under chain of custody documentation within holding times. Copies of COC and Sample Receipts are provided in Attachment E.

5.4 Laboratory Analytical Suite

Laboratory analysis was carried out by Envirolab Pty Ltd a NATA accredited laboratory. Summary of laboratory analyses is summarised in Table 10.

Table 10: Summary of soil laboratory analyses.

COPC	Primary Samples Analysed	QA/QC Samples Analysed
BTEXN	10	1 trip spike
TRH	10	1 trip blank, 1 trip spike
PAH	10	
Heavy metals[1]	10	1 duplicate
OCP / OPP	7	
PCBs	7	
Asbestos in soil	7	

Notes
[1.] Heavy metals – arsenic, cadmium, chromium, copper, lead, mercury, nickel and zinc.

Laboratory chain of custody documentation are provided in Attachment E.

6 Site Assessment Criteria

The site assessment criteria (SAC) adopted for this SCA, are listed in Table 11 and derived from the ASC NEPM (2013).

Table 11: Site assessment criteria.

Media	Adopted Guidelines	Applicability
Soil	ASC NEPM (2013)	Health investigation levels (HIL) HIL A – Residential A with access to soil was adopted based on the proposed boarding house development and intended end land use at the site. Health screening levels (HSL) HSL A – Residential land use for sand was adopted based on the sand texture of the encountered soil. Ecological Investigation Levels (EIL) EILs were derived from methodology from ASC NEPM (2013) for the protection of terrestrial ecosystems for urban residential areas and public spaces. EILs for selected metals were calculated based on the most conservative added contaminant limit (ACL) values presented in ASC NEPM (2013) and published ambient background concentrations (ABC) values. This method is considered to be adequate for Tier 1 screening purposes. Ecological Screening Levels (ESL) ESLs for hydrocarbons - urban residential and public open space, coarse soil . Management Limits Management limits for petroleum hydrocarbons - residential, parkland, and public open space land use, course soil. Asbestos NEPM Asbestos HSL were not adopted for this investigation. Alternatively, assessment for asbestos in soil was conducted on a detect / non-detect basis.

7 Results

7.1 Summary of QA/QC results

A review of QA/QC data is provided in the data validation report in Attachment G.

The report concludes that the data is suitable for use to achieve the objective of this investigation.

7.2 Soil Conditions

Intrusive investigations consisting of nine shallow boreholes was undertaken on 24 June 2022.

The surface of the investigation area was lightly vegetated with grass. Subsurface conditions generally consisted of silty sand and clay sands, underlain by weathered sandstone.

Soil depth (including observed fill material) ranged between 0.3 – 0.5 mbgl. All test locations refused on bedrock material. No visual observations (such as odours, soil staining or anthropogenic inclusion) were made during test location excavations. The soil appeared to be 'reworked' natural soils. It is unclear based on the current data if this material was imported to site however no signs of potential contamination were observed during test pitting works.

Borehole locations are shown on the sampling plan in Attachment A.

7.3 Analytical Results

Soil laboratory results were compared against the adopted SAC outlined in Section 6. Individual SAC are provided in the laboratory summary reports in Attachment F and are Laboratory analytical documentation is available in Attachment E. A summary of results is provided in Table 12.

Table 12: Summary of soil analytical results.

Analyte	Results Compared to SAC
Heavy metals	HIL All results below the SAC. EIL All results below SAC.

Analyte	Results Compared to SAC
TPH/BTEXN	HSL All results below SAC. ESL All results below SAC. Management Limits All results below SAC.
OCP / OPP	HIL All results below SAC.
PAH	HIL All results below SAC. EIL All results below SAC.
Asbestos in soil	No asbestos detected in samples by the laboratory.

8 Discussion and Data Gaps

8.1 Discussion

The review of the site history indicated that land use has been residential since at least 1951 with no changes to land use occurring to present day. There are no lines of evidence to suggest that the site has been used for industrial purposes, intensive agricultural, or any other potentially contaminating purpose.

Publicly available records show that the site has not been listed relevant contaminated land registers and is not currently under investigation by any consent authority (or other) for potential contamination.

The closest potentially contaminating activity to the site was identified as the TransGrid Belrose substation located approximately 300 m to the west of the site. Given the distance of the substation from the site, the potential for contamination impacts are considered to be negligible and does not warrant any further assessment.

The desktop phase of the investigation concluded that potential sources of site contamination included the use and construction of dwellings and sheds and the potential presence of site fill material in the centre of the site to establish a horse dressage area.

A soil sampling program was undertaken to asses the identified potential area of filling (AEC C). Soil samples were collected in a general grid pattern across the horse dressage area (as shown in the sampling plan in Attachment A). The sampling locations found a thin layer of fill material at most locations up to a maximum depth of 0.5 m below ground level. There were no observations of soil odours, staining or inclusions which would suggest contamination is present. Representative soil samples were collected and submitted to a NATA accredited laboratory and tested for a range of COPC identified in the CSM (Table 5).

Laboratory results were compared to assessment criteria based on the proposed future residential land use (Residential-A) as part of the proposed boarding house development. All laboratory results for COPC were generally found to be less than the detection limit and well below the adopted assessment criteria for protection of human health. Minor detections of total recoverable hydrocarbons (TRH) and polycyclic aromatic hydrocarbons (PAH) were reported in several samples analysed. These results were however below the adopted assessment criteria.

Based on the results of both desktop review and analytical testing, we considered the overall site to have a low risk of contamination and the soils within AEC C (horse dressage area) to be suitable for the proposed development. Further testing beneath the existing site structures (AEC A and AEC B) will be required is discussed in the following Section.

8.2 Data Gap Closure Investigations

It is recommended that following site demolition works, a data gap closure investigation is undertaken to assess soil quality within the areas of AEC A and AEC B, which are currently not able to be assessed due to existing site structures. The data gap closure works should target the footprints of all existing site structures and be completed in accordance with the sampling density requirements of the NSW EPA (1995) *Sampling Design Guidelines*.

Data gap closure works are to be completed in general accordance with the methodology outlined in the SAQP (Section 5) prepared for the current investigation.

Laboratory analysis of data gap closure samples is to be completed for relevant COPC outlined in the current CSM (Section 4).

Implementation of the data gap closure investigation should be made a condition of development consent and completed following site demolition works to give Council the required certainty that identified AECs (while considered to be a low risk) are adequately assessed.

9 Conclusion

This SCA was undertaken to provide an assessment of potential contamination risks to support a proposed boarding house development at 16 Wyatt Ave, Belrose NSW. The SCA included a detailed site history review and a soil sampling program within accessible areas of the site.

The key conclusions of the SCA are as follows:

- Detailed site history review found no evidence of potentially contaminating land use.
- There are no available records to suggest that the site or nearby land is currently or has previously been contaminated.
- Several onsite aeras of environmental concern (AECs) were identified including former and current structures (dwelling and sheds) as well as the potential importation of fill material.
- A detailed soil investigation program was undertaken within the area of suspected filling. The results of sampling (both visual and laboratory analytical results) found no evidence of contamination.

Based on the findings of this SCA, site contamination risks are considered to be low and we considered the site can be made suitable for the proposed development with the implementation of a data gap closure investigation (outlined in Section 8.2), which is to be completed following site demolition works.

10 Limitations Statement

The SCA was undertaken in line with current industry standards.

It is important, however, to note that no land contamination study can be considered to be a complete and exhaustive characterisation of a site nor can it be guaranteed that any assessment shall identify and characterise all areas of potential contamination or all past potentially contaminating land uses. This is particularly the case where borehole investigation methods are used to assess fill material. Therefore, this report should not be read as a guarantee that no contamination shall be found on the site. Should material be exposed in future which appears to be contaminated or inconsistent with natural site soils, additional testing may be required to determine the implications for the site.

Martens & Associates Pty Ltd has undertaken this assessment for the purposes of the current development proposal. No reliance on this report should be made for any other investigation or proposal. Martens & Associates Pty Ltd accepts no responsibility and provides no guarantee regarding the characteristics of areas of the site not specifically studied in this investigation.

11 References

ASC NEPM (1999, amended 2013) *National Environmental Protection (Assessment of Site Contamination) Measure, 2013.*

Herbert C. (1983) Sydney 1:100 000 Geological Sheet 9130, 1st edition. Geological Survey of New South Wales, Sydney.

NSW Department of Environment & Heritage (eSPADE, NSW soil and land information), www.environment.nsw.gov.au.

NSW EPA (2014) *Waste Classification Guidelines.*

NSW EPA (2017) 3rd Ed. *Contaminated Land Management: Guidelines for the NSW Site Auditor Scheme.*

NSW EPA (2020) *Contaminated Sites: Guidelines for Consultants Reporting on Contaminated Land.*

State Environmental Planning Policy No. 55 – *Remediation of Contaminated Land*.

WaterNSW Real-Time Water Database. https://realtimedata.waternsw.com.au/water.stm.

Attachment A: Mapset

Map	Title
Map 01	Vicinity Map
Map 02	Site Overview Plan
Map 03	Site Location Map
Map 04	Topographic Plan
Map 05	Groundwater Bores Within 500 m Radius
Map 06	Areas of Environmental Concern (AECs)
Map 07	Sampling Locations
Map 08	1947 Aerial Photo
Map 09	1961 Aerial Photo
Map 10	1971 Aerial Photo
Map 11	1979 Aerial Photo
Map 12	1986 Aerial Photo
Map 13	1994 Aerial Photo
Map 14	1998 Aerial Photo
Map 15	2004 Aerial Photo
Map 16	2010 Aerial Photo
Map 17	2015 Aerial Photo
Map 18	2020 Aerial Photo
Map 19	2022 Aerial Photo

0 60 120 180 240 300 m

1:5000 @ A3

Aerial Photo Source: Nearmap

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

Map Title / Figure:

Vicinity Map

Map 01	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

martens
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Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 60 120 180 240 300 m

1:5000 @ A3

Aerial Photo Source: Nearmap

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Map Title / Figure:
Site Overview Plan

Map 02	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: Nearmap

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Map Title / Figure:
Site Location Map

Map 03	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Legend

- Contour Interval (1m)
- Site Boundary

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

N

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: Nearmap; Topographic Data Source: ELVIS.

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Map Title / Figure:

Topographic Plan

Map 04	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

0 60 120 180 240 300 m

1:5000 @ A3

Aerial Photo Source: Nearmap; Groundwater Bore Source: Bureau of Meteorology

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

Map Title / Figure:

Groundwater Bores Within 500 m Radius

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Map 05	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: Nearmap

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Map Title / Figure:

Areas of Environmental Concern (AECs)

Map 06	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: HAPE

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Map Title / Figure:
Sampling Locations

Map 07	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

Attachment B: Aerial Photography

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: HAPE

Map Title / Figure:
1947 Aerial Photo

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Map 08	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: HAPE

Map Title / Figure:

1961 Aerial Photo

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Map 09	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: HAPE

Map Title / Figure:

1971 Aerial Photo

Map 10	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

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0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: HAPE

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Map Title / Figure:
1979 Aerial Photo

Map 11	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: HAPE

Map Title / Figure:

1986 Aerial Photo

Map 12	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

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Legend

Site Boundary

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: HAPE
Image distortion due to image located at edge of aerial photo.

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Map Title / Figure:
1994 Aerial Photo

Map 13	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: HAPE

Map Title / Figure:
1998 Aerial Photo

Map 14	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

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Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: HAPE

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Map Title / Figure:
2004 Aerial Photo

Map 15	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

Legend

Site Boundary

N

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: Nearmap

Map Title / Figure:

2010 Aerial Photo

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Map 16	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: Nearmap

Map Title / Figure:

2015 Aerial Photo

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Map 17	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: Nearmap

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Map Title / Figure:
2020 Aerial Photo

Map 18	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

0 10 20 30 40 50 m

1:1250 @ A3

Aerial Photo Source: Nearmap

Map Title / Figure:
2022 Aerial Photo

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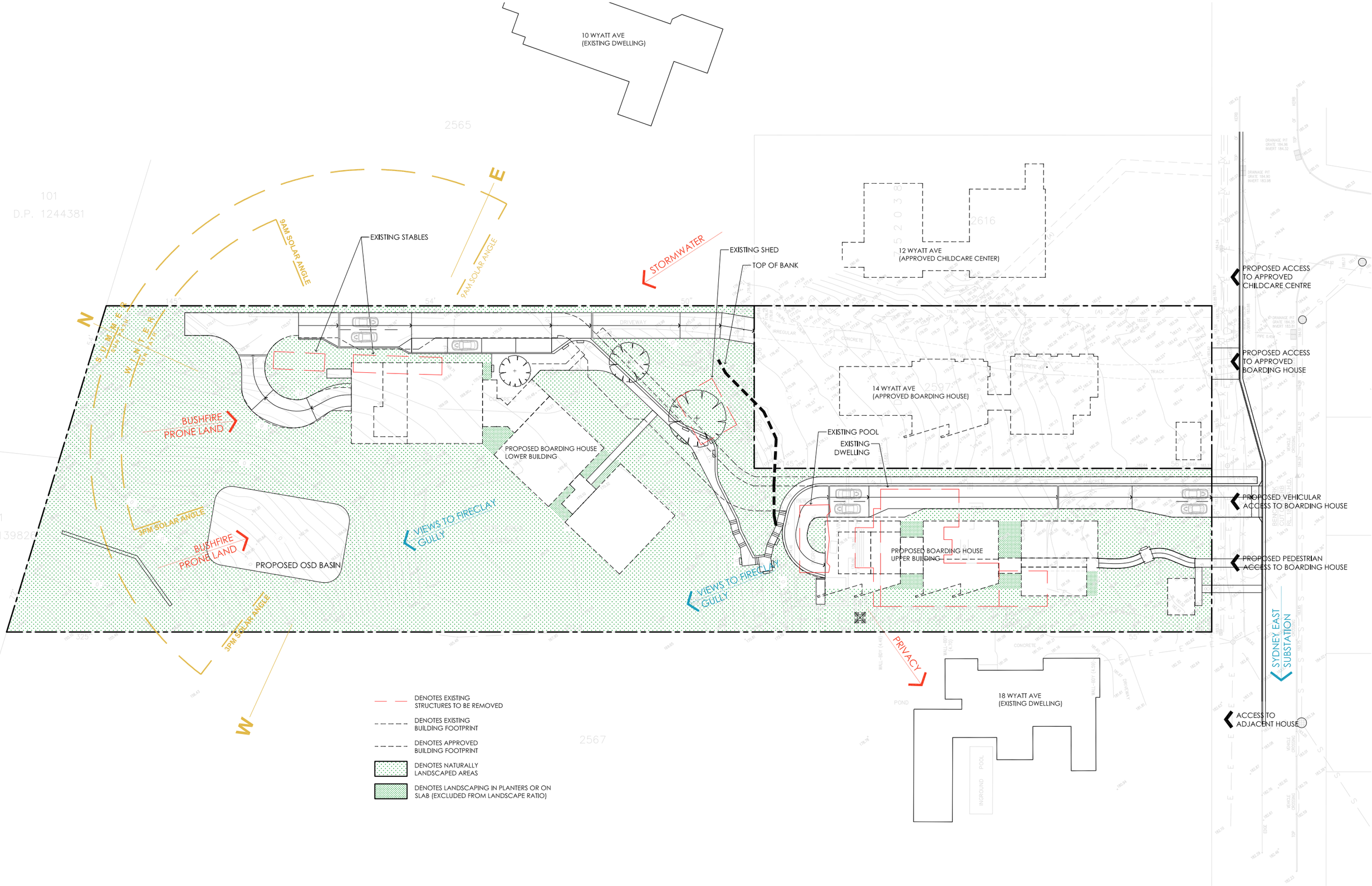
Map 19	Map
16 Wyatt Avenue, Belrose, NSW.	Site
Preliminary Site Investigation	Project
Mapset	Sub-Project
John Holman	Client
06/07/2022	Date

Project No: P2108187 Map Set: MS01-R01 EPSG: 28356

Attachment C: Proposed Development Plans



IMPORTANT NOTES:
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- The Estuarine Planning Level is min 3.1m AHD. All levels to AHD.

REVISION	DATE	DESCRIPTION	BY
0	Jan '21	CONCEPT DRAWINGS	OH
P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

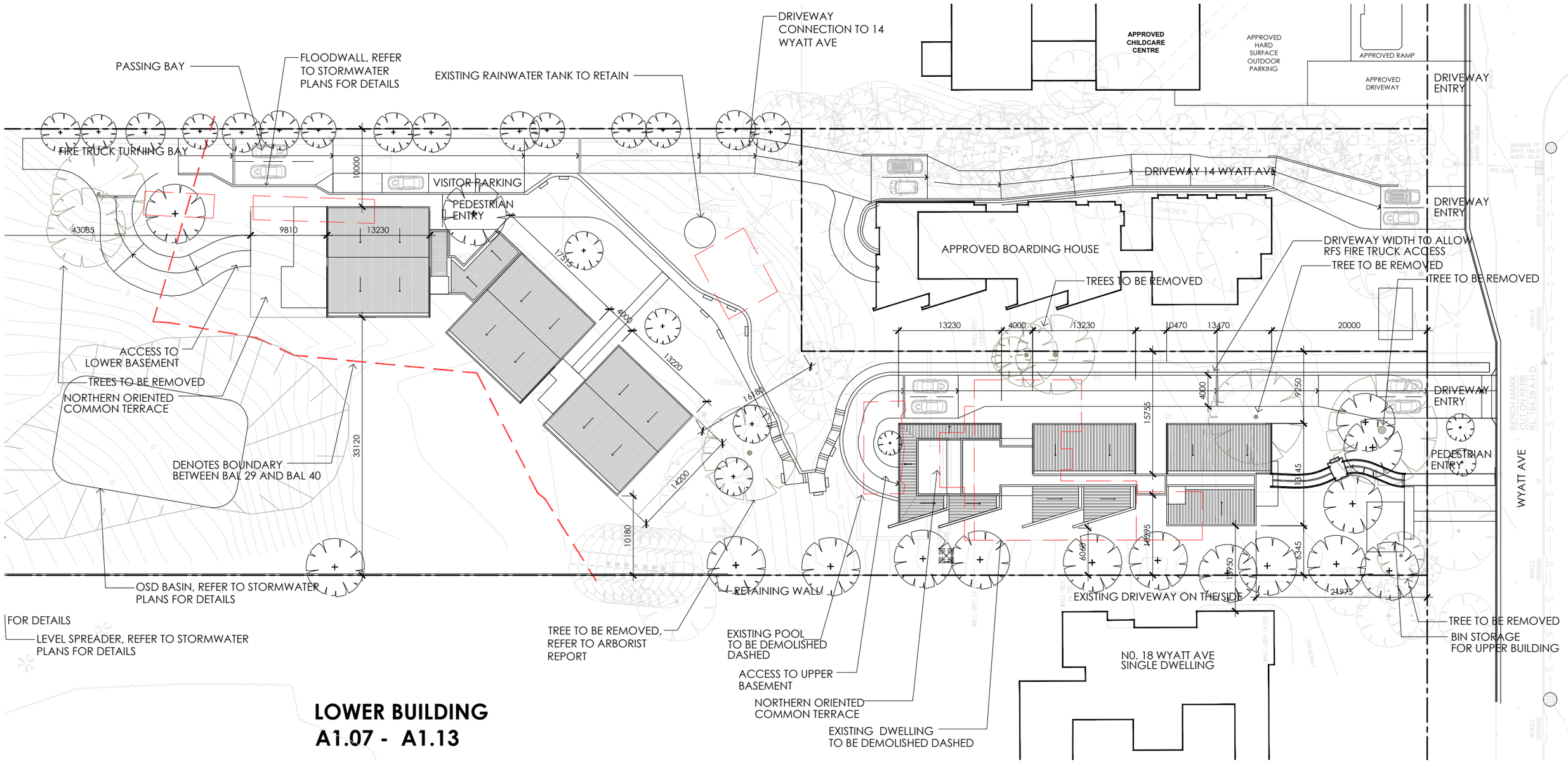
SITE ANALYSIS

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A0.01	1:600 @A3	DA05	WAB2

SITE STATISTICS
SITE AREA: 9342 SQ.M
GFA: 2046.6 SQ.M (EXCL. LIFTS, STAIRS AND BASEMENT)
SITE COVERAGE: 3072.1 SQ.M (32.9%) (INCL DRIVEWAY, BUILDINGS, BIN ROOM, FOOTPATHS AND ALL HARD SURFACE)
NATURALLY LANDSCAPED AREA: 6269.9 SQ.M (>50%)
LANDSCAPING IN PLANTERS: 47.6 SQ.M

LOWER BUILDING
32x BOARDING ROOMS (EACH ROOM INCL. ENSUITE)
20x CAR PARKING SPACES + 4 EXTERNAL VISITOR SPACES
8x MOTOR BIKES SPACES
32x RACKS FOR BICYCLES
4x COMMON AREA TOTAL 216.2 SQ.M

UPPER BUILDING
22x BOARDING ROOMS (EACH ROOM INCL. ENSUITE)
1x MANAGERS ROOM (WITH ENSUITE)
11x CAR PARKING SPACES (2 x ACCESSIBLE)
5x MOTOR BIKES SPACES
23x RACKS FOR BICYCLES
2x COMMON AREA TOTAL 126.9 Q.M



LOWER BUILDING
A1.07 - A1.13
PROPOSED TWO STOREYS AND BASEMENT CAR PARK

UPPER BUILDING
A1.01 - A1.06
PROPOSED THREE STOREYS AND BASEMENT CAR PARK

REVISION	DATE	DESCRIPTION	BY
0	Jan '21	CONCEPT DRAWINGS	OH
P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

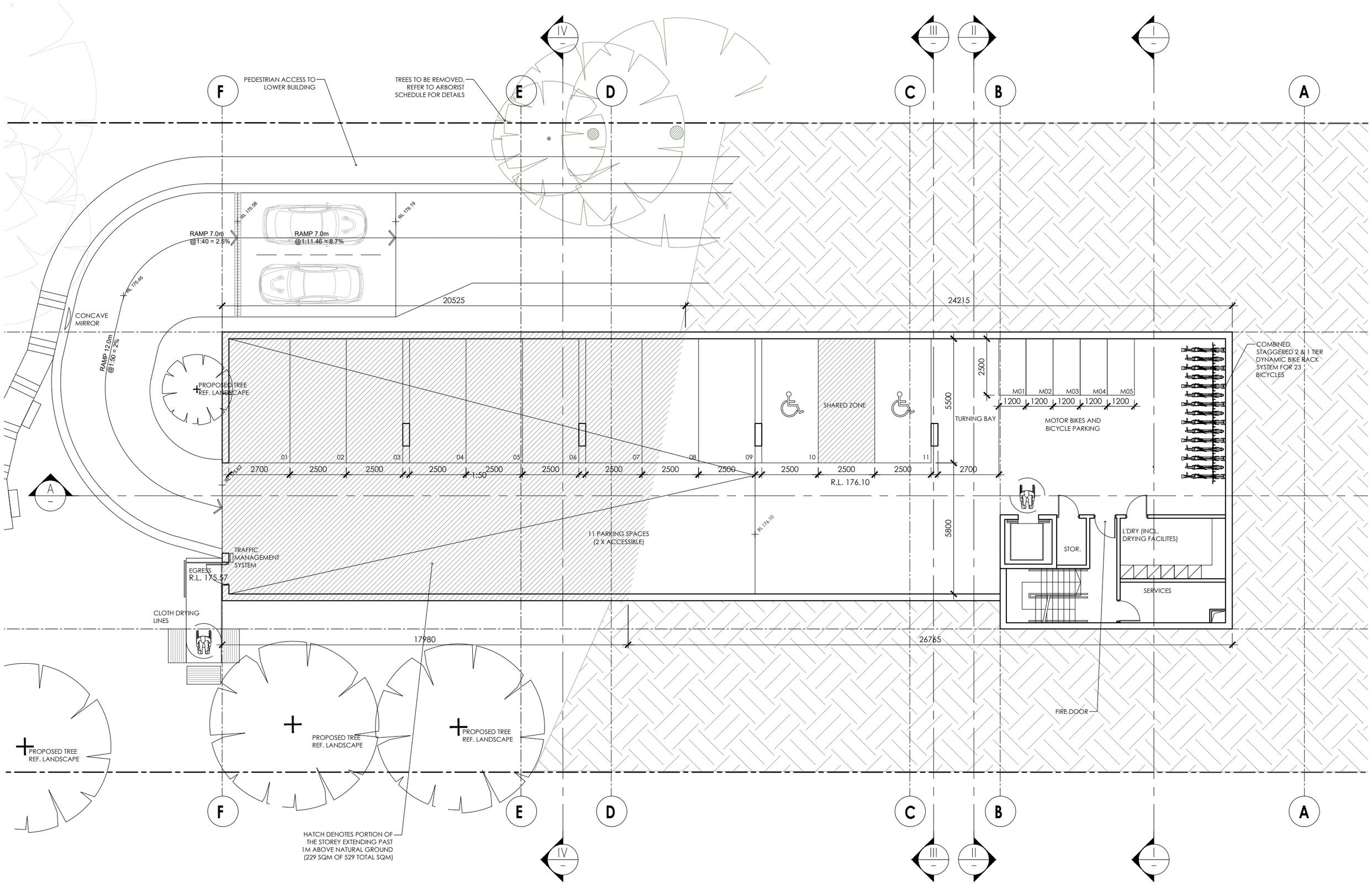
REVISION NOTES
ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT
NORTHERN BEACHES ESSENTIAL SERVICES ACCOMMODATION

DRAWING TITLE
SITE PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A0.02	1:500 @A3	DA05	WAB2



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DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

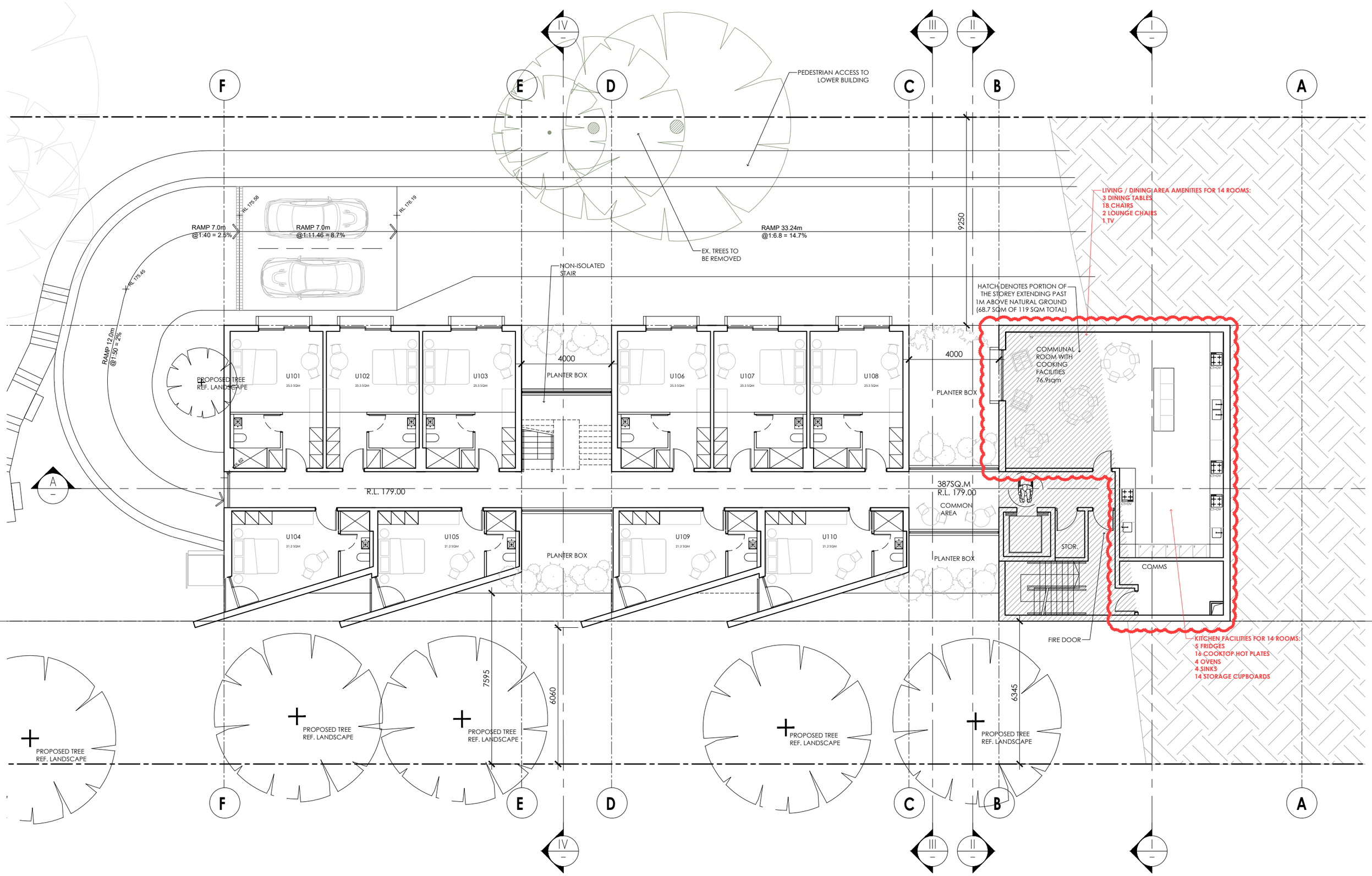
REVISION NOTES
ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT
NORTHERN BEACHES ESSENTIAL SERVICES ACCOMMODATION

DRAWING TITLE
UPPER BUILDING
BASEMENT PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.01	1:150 @A3	DA05	WAB2



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DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES
ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT
NORTHERN BEACHES ESSENTIAL SERVICES ACCOMMODATION

DRAWING TITLE
UPPER BUILDING
LOWER GROUND FLOOR PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.02	1:150 @A3	DA05	WAB2

IMPORTANT NOTES:
Do not scale from drawings, use figured dimensions only. Ensure that the drawings used carry the latest revision no. Read in conjunction with consultant engineers drawings - refer contract drawing list.

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- All discrepancies to be brought to the attention of the Architect.
- Larger scale drawings and written dimensions take precedence.
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REVISION	DATE	DESCRIPTION	BY
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P1	Apr '21	PRELIMINARY ISSUE	OH
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DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA05	13/05/22	DA ISSUE	PH

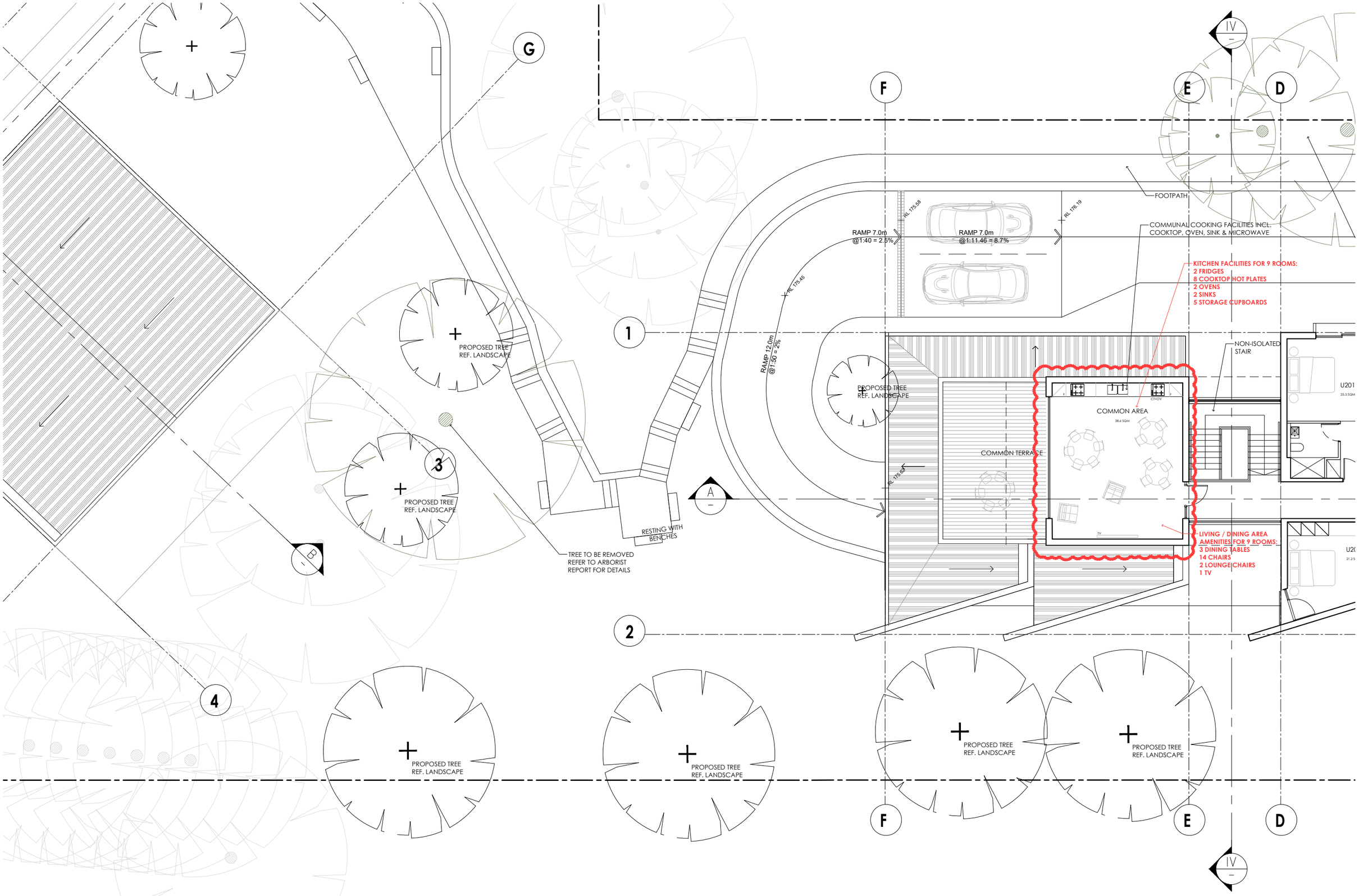
REVISION NOTES
ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT
NORTHERN BEACHES ESSENTIAL SERVICES ACCOMMODATION

DRAWING TITLE
UPPER BUILDING
GROUND FLOOR PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.03	1:150 @A1	DA05	WAB2



CONTINUATION A1.04

IMPORTANT NOTES:
Do not scale from drawings, use figured dimensions only. Ensure that the drawings used carry the latest revision no. Read in conjunction with consultant engineers drawings - refer contract drawing list.

- All dimensions to be checked on site before commencement of work.
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- Larger scale drawings and written dimensions take precedence.
- The Estuarine Planning Level is min 3.1m AHD. All levels to AHD.

REVISION	DATE	DESCRIPTION	BY
0	Jan '21	CONCEPT DRAWINGS	OH
P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

UPPER BUILDING
GROUND FLOOR PLAN - SHEET 1

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.03A	1:150 @A3	DA05	WAB2

CONTINUATION A1.03

C B A

RAMP 33.24m
@1:6.8 = 14.7%

EX. TREES TO
BE REMOVED

RL 181.09

RAMP 13.0m
@1:8 = 12.5%

RL 182.71

RAMP 14.0m
@1:12.14 = 8.24%

RL 183.86

RAMP 7.0m
@1:20 = 5%

U201 25.5 SQM | U202 25.5 SQM | U203 25.5 SQM

U206 ACCESSIBLE 25.5 SQM | U207 ACCESSIBLE 25.5 SQM | U208 ACCESSIBLE 25.5 SQM

U204 21.2 SQM | U205 21.2 SQM

R.L. 182.00

COMMON
AREA

STOR.

TYPE 2
26 SQM
CARETAKER
UNIT

FIRE DOOR

CARETAKER UNIT PRIVATE YARD -
SOFT LANDSCAPING
18 SQM

LOW PLANTER

ENTRY
R.L. 182.00

EX. TREE TO
BE REMOVED

AWNING OVER
ENTRY

RAMP @ 1:15

RESTING WITH
BENCH

FFL 182.51

RAMP @ 1:15

FFL 183.02

L'BOXES

PROPOSED TREE
REF. LANDSCAPE

EX. TREE TO BE REMOVED, NEW
TREE TO BE PLANTED INSTEAD
(REFER TO LANDSCAPE PLANS)

1

2

A

BINS AND BULKY
GOODS STORAGE
TO COUNCIL WASTE
OFFICER AND
LANDSCAPING
REQUIREMENTS

BIN STORAGE
ROOM
FFL 183.00

BULKY
GOODS
STORAGE

3000

3000

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REVISION	DATE	DESCRIPTION	BY
0	Jan '21	CONCEPT DRAWINGS	OH
P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

UPPER BUILDING

GROUND FLOOR PLAN - SHEET 2

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.03B	1:150 @A3	DA05	WAB2

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P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

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platform
ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

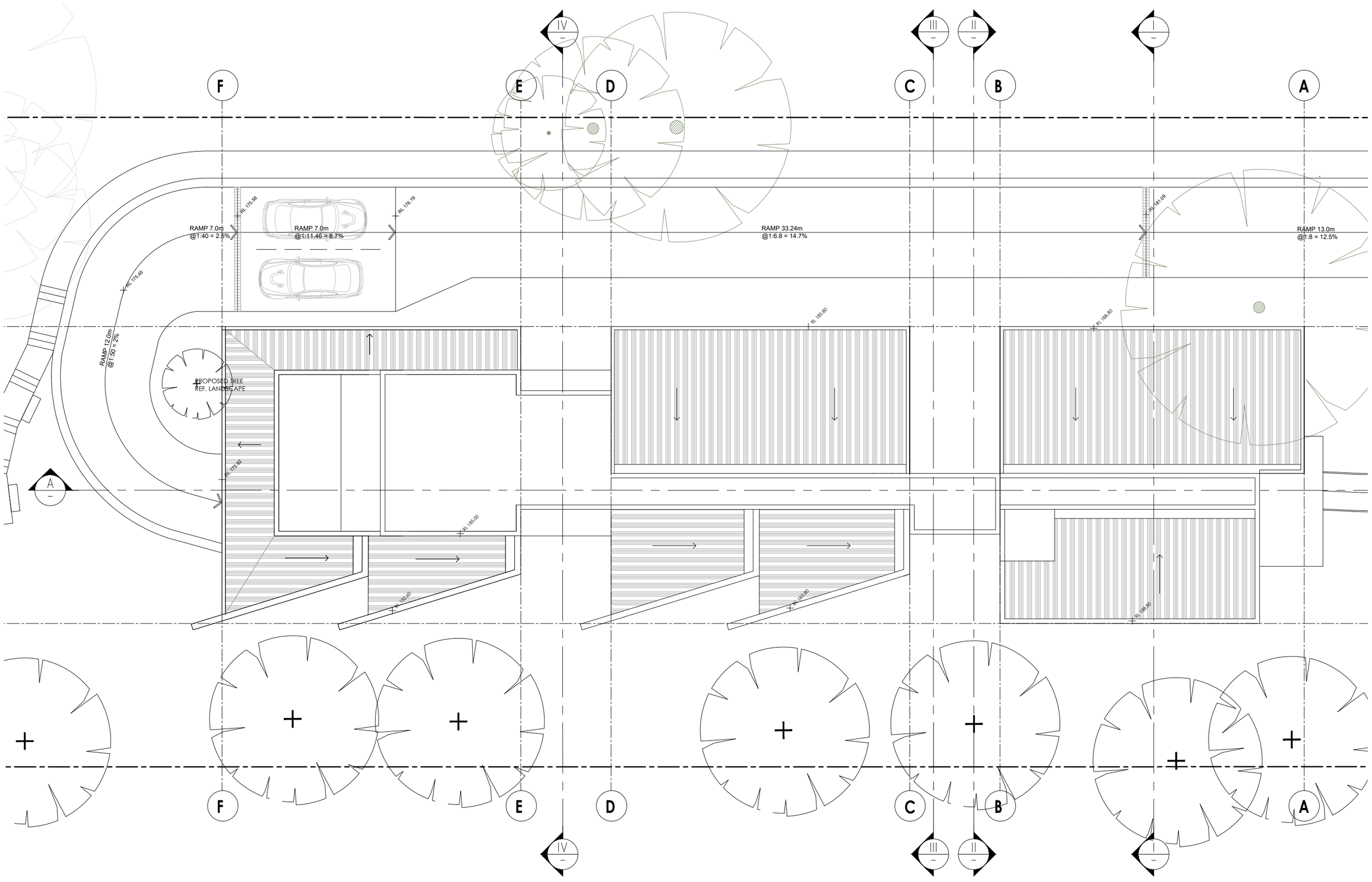
CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

UPPER BUILDING
FIRST FLOOR PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.04	1:150 @A3	DA05	WAB2



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0	Jan '21	CONCEPT DRAWINGS	OH
P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

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p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

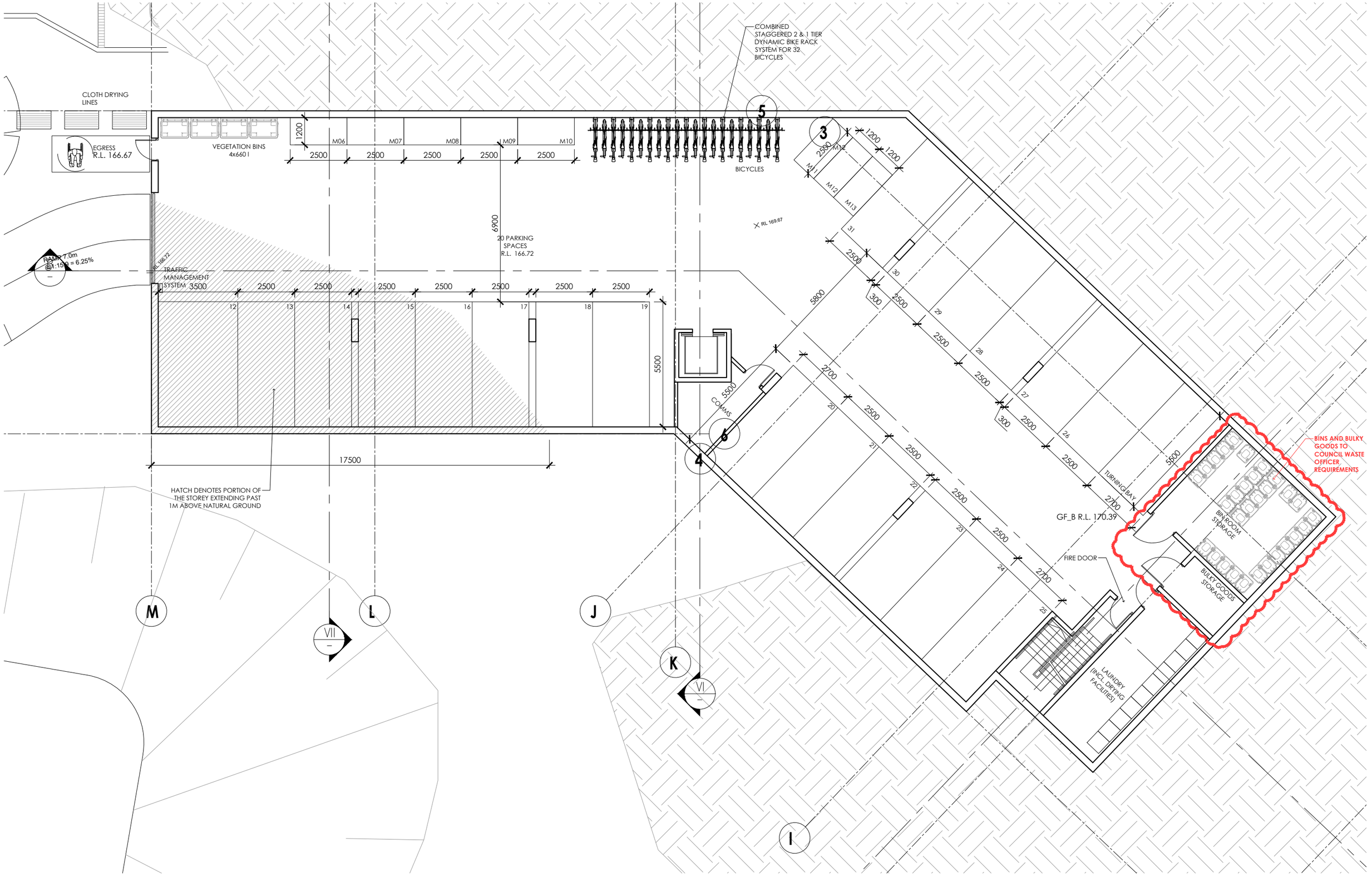
CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

UPPER BUILDING
ROOF PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.05	1:150 @A3	DA05	WAB2



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P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

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nominated architect Bridie Gough Reg No. 8280

CLIENT

NORTHERN BEACHES ESSENTIAL SERVICES ACCOMMODATION

DRAWING TITLE

LOWER BUILDING
BASEMENT PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.06	1:150 @A3	DA05	WAB2

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REVISION	DATE	DESCRIPTION	BY
0	Jan '21	CONCEPT DRAWINGS	OH
P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA05	13/05/22	DA ISSUE	PH

REVISION NOTES
ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT
NORTHERN BEACHES ESSENTIAL SERVICES ACCOMMODATION

DRAWING TITLE
LOWER BUILDING
GROUND FLOOR PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.07	1:150 @A1	DA05	WAB2

PROPOSED TREE REF. LANDSCAPE

RL 168.30

RL 168.74

RL 169.87

RL 171.41

RAMP 7.0m @1:15.9 = 6.25%

RAMP 12.88m @1:11.4 = 8.75%

RAMP 24.6m @1:16 = 6.25%

6300 6000 6000 6000 6300

VISITOR 1 VISITOR 2 VISITOR 3 VISITOR 4

2500

PLANTING

NON-ISOLATED STAIR

BENCH

SANDSTONE RETAINING WALL

TREE TO BE REMOVED

RL 169.30

RAMP 7.0m @1:15.9 = 6.25%

PROPOSED TREE

EGRESS BELOW

COMMON TERRACE

L101 25.5 SQM

L102 25.5 SQM

L103 25.5 SQM

L104 25.5 SQM

PLANTERBOX

AWNING OVER ENTRY

RL 167.86

RL 167.16

RL 168.72

RAMP 6.3m @1:9 = 11.1%

GF_A R.L. 169.67

ENTRY R.L. 169.67

FOYER

L107 25.5 SQM

L108 25.5 SQM

L109 25.5 SQM

COMMON AREA 53.6sqm

L105 25.5 SQM

L106 25.5 SQM

639SQ.M GF_B R.L. 170.39

PLANTERBOX

L111 25.5 SQM

L112 25.5 SQM

L113 25.5 SQM

LIVING / DINING AREA AMENITIES FOR 7 ROOMS:
4 DINING TABLES
18 CHAIRS
2 LOUNGE CHAIRS
1 TV

KITCHEN FACILITIES FOR 7 ROOMS:
2 FRIDGES
8 COOKTOP HOT PLATES
2 OVENS
2 SINKS
7 STORAGE CUPBOARDS

CONTINUATION A1.09

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P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES
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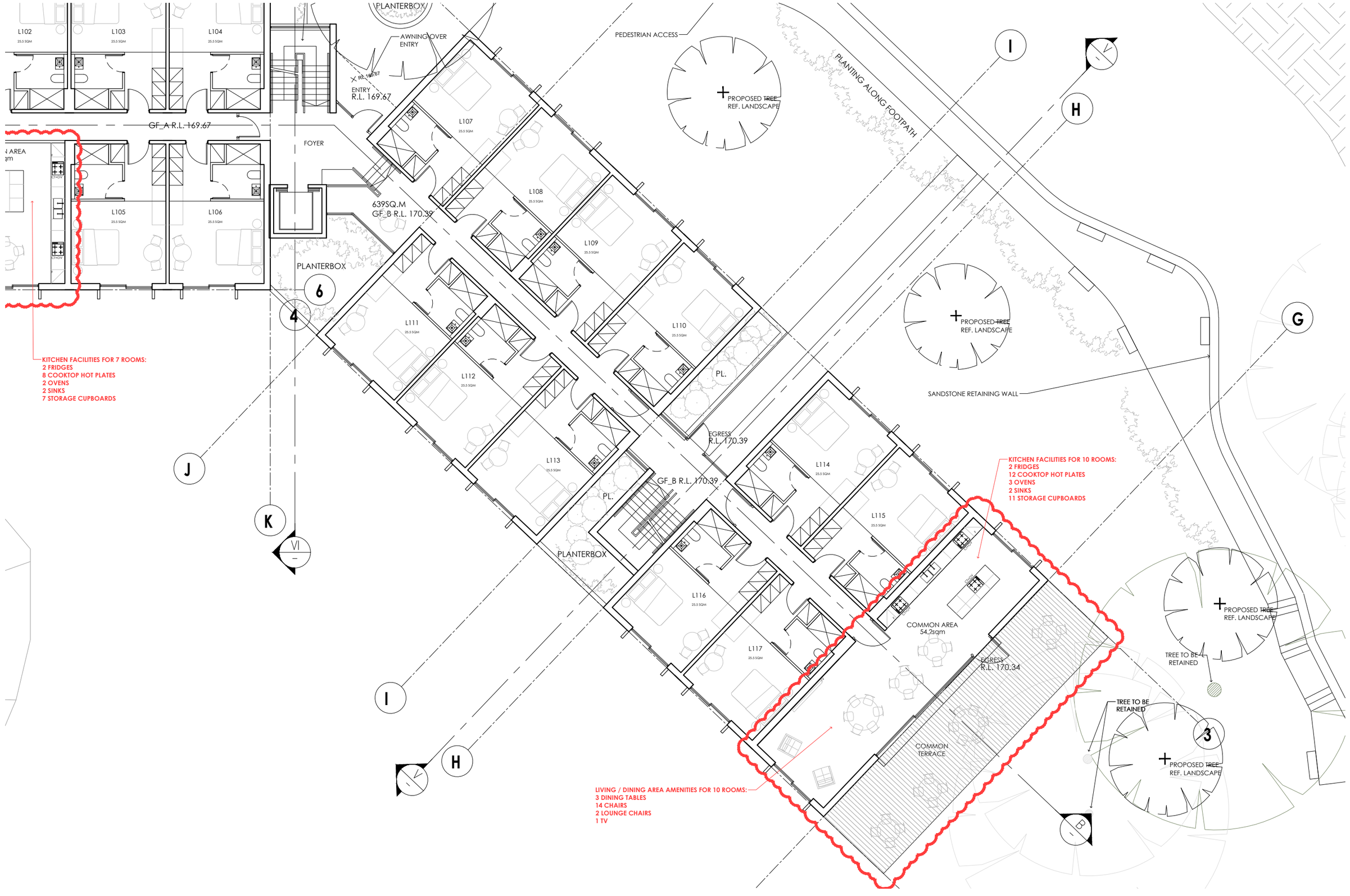
platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT
NORTHERN BEACHES ESSENTIAL SERVICES ACCOMMODATION

DRAWING TITLE
LOWER BUILDING
GROUND FLOOR PLAN - SHEET 1

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.07A	1:150 @A3	DA05	WAB2

CONTINUATION A1.08



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P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

ISSUED FOR DA LODGMENT
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nominated architect Bridie Gough Reg No. 8280

CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

LOWER BUILDING
GROUND FLOOR PLAN - SHEET 2

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.07B	1:150 @A3	DA05	WAB2

IMPORTANT NOTES:
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REVISION	DATE	DESCRIPTION	BY
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P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA05	13/05/22	DA ISSUE	PH

REVISION NOTES
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NORTHERN BEACHES ESSENTIAL SERVICES ACCOMMODATION

DRAWING TITLE
LOWER BUILDING
FIRST FLOOR PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.08	1:150 @A1	DA05	WAB2

PROPOSED TREE REF. LANDSCAPE

RL 168.30

RL 168.74

RL 169.67

RL 171.41

RAMP 7.0m @1:15.9 = 6.25%

RAMP 12.88m @1:11.4 = 8.75%

RAMP 24.6m @1:16 = 6.25%

KITCHEN FACILITIES FOR 7 ROOMS:
2 FRIDGES
12 COOKTOP HOT PLATES
3 OVENS
2 SINKS
9 STORAGE CUPBOARDS

NON-ISOLATED STAIR

AWNING OVER ENTRY

RL 169.30

RAMP 7.0m @1:15.9 = 6.25%

RL 167.86

RAMP 6.3m @1:9 = 11.1%

RL 167.16

RAMP 7.0m @1:15.9 = 6.25%

RL 166.72

COMMON TERRACE

COMMON AREA 54.2sqm

L201 25.5 SQM

L202 25.5 SQM

FF_A R.L. 172.77

L203 25.5 SQM

L204 25.5 SQM

RL 169.67

L205 25.5 SQM

L206 25.5 SQM

577.6SQ.M
FF_B R.L. 173.49

L207 25.5 SQM

L209 25.5 SQM

L210 25.5 SQM

L211 25.5 SQM

LIVING / DINING AREA AMENITIES
FOR 7 ROOMS:
3 DINING TABLES
14 CHAIRS
2 LOUNGE CHAIRS
1 TV

CONTINUATION A1.11

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DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

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CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

LOWER BUILDING
FIRST FLOOR PLAN - SHEET 1

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.08A	1:150 @A3	DA05	WAB2

CONTINUATION A1.10

L201 25.5 SQM
L202 25.5 SQM
L203 25.5 SQM
L204 25.5 SQM
L205 25.5 SQM
L206 25.5 SQM
L207 25.5 SQM
L208 25.5 SQM
L209 25.5 SQM
L210 25.5 SQM
L211 25.5 SQM
L212 25.5 SQM
L213 25.5 SQM
L214 25.5 SQM
L215 25.5 SQM

COMMON AREA
54.2sqm

FF_A R.L. 172.77
577.6SQ.M
FF_B R.L. 173.49
FF_B R.L. 173.49
RL 169.67

PROPOSED TREE
REF. LANDSCAPE
PROPOSED TREE
REF. LANDSCAPE
PROPOSED TREE
REF. LANDSCAPE
PROPOSED TREE
REF. LANDSCAPE

KITCHEN FACILITIES FOR 8 ROOMS:
2 FRIDGES
12 COOKTOP HOT PLATES
3 OVENS
2 SINKS
11 STORAGE CUPBOARDS

LIVING / DINING AREA AMENITIES FOR 8 ROOMS:
4 DINING TABLES
20 CHAIRS
2 LOUNGE CHAIRS
1 TV

COMMON AREA
54.2sqm

6
4
3
I
H
G
J
K
I
H

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DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES
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CLIENT
NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE
LOWER BUILDING
FIRST FLOOR PLAN - SHEET 2

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.08B	1:150 @A3	DA05	WAB2

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REVISION	DATE	DESCRIPTION	BY
0	Jan '21	CONCEPT DRAWINGS	OH
P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA05	13/05/22	DA ISSUE	PH

REVISION NOTES

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platform
ARCHITECTS
2/40 East Esplanade Manly 2095
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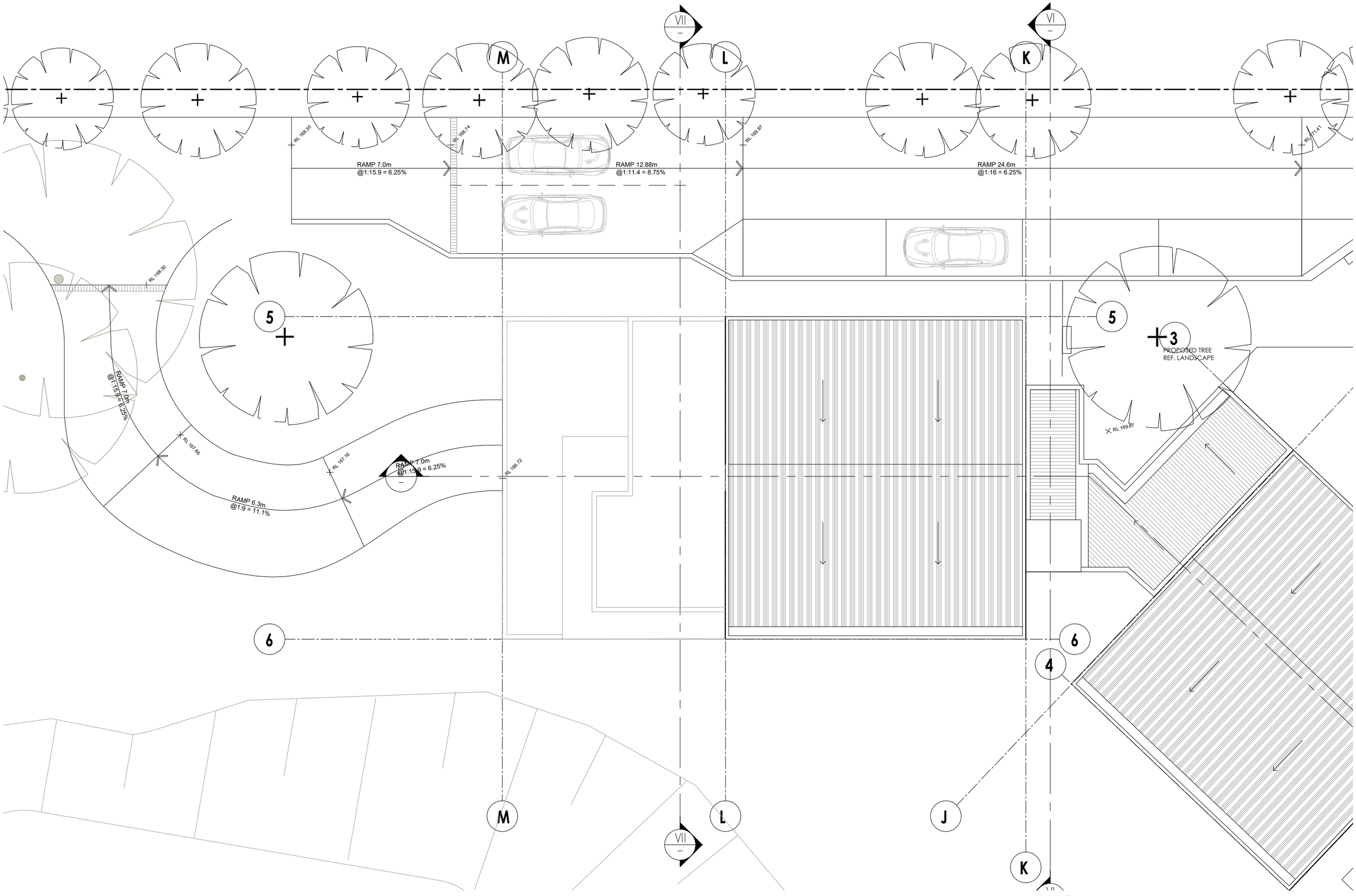
CLIENT
NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE
LOWER BUILDING
ROOF PLAN

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.09	1:150 @A1	DA05	WAB2



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P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

ISSUED FOR DA LODGMENT
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CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

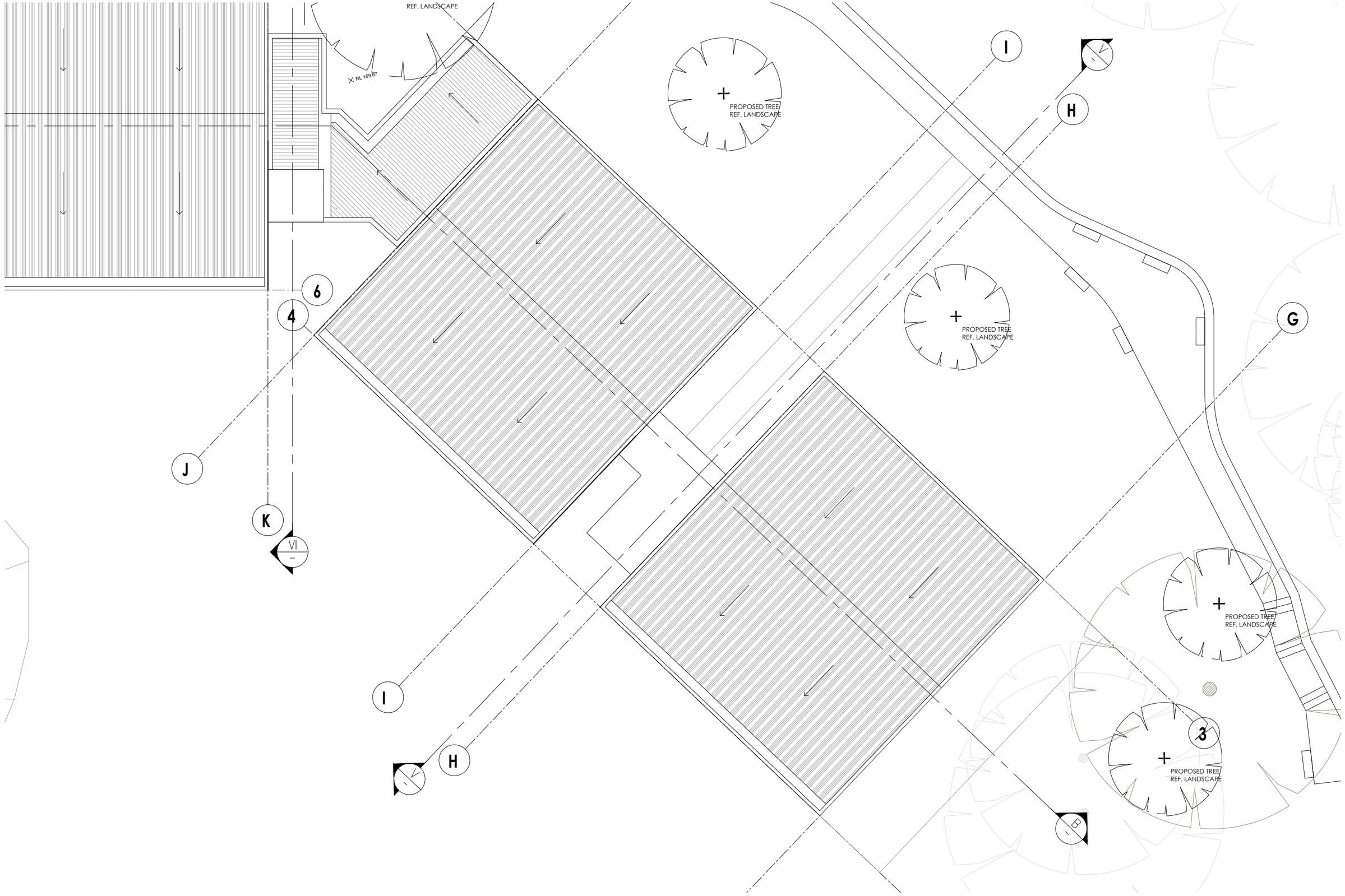
DRAWING TITLE

LOWER BUILDING

ROOF PLAN - SHEET 1

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.09A	1:150 @A3	DA05	WAB2

CONTINUATION A1.12



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DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

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ESSENTIAL SERVICES
ACCOMMODATION

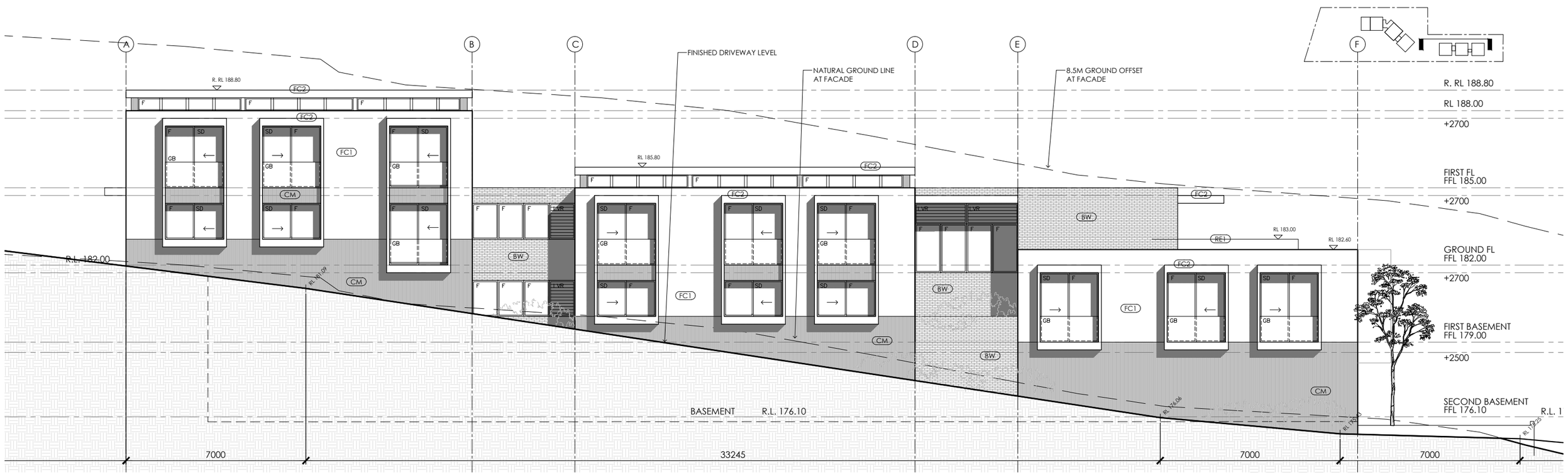
DRAWING TITLE

LOWER BUILDING

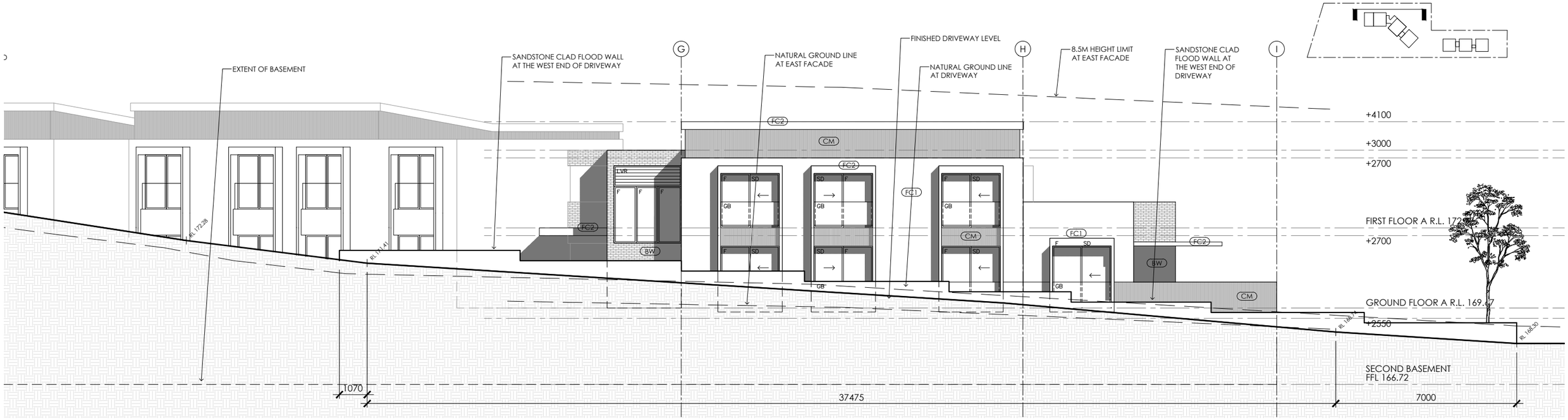
ROOF PLAN - SHEET 2

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A1.09B	1:150 @A3	DA05	WAB2

NORTH EAST ELEVATION
UPPER BUILDING



NORTH EAST ELEVATION
LOWER BUILDING



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DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

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nominated architect Bridie Gough Reg No. 8280

CLIENT

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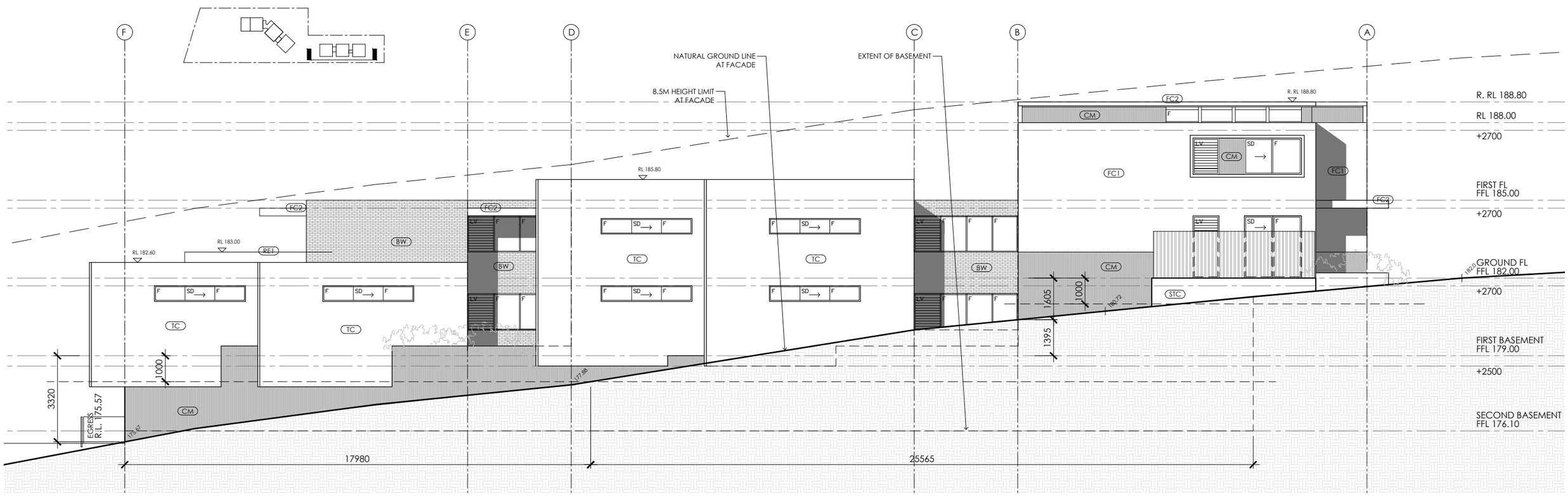
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

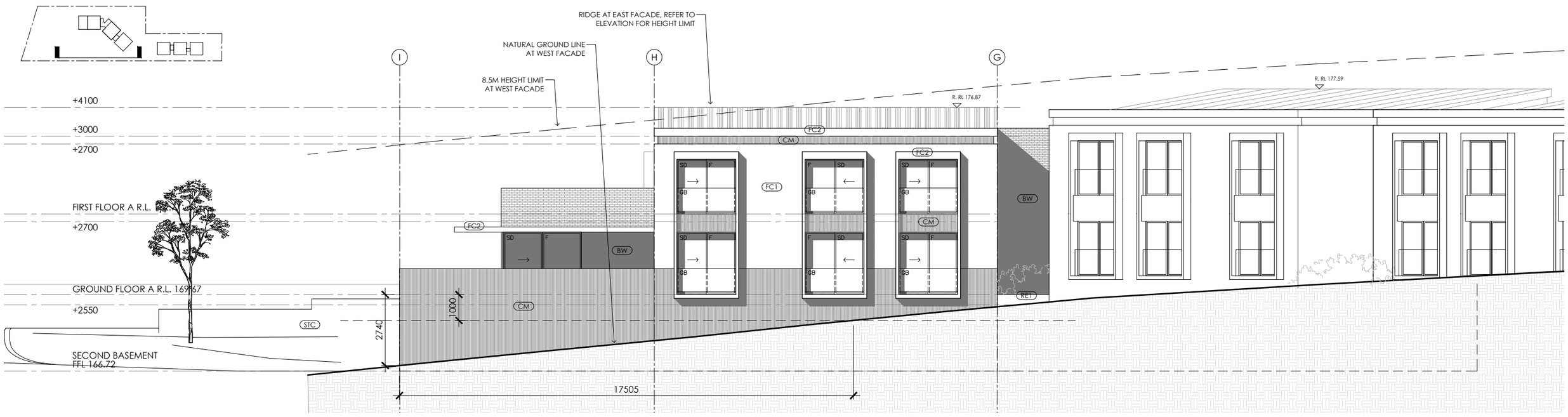
NORTH EAST ELEVATIONS
UPPER AND LOWER BUILDING

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A2.01	1:150@A3	DA05	WAB2

SOUTH WEST ELEVATION
UPPER BUILDING



SOUTH WEST ELEVATION
LOWER BUILDING



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REVISION	DATE	DESCRIPTION	BY
0	Jan '21	CONCEPT DRAWINGS	OH
P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

ISSUED FOR DA LODGMENT
NOT FOR CONSTRUCTION

platform ARCHITECTS
2/40 East Esplanade Manly 2095
p. 02 8385 9759 abn. 74602856157
nominated architect Bridie Gough Reg No. 8280

CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

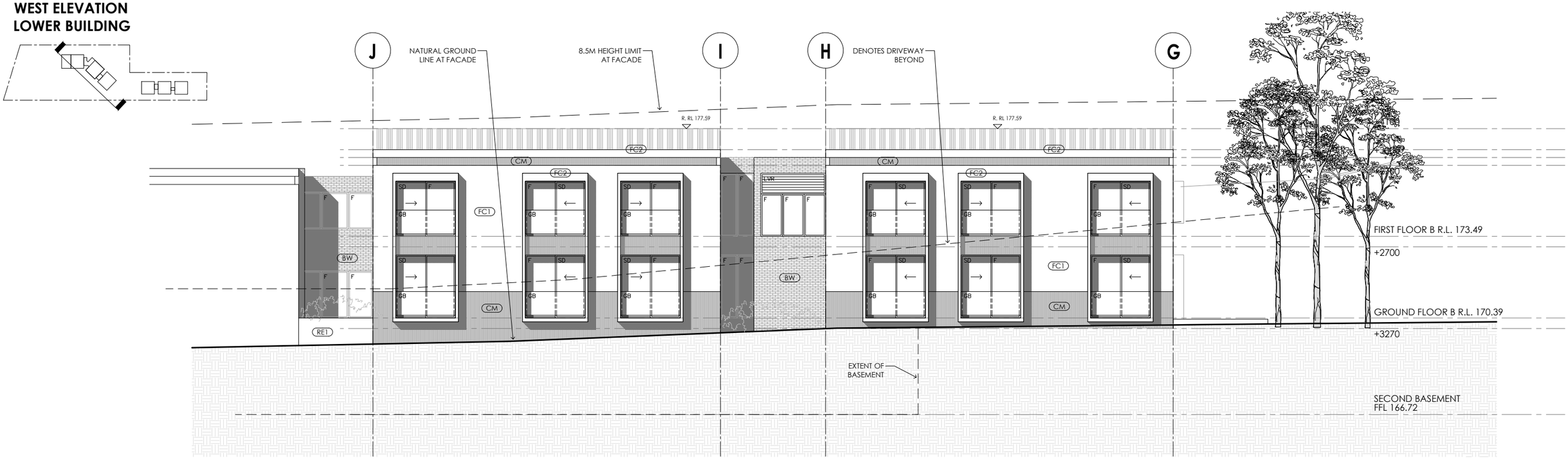
DRAWING TITLE

SOUTH WEST ELEVATIONS
UPPER AND LOWER BUILDING

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A2.02	1:150@A3	DA05	WAB2

EAST ELEVATION
LOWER BUILDING

WEST ELEVATION
LOWER BUILDING



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DA02	Apr '21	DA ISSUE	BG
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DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

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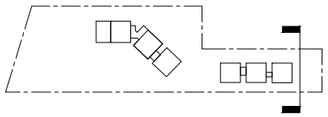
NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

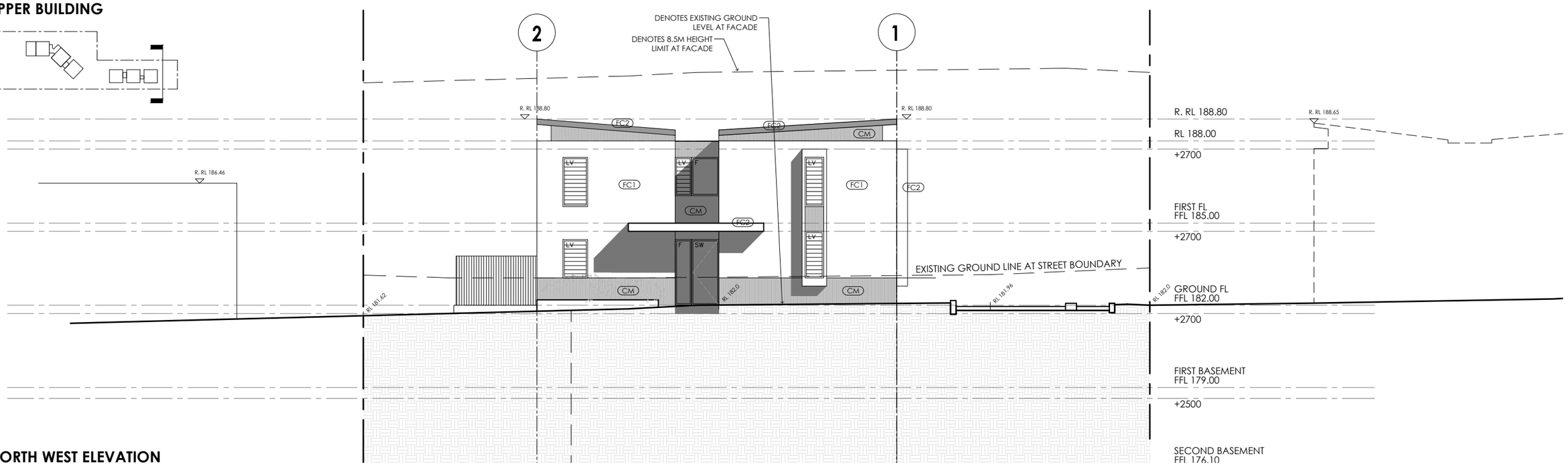
DRAWING TITLE

EAST WEST ELEVATIONS
LOWER BUILDING

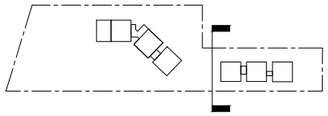
STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A2.03	1:150@A3	DA05	WAB2

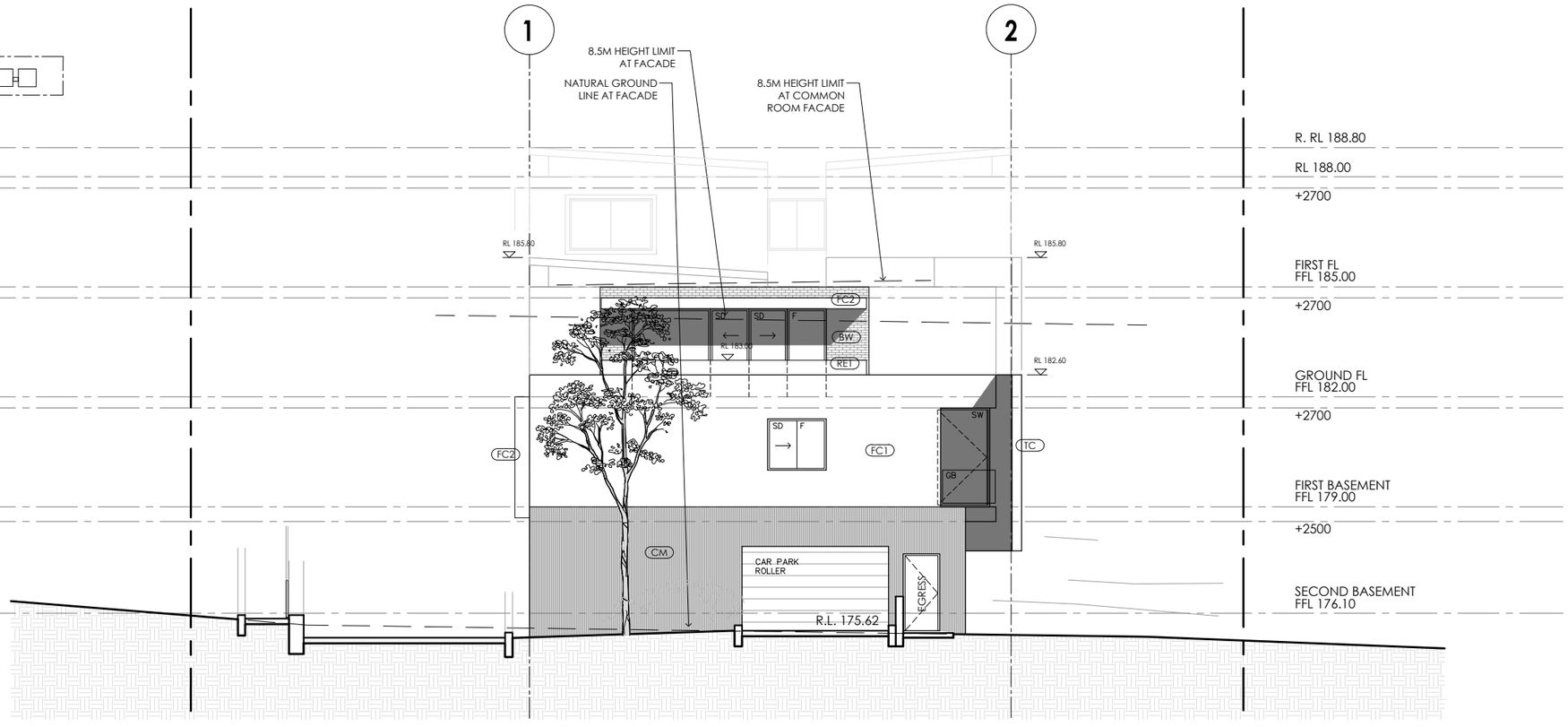
SOUTH EAST ELEVATION
UPPER BUILDING





NORTH WEST ELEVATION
UPPER BUILDING





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DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

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nominated architect Bridie Gough Reg No. 8280

CLIENT

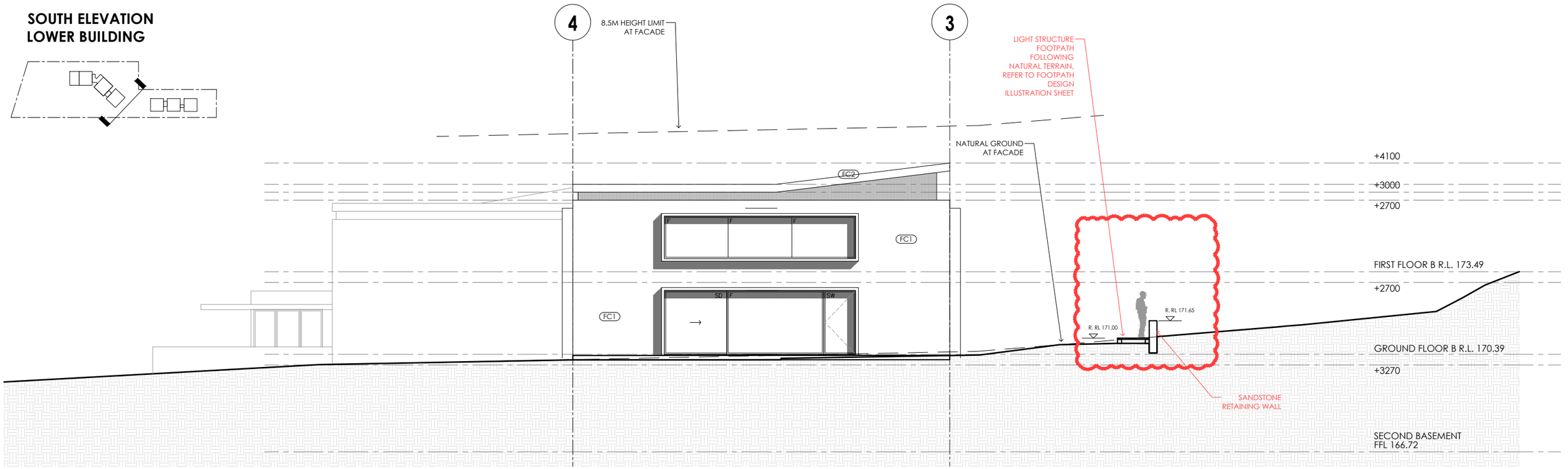
NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

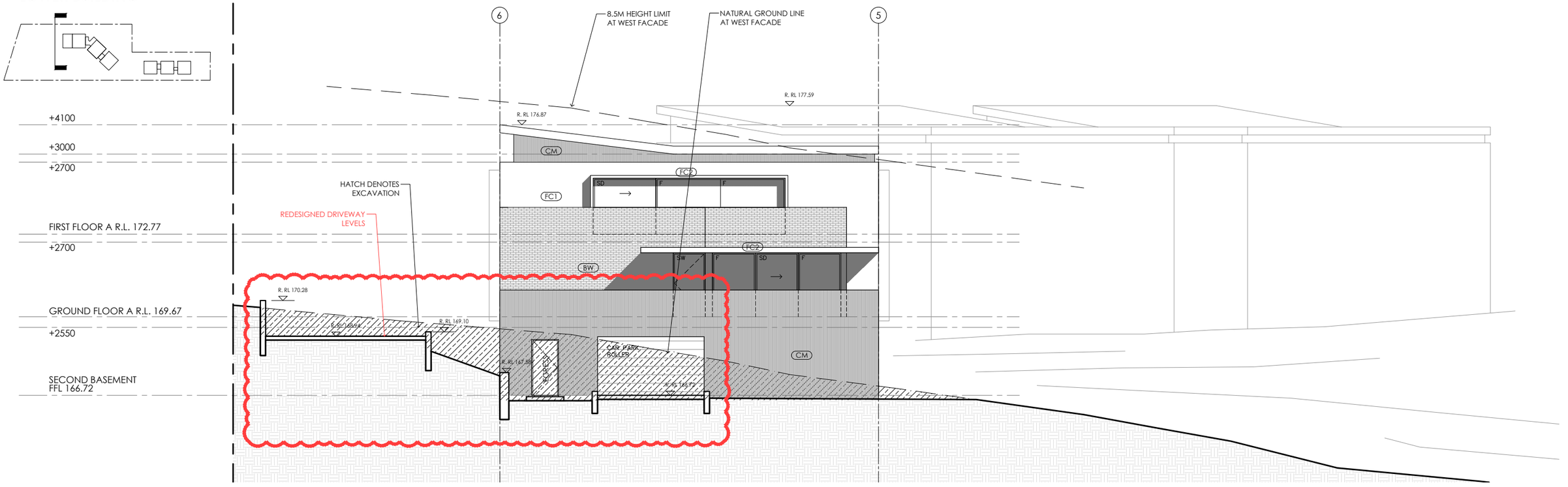
SOUTH EAST ELEVATION
NORTH WEST ELEVATION

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A2.04	1:150@A3	DA05	WAB2

SOUTH ELEVATION
LOWER BUILDING



NORTH WEST ELEVATION
LOWER BUILDING



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DA04	13/05/22	DA ISSUE	PH

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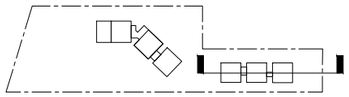
NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

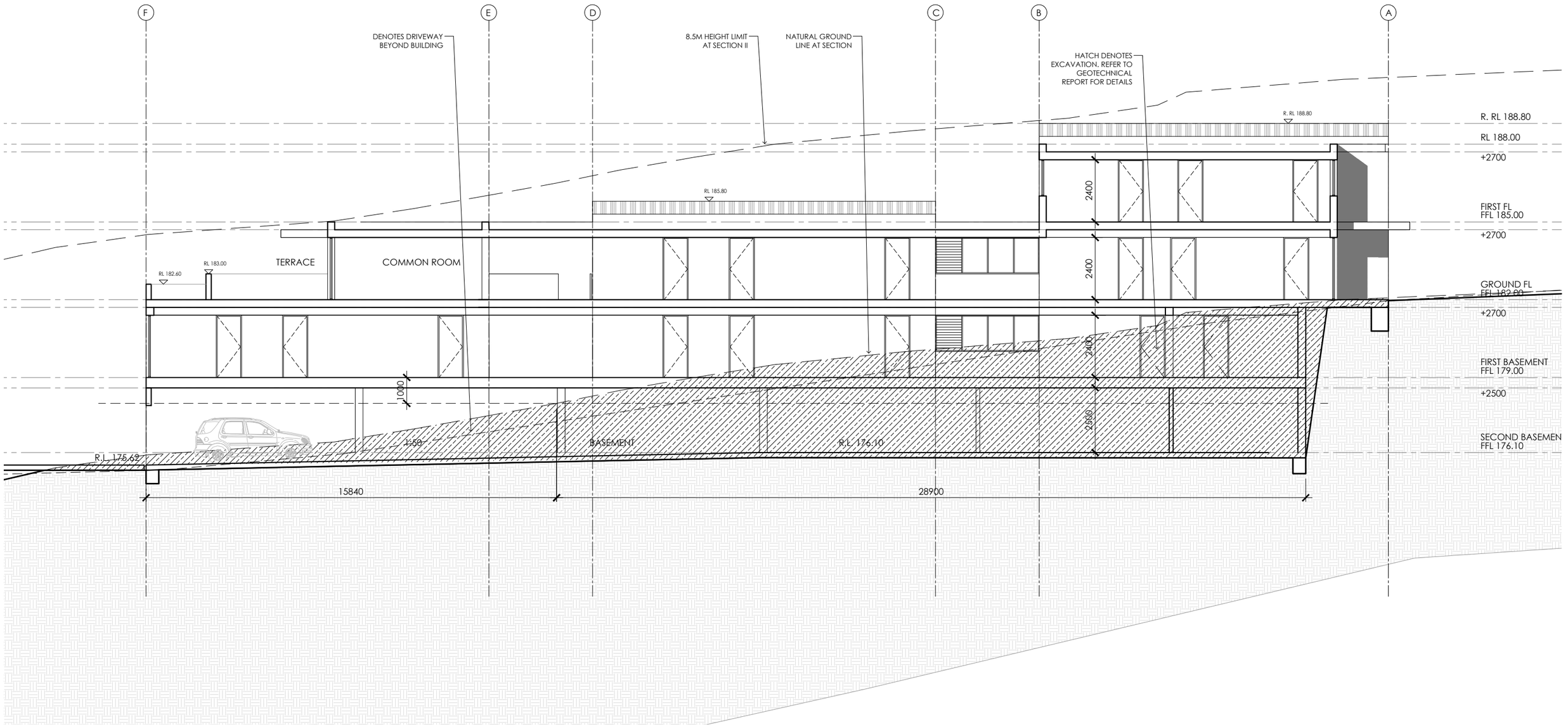
DRAWING TITLE

SOUTH EAST ELEVATION
NORTH WEST ELEVATION

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A2.05	1:150@A3	DA05	WAB2

SECTION A
UPPER BUILDING





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DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

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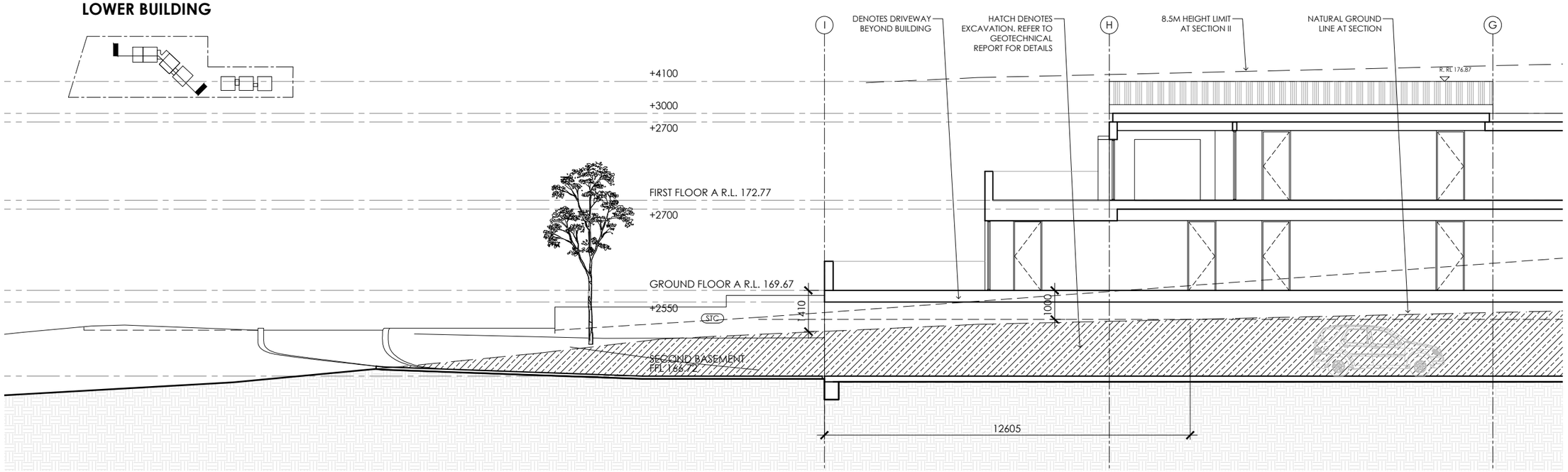
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

SECTION A
UPPER BUILDING

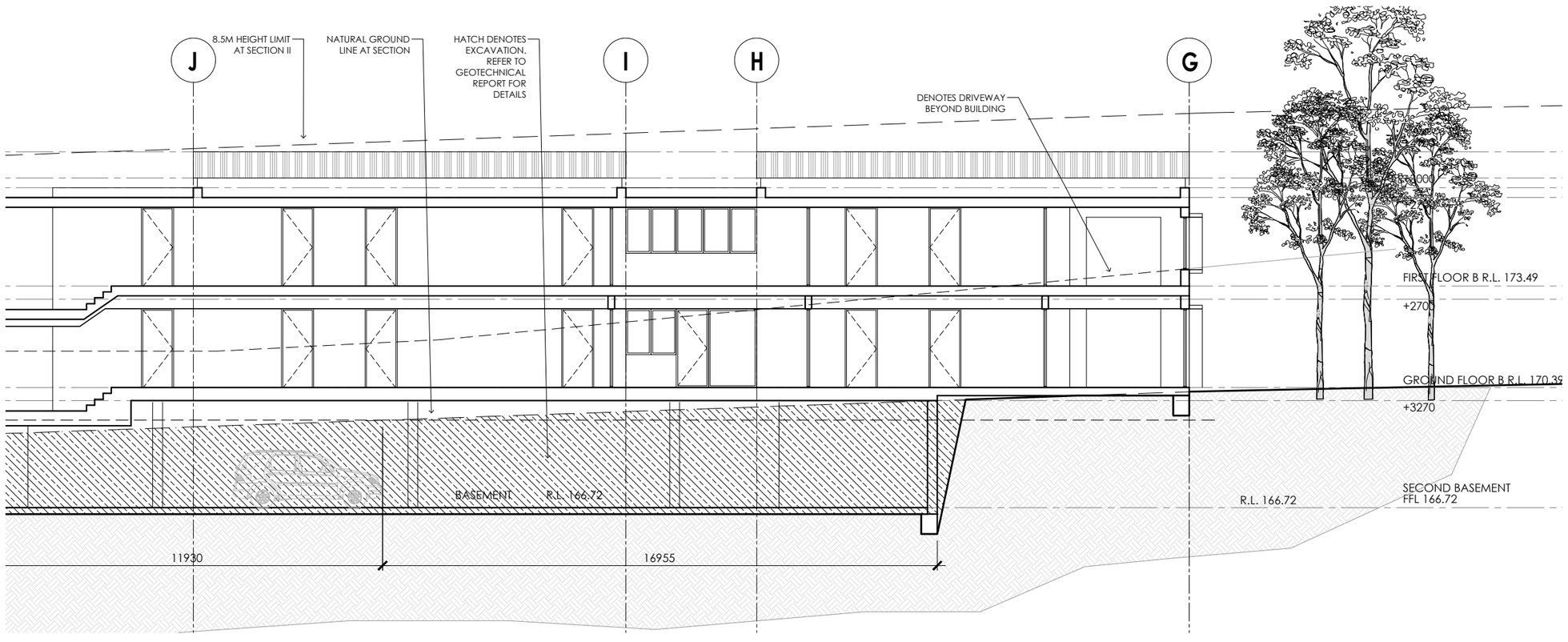
STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A3.01	1:150@A3	DA05	WAB2

SECTION B
LOWER BUILDING



CONTINUATION BELOW

CONTINUATION ABOVE



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CLIENT

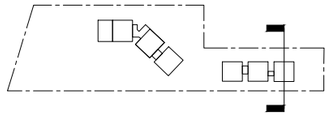
NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

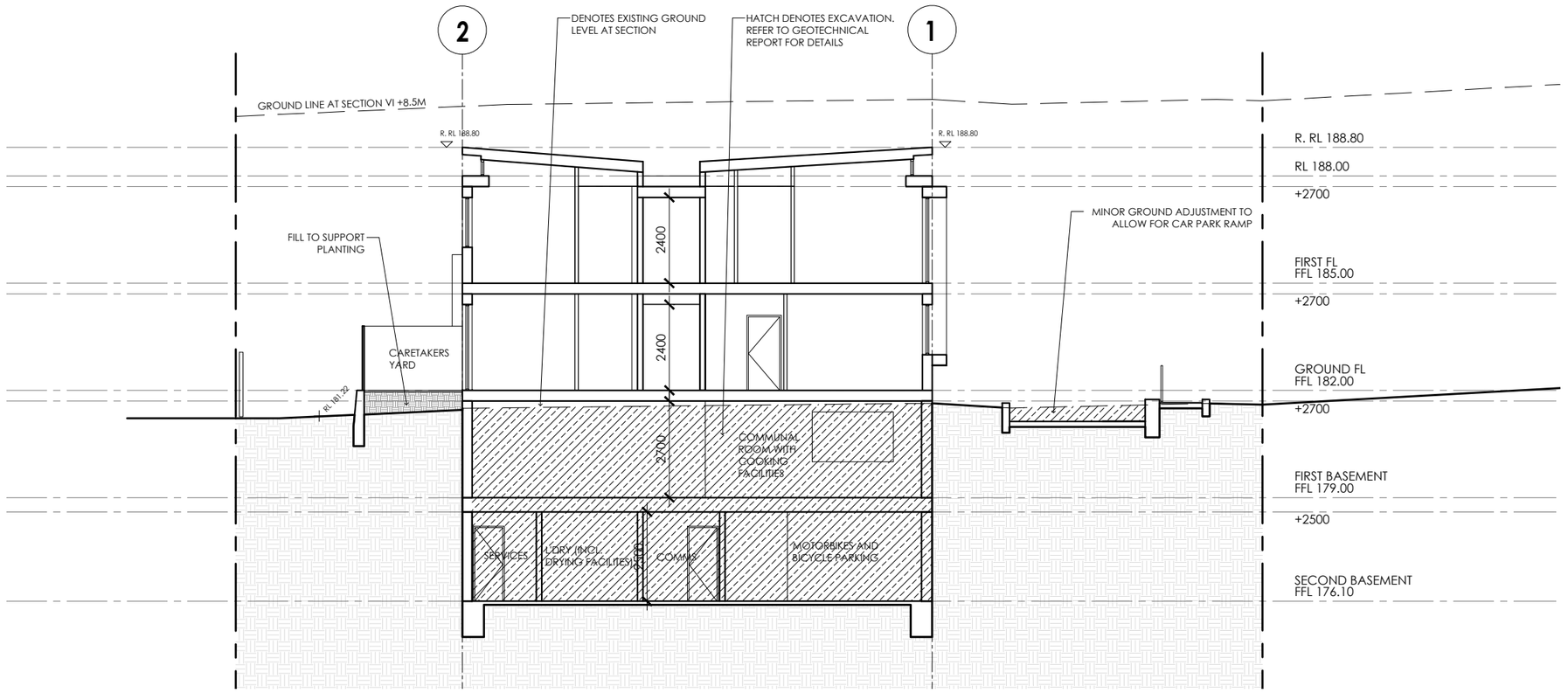
DRAWING TITLE

SECTION B
LOWER BUILDING

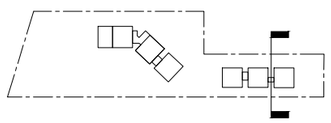
STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A3.02	1:150@A3	DA05	WAB2

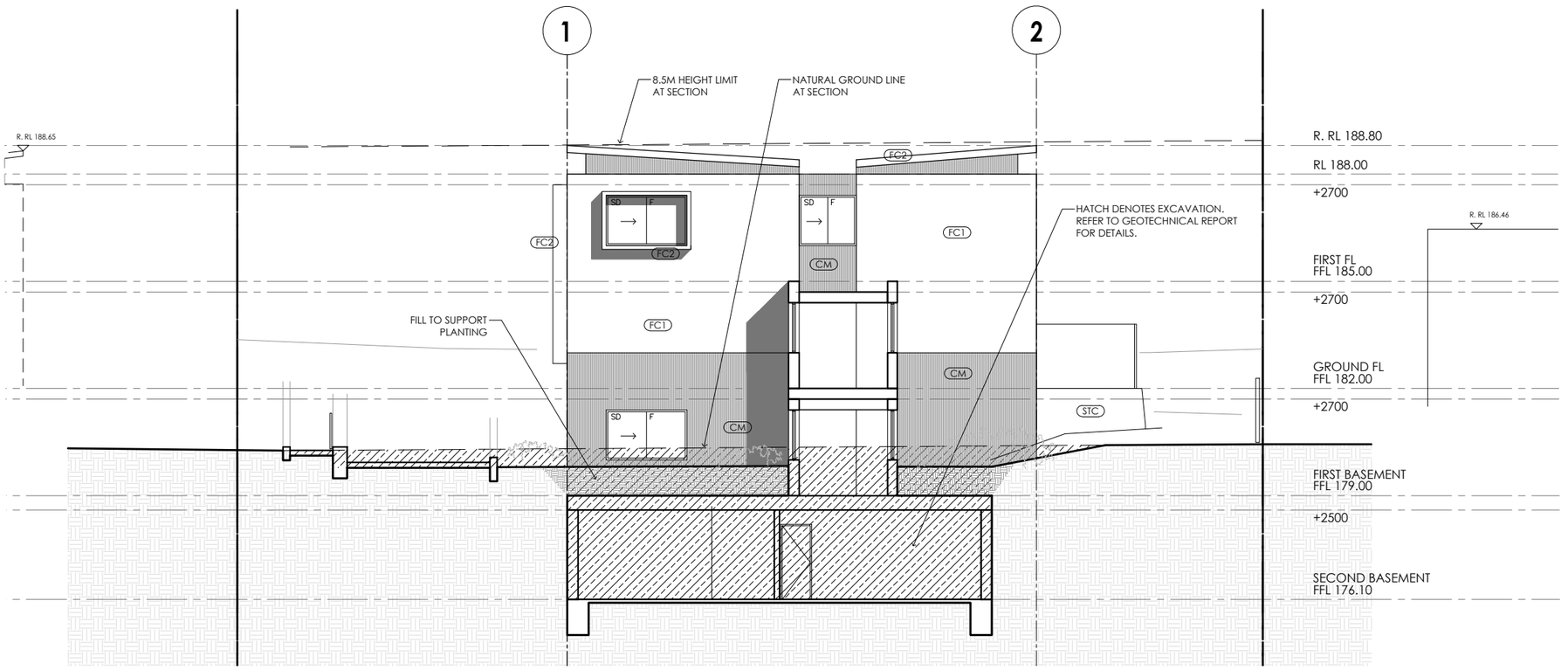
SECTION I
UPPER BUILDING





SECTION II
UPPER BUILDING





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P1	Apr '21	PRELIMINARY ISSUE	OH
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DA04	13/05/22	DA ISSUE	PH

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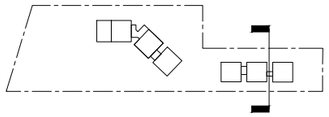
ESSENTIAL SERVICES
ACCOMMODATION

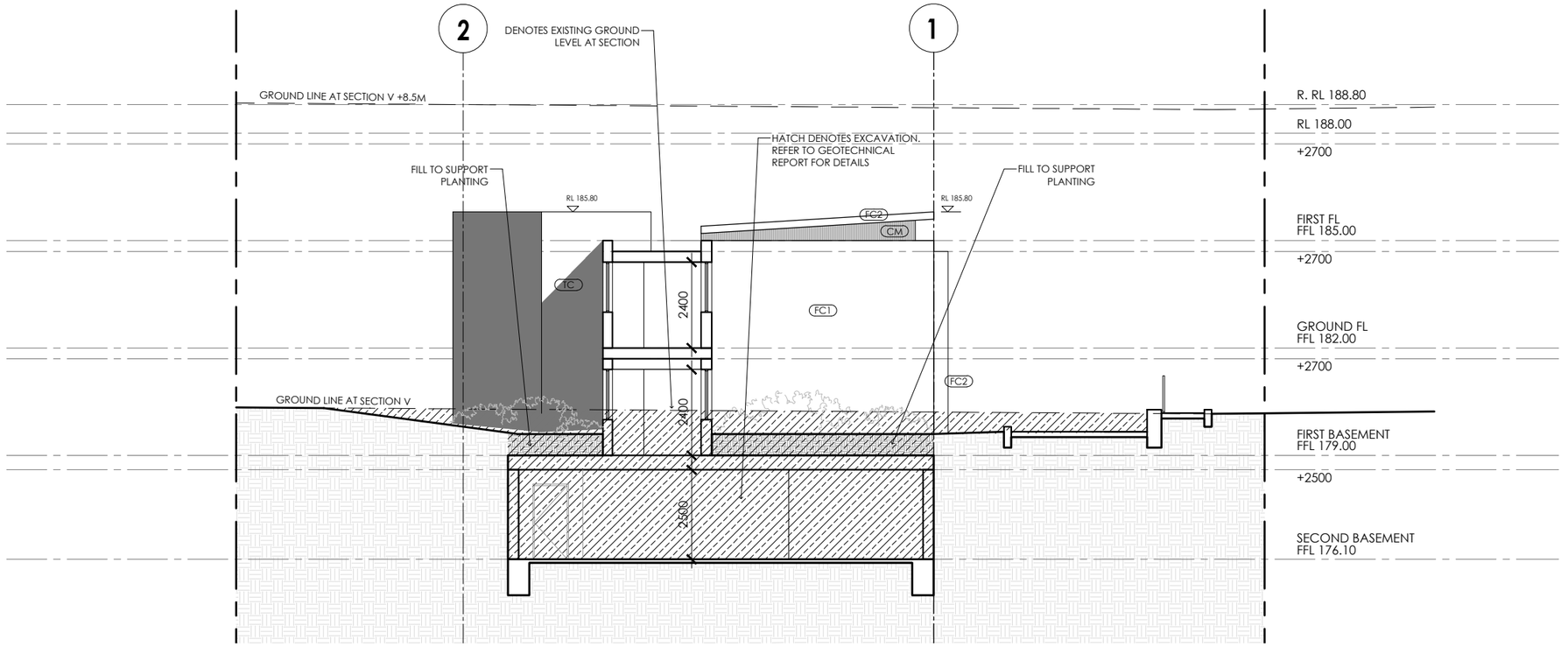
DRAWING TITLE

SECTIONS I & II
UPPER BUILDING

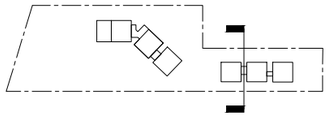
STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A3.03	1:150@A3	DA05	WAB2

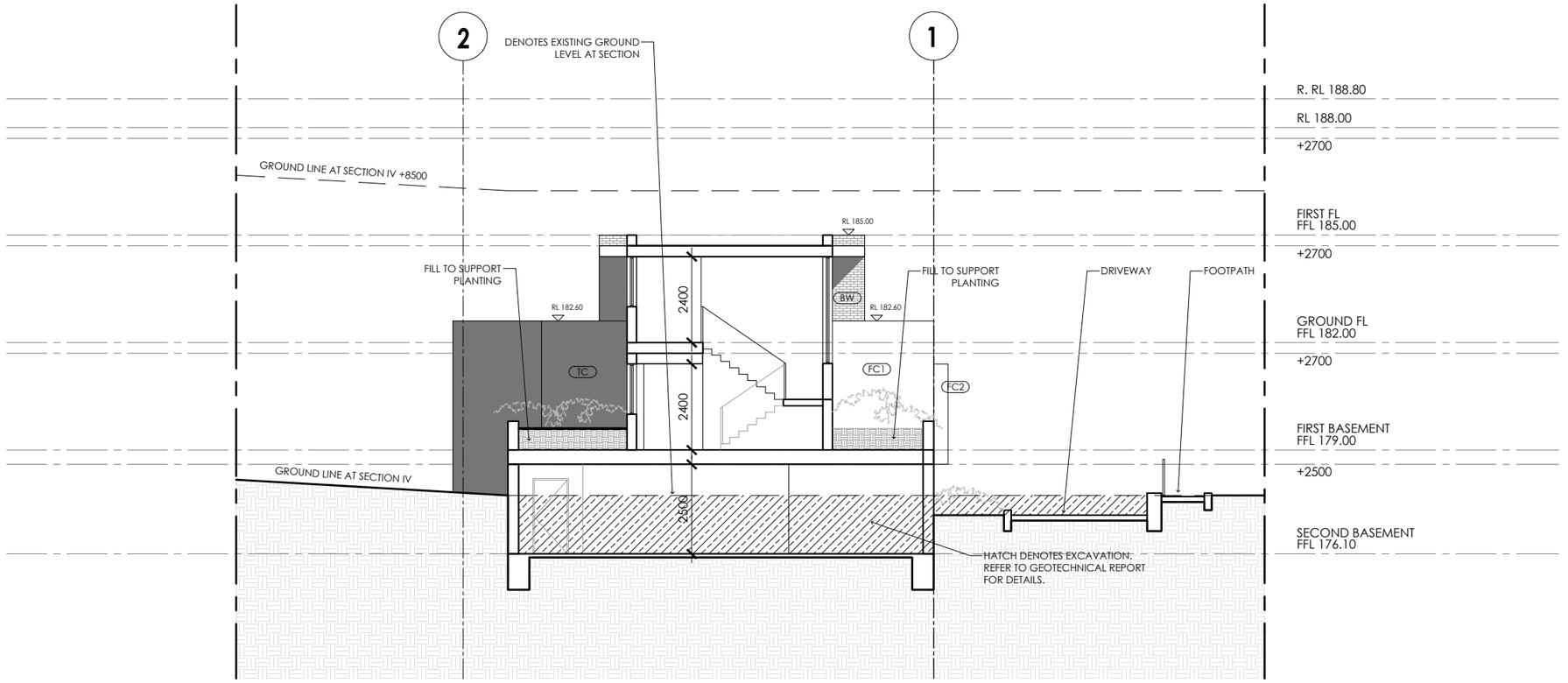
SECTION III
UPPER BUILDING





SECTION IV
UPPER BUILDING





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DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

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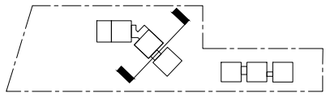
ESSENTIAL SERVICES
ACCOMMODATION

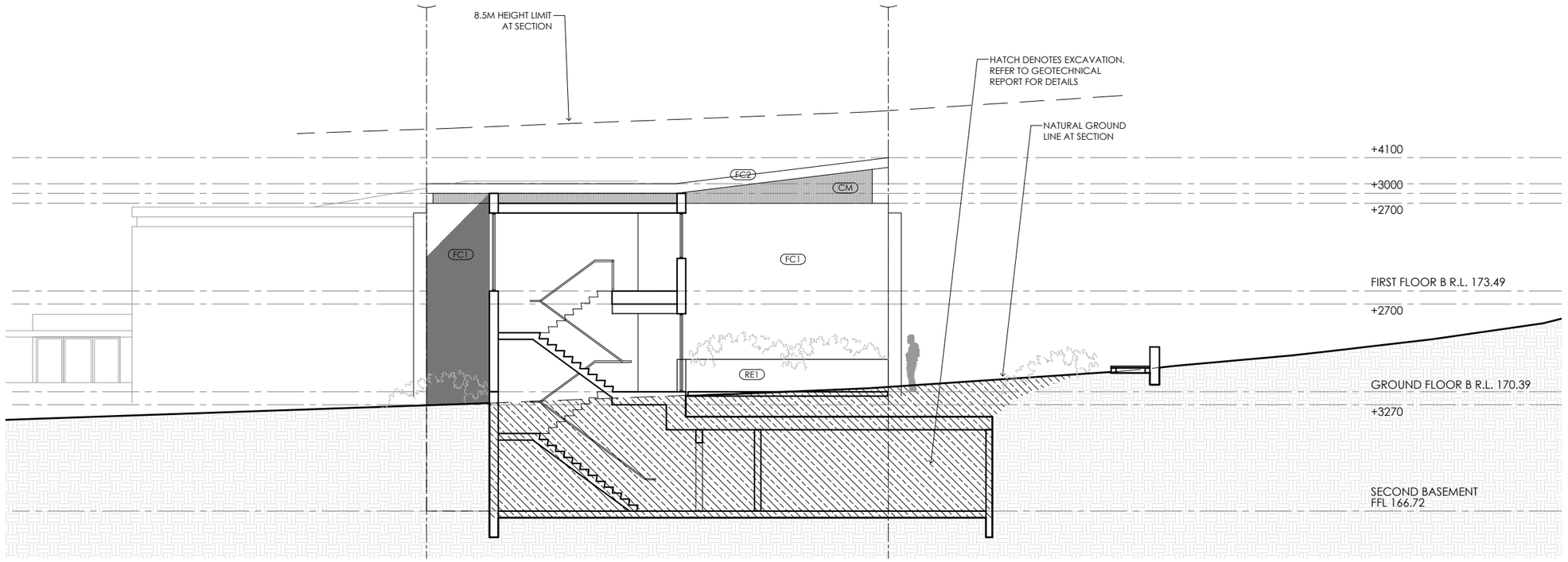
DRAWING TITLE

SECTIONS III & IV
UPPER BUILDING

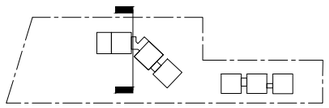
STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A3.04	1:150@A3	DA05	WAB2

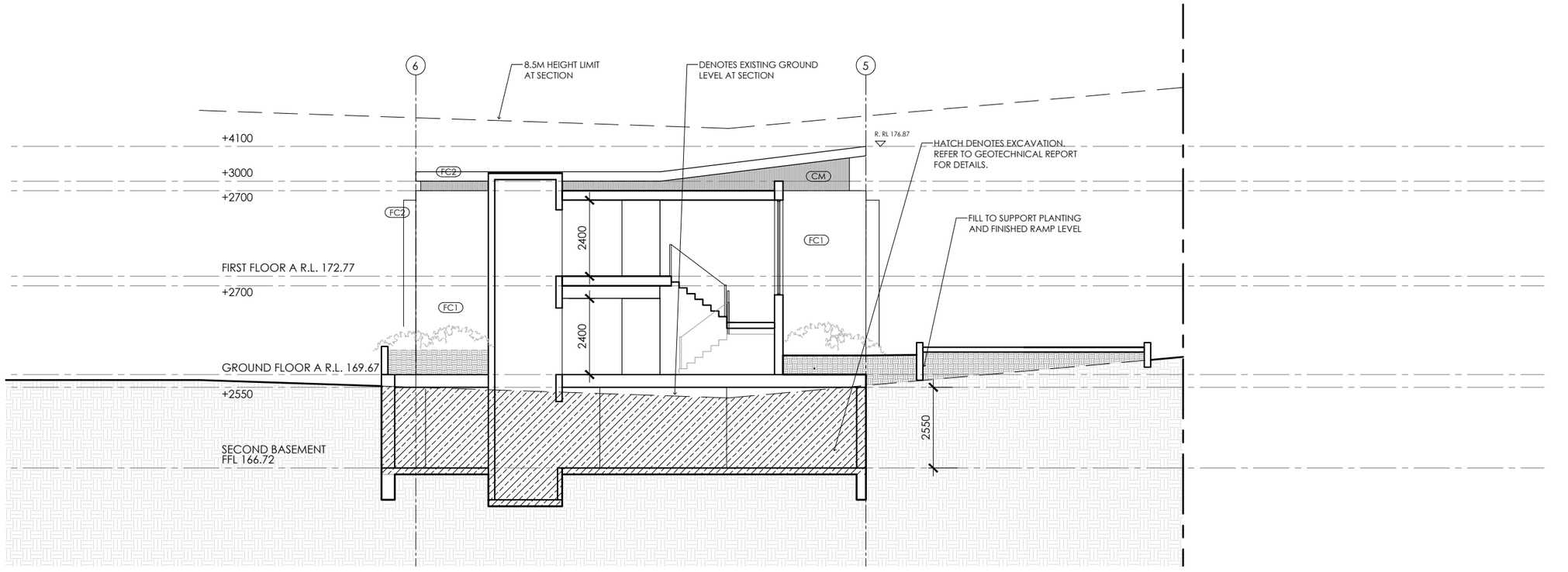
SECTION V
LOWER BUILDING





SECTION VI
LOWER BUILDING





REVISION	DATE	DESCRIPTION	BY
0	Jan '21	CONCEPT DRAWINGS	OH
P1	Apr '21	PRELIMINARY ISSUE	OH
DA02	Apr '21	DA ISSUE	BG
DA03	09/06/21	DA ISSUE	BG/OH
DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

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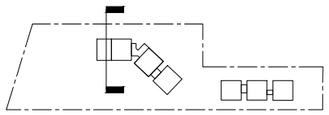
ACCOMMODATION

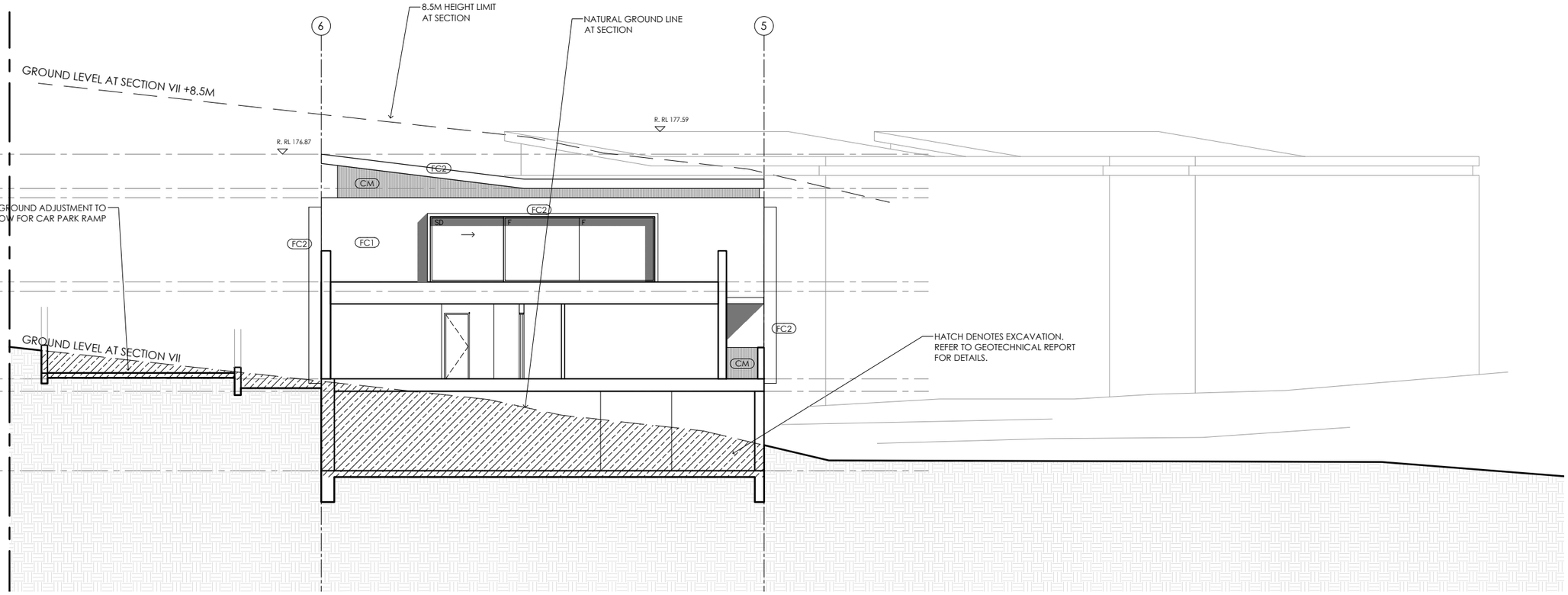
DRAWING TITLE

SECTIONS V & VI
LOWER BUILDING

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A3.05	1:150@A3	DA05	WAB2

SECTION VII
LOWER BUILDING





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DA04	08/12/21	DA ISSUE	PH/OH
DA04	13/05/22	DA ISSUE	PH

REVISION NOTES

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nominated architect Bridie Gough Reg No. 8280

CLIENT

NORTHERN BEACHES
ESSENTIAL SERVICES
ACCOMMODATION

DRAWING TITLE

SECTION VII
LOWER BUILDING

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A3.06	1:150@A3	DA05	WAB2

LIGHT TIMBER AND METAIL STRUCTURE MAXIMIZING CONTACT WITH LANDSCAPING

LOW SANDSTONE RETAINING WALLS PROVIDED WHERE REQUIRED FOR STRUCTURAL AND STORMWATER PURPOSE

FOOTPATH FOLLOWS NATURAL TERAIN AND LANDSCAPING. STEPS FOLLOW EXISTING SLOPES AROUND THE ROCK BANK FEATURE THAT REMAINS MAINTAINED. OUTDOOR RELAXING AREAS ARE CREATED AND PROVIDED WITH BENCHES

IMPORTANT NOTES:
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DA04	13/05/22	DA ISSUE	PH

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nominated architect Bridie Gough Reg No. 8280

CLIENT
NORTHERN BEACHES ESSENTIAL SERVICES ACCOMMODATION

DRAWING TITLE
FOOTPATH DESIGN ILLUSTRATION

STATUS	NUMBER	SCALE	REVISION	PROJECT
DA	A4.01	1:150@A3	DA05	WAB2

Attachment D: Borehole Logs

Environmental Borehole BH101

PROJECT NUMBER P2108187	**SAMPLING DATE** 24/06/2022	**COORDINATES**
PROJECT NAME Site Contamination Assessment	**SAMPLING METHOD** HA/ PD	**SURFACE ELEVATION**
CLIENT John Holman	**LOGGED BY** BM	
ADDRESS 16 Wyatt Ave, Belrose, NSW	**CHECKED BY** NF	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
	BH101/0.1 - 0.2		XX	Fill: Silty SAND; fine grained, dark brown	No observations of odors, soils staining or anthropogenic inclusions
	BH101/0.3 - 0.4		SC	CLAYEY SAND: light brown with sand stone gravel	
0.5				WEATHERED SANDSTONE: fine to medium grained; light brown / grey	
				Termination Depth at:0.5 refusal on Sandstone	
1					
1.5					

Environmental Borehole BH102

PROJECT NUMBER P2108187	**SAMPLING DATE** 24/06/2022	**COORDINATES**
PROJECT NAME Site Contamination Assessment	**SAMPLING METHOD** HA/ PD	**SURFACE ELEVATION**
CLIENT John Holman	**LOGGED BY** BM	
ADDRESS 16 Wyatt Ave, Belrose, NSW	**CHECKED BY** NF	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
	BH102/0.1 - 0.2		XX	Fill: Silty SAND; fine grained, dark brown	No observations of odors, soils staining or anthropogenic inclusions
	BH102/0.3 - 0.4		SC	CLAYEY SAND: light brown with sand stone gravel	
0.5				WEATHERED SANDSTONE: fine to medium grained; light brown / grey	
				Termination Depth at:0.5 refusal on Sandstone	
1					
1.5					

Environmental Borehole BH103

PROJECT NUMBER P2108187	**SAMPLING DATE** 24/06/2022	**COORDINATES**
PROJECT NAME Site Contamination Assessment	**SAMPLING METHOD** HA/ PD	**SURFACE ELEVATION**
CLIENT John Holman	**LOGGED BY** BM	
ADDRESS 16 Wyatt Ave, Belrose, NSW	**CHECKED BY** NF	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
	BH103/0.1 - 0.2		XX	Fill: Silty SAND; fine grained, dark brown	No observations of odors, soils staining or anthropogenic inclusions
			SC	CLAYEY SAND: light brown with sand stone gravel	
	BH103/0.3 - 0.4			WEATHERED SANDSTONE: fine to medium grained; light brown / grey	
0.5 1 1.5				Termination Depth at:0.4 refusal on Sandstone	

Environmental Borehole BH104

PROJECT NUMBER P2108187	**SAMPLING DATE** 24/06/2022	**COORDINATES**
PROJECT NAME Site Contamination Assessment	**SAMPLING METHOD** HA/ PD	**SURFACE ELEVATION**
CLIENT John Holman	**LOGGED BY** BM	
ADDRESS 16 Wyatt Ave, Belrose, NSW	**CHECKED BY** NF	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
	BH104/0.1 - 0.2		XX	Fill: Silty SAND; fine grained, dark brown	No observations of odors, soils staining or anthropogenic inclusions
				WEATHERED SANDSTONE: fine to medium grained; light brown / grey	
0.5 1 1.5				Termination Depth at:0.4 refusal on Sandstone	

Environmental Borehole BH106

PROJECT NUMBER P2108187	**SAMPLING DATE** 24/06/2022	**COORDINATES**
PROJECT NAME Site Contamination Assessment	**SAMPLING METHOD** HA/ PD	**SURFACE ELEVATION**
CLIENT John Holman	**LOGGED BY** BM	
ADDRESS 16 Wyatt Ave, Belrose, NSW	**CHECKED BY** NF	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
	BH106/0.1 - 0.2		XX	Fill: Silty SAND; fine grained, dark brown	No observations of odors, soils staining or anthropogenic inclusions
	BH106/0.3 - 0.4		SC	CLAYEY SAND: light brown with sand stone gravel	
0.5				WEATHERED SANDSTONE: fine to medium grained; light brown / grey	
				Termination Depth at:0.5 refusal on Sandstone	
1					
1.5					

Environmental Borehole BH105

PROJECT NUMBER P2108187	**SAMPLING DATE** 24/06/2022	**COORDINATES**
PROJECT NAME Site Contamination Assessment	**SAMPLING METHOD** HA/ PD	**SURFACE ELEVATION**
CLIENT John Holman	**LOGGED BY** BM	
ADDRESS 16 Wyatt Ave, Belrose, NSW	**CHECKED BY** NF	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
	BH105/0.1 - 0.2		XX	Fill: Silty SAND; fine grained, dark brown	No observations of odors, soils staining or anthropogenic inclusions
				WEATHERED SANDSTONE: fine to medium grained; light brown / grey	
0.5 1 1.5				Termination Depth at:0.4 refusal on Sandstone	

Environmental Borehole BH107

PROJECT NUMBER P2108187	**SAMPLING DATE** 24/06/2022	**COORDINATES**
PROJECT NAME Site Contamination Assessment	**SAMPLING METHOD** HA/ PD	**SURFACE ELEVATION**
CLIENT John Holman	**LOGGED BY** BM	
ADDRESS 16 Wyatt Ave, Belrose, NSW	**CHECKED BY** NF	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
	BH107/0.1 - 0.2		XX	Fill: Silty SAND; fine grained, dark brown	No observations of odors, soils staining or anthropogenic inclusions
	BH107/0.3 - 0.4		SC	CLAYEY SAND: light brown with sand stone gravel	
0.5				WEATHERED SANDSTONE: fine to medium grained; light brown / grey	
				Termination Depth at:0.5 refusal on Sandstone	
1					
1.5					

Environmental Borehole BH108

PROJECT NUMBER P2108187	**SAMPLING DATE** 24/06/2022	**COORDINATES**
PROJECT NAME Site Contamination Assessment	**SAMPLING METHOD** HA/ PD	**SURFACE ELEVATION**
CLIENT John Holman	**LOGGED BY** BM	
ADDRESS 16 Wyatt Ave, Belrose, NSW	**CHECKED BY** NF	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
	BH108/0.1 - 0.2		XX	Fill: Silty SAND; fine grained, dark brown	No observations of odors, soils staining or anthropogenic inclusions
	BH108/0.3 - 0.4		SC	CLAYEY SAND: light brown with sand stone gravel	
0.5				WEATHERED SANDSTONE: fine to medium grained; light brown / grey	
1				Termination Depth at:0.6 refusal on Sandstone	
1.5					

Environmental Borehole BH109

PROJECT NUMBER P2108187	**SAMPLING DATE** 24/06/2022	**COORDINATES**
PROJECT NAME Site Contamination Assessment	**SAMPLING METHOD** HA/ PD	**SURFACE ELEVATION**
CLIENT John Holman	**LOGGED BY** BM	
ADDRESS 16 Wyatt Ave, Belrose, NSW	**CHECKED BY** NF	

COMMENTS

Depth (m)	Samples	Graphic Log	USCS	Material Description	Additional Observations
	BH109/0.1 - 0.2		XX	Fill: Silty SAND; fine grained, dark brown	No observations of odors, soils staining or anthropogenic inclusions
	BH109/0.3 - 0.4		SC	CLAYEY SAND: light brown with sand stone gravel	
0.5				WEATHERED SANDSTONE: fine to medium grained; light brown / grey	
				Termination Depth at:0.5 refusal on Sandstone	
1					
1.5					

Attachment E: Laboratory Certificates

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

CERTIFICATE OF ANALYSIS 299126

Client Details

Client	Martens & Associates Pty Ltd
Attention	Ben McGiffin
Address	Suite 201, 20 George St, Hornsby, NSW, 2077

Sample Details

Your Reference	**P2108187 - 16 Wyatt Ave, Belrose, NSW**
Number of Samples	19 Soil
Date samples received	27/06/2022
Date completed instructions received	28/06/2022

Analysis Details

Please refer to the following pages for results, methodology summary and quality control data.

Samples were analysed as received from the client. Results relate specifically to the samples as received.

Results are reported on a dry weight basis for solids and on an as received basis for other matrices.

Please refer to the last page of this report for any comments relating to the results.

Report Details

Date results requested by	05/07/2022
Date of Issue	05/07/2022

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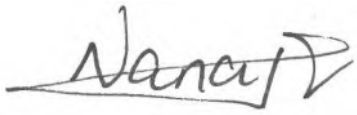
Accredited for compliance with ISO/IEC 17025 - Testing. **Tests not covered by NATA are denoted with ***

Asbestos Approved By
Analysed by Asbestos Approved Analyst: Wonnie Condos
Authorised by Asbestos Approved Signatory: Lucy Zhu

Results Approved By
Dragana Tomas, Senior Chemist
Giovanni Agosti, Group Technical Manager
Josh Williams, Organics and LC Supervisor
Liam Timmins, Organic Instruments Team Leader
Lucy Zhu, Asbestos Supervisor

Authorised By



Nancy Zhang, Laboratory Manager

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		299126-1	299126-3	299126-5	299126-7	299126-8
Your Reference	UNITS	8187/BH101/0.1-0.2	8187/BH102/0.1-0.2	8187/BH103/0.1-0.2	8187/BH104/0.1-0.2	8187/BH105/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022	01/07/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	<25
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	<25
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	mg/kg	<1	<1	<1	<1	<1
m+p-xylene	mg/kg	<2	<2	<2	<2	<2
o-Xylene	mg/kg	<1	<1	<1	<1	<1
Naphthalene	mg/kg	<1	<1	<1	<1	<1
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	<1
Surrogate aaa-Trifluorotoluene	%	108	81	94	96	89

vTRH(C6-C10)/BTEXN in Soil						
Our Reference		299126-9	299126-11	299126-13	299126-15	299126-18
Your Reference	UNITS	8187/BH106/0.1–0.2	8187/BH107/0.1-0.2	8171/BH108/0.1-0.2	8187/BH109/0.1-0.2	Trip Spike
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022	01/07/2022
TRH C_6 - C_9	mg/kg	<25	<25	<25	<25	[NA]
TRH C_6 - C_{10}	mg/kg	<25	<25	<25	<25	[NA]
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25	<25	<25	<25	[NA]
Benzene	mg/kg	<0.2	<0.2	<0.2	<0.2	88%
Toluene	mg/kg	<0.5	<0.5	<0.5	<0.5	106%
Ethylbenzene	mg/kg	<1	<1	<1	<1	111%
m+p-xylene	mg/kg	<2	<2	<2	<2	112%
o-Xylene	mg/kg	<1	<1	<1	<1	114%
Naphthalene	mg/kg	<1	<1	<1	<1	[NT]
Total +ve Xylenes	mg/kg	<1	<1	<1	<1	[NT]
Surrogate aaa-Trifluorotoluene	%	90	94	91	84	88

vTRH(C6-C10)/BTEXN in Soil		
Our Reference		299126-19
Your Reference	UNITS	Trip Blank
Date Sampled		24/06/2022
Type of sample		Soil
Date extracted	-	30/06/2022
Date analysed	-	01/07/2022
TRH C_6 - C_9	mg/kg	<25
TRH C_6 - C_{10}	mg/kg	<25
vTPH C_6 - C_{10} less BTEX (F1)	mg/kg	<25
Benzene	mg/kg	<0.2
Toluene	mg/kg	<0.5
Ethylbenzene	mg/kg	<1
m+p-xylene	mg/kg	<2
o-Xylene	mg/kg	<1
Naphthalene	mg/kg	<1
Total +ve Xylenes	mg/kg	<1
Surrogate aaa-Trifluorotoluene	%	111

svTRH (C10-C40) in Soil						
Our Reference		299126-1	299126-3	299126-5	299126-7	299126-8
Your Reference	UNITS	8187/BH101/0.1-0.2	8187/BH102/0.1-0.2	8187/BH103/0.1-0.2	8187/BH104/0.1-0.2	8187/BH105/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	<100	<100	<100	<100	<100
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	<50	<50	<50	<50	<50
Surrogate o-Terphenyl	%	94	91	86	89	88

svTRH (C10-C40) in Soil					
Our Reference		299126-9	299126-11	299126-13	299126-15
Your Reference	UNITS	8187/BH106/0.1–0.2	8187/BH107/0.1-0.2	8171/BH108/0.1-0.2	8187/BH109/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022
TRH C_{10} - C_{14}	mg/kg	<50	<50	<50	<50
TRH C_{15} - C_{28}	mg/kg	<100	<100	<100	<100
TRH C_{29} - C_{36}	mg/kg	140	100	<100	<100
Total +ve TRH (C10-C36)	mg/kg	140	100	<50	<50
TRH >C_{10} -C_{16}	mg/kg	<50	<50	<50	<50
TRH >C_{10} - C_{16} less Naphthalene (F2)	mg/kg	<50	<50	<50	<50
TRH >C_{16} -C_{34}	mg/kg	170	140	<100	150
TRH >C_{34} -C_{40}	mg/kg	<100	<100	<100	<100
Total +ve TRH (>C10-C40)	mg/kg	170	140	<50	150
Surrogate o-Terphenyl	%	98	93	86	96

PAHs in Soil						
Our Reference		299126-1	299126-3	299126-5	299126-7	299126-8
Your Reference	UNITS	8187/BH101/0.1-0.2	8187/BH102/0.1-0.2	8187/BH103/0.1-0.2	8187/BH104/0.1-0.2	8187/BH105/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022	01/07/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Pyrene	mg/kg	<0.1	<0.1	0.1	<0.1	<0.1
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chrysene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	<0.2	<0.2
Benzo(a)pyrene	mg/kg	<0.05	<0.05	0.09	0.09	<0.05
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PAH's	mg/kg	<0.05	<0.05	0.3	0.09	<0.05
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	78	73	77	76	77

PAHs in Soil					
Our Reference		299126-9	299126-11	299126-13	299126-15
Your Reference	UNITS	8187/BH106/0.1–0.2	8187/BH107/0.1-0.2	8171/BH108/0.1-0.2	8187/BH109/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022
Naphthalene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthylene	mg/kg	<0.1	<0.1	<0.1	<0.1
Acenaphthene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluorene	mg/kg	<0.1	<0.1	<0.1	<0.1
Phenanthrene	mg/kg	<0.1	<0.1	<0.1	0.2
Anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Fluoranthene	mg/kg	<0.1	<0.1	<0.1	0.4
Pyrene	mg/kg	<0.1	<0.1	<0.1	0.4
Benzo(a)anthracene	mg/kg	<0.1	<0.1	<0.1	0.2
Chrysene	mg/kg	<0.1	<0.1	<0.1	0.2
Benzo(b,j+k)fluoranthene	mg/kg	<0.2	<0.2	<0.2	0.4
Benzo(a)pyrene	mg/kg	0.09	0.09	<0.05	0.3
Indeno(1,2,3-c,d)pyrene	mg/kg	<0.1	<0.1	<0.1	0.1
Dibenzo(a,h)anthracene	mg/kg	<0.1	<0.1	<0.1	<0.1
Benzo(g,h,i)perylene	mg/kg	<0.1	<0.1	<0.1	0.2
Total +ve PAH's	mg/kg	0.09	0.09	<0.05	2.2
Benzo(a)pyrene TEQ calc (zero)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(half)	mg/kg	<0.5	<0.5	<0.5	<0.5
Benzo(a)pyrene TEQ calc(PQL)	mg/kg	<0.5	<0.5	<0.5	<0.5
Surrogate p-Terphenyl-d14	%	90	75	80	86

Organochlorine Pesticides in soil						
Our Reference		299126-1	299126-3	299126-5	299126-7	299126-8
Your Reference	UNITS	8187/BH101/0.1-0.2	8187/BH102/0.1-0.2	8187/BH103/0.1-0.2	8187/BH104/0.1-0.2	8187/BH105/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022	01/07/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	93	97	94	95

Organochlorine Pesticides in soil					
Our Reference		299126-9	299126-11	299126-13	299126-15
Your Reference	UNITS	8187/BH106/0.1–0.2	8187/BH107/0.1-0.2	8171/BH108/0.1-0.2	8187/BH109/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022
alpha-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
HCB	mg/kg	<0.1	<0.1	<0.1	<0.1
beta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor	mg/kg	<0.1	<0.1	<0.1	<0.1
delta-BHC	mg/kg	<0.1	<0.1	<0.1	<0.1
Aldrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Heptachlor Epoxide	mg/kg	<0.1	<0.1	<0.1	<0.1
gamma-Chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
alpha-chlordane	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan I	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Dieldrin	mg/kg	<0.1	<0.1	0.2	<0.1
Endrin	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan II	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDD	mg/kg	<0.1	<0.1	<0.1	<0.1
Endrin Aldehyde	mg/kg	<0.1	<0.1	<0.1	<0.1
pp-DDT	mg/kg	<0.1	<0.1	<0.1	<0.1
Endosulfan Sulphate	mg/kg	<0.1	<0.1	<0.1	<0.1
Methoxychlor	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve DDT+DDD+DDE	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	109	93	96	101

Organophosphorus Pesticides in Soil						
Our Reference		299126-1	299126-3	299126-5	299126-7	299126-8
Your Reference	UNITS	8187/BH101/0.1-0.2	8187/BH102/0.1-0.2	8187/BH103/0.1-0.2	8187/BH104/0.1-0.2	8187/BH105/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022	01/07/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	93	97	94	95

Organophosphorus Pesticides in Soil					
Our Reference		299126-9	299126-11	299126-13	299126-15
Your Reference	UNITS	8187/BH106/0.1–0.2	8187/BH107/0.1-0.2	8171/BH108/0.1-0.2	8187/BH109/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022
Dichlorvos	mg/kg	<0.1	<0.1	<0.1	<0.1
Dimethoate	mg/kg	<0.1	<0.1	<0.1	<0.1
Diazinon	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos-methyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ronnel	mg/kg	<0.1	<0.1	<0.1	<0.1
Fenitrothion	mg/kg	<0.1	<0.1	<0.1	<0.1
Malathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Chlorpyriphos	mg/kg	<0.1	<0.1	<0.1	<0.1
Parathion	mg/kg	<0.1	<0.1	<0.1	<0.1
Bromophos-ethyl	mg/kg	<0.1	<0.1	<0.1	<0.1
Ethion	mg/kg	<0.1	<0.1	<0.1	<0.1
Azinphos-methyl (Guthion)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	109	93	96	101

PCBs in Soil						
Our Reference		299126-1	299126-3	299126-5	299126-7	299126-8
Your Reference	UNITS	8187/BH101/0.1-0.2	8187/BH102/0.1-0.2	8187/BH103/0.1-0.2	8187/BH104/0.1-0.2	8187/BH105/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022	01/07/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	89	93	97	94	95

PCBs in Soil					
Our Reference		299126-9	299126-11	299126-13	299126-15
Your Reference	UNITS	8187/BH106/0.1–0.2	8187/BH107/0.1-0.2	8171/BH108/0.1-0.2	8187/BH109/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil
Date extracted	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022
Aroclor 1016	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1221	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1232	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1242	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1248	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1254	mg/kg	<0.1	<0.1	<0.1	<0.1
Aroclor 1260	mg/kg	<0.1	<0.1	<0.1	<0.1
Total +ve PCBs (1016-1260)	mg/kg	<0.1	<0.1	<0.1	<0.1
Surrogate TCMX	%	109	93	96	101

Acid Extractable metals in soil						
Our Reference		299126-1	299126-3	299126-5	299126-7	299126-8
Your Reference	UNITS	8187/BH101/0.1-0.2	8187/BH102/0.1-0.2	8187/BH103/0.1-0.2	8187/BH104/0.1-0.2	8187/BH105/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	1/07/2022	1/07/2022	1/07/2022	1/07/2022	1/07/2022
Arsenic	mg/kg	<4	<4	6	5	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	8	7	13	12	2
Copper	mg/kg	3	4	22	21	3
Lead	mg/kg	6	6	38	32	10
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	4	4	7	7	1
Zinc	mg/kg	17	24	63	57	14

Acid Extractable metals in soil						
Our Reference		299126-9	299126-11	299126-13	299126-15	299126-17
Your Reference	UNITS	8187/BH106/0.1–0.2	8187/BH107/0.1-0.2	8171/BH108/0.1-0.2	8187/BH109/0.1-0.2	8187/Dup01
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	1/07/2022	1/07/2022	1/07/2022	1/07/2022	1/07/2022
Arsenic	mg/kg	<4	<4	<4	9	<4
Cadmium	mg/kg	<0.4	<0.4	<0.4	<0.4	<0.4
Chromium	mg/kg	5	6	4	15	4
Copper	mg/kg	15	6	3	32	4
Lead	mg/kg	18	19	11	150	5
Mercury	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1
Nickel	mg/kg	2	3	1	4	3
Zinc	mg/kg	50	31	13	140	16

Acid Extractable metals in soil		
Our Reference		299126-20
Your Reference	UNITS	8187/BH101/0.1-0.2 - [TRIPLICATE]
Date Sampled		24/06/2022
Type of sample		Soil
Date prepared	-	30/06/2022
Date analysed	-	1/07/2022
Arsenic	mg/kg	<4
Cadmium	mg/kg	<0.4
Chromium	mg/kg	5
Copper	mg/kg	4
Lead	mg/kg	5
Mercury	mg/kg	<0.1
Nickel	mg/kg	4
Zinc	mg/kg	18

Moisture						
Our Reference		299126-1	299126-3	299126-5	299126-7	299126-8
Your Reference	UNITS	8187/BH101/0.1-0.2	8187/BH102/0.1-0.2	8187/BH103/0.1-0.2	8187/BH104/0.1-0.2	8187/BH105/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022	01/07/2022
Moisture	%	12	17	15	16	8.5

Moisture						
Our Reference		299126-9	299126-11	299126-13	299126-15	299126-17
Your Reference	UNITS	8187/BH106/0.1–0.2	8187/BH107/0.1-0.2	8171/BH108/0.1-0.2	8187/BH109/0.1-0.2	8187/Dup01
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date prepared	-	30/06/2022	30/06/2022	30/06/2022	30/06/2022	30/06/2022
Date analysed	-	01/07/2022	01/07/2022	01/07/2022	01/07/2022	01/07/2022
Moisture	%	34	19	12	26	12

Asbestos ID - soils						
Our Reference		299126-1	299126-3	299126-5	299126-7	299126-8
Your Reference	UNITS	8187/BH101/0.1-0.2	8187/BH102/0.1-0.2	8187/BH103/0.1-0.2	8187/BH104/0.1-0.2	8187/BH105/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil	Soil
Date analysed	-	04/07/2022	04/07/2022	04/07/2022	04/07/2022	04/07/2022
Sample mass tested	g	Approx. 45g	Approx. 40g	Approx. 40g	Approx. 40g	Approx. 45g
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Asbestos ID - soils					
Our Reference		299126-9	299126-11	299126-13	299126-15
Your Reference	UNITS	8187/BH106/0.1–0.2	8187/BH107/0.1-0.2	8171/BH108/0.1-0.2	8187/BH109/0.1-0.2
Date Sampled		24/06/2022	24/06/2022	24/06/2022	24/06/2022
Type of sample		Soil	Soil	Soil	Soil
Date analysed	-	04/07/2022	04/07/2022	04/07/2022	04/07/2022
Sample mass tested	g	Approx. 30g	Approx. 40g	Approx. 40g	Approx. 35g
Sample Description	-	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks	Brown sandy soil & rocks
Asbestos ID in soil	-	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected	No asbestos detected at reporting limit of 0.1g/kg Organic fibres detected
Trace Analysis	-	No asbestos detected	No asbestos detected	No asbestos detected	No asbestos detected

Method ID	Methodology Summary
ASB-001	Asbestos ID - Qualitative identification of asbestos in bulk samples using Polarised Light Microscopy and Dispersion Staining Techniques including Synthetic Mineral Fibre and Organic Fibre as per Australian Standard 4964-2004.
Inorg-008	Moisture content determined by heating at 105+/-5 °C for a minimum of 12 hours.
Metals-020	Determination of various metals by ICP-AES.
Metals-021	Determination of Mercury by Cold Vapour AAS.
Org-020	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-FID. F2 = (>C10-C16)-Naphthalene as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater (HSLs Tables 1A (3, 4)). Note Naphthalene is determined from the VOC analysis.
Org-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. Note, the Total +ve TRH PQL is reflective of the lowest individual PQL and is therefore "Total +ve TRH" is simply a sum of the positive individual TRH fractions (>C10-C40).
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD.
Org-021	Soil samples are extracted with dichloromethane/acetone and waters with dichloromethane and analysed by GC-ECD. 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	Determination of VOCs sampled onto coconut shell charcoal sorbent tubes, that can be desorbed using carbon disulphide, and analysed by GC-MS.
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. Note, the Total +ve reported DDD+DDE+DDT PQL is reflective of the lowest individual PQL and is therefore simply a sum of the positive individually report DDD+DDE+DDT.

Method ID	Methodology Summary
Org-022/025	Soil samples are extracted with Dichloromethane/Acetone and waters with Dichloromethane and analysed by GC-MS and/or GC-MS/MS. Benzo(a)pyrene TEQ as per NEPM B1 Guideline on Investigation Levels for Soil and Groundwater - 2013. For soil results:- 1. 'EQ PQL'values are assuming all contributing PAHs reported as <PQL are actually at the PQL. This is the most conservative approach and can give false positive TEQs given that PAHs that contribute to the TEQ calculation may not be present. 2. 'EQ zero'values are assuming all contributing PAHs reported as <PQL are zero. This is the least conservative approach and is more susceptible to false negative TEQs when PAHs that contribute to the TEQ calculation are present but below PQL. 3. 'EQ half PQL'values are assuming all contributing PAHs reported as <PQL are half the stipulated PQL. Hence a mid-point between the most and least conservative approaches above. Note, the Total +ve PAHs PQL is reflective of the lowest individual PQL and is therefore "Total +ve PAHs" is simply a sum of the positive individual PAHs.
Org-023	Soil samples are extracted with methanol and spiked into water prior to analysing 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-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. Note, the Total +ve Xylene PQL is reflective of the lowest individual PQL and is therefore "Total +ve Xylenes" is simply a sum of the positive individual Xylenes.

QUALITY CONTROL: vTRH(C6-C10)/BTEXN in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	299126-3
Date extracted	-			30/06/2022	1	30/06/2022	30/06/2022		30/06/2022	30/06/2022
Date analysed	-			01/07/2022	1	01/07/2022	01/07/2022		01/07/2022	01/07/2022
TRH C_6 - C_9	mg/kg	25	Org-023	<25	1	<25	<25	0	73	92
TRH C_6 - C_{10}	mg/kg	25	Org-023	<25	1	<25	<25	0	73	92
Benzene	mg/kg	0.2	Org-023	<0.2	1	<0.2	<0.2	0	74	87
Toluene	mg/kg	0.5	Org-023	<0.5	1	<0.5	<0.5	0	79	95
Ethylbenzene	mg/kg	1	Org-023	<1	1	<1	<1	0	67	86
m+p-xylene	mg/kg	2	Org-023	<2	1	<2	<2	0	73	95
o-Xylene	mg/kg	1	Org-023	<1	1	<1	<1	0	72	94
Naphthalene	mg/kg	1	Org-023	<1	1	<1	<1	0	[NT]	[NT]
Surrogate aaa-Trifluorotoluene	%		Org-023	76	1	108	95	13	88	91

QUALITY CONTROL: svTRH (C10-C40) in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	299126-3
Date extracted	-			30/06/2022	1	30/06/2022	30/06/2022		30/06/2022	30/06/2022
Date analysed	-			30/06/2022	1	30/06/2022	30/06/2022		30/06/2022	30/06/2022
TRH C_{10} - C_{14}	mg/kg	50	Org-020	<50	1	<50	<50	0	135	109
TRH C_{15} - C_{28}	mg/kg	100	Org-020	<100	1	<100	<100	0	137	112
TRH C_{29} - C_{36}	mg/kg	100	Org-020	<100	1	<100	<100	0	133	109
TRH >C_{10} -C_{16}	mg/kg	50	Org-020	<50	1	<50	<50	0	135	109
TRH >C_{16} -C_{34}	mg/kg	100	Org-020	<100	1	<100	<100	0	137	112
TRH >C_{34} -C_{40}	mg/kg	100	Org-020	<100	1	<100	<100	0	133	109
Surrogate o-Terphenyl	%		Org-020	113	1	94	92	2	112	94

QUALITY CONTROL: PAHs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	299126-3
Date extracted	-			30/06/2022	1	30/06/2022	30/06/2022		30/06/2022	30/06/2022
Date analysed	-			01/07/2022	1	01/07/2022	01/07/2022		01/07/2022	01/07/2022
Naphthalene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	86
Acenaphthylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Acenaphthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	89	87
Fluorene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	92
Phenanthrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	96
Anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Fluoranthene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	84	88
Pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	87	89
Benzo(a)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chrysene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	85	87
Benzo(b,j+k)fluoranthene	mg/kg	0.2	Org-022/025	<0.2	1	<0.2	<0.2	0	[NT]	[NT]
Benzo(a)pyrene	mg/kg	0.05	Org-022/025	<0.05	1	<0.05	<0.05	0	100	98
Indeno(1,2,3-c,d)pyrene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Dibenzo(a,h)anthracene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Benzo(g,h,i)perylene	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate p-Terphenyl-d14	%		Org-022/025	67	1	78	77	1	84	82

QUALITY CONTROL: Organochlorine Pesticides in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	299126-3
Date extracted	-			04/07/2022	1	30/06/2022	30/06/2022		30/06/2022	30/06/2022
Date analysed	-			04/07/2022	1	01/07/2022	01/07/2022		01/07/2022	01/07/2022
alpha-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	86
HCB	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	71	78
gamma-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	79	81
delta-BHC	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	93
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	80
gamma-Chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	86	88
Dieldrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	94	96
Endrin	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	80	78
Endosulfan II	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	82	84
Endrin Aldehyde	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	66	62
Methoxychlor	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	95	1	89	91	2	98	96

QUALITY CONTROL: Organochlorine Pesticides in soil					Duplicate				Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	[NT]	[NT]
Date extracted	-			[NT]	13	30/06/2022	30/06/2022		[NT]	[NT]
Date analysed	-			[NT]	13	01/07/2022	01/07/2022		[NT]	[NT]
alpha-BHC	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
HCB	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
beta-BHC	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
gamma-BHC	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Heptachlor	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
delta-BHC	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Aldrin	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Heptachlor Epoxide	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
gamma-Chlordane	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
alpha-chlordane	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Endosulfan I	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
pp-DDE	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Dieldrin	mg/kg	0.1	Org-022/025	[NT]	13	0.2	0.2	0	[NT]	[NT]
Endrin	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Endosulfan II	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
pp-DDD	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Endrin Aldehyde	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
pp-DDT	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Endosulfan Sulphate	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Methoxychlor	mg/kg	0.1	Org-022/025	[NT]	13	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	[NT]	13	96	101	5	[NT]	[NT]

QUALITY CONTROL: Organophosphorus Pesticides in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	299126-3
Date extracted	-			30/06/2022	1	30/06/2022	30/06/2022		30/06/2022	30/06/2022
Date analysed	-			01/07/2022	1	01/07/2022	01/07/2022		01/07/2022	01/07/2022
Dichlorvos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	123	125
Dimethoate	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Diazinon	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Chlorpyriphos-methyl	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ronnel	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	81	83
Fenitrothion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	97	105
Malathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	114	126
Chlorpyriphos	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	92	96
Parathion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	95	97
Bromophos-ethyl	mg/kg	0.1	Org-022	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Ethion	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	102	106
Azinphos-methyl (Guthion)	mg/kg	0.1	Org-022/025	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-022/025	95	1	89	91	2	98	96

QUALITY CONTROL: PCBs in Soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	299126-3
Date extracted	-			30/06/2022	1	30/06/2022	30/06/2022		30/06/2022	30/06/2022
Date analysed	-			01/07/2022	1	01/07/2022	01/07/2022		01/07/2022	01/07/2022
Aroclor 1016	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1221	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1232	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1242	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1248	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Aroclor 1254	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	112	120
Aroclor 1260	mg/kg	0.1	Org-021	<0.1	1	<0.1	<0.1	0	[NT]	[NT]
Surrogate TCMX	%		Org-021	95	1	89	91	2	98	96

QUALITY CONTROL: Acid Extractable metals in soil						Duplicate			Spike Recovery %	
Test Description	Units	PQL	Method	Blank	#	Base	Dup.	RPD	LCS-5	299126-3
Date prepared	-			30/06/2022	1	30/06/2022	30/06/2022		30/06/2022	30/06/2022
Date analysed	-			1/07/2022	1	1/07/2022	1/07/2022		1/07/2022	1/07/2022
Arsenic	mg/kg	4	Metals-020	<4	1	<4	<4	0	107	103
Cadmium	mg/kg	0.4	Metals-020	<0.4	1	<0.4	<0.4	0	106	93
Chromium	mg/kg	1	Metals-020	<1	1	8	5	46	106	99
Copper	mg/kg	1	Metals-020	<1	1	3	3	0	104	107
Lead	mg/kg	1	Metals-020	<1	1	6	5	18	107	97
Mercury	mg/kg	0.1	Metals-021	<0.1	1	<0.1	<0.1	0	97	94
Nickel	mg/kg	1	Metals-020	<1	1	4	3	29	108	98
Zinc	mg/kg	1	Metals-020	<1	1	17	16	6	108	91

Result Definitions

NT	Not tested
NA	Test not required
INS	Insufficient sample for this test
PQL	Practical Quantitation Limit
<	Less than
>	Greater than
RPD	Relative Percent Difference
LCS	Laboratory Control Sample
NS	Not specified
NEPM	National Environmental Protection Measure
NR	Not Reported

Quality Control Definitions

Blank	This is the component of the analytical signal which is not derived from the sample but from reagents, glassware etc, can be determined by processing solvents and reagents in exactly the same manner as for samples.
Duplicate	This is the complete duplicate analysis of a sample from the process batch. If possible, the sample selected should be one where the analyte concentration is easily measurable.
Matrix Spike	A portion of the sample is spiked with a known concentration of target analyte. The purpose of the matrix spike is to monitor the performance of the analytical method used and to determine whether matrix interferences exist.
LCS (Laboratory Control Sample)	This comprises either a standard reference material or a control matrix (such as a blank sand or water) fortified with analytes representative of the analyte class. It is simply a check sample.
Surrogate Spike	Surrogates are known additions to each sample, blank, matrix spike and LCS in a batch, of compounds which are similar to the analyte of interest, however are not expected to be found in real samples.

Australian Drinking Water Guidelines recommend that Thermotolerant Coliform, Faecal Enterococci, & E.Coli levels are less than 1cfu/100mL. The recommended maximums are taken from "Australian Drinking Water Guidelines", published by NHMRC & ARMC 2011.

The recommended maximums for analytes in urine are taken from “2018 TLVs and BEIs”, as published by ACGIH (where available). Limit provided for Nickel is a precautionary guideline as per Position Paper prepared by AIOH Exposure Standards Committee, 2016.

Guideline limits for Rinse Water Quality reported as per analytical requirements and specifications of AS 4187, Amdt 2 2019, Table 7.2

Laboratory Acceptance Criteria

Duplicate sample and matrix spike recoveries may not be reported on smaller jobs, however, were analysed at a frequency to meet or exceed NEPM requirements. All samples are tested in batches of 20. The duplicate sample RPD and matrix spike recoveries for the batch were within the laboratory acceptance criteria.

Filters, swabs, wipes, tubes and badges will not have duplicate data as the whole sample is generally extracted during sample extraction.

Spikes for Physical and Aggregate Tests are not applicable.

For VOCs in water samples, three vials are required for duplicate or spike analysis.

Duplicates: >10xPQL - RPD acceptance criteria will vary depending on the analytes and the analytical techniques but is typically in the range 20%-50% – see ELN-P05 QA/QC tables for details; <10xPQL - RPD are higher as the results approach PQL and the estimated measurement uncertainty will statistically increase.

Matrix Spikes, LCS and Surrogate recoveries: Generally 70-130% for inorganics/metals (not SPOCAS); 60-140% for organics/SPOCAS (+/-50% surrogates) and 10-140% for labile SVOCs (including labile surrogates), ultra trace organics and speciated phenols is acceptable.

In circumstances where no duplicate and/or sample spike has been reported at 1 in 10 and/or 1 in 20 samples respectively, the sample volume submitted was insufficient in order to satisfy laboratory QA/QC protocols.

When samples are received where certain analytes are outside of recommended technical holding times (THTs), the analysis has proceeded. Where analytes are on the verge of breaching THTs, every effort will be made to analyse within the THT or as soon as practicable.

Where sampling dates are not provided, Envirolab are not in a position to comment on the validity of the analysis where recommended technical holding times may have been breached.

Measurement Uncertainty estimates are available for most tests upon request.

Analysis of aqueous samples typically involves the extraction/digestion and/or analysis of the liquid phase only (i.e. NOT any settled sediment phase but inclusive of suspended particles if present), unless stipulated on the Envirolab COC and/or by correspondence. Notable exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, total recoverable metals and PFAS where solids are included by default.

Samples for Microbiological analysis (not Amoeba forms) received outside of the 2-8°C temperature range do not meet the ideal cooling conditions as stated in AS2031-2012.

Report Comments

Acid Extractable Metals in Soil: The laboratory RPD acceptance criteria has been exceeded for 299126-1 for Cr. Therefore a triplicate result has been issued as laboratory sample number 299126-3.

Asbestos: A portion of the supplied sample was sub-sampled for asbestos according to ASB-001 asbestos subsampling procedure. We cannot guarantee that this sub-sample is indicative of the entire sample. Envirolab/MPL recommends supplying 40-60g or 500ml of sample in its own container.
Note: Samples 299126-1,3,5,7,8,9,11,13,15 were sub-sampled from jars provided by the client.

COC 28/6 12:49

martens
consulting engineers since 1989

WATER ANALYSIS CHAIN OF CUSTODY FORM

Additional Testing												
Name	P2108187– 16 Wyatt Ave, Belrose, NSW											
Martens Contact Officer	Ben McGiffin					Contact Email	bmcgiffin@martens.com.au					
Sampling and Shipping	Sample Date	24/06/22	Dispatch Date	27/06/2022		Turnaround Time		standard				
	Our Reference	P2108187COC01V01				Shipping Method (X)	Hand		Post		Courier	X
	On Ice (X)	X	No Ice (X)		Other (X)							
Laboratory												
Name	EnviroLab											
Sample Delivery Address	12 Ashley Street, Chatswood											
Delivery Contact	Name		Phone	9910 6200	Fax		Email	samplereceipt@envirolabservices.com.au				
Please Send Report By (X)	Post		Fax		Email	X	Reporting Email Address	bmcgiffin@martens.com.au				

	Sample ID	Depth	Combo 6A	HM	TRH	BTEX
1	8187/BH101/0.1-0.2	0.1 – 0.2	X			
2	8187/BH101/0.3 – 0.4	0.3 – 0.4				
3	8187/BH102/0.1-0.2	0.1 – 0.2	X			
4	8187/BH102/0.3 – 0.4	0.3 – 0.4				
5	8187/BH103/0.1-0.2	0.1 – 0.2	X			
6	8187/BH103/0.2 – 0.3	0.2 – 0.3				
7	8187/BH104/0.1-0.2	0.1 – 0.2	X			
8	8187/BH105/0.1-0.2	0.1 – 0.2	X			
9	8187/BH106/0.1 – 0.2	0.1 – 0.2	X			
10	8187/BH106/0.4-0.5	0.4 – 0.5				
11	8187/BH107/0.1-0.2	0.1 – 0.2	X			
12	8187/BH107/0.3 – 0.4	0.3 – 0.4				
17	8171/BH108/0.1-0.2	0.1 – 0.2	X			

ENVIROLAB GROUP
Envirolab Services
12 Ashley St
Chatswood NSW 2067
Ph: (02) 9910 6200

Job No: ~~28~~ 299126
Date Received: 27/06/22
Time Received: 1850
Received By: CA
Temp: Cool/Ambient
Cooling: Ice/Icepack
Security: Intact/Broken/None

Head Office
Suite 201, Level 2, 20 George Street
Hornsby NSW 2077, Australia
Ph 02 9476 9999 **Fax** 02 9476 8767

> mail@martens.com.au
> www.martens.com.au
MARTENS & ASSOCIATES P/L
ABN 85 070 240 890 ACN 070 240 890

SOIL ANALYSIS CHAIN OF CUSTODY

	Sample ID	Depth	Combo 6A	HM	TRH	BTEX
14	8187/BH108/0.4 – 0.5	0.4 – 0.5				
15	8187/BH109/0.1-0.2	0.1 – 0.2	X			
16	8187/BH109/0.3-0.4	0.3 – 0.4				
17	8187/Dup01			X		
18	Trip Spike					X
19	Trip Blank				X	X

29/9/26
27106 CM.

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

SAMPLE RECEIPT ADVICE

Client Details

Client	Martens & Associates Pty Ltd
Attention	Ben McGiffin

Sample Login Details

Your reference	P2108187 - 16 Wyatt Ave, Belrose, NSW
Envirolab Reference	299126
Date Sample Received	27/06/2022
Date Instructions Received	28/06/2022
Date Results Expected to be Reported	05/07/2022

Sample Condition

Samples received in appropriate condition for analysis	Yes
No. of Samples Provided	19 Soil
Turnaround Time Requested	Standard
Temperature on Receipt (°C)	5
Cooling Method	Ice
Sampling Date Provided	YES

Comments

Nil

Please direct any queries to:

Aileen Hie	Jacinta Hurst
Phone: 02 9910 6200	**Phone: 02 9910 6200**
Fax: 02 9910 6201	**Fax: 02 9910 6201**
Email: ahie@envirolab.com.au	**Email: jhurst@envirolab.com.au**

Analysis Underway, details on the following page:

Envirolab Services Pty Ltd
ABN 37 112 535 645
12 Ashley St Chatswood NSW 2067
ph 02 9910 6200 fax 02 9910 6201
customerservice@envirolab.com.au
www.envirolab.com.au

Sample ID	vTRH(C6-C10)/BTEXN in Soil	svTRH (C10-C40) in Soil	PAHs in Soil	Organochlorine Pesticides in soil	Organophosphorus Pesticides in Soil	PCBs in Soil	Acid Extractable metalsin soil	Asbestos ID - soils	On Hold
8187/BH101/0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
8187/BH101/0.3 – 0.4									✓
8187/BH102/0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
8187/BH102/0.3 – 0.4									✓
8187/BH103/0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
8187/BH103/0.2 – 0.3									✓
8187/BH104/0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
8187/BH105/0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
8187/BH106/0.1 – 0.2	✓	✓	✓	✓	✓	✓	✓	✓	
8187/BH106/0.4-0.5									✓
8187/BH107/0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
8187/BH107/0.3 – 0.4									✓
8171/BH108/0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
8187/BH108/0.4 – 0.5									✓
8187/BH109/0.1-0.2	✓	✓	✓	✓	✓	✓	✓	✓	
8187/BH109/0.3-0.4									✓
8187/Dup01							✓		
Trip Spike	✓								
Trip Blank	✓								

The '✓' indicates the testing you have requested. **THIS IS NOT A REPORT OF THE RESULTS.**

Additional Info

Sample storage - Waters are routinely disposed of approximately 1 month and soils approximately 2 months from receipt.
Requests for longer term sample storage must be received in writing.
Please contact the laboratory immediately if observed settled sediment present in water samples is to be included in the extraction and/or analysis (exceptions include certain Physical Tests (pH/EC/BOD/COD/Apparent Colour etc.), Solids testing, Total Recoverable metals and PFAS analysis where solids are included by default.
TAT for Micro is dependent on incubation. This varies from 3 to 6 days.

Attachment F: Tabular Soil Analytical Results

		Asbestos	BTEX							TRH							Halogenated Benzenes
		Asbestos fibres	Naphthalene (VOC)	Benzene	Toluene	Ethylbenzene	Xylene (m & p)	Xylene (o)	Xylene Total	C6-C10 Fraction (F1)	C6-C10 (F1 minus BTEX)	>C10-C16 Fraction (F2)	>C10-C16 Fraction (F2 minus Naphthalene)	>C16-C34 Fraction (F3)	>C34-C40 Fraction (F4)	>C10-C40 Fraction (Sum)	Hexachlorobenzene
		Detect	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL			1	0.2	0.5	1	2	1	1	25	25	50	50	100	100	50	0.1
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil										700		1,000		2,500	10,000		
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand			3	0.5 | 0.5 | 0.5 | 0.5	160 | 220 | 310 | 540	55			40 | 60 | 95 | 170		45 | 70 | 110 | 200		110 | 240 | 440				
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space			170														
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil				50	85	70			105		180	120	120	300	2,800		
NEPM 2013 Table 1A(1) HILs Res A Soil																	10
Field ID	**Date**																
8171/BH108/0.1-0.2	**24/06/2022**	0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<0.1
8187/BH101/0.1-0.2	**24/06/2022**	0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<0.1
8187/BH101/0.1-0.2 - [TRIP	**24/06/2022**																
8187/BH102/0.1-0.2	**24/06/2022**	0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<0.1
8187/BH103/0.1-0.2	**24/06/2022**	0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<0.1
8187/BH104/0.1-0.2	**24/06/2022**	0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<0.1
8187/BH105/0.1-0.2	**24/06/2022**	0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<0.1
8187/BH106/0.1 â€“ 0.2	**24/06/2022**	0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	170	<100	170	<0.1
8187/BH107/0.1-0.2	**24/06/2022**	0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	140	<100	140	<0.1
8187/BH109/0.1-0.2	**24/06/2022**	0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	150	<100	150	<0.1
Statistics																	
Number of Results		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Detects		9	0	0	0	0	0	0	0	0	0	0	0	3	0	3	0
Minimum Concentration		0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	<100	<100	<50	<0.1
Minimum Detect		0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	ND	140	ND
Maximum Concentration		0	<1	<0.2	<0.5	<1	<2	<1	<1	<25	<25	<50	<50	170	<100	170	<0.1
Maximum Detect		0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	170	ND	170	ND
Average Concentration *		0	0.5	0.1	0.25	0.5	1	0.5	0.5	12	12	25	25	84	50	68	0.05
Median Concentration *		0	0.5	0.1	0.25	0.5	1	0.5	0.5	12.5	12.5	25	25	50	50	25	0.05
Standard Deviation *		0	0	0	0	0	0	0	0	0	0	0	0	52	0	65	0
95% UCL (Student's-t) *		0	0.5	0.1	0.25	0.5	1	0.5	0.5	12.5	12.5	25	25	116.8	50	107.8	0.05
% of Detects		100	0	0	0	0	0	0	0	0	0	0	0	33	0	33	0
% of Non-Detects		0	100	100	100	100	100	100	100	100	100	100	100	67	100	67	100

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
2013, NEPM 2013 Table 1A(1) HILs Res A Soil

		Metals								Organochlori									
		Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc	4,4-DDE	a-BHC	Aldrin	b-BHC	Chlordane (cis)	Chlordane (trans)	d-BHC	DDD	DDT	DDT+DDE+DDD
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		4	0.4	1	1	1	0.1	1	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																			
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																			
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space		100			230	1100		270	770									180	
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																			
NEPM 2013 Table 1A(1) HILs Res A Soil		100	20		6,000	300	40	400	7,400										240
Field ID	**Date**																		
8171/BH108/0.1-0.2	**24/06/2022**	<4	<0.4	4	3	11	<0.1	1	13	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH101/0.1-0.2	**24/06/2022**	<4	<0.4	8	3	6	<0.1	4	17	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH101/0.1-0.2 - [TRIP	**24/06/2022**	<4	<0.4	5	4	5	<0.1	4	18										
8187/BH102/0.1-0.2	**24/06/2022**	<4	<0.4	7	4	6	<0.1	4	24	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH103/0.1-0.2	**24/06/2022**	6	<0.4	13	22	38	<0.1	7	63	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH104/0.1-0.2	**24/06/2022**	5	<0.4	12	21	32	<0.1	7	57	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH105/0.1-0.2	**24/06/2022**	<4	<0.4	2	3	10	<0.1	1	14	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH106/0.1 â€“ 0.2	**24/06/2022**	<4	<0.4	5	15	18	<0.1	2	50	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH107/0.1-0.2	**24/06/2022**	<4	<0.4	6	6	19	<0.1	3	31	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH109/0.1-0.2	**24/06/2022**	9	<0.4	15	32	150	<0.1	4	140	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Statistics																			
Number of Results		**10**	**10**	**10**	**10**	**10**	**10**	**10**	**10**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**	**9**
Number of Detects		**3**	**0**	**10**	**10**	**10**	**0**	**10**	**10**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Minimum Concentration		**<4**	**<0.4**	**2**	**3**	**5**	**<0.1**	**1**	**13**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Minimum Detect		**5**	**ND**	**2**	**3**	**5**	**ND**	**1**	**13**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Maximum Concentration		**9**	**<0.4**	**15**	**32**	**150**	**<0.1**	**7**	**140**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**	**<0.1**
Maximum Detect		**9**	**ND**	**15**	**32**	**150**	**ND**	**7**	**140**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**	**ND**
Average Concentration *		**3.4**	**0.2**	**7.7**	**11**	**30**	**0.05**	**3.7**	**43**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
Median Concentration *		**2**	**0.2**	**6.5**	**5**	**14.5**	**0.05**	**4**	**27.5**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
Standard Deviation *		**2.5**	**0**	**4.3**	**10**	**44**	**0**	**2.1**	**39**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
95% UCL (Student's-t) *		**4.825**	**0.2**	**10.18**	**17.39**	**54.89**	**0.05**	**4.924**	**65.23**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**	**0.05**
% of Detects		**30**	**0**	**100**	**100**	**100**	**0**	**100**	**100**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
% of Non-Detects		**70**	**100**	**0**	**0**	**0**	**100**	**0**	**0**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**	**100**

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
2013, NEPM 2013 Table 1A(1) HILs Res A Soil

	ne Pesticides										Organophosphorous Pesticides							
	Dieldrin	Endosulfan I	Endosulfan II	Endosulfan sulphate	Endrin	Endrin aldehyde	g-BHC (Lindane)	Heptachlor	Heptachlor epoxide	Methoxychlor	Azinophos methyl	Bromophos-ethyl	Chlorpyrifos	Chlorpyrifos-methyl	Diazinon	Dichlorvos	Dimethoate	Ethion
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																		
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																		
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil																		
NEPM 2013 Table 1A(1) HILs Res A Soil					10			6		300			160					
Field ID **Date**																		
8171/BH108/0.1-0.2 **24/06/2022**	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH101/0.1-0.2 **24/06/2022**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH101/0.1-0.2 - [TRIP **24/06/2022**																		
8187/BH102/0.1-0.2 **24/06/2022**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH103/0.1-0.2 **24/06/2022**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH104/0.1-0.2 **24/06/2022**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH105/0.1-0.2 **24/06/2022**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH106/0.1 â€“ 0.2 **24/06/2022**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH107/0.1-0.2 **24/06/2022**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH109/0.1-0.2 **24/06/2022**	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Statistics																		
Number of Results	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Detects	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Minimum Concentration	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Minimum Detect	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Maximum Concentration	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Maximum Detect	0.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Average Concentration *	0.067	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Median Concentration *	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Standard Deviation *	0.05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
95% UCL (Student's-t) *	0.0977	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
% of Detects	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% of Non-Detects	89	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
2013, NEPM 2013 Table 1A(1) HILs Res A Soil

					PAH														
		Fenitrothion	Malathion	Ronnel	Benzo(b+j+k)fluoranthene	Acenaphthene	Acenaphthylene	Anthracene	Benzo(a)anthracene	Benzo(a) pyrene	Benzo(g,h,i)perylene	Chrysene	Dibenz(a,h)anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-c,d)pyrene	Naphthalene	Phenanthrene	Pyrene
		mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL		0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil																			
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand																	3		
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space																	170		
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil										0.7									
NEPM 2013 Table 1A(1) HILs Res A Soil																			
Field ID	**Date**																		
8171/BH108/0.1-0.2	**24/06/2022**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH101/0.1-0.2	**24/06/2022**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH101/0.1-0.2 - [TRIP	**24/06/2022**																		
8187/BH102/0.1-0.2	**24/06/2022**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH103/0.1-0.2	**24/06/2022**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	0.09	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	0.1
8187/BH104/0.1-0.2	**24/06/2022**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH105/0.1-0.2	**24/06/2022**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH106/0.1 â€“ 0.2	**24/06/2022**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH107/0.1-0.2	**24/06/2022**	<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
8187/BH109/0.1-0.2	**24/06/2022**	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	0.2	0.3	0.2	0.2	<0.1	0.4	<0.1	0.1	<0.1	0.2	0.4
Statistics																			
Number of Results		9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Detects		0	0	0	1	0	0	0	1	5	1	1	0	2	0	1	0	1	2
Minimum Concentration		<0.1	<0.1	<0.1	<0.2	<0.1	<0.1	<0.1	<0.1	<0.05	<0.1	<0.1	<0.1	0.1	<0.1	0.1	<0.1	<0.1	0.1
Minimum Detect		ND	ND	ND	0.4	ND	ND	ND	0.2	0.09	0.2	0.2	ND	0.1	ND	0.1	ND	0.2	0.1
Maximum Concentration		<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	0.2	0.3	0.2	0.2	<0.1	0.4	<0.1	0.1	<0.1	0.2	0.4
Maximum Detect		ND	ND	ND	0.4	ND	ND	ND	0.2	0.3	0.2	0.2	ND	0.4	ND	0.1	ND	0.2	0.4
Average Concentration *		0.05	0.05	0.05	0.13	0.05	0.05	0.05	0.067	0.084	0.067	0.067	0.05	0.094	0.05	0.056	0.05	0.067	0.094
Median Concentration *		0.05	0.05	0.05	0.1	0.05	0.05	0.05	0.05	0.09	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Standard Deviation *		0	0	0	0.1	0	0	0	0.05	0.087	0.05	0.05	0	0.12	0	0.017	0	0.05	0.12
95% UCL (Student's-t) *		0.05	0.05	0.05	0.195	0.05	0.05	0.05	0.0977	0.138	0.0977	0.0977	0.05	0.166	0.05	0.0659	0.05	0.0977	0.166
% of Detects		0	0	0	11	0	0	0	11	56	11	11	0	22	0	11	0	11	22
% of Non-Detects		100	100	100	89	100	100	100	89	44	89	89	100	78	100	89	100	89	78

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
2013, NEPM 2013 Table 1A(1) HILs Res A Soil

		PCBs								Pesticides	TPH				
	PAHs (Sum of positives)	Arochlor 1016	Arochlor 1221	Arochlor 1232	Arochlor 1242	Arochlor 1248	Arochlor 1254	Arochlor 1260	PCBs (Sum of total)	Parathion	C6-C9 Fraction	C10-C14 Fraction	C15-C28 Fraction	C29-C36 Fraction	C10-C36 Fraction (Sum)
	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL	0.05	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	25	50	100	100	50
NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil															
NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand															
NEPM 2013 Table 1B(5) Generic EIL - Urban Res & Public Open Space															
NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil															
NEPM 2013 Table 1A(1) HILs Res A Soil									1						
Field ID **Date**															
8171/BH108/0.1-0.2 24/06/2022	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50
8187/BH101/0.1-0.2 24/06/2022	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50
8187/BH101/0.1-0.2 - [TRIP 24/06/2022															
8187/BH102/0.1-0.2 24/06/2022	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50
8187/BH103/0.1-0.2 24/06/2022	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50
8187/BH104/0.1-0.2 24/06/2022	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50
8187/BH105/0.1-0.2 24/06/2022	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50
8187/BH106/0.1 â€“ 0.2 24/06/2022	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	140	140
8187/BH107/0.1-0.2 24/06/2022	0.09	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	100	100
8187/BH109/0.1-0.2 24/06/2022	2.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	<100	<50
Statistics															
Number of Results	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9
Number of Detects	5	0	0	0	0	0	0	0	0	0	0	0	0	2	2
Minimum Concentration	<0.05	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	100	<50
Minimum Detect	0.09	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	100	100
Maximum Concentration	2.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<25	<50	<100	140	140
Maximum Detect	2.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	140	140
Average Concentration *	0.32	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	12	25	50	66	46
Median Concentration *	0.09	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	12.5	25	50	50	25
Standard Deviation *	0.71	0	0	0	0	0	0	0	0	0	0	0	0	32	43
95% UCL (Student's-t) *	0.759	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	12.5	25	50	85.67	72.81
% of Detects	56	0	0	0	0	0	0	0	0	0	0	0	0	22	22
% of Non-Detects	44	100	100	100	100	100	100	100	100	100	100	100	100	78	78

* A Non Detect Multiplier of 0.5 has been applied.

Environmental Standards

NEPM, NEPM 2013 Table 1B(7) Management Limits in Res / Parkland, Coarse Soil
2013, NEPM 2013 Table 1A(3) Res A/B Soil HSL for Vapour Intrusion, Sand
2013, NEPM 2013 Table 1B(6) ESLs for Urban Res, Coarse Soil
2013, NEPM 2013 Table 1A(1) HILs Res A Soil

Attachment G: Data Validation Report

Sample Handling

Lab Report	Sample Chain of Custody (COC) Procedures	Sample Preservation	Sample Receipt Notification Matches COC	Samples Analysed Within Holding Time
299126	Pass	Pass	Pass	Pass

Precision / Accuracy

Lab Report	Analysed by NATA Laboratory	Trip Spike and Blank Used	Adequate Duplicates Analysed	Field Rinsate Analysed
299126	Pass	NA	Pass	NA

Decontamination procedures were conducted in accordance with MA SOP therefore no rinsate sample was analysed.

Duplicates/ laboratory QA / QC

Lab Report	Field RPD	Laboratory Surrogate Recovery	Laboratory Duplicate RPD	Lab Blank and Matrix Spike Recovery	Laboratory Control Sample
2532733	Pass	Pass	Pass	Pass	Pass

The laboratory RPD acceptance criteria was exceeded for sample 299126-1 for chromium. A triplicate laboratory samples was released as 299126-3.

				Metals							
				Arsenic	Cadmium	Chromium (III+VI)	Copper	Lead	Mercury	Nickel	Zinc
				mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg	mg/kg
EQL				4	0.4	1	1	1	0.1	1	1
Lab Report Number	**Field ID**	**Date**	**Matrix Type**								
299126	**8187/BH101/0.1-0.2**	**24/06/2022**	**Soil**	<4	<0.4	8	3	6	<0.1	4	17
299126	**8187/Dup01**	**24/06/2022**	**Soil**	<4	<0.4	4	4	5	<0.1	3	16
RPD				0	0	67	29	18	0	29	6

***RPDs have only been considered where a concentration is greater than 1 times the EQL.**

****Elevated RPDs are highlighted as per QAQC Profile settings (Acceptable RPDs for each EQL multiplier range are: 81 (1 - 10 x EQL); 50 (10 - 30 x EQL); 30 (> 30 x EQL))**

*****Interlab Duplicates are matched on a per compound basis as methods vary between laboratories. Any methods in the row header relate to those used in the primary laboratory**