



WARATAH

ENVIRONMENTAL CONSULTING

Remediation Action Plan

Prepared for

Balito Investments

142-146 Pitt Road, North Curl Curl NSW

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Recipient

Mr Grant Price
Balito Investments

Original

Waratah Environmental Consulting
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Author



Jordan Thomas
Senior Environmental Scientist
LAA001497

1. Introduction

1.1. Background

Mr Grant Price of Balito Investments (the client) engaged Waratah Environmental Consultants (Waratah) to conduct a Remediation Action Plan (RAP) for the property located at 142-146 Pitt Road, North Curl Curl NSW (the Site). This investigation follows on from a Detailed Site Investigation (DSI) prepared by Waratah (2023).

The subject site is located approximately 18.5 km north-east of Sydney CBD, within the Local Government Area of Northern Beaches Council. The site covers an area of approximately 1,250 m² ([Lhttps://maps.six.nsw.gov.au/#](https://maps.six.nsw.gov.au/#)). The site is further defined as Lots 28-30 of DP394337.

1.2. Proposed Development

Based on the approved development plans provided in **Appendix B** (Warren and Mahoney, 2023) the site is to be developed into a multi-storey, mixed-use building with ground level commercial overlain by residential apartments with one level of basement car parking extending to a maximum depth of 2.2 mBLG (RL 10.92 mAHD).

1.3. Remediation Objectives

The goal of the remedial works is to render the site suitable for its intended land use from a contaminated land standpoint. The remedial goals will be achieved by reducing the risk to human health and ecological receptors, to a level that meets the site acceptance criteria (SAC) as dictated by the appropriate guidelines (NEPC, 2013).

The remedial objectives are the following;

- Provide a framework for the data gap investigation and rationale to support the remedial approach;
- Provide a methodology to render the site suitable for its intended use;
- Provide a contingency plan for additional remedial works / unexpected finds;
- Outline the site management procedures to be implemented during remediation; and
- Provide an unexpected finds protocol to be implemented during the development works.

1.4. Scope of Work

The RAP was prepared in accordance with the recommendations outlined in the detailed site investigation (Waratah, 2023a). The scope of the RAP includes a review of all available environmental and geotechnical reports for the subject site, update the conceptual site model, identify and close applicable data gaps, and compile the RAP.

The scope of works was undertaken with reference to the National Environmental Protection Measures 1999 (Assessment of Site Contamination; amended 2013), other guidelines made under or with regards to the CLM Act (1997) and State Environmental Planning Policy Resilience and Hazards (2021).

2. Site Information

2.1. Cadastral Information

Attribute	Description
Site Address	142-146 Pitt Road, North Curl Curl NSW
Lot / Section / Deposition Plan	Lots 28-30 of DP 394337
Site Area	1,250 m ² (https://maps.six.nsw.gov.au/#)
State Survey Marks	A total of two (2) state survey markers (SS) and three (3) permanent markers (PM) were identified within close proximity (<150m) to the site: - SS40983 on Pitt Road; - SS783 D on Pitt Road; - PM1994 D on corner of Pitt Road and Playfair Road; - PM1995 on corner of Ross Street and Jameson Avenue; and - PM2015 on corner of Bellevue Parade and Red Avenue.



Figure 2.1 – Site Locality (source: maps.six.nsw.gov.au)

Local Government Authority	Northern Beaches Council
County	Cumberland
Current Zoning	E1 – Local Centre
Current Land Use	The site is currently occupied by a two-level mixed-use building with ground level commercial and residential apartments on the second level.

2.2. Previous Investigations

A Preliminary Site Investigation (Waratah, 2023) and subsequent Detailed Site Investigation (Waratah, 2023a) have been conducted for the subject site. Waratah (2023) concluded that uncontrolled fill soils had been imported to the site and used for vehicle movement / parking, asbestos containing cement debris was observed on the surface of the ground. In addition, several underground services / storage tank(s) were identified in the rear of the property. Furthermore, ACM was identified in both a bonded and friable condition in several building materials onsite.

A detailed sampling program was incorporated into Waratah (2023a) which confirmed the presence of ACM within the fill soil materials, located in the northern portion of the site. The soil samples that were analysed found the ACM to be in a bonded and friable condition. All anthropogenic hydrocarbons were below the laboratory limit of detection for the samples that were analysed, indicating that any underground services either did not contain hydrocarbons, or were in sound working condition and not leaking. Uncertainty still remained with regards to the contamination status of soil material beneath site buildings. Boreholes advanced within the northern portion of the site indicated that the imported fill soils extended to an average depth of approximately 0.5 mBGL.

3. Conceptual Site Model

The NEPM (NEPC, 2013) defines a CSM as a representation of the site related information regarding contamination sources, receptors and exposure pathways. The CSM for the subject site is based on the information and contamination data presented in the PSI (Waratah, 2023) and DSI (Waratah, 2023a).

3.1. Potential Sources of Contamination / AEC & CoPC

The areas of environmental concern (AEC) with the corresponding contaminants of potential concern (CoPC) are presenting in **Table 3.1**.

Table 3.1 Potential AEC and corresponding CoPCs

Source / AOC	CoPC
<u>Uncontrolled imported fill soil:</u> The entire northern portion of the site comprises shallow imported fill soils of an unknown origin. The previous investigation (Waratah, 2023a) concluded that the fill soils ranged in depth with an average depth of 0.5 mBG; and contained ACM in a friable condition.	Asbestos containing materials (friable and bonded)
<u>Fill soils in building footprint:</u> At the time of this report, all site buildings were still in use. As such, the soil materials within the building footprint(s) could not be inspected. Waratah notes that ACM (friable & bonded) has been identified with in the site buildings and may present a secondary contamination source following demolition.	Heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Zn) Total Recoverable Hydrocarbons (TRHs) Polycyclic aromatic Hydrocarbons (PAHs) Benzene, Toluene, Ethyl-benzene, Xylenes, Naphthalene (BTEXN) Polychlorinated Biphenyls (PCBs) Organo-Chlorine / Organo-Phosphate Pesticides (OCP / OPP) ACM

3.2. Transport Mechanism

The anticipated primary transport media for the migration of contaminants of concern are:

- Dermal contact / inhalation / ingestion of contaminated site soils by construction workers and future site occupants / users.
- Mobile contaminants transported by groundwater / surface runoff to downgradient ecological / human receptors.

3.3. Potential Migration Pathways

There are a number of mechanisms by which identified receptors may come into contact with contaminated sources, including the following:

- Incidental dermal contact or ingestion of impacted soils;
- Generation of impacted dusts, aerosols or sediments from impacted soils; and
- Surface runoff and stormwater drainage system.

3.4. Potential Receptors

- Human Receptor – Direct contact of the contaminated soil / dust in a commercial / residential setting including any contractors or maintenance workers.
- Offsite ecological receptors, including Curl Curl Lagoon aquatic ecosystem.

3.5. Assessment of Data Gaps

Soil material within existing building footprint(s) have not been inspected or analysed. Uncertainty remains with regards to the quality of these fill soils. Given that this material is designated for excavation and offsite disposal, the characterisation of this material will be completed during the waste classification phase of work. If the underlying natural soil material meets the SAC, no further remedial action would be required.

4. Remedial Extent

For the purpose of the RAP, the extent of remediation includes all shallow fill materials within the northern portion of the site. Should any soil materials within site building footprints be found to contain contaminants exceeding the SAC, the remediation zone may be extended to incorporate these areas.

Waratah (2023a) identified the depth of fill soils to range from approximately 1.0 to 0.3 mBGL. These depths should be used as an indicative guide for vertical delineation of sill. However, the borehole adjacent the identified redundant tank, did not penetrate the depth of fill, therefore deeper fill may be present adjacent subsurface services.

5. Remediation Options

5.1. Soil Remediation

The NSW EPA follows the hierarchy set out in NEPM (2013) for the remediation of contaminated sites. The preferred order for soil remediation and management is as follows:

1. On-site treatment of soil so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level;
2. Off-site treatment of excavated material so that the contaminant is either destroyed or the associated hazard is reduced to an acceptable level, after which the soil is returned to the site;

Or if the above are not practicable:

3. Consolidation and isolation of the soil by on-site containment within a properly designed barrier; and
4. Removal of contaminated material to an approved site or facility, followed where necessary by replacement with clean material; or
5. Where the assessment indicates that remediation would have no net environmental benefit or would have a net adverse environmental effect, implementation of an appropriate management strategy.

For simplicity herein, the above hierarchy are respectively referred to as Option 1, Option 2, Option 3 etc.

The NEPM (2013) and the WA DoH (2009) guidelines prefer the following asbestos remediation hierarchy:

1. Minimisation of public risk;
2. Minimisation of contaminated soil disturbance; and
3. Minimisation of contaminated material/soil moved to landfill.

The Guidelines for the NSW Site Auditor Scheme, 3rd Edition (2017)¹⁸ provides the following additional

requirements to be taken into consideration:

Remediation should not proceed in the event that it is likely to cause a greater adverse effect than leaving the site undisturbed; and

Where there are large quantities of soil with low levels of contamination, alternative strategies should be considered or developed.

5.2. Consideration of Remediation Options

Option	Discussion	Suitability
Option 1 On-site treatment of contaminated soil	On-site treatment provides a mechanism to reuse the processed material and, in some instances, to avoid the need for large scale earthworks. Some of the treatment options include bio-remediation, soil washing, air sparging and soil vapour extraction, thermal	Not applicable for the combination of the contaminants of concern identified at the site (friable asbestos).

	desorption and physical removal of bonded ACM in the absence of friable asbestos (FA).	
Option 2 Off-site treatment of contaminated soil	Contaminated soils are excavated, transported to an approved/ licensed treatment facility, treated to remove/stabilise the contaminants then returned to the subject site, transported to an alternative site or disposed to an approved landfill facility. This option is contaminant-specific. The cost per tonne for transport to and from the site and for treatment is considered to be relatively high. The material would also have to be assessed in terms of suitability for reuse as part of the proposed development works under the waste and resource recovery regulatory framework.	Not applicable for asbestos.
Option 3 Removal of contaminated material to an appropriate facility	Contaminated soils would be classified in accordance with NSW EPA guidelines for waste disposal, excavated and disposed of off-site to a NSW EPA licensed landfill. The material would have to meet the requirements for landfill disposal. Landfill gate fees (which may be significant) would apply in addition to transport costs.	Applicable for the contaminants identified to date. May be cost prohibitive if the DGI confirms that all fill is contaminated and requires remediation. Could be used for parts of the site (such as in-ground planting areas, if included) in combination with Option 4 below to better mitigate risks and to simplify future management.
Option 4 Consolidation and isolation of impacted soil by cap and containment	This would include the placement of an impermeable barrier such as concrete/pavers etc, or a warning barrier and non-contaminated soil material, over the existing ground surface to isolate the contaminated material within areas outside of the basement and thereby reduce the health risk to future site users. The capping and/or containment must be appropriate for the specific contaminants of concern. An ongoing Long Term Environmental Management Plan (LTEMP) would be required and site identification documentation, possibly including the Section 10.7 council planning certificate, land title or other appropriate statutory documentation, would be modified to note the presence of the contamination. This may impact upon development approval conditions (requiring a Section 4.55 application pursuant to the <i>Environmental Planning and Assessment Act 1979</i>), place restrictions on the use of the land and limit the future potential land value.	Applicable option for the contaminants of concern. Consideration would need to be given if inground planting areas are considered.
Option 5 Implementation of management strategy	Contaminated soils would be managed in such a way to reduce risks to the receptors and monitor the conditions over time so that there is an ongoing minimisation of risk. This may occur via the implementation of monitoring programs, potentially also involving capping systems.	Not applicable given the context of the development proposal.

5.3. Preferred Remediation Option & Rationale

The preferred option for remediation of the contaminated fill at the site is Option 4 – cap and contain. Option 4 was assessed to be: technically feasible; cost and time beneficial; and in-line with the principles of ecologically sustainable development as it minimises unnecessary excavation works and disposal of materials to landfill. The commercial use and ownership of the site will allow for implementation of a LTEMP. This option was considered in consultation with the project managers. Confirmation that the party responsible for implementing the LTEMP (i.e. the site owner) is in acceptance of this approach will be required as part of the validation process.

Waratah note that off-site disposal of some contaminated material to a licensed landfill will be required to facilitate the installation of the capping layers.

In the event that Option 4 is not accepted by the responsible party, or the waste classification of material within the building footprint identifies contamination that is not suitable to be managed under Option 4, the alternative remediation strategy is Option 3 – excavation and off-site disposal of the contaminated material to a licensed landfill. If Option 3 – excavation and off-site disposal of the contaminated material, is to be adopted as the preferred option, the details are to be finalised in the site validation report.

6. Remediation Details

6.1. Roles & Responsibilities

Role	Responsibility
<u>Client / Developer</u>	Balito Investments The client/developer is required to appoint the project team for the remediation and must provide all investigation reports and this RAP to the project manager, remediation contractor, consent authority and any other relevant parties involved in the project.
<u>Project Manager</u>	Not yet assigned. The project manager is required to review all documents prepared for the project and manage the implementation of the procedures outlined in this RAP. The project manager is to take reasonable steps so that the remediation contractor and others have understood the RAP and will implement it in its totality. The project manager will review the RAP and other documents and will update the parties involved of any changes to the development or remediation sequence (in consultation with the validation consultant).
<u>Remediation Contractor</u>	Not yet assigned. The remediation contractor is required to review all documents prepared for the project, apply for any relevant removal licences or permits and implement the remediation requirements outlined in this RAP. The remediation contractor may also be the construction contractor. The remediation contractor is required to collect all necessary documentation associated with the remediation activities and forward this documentation onto the client, project manager and validation consultant as it becomes available. The remediation contractor is required to advise the validation consultant at key points in the remediation and validation programme, and implement various aspects of the validation plan assigned to them.
<u>Validation Consultant</u>	Not yet assigned. The validation consultant provides consulting advice and validation services in relation to the remediation, and prepares the site validation report to address Conditions in the Notice of Determination Approval. The validation is required to review any deviation to this RAP or in the event of unexpected finds if and when encountered during the site work. The validation consultant is to have a SafeWork Licensed Asbestos Assessor (LAA) on staff to provide the necessary surface clearance inspections and certificates for the project. The validation consultant is required to liaise with the client, project manager and remediation contractor on all matters pertaining to the site contamination, remediation and validation.

6.2. Pre-Commencement

The project team is to have a pre-commencement meeting to discuss the sequence of remediation, and the remediation and validation tasks. The site management plan for remediation works must be reviewed by project manager and remediation contractor, and appropriate steps are to be taken to ensure the adequate implementation of the plan.

6.3. Sequence of Remedial Work

Waratah anticipate the following general sequence of work for the project (in the context of the remediation):

1. Hold Point - Preparation of an Asbestos Management Plan (AMP) for the proposed development;
2. Site establishment, demolition and removal of structures and pavement;
3. Remediation and validation of the fill contamination at the site (concurrently with item 5 below); and
6. Validation of imported soil materials. This includes engineering material such as sub-base and drainage materials (e.g. recovered aggregate etc), capping materials, or any other materials such as landscaping soil, material imported for service trenches etc, to the point in time that the validation report is issued.

6.4. Asbestos Management Plan (AMP)

An AMP must be prepared for the site by a LAA and implemented for the site demolition, remediation and development works (involving asbestos). The AMP must include the minimum PPE, WHS and other requirements outlined in the documents published by SafeWork NSW, National Occupational Health and Safety Commission, and other relevant authorities as applicable.

6.5. Site Establishment & Demolition

The remediation contractor is to establish on site as required to facilitate the remediation. Consideration must be given to the work sequence and extent of remediation so that the site establishment (e.g. site sheds, fencing, access points etc) does not inhibit the remediation works.

The hazardous building materials in the existing structures should be demolished and removed in accordance with the relevant codes and standards. An AMP is to be prepared prior to the commencement of demolition (as discussed in **Section 7.3**) and the AMP is to outline additional detailed regarding notifications for asbestos removal and additional plans to be prepared by the asbestos removalist (e.g. asbestos removal control plan - ARCP). A clearance certificate is to be obtained from a LAA by the demolition contractor following the removal of any hazardous materials. The concrete slabs must also be inspected for potential ACM post-demolition by the LAA and all hardstand surfaces must be included as part of the asbestos clearance process.

All waste from the demolition is to be disposed to facilities that are licenced by the NSW EPA to accept the waste. The demolition contractor is to maintain adequate records and retain all documentation for such activities including:

- A summary register including details such as waste disposal dates, waste materials descriptions, disposal locations (i.e. facility details) and reconciliation of this information with waste disposal docket numbers;
- Waste tracking records and transport certificates (where waste is required to be tracked/transported in accordance with the regulations); and

- Disposal dockets for the waste. Legible dockets are to be provided for all waste materials so they can be reconciled with the register.

The above information is to be supplied to the validation consultant for assessment and inclusion in the site validation report.

6.6. Remediation Details – Cap & Contain

The premise for remediating the site is based around capping the fill/soil beneath appropriate (clean) capping layers. The proposed capping system requires consideration during the design of the pavements and any landscaping / planting areas. A summary of the proposed capping strategy is provided in the following table:

Area	Capping Specification
<u>New buildings / structures</u>	Installation of: - High visibility (i.e. orange) builders' plastic marker layer over the contaminated fill; - >50mm clean imported (validated) basecourse, as required for engineering specification; and - >125mm (minimum) of concrete.
<u>Landscaping areas</u>	Any planting areas that are not in planters are to be capped as follows: - Geotextile marker layer over the contaminated fill; - >500mm of clean (validated) soil/topsoil/growing medium; and - All tree plantings (root zones) are to be within the clean layer. The above capping specification is only applicable to trees and shrubs with shallow root zones. The required depth of the root zone should be confirmed with the appointed arborist. Should larger tree plantings or deeper root zones be required, further consultation with the appointed arborist will be required to determine the appropriate capping specification, and the amended capping specification will need to be detailed in an RWP or an addendum to this RAP. Waratah note that it is likely that all fill would need to be removed in order to facilitate the capping layer noted above, due to the generally shallow fill depths encountered within the proposed landscaping areas. On this basis, Option 3 – off-site disposal of contaminated soil may be adopted as the remediation strategy for landscaping areas which are not located within planters.

Waratah notes that the capping specifications relate to remedial options only and do not consider engineering requirements.

The remediation steps are provided below;

Step	Role / Responsibility	Procedure
1	Remediation Contractor	Earthworks/site preparations: The remediation contractor is to complete the earthworks required to facilitate the proposed capping of the site. It would be preferable for this to occur for all areas concurrently, rather than some areas being left until late in the construction program. Where piling is required, it would also be preferable for the piling area to be stripped of fill soils and the piling platform created

adjacent to the alignment of the piles, to minimise the potential for cross-contamination between fill and natural soils. It is expected that piling spoil will be required to be disposed off-site.

	Validation Consultant	Any imported materials used (including materials used for site preparation, including a piling platform) are to be validated by the validation consultant in accordance with Section 8 .
2	Remediation Contractor	Survey of site levels: A pre-capping levels survey is to be completed by the relevant contractor. This should occur after the installation of the geotextile marker layer, but before the installation of any overlying capping layers. The purpose of the survey is to provide a record of the site levels across the top of the geotextile marker layer. It is recommended that the survey points are recorded with a spacing of not more than 10m between adjacent points. Additional survey points will be required in the vicinity of changes in surface slope and for specific features such as service trenches. A post-capping levels survey is to be completed by the relevant contractor. This should occur after the installation of all overlying capping layers, and the survey points should generally align with the pre-capping survey points. The purpose of the survey is to provide a record of the thickness of the capping layers installed above the geotextile marker layer.
3	Remediation Contractor	Capping: The cap is to be constructed in accordance with the capping specification. Any variations to the specifications should be discussed with and approved by the site auditor.
	Validation Consultant	Any imported materials used are to be validated by the validation consultant in accordance with Section 8. The validation consultant is required to inspect the capping works and imported materials in accordance with the validation plan.
4	Validation Consultant	Long Term Environmental Management Plan (LTEMP): The capping of contaminated fill on-site will require a LTEMP to be prepared for the site with reference to the NSW EPA guidelines on Preparing Environmental Management Plans for Contaminated Land (January 2022)20.
	Client	The LTEMP will require public notification and must be legally enforceable. This may include listings in the Section 10.7 planning certificate and on the land title, and/or a modification to the consent conditions. Waratah recommend obtaining legal advice on the legal enforceability of the LTEMP.

6.7. Disposal Requirements

Any material removed from the site must be disposed of to a waste facility licensed by the NSW EPA to receive the waste stream. The waste classification report (as outlined in **Section 5**) must be used to facilitate the lawful disposal of the waste.

6.8. Remediation Documentation

The construction/remediation contractor must keep records and retain all documentation associated with the remediation, including but not limited to:

- Waste/surplus soil disposal dockets;
- Asbestos management documentation, including all relevant notifications, licences, clearance certificates and air monitoring reports (additional details in this regard are to be outlined in the AMP);
- Imported materials information;
- Survey of marker layer installation;
- Survey of top of capping layer;
- Photographs of remediation works; and
- Waste tracking documentation.

Copies of the documents must be forwarded to the validation consultant on completion of the remediation for inclusion in the validation report.

Any waste movements should be documented. Copies of the documents must be forwarded to the validation consultant on completion of the remediation for inclusion in the validation report.

6.9. Soil Waste Material

All waste removed from the site is to be appropriately tracked and managed in accordance with the relevant regulations. The remediation contractor (and/or their nominated construction contractor) is to maintain adequate records and retain all documentation for waste disposal activities including:

- A summary register including details such as waste disposal dates, waste materials descriptions, disposal locations (i.e. facility details, including applicable NSW Environmental Protection Licence) and reconciliation of this information with waste disposal docket numbers; and
- Waste tracking records and transport certificates (where waste is required to be tracked/transported in accordance with the regulations); and
- Disposal dockets for the waste.

Any soil waste classification documentation is to be prepared in accordance with the reporting requirements specified by the NSW EPA. Reports are to include:

- The full name, address, Australian Company Number (ACN) or Australian Business Number (ABN) of the organisation and person(s) providing the waste classification;
- Location of the site where the waste was generated, including the source site address;
- History of the material and the processes and activities that have taken place to produce the waste;
- Potential contaminating activities that may have occurred at the site where the waste was generated;
- Description of the waste, including photographs, visible signs of contamination, such as discolouration, staining, odours, etc;

- Quantity of the waste;
- Number of samples collected and analysed;
- Sampling method including pattern, depth, locations, sampling devices, procedures, and photos of the sample locations and samples;
- Contaminants tested;
- Laboratory documentation – CoC, sample receipt, laboratory report;
- All results regardless of whether they are not used in the classification process;
- Results of sample mean, sample standard deviation and the 95% upper confidence limit (UCL) where relevant;
- Brief summary of findings including discussion of results; and
- A clear statement of the classification of the waste as at the time of the report.

Copies of the documents must be forwarded to the validation consultant on completion of the remediation for inclusion in the validation report.

6.10. Imported Materials

The remediation contractor (and/or their nominated construction contractor) is to maintain for the duration of the project an imported material register. This must include a register with details of each imported material type, supplier details, summary record of where the imported materials were placed on site, and importation docket numbers and a tally of quantities (separated for each import stream). Dockets for imported materials are to be provided electronically so these can be reconciled with the register.

The above information is to be provided to the validation consultant for inclusion in the validation report. It is recommended that the register be set up at the beginning of the project and provided to the validation consultant regularly so the details can be checked and any rectification of the record keeping process can occur in a timely manner.

7. Validation Plan

Validation is necessary to demonstrate that remedial measures described in this RAP have been successful and that the site is suitable for the intended land use. The validation can be staged if required, depending on the sequence of excavation. Additional validation sampling may be required based on site observations made during remediation. Site observations will also be used as a validation tool to assess the extent of site contamination.

7.1. Validation Sampling and Documentation

The validation requirements for the site are detailed below;

Aspect	Sampling	Analysis	Observations & Documentation
<i>Capping</i>			
Survey of site levels.	NA	NA	Remediation contractor to obtain the survey as required in Section 6.3 . It is also expected that the remediation contractor or their nominated construction contractor will provide as-built drawings for the project which document the capping layers.
Inspections	NA	NA	Validation consultant to carry out inspections to document the installation of the cap. Key hold points for inspections include: Geotextile/geogrid/marker installation; During importation of materials used to construct the cap; and Finished surface levels. A photographic record is to be maintained by the remediation contractor and validation consultant.
Validation of imported materials	See below	See below	See below
<i>Imported Materials – validation of imported materials is required for any materials imported onto the site during the remediation and to the point in time that the site validation report is prepared (e.g. gravel for site preparation, basecourse, landscaping materials, VENM, backfill for service trenches, material used for capping layers etc).</i>			
Imported VENM backfill (if required)	Minimum of three samples per source. Additional sampling may be required at the validation consultant's discretion based on robustness of supplier	Heavy metals TRH/BTEX, PAHs, OCPs, OPPs PCBs and Asbestos	VENM documentation/report required from the remediation contractor. The documentation/report must be provided to the validation consultant prior to importation to the site. The provided documentation/report should include source site history to demonstrate analytes are appropriate.

documentation /
VENM report

Photographs of the VENM at the source site.

The VENM is to be inspected upon importation by the validation consultant to confirm it is free of visible/olfactory indicators of contamination and is consistent with documentation. Photographic documentation and an inspection log are to be maintained.

Where check sampling occurs by the validation consultant due to deficiencies or irregularities in existing VENM documentation, the following is required:

Date of sampling and description of material sampled;

An estimate of the volume of material imported at the time of sampling;

Sample location plan; and

Analytical reports and tabulated results with comparison to the site acceptance criteria (SAC).

7.2. Site Acceptance Criteria and Data Assessment

The site acceptance criteria (SAC) is presented below;

Validation Aspect	Criteria
<u>Waste Classification</u>	NSW EPA Waste Classification Guidelines (2014)
<u>Validation of Capping</u>	Validation of capping will occur via a review of survey information, as-built drawings and via the inspection process. The validation report is to include cross-sections documenting the completed capping details for the various areas of the site.
<u>Imported Materials</u>	Material imported as general fill must only be VENM or ENM. VENM is defined in the POEO Act (1997) as material: - That has been excavated or quarried from areas that are not contaminated with manufactured chemicals, or with process residues, as a result of industrial, commercial mining or agricultural activities; - That does not contain sulfidic ores or other waste; and - Includes excavated natural material that meets such criteria for virgin excavated natural material as may be approved from time to time by a notice published in the NSW Government Gazette. ENM and recycled materials are to meet the criteria of the relevant exemption/order under which they are produced. Analytical results for VENM and other imported materials will need to be consistent with expectations for those materials. For VENM, it is expected that:

- Heavy metal concentrations are to be less than the most conservative ACL concentrations for a 'commercial/industrial' exposure setting presented in Schedule B1 of the NEPM (2013); and
- Organic compounds are to be less than the laboratory PQLs and asbestos to be absent.

All materials imported onto the site must also be adequately assessed as being appropriate for the final use of the site. A risk-based assessment approach is to be adopted with regards to the tier 1 screening criteria presented in Schedule B1 of NEPM (2013).

Aesthetics: all imported materials are to be free of staining and odours.

7.3. Validation Report

As part of the validation process a site validation report will be prepared on completion of remediation and validation by the validation consultant. The report will outline the remediation work undertaken at the site and any deviations to the remediation strategy. The report will present the results of the validation assessment and will be prepared in accordance with the Reporting Guidelines. The validation report should draw conclusions regarding the success of the remediation/validation and the suitability of the site for the proposed development (from a contamination viewpoint).

7.4. Data Quality

Data Quality Objectives (DQOs) and Data Quality Indicators (DQIs) must be clearly outlined and assessed as part of the validation process. A framework for the DQO and DQI process is outlined below and should be reflected in the validation report. DQOs should be established for the validation with regards to the seven-step process outlined in the NEPM (2013). The seven steps include the following:

- State the problem;
- Identify the decisions/goal of the study;
- Identify information inputs;
- Define the study boundary;
- Develop the analytical approach/decision rule;
- Specify the performance/acceptance criteria; and
- Optimise the design for obtaining the data.

DQIs are to be assessed based on field and laboratory considerations for precision, accuracy, representativeness, completeness and comparability.

8. Contingency Plan

A review of the proposed remediation works has indicated that the greatest risks that may affect the success of the remediation include identification of unexpected finds. Contingency plans to address these risks are outlined below, in conjunction with a selection of other contingencies that may apply to this project.

8.1. Unexpected Finds

Residual hazards that may exist at the site would generally be expected to be detectable through visual or olfactory means. At this site, these types of hazards may include: underground tanks and odorous or stained hydrocarbon impacted soils. The procedure to be followed in the event of an unexpected find is presented below:

- In the event of an unexpected find, all work in the immediate vicinity should cease and the client should be contacted immediately;
- Temporary barriers should be erected to isolate the area from access to the public and workers;
- The client should engage the validation consultant to attend the site and assess the extent of remediation that may be required and/or adequately characterise the contamination in order to allow for remediation of the material;
- In the event additional remediation is required, the procedures outlined within this report should be adopted where appropriate;
- An additional sampling and analytical rationale should be established by the consultant and should be implemented with reference to the relevant guideline documents; and
- Appropriate validation sampling should be undertaken and the results should be included in the validation report.

8.2. Importation Failure for Imported Materials

Where material to be imported onto the site does not meet the importation acceptance criteria detailed in **Section 8**, the only option is to not accept the material. Alternative material must be sourced that meets the importation requirements. For this reason, any material to be imported to the site should be appropriately validated prior to receiving at the subject site.

8.3. Contingency Remediation Option

Alternative to the use of containment cells, it may be more feasible for project outcomes to dispose of contaminated materials offsite. The procedure for excavation of contaminated fill soil is outlined below:

- The remediation contractor is to ensure compliance with WHS requirements, including PPE and asbestos monitoring requirements outlined in the AMP;
- The excavation area should be clearly defined and the site prepared appropriately to facilitate the excavation. Appropriate geotechnical advice relating to temporary shoring, earthworks and battering requirements etc should be sought;
- The contaminated material is to be disposed of in accordance with the assigned waste classification to a landfill licensed by the NSW EPA to receive the waste. A letter confirming the landfill is appropriately licensed should be obtained;
- All documents including the waste disposal dockets must be retained by the remediation contractor and forwarded to the client and validation consultant. This documentation forms a key part of the validation process and must be included in the validation report;

- If the validation fails, the excavation must be chased out until the validation is successful; and
- If the validation is successful, the excavation can be backfilled/reinstated (in accordance with the project geotechnical requirements) with clean/validated material.

8.4. Validation Sampling and Documentation

As a minimum, the following validation sampling and documentation will be required:

- One sample per 25m² of the base of the excavation (i.e. on a 5m by 5m grid), with additional samples targeting any areas where fill removal does not appear adequate;
- Any exposed soil at the excavation walls should be sampled every 5m lineal and every fill profile (with a minimum of one sample per 1m vertical of fill);
- Validation samples are to be analysed for the contaminant of concern. If asbestos is identified/suspected, the validation samples are to include bulk (10L) field quantification and laboratory 500mL) samples;
- As a minimum, validation records are to include:
 - o Visual observations to confirm the fill removal is acceptable;
 - o Photographs to be taken;
 - o Samples to be screened using a PID;
 - o Observations of staining and odour to be recorded;
 - o Disposal dockets to be retained and forwarded to the validation consultant for inclusion in the validation report; and
 - o Any asbestos-specific requirements (air monitoring results, clearance inspections), as relevant.
- Analytical results for the contaminants of concern are to be below the HIL/HSL-D criteria for soils presented in Schedule B(1) of the NEPM (2013), as applicable. The HSLs are to assume a depth interval of 0-1m and a sand-type soil;
- Any areas used for residential access, communal areas or garden areas will be assess against the applicable HIL / HSL-A for residential areas with access to soils, and HIL / HSL-B for residential areas without access to soils;
- Analytical results for the contaminants of concern are to be below the EIL for a commercial/industrial exposure scenario. The EILs for selected metals are to be calculated based on the ABC and ACL values presented in the validation report;
- Analytical results for the contaminants of concern are to be below the ESL criteria for commercial/industrial exposure scenario, adopting a 'coarse' type soil;
- Analytical results for AF/FA in soil are to be <0.001%w/w, based on the HSL-D criterion for soil presented in schedule B(1) of the NEPM (2013);
- Analytical results for ACM in soil are to be <0.05%w/w based on the HSL-D criterion for soil presented in schedule B(1) of the NEPM (2013); and
- No visible FCF at the site surface and/or within the base of exposed excavations.

The EIL/ESL criteria are only applicable to the top 2m of soil within unpaved/landscaped areas, if included.

9. Site Management

The information outlined in this section of the RAP is for the remediation work only. The client should make reference to the development consent for specific site management requirements for the overall development of the site.

A Construction Environmental Management Plan (CEMP) is required for the construction works. The CEMP must capture relevant information documented in this RAP for consistency, where applicable.

9.1. Asbestos Management Plan

Prior to the commencement of any soil disturbance in the remediation areas, an AMP is to be prepared by the validation consultant (or the remediation contractor) to document the asbestos-related management requirements for the remediation. The AMP is to be implemented by the remediation contractor (and their nominated subcontractors where relevant) throughout the remediation. The AMP should include the removal of ACM within building materials prior to demolition.

9.2. Airborne Asbestos Monitoring (AAMs)

Due to the friable nature of the identified ACM, airborne asbestos monitoring (AAM) must be included in the AMP. The AAM must only be carried out by personnel registered and accredited by NATA. Filter analysis must only be carried out within a NATA certified laboratory. The monitoring results must conform to the requirements of the National Occupational Health and Safety Commission (NOHSC) Guidance note on the Membrane Filter Method for Estimating Airborne Asbestos Fibres 2nd Edition [NOHSC:3003 (2005)]²³.

The monitoring program will be used to assess whether the control procedures being applied are satisfactory and that criteria for airborne asbestos fibre levels are not being exceeded. The following levels will be used as action criteria during the air monitoring:

- <0.01 Fibres/ml: Work procedures deemed to be successful;
- 0.01 to 0.02 Fibres/ml: Inspection of the site and review of procedures; and
- >0.02 Fibres/ml: Stop work, inspection of the site, review of procedures, clean-up, rectification works where required and notify the relevant regulator.

9.3. Health & Safety Plan

A site specific WHS plan should be prepared by the contractor for all work to be undertaken at the site. The WHS plan should meet all the requirements outlined in SafeWork NSW WHS regulations.

At a minimum requirement, personnel must wear appropriate protective clothing, including long sleeve shirts, dust masks/respirators, long trousers, steel cap boots and hard hats. Additional asbestos-related PPE will be required for asbestos-related works and this will be specified in the AMP. Washroom and lunchroom facilities should also be provided to allow workers to remove potential contamination from their hands and clothing prior to eating or drinking. This will include the use of a wet decontamination unit for all friable asbestos removal works.

10. Conclusion

The PSI (Waratah, 2023) identified historically imported fill soil, The DSI (Waratah, 2023a) confirmed that the fill soils in the northern portion of the site contained ACM in a bonded and friable condition.

Waratah has identified data gaps which require addressing (refer to **Section 3.5**) and recommend that that these data gaps be closed as part of the validation report. In the event that additional contamination is encountered that requires remedial or site management measures to be implemented outside the scope of this RAP, the remediation and validation details must be included in the validation report. This includes remediation and validation associated with the removal of any USTs or other buried infrastructure.

The remediation strategy includes the capping of contaminated fill on-site. This RAP also provides a contingency option for off-site disposal of contaminated fill, should the data gap investigation identify contamination which is not suitable to be capped, and/or subsequent stakeholder consultation establish that this option is most preferred.

Both remedial options outlined above are considered technically achievable to implement and validate. On this basis, Waratah is of the opinion that the site can be made suitable for the proposed development provided this RAP is implemented.

A site validation report is to be prepared on completion of remediation activities and submitted to the consent authority to demonstrate that the site is suitable for the proposed development. In the event that contaminated fill is capped on site (i.e. the preferred remediation approach), an EMP will also be required as part of the validation documentation process.

10.1. Regulatory Requirements

Guideline / Legislation	Details
<u>Resilience and Hazards SEPP</u>	Under the Resilience and Hazards SEPP, site remediation can fall under Category 1 or Category 2 remediation works. In our opinion the remediation will fall within Category 2. However, Waratah recommend that the client to consult the project planner to confirm the remediation category prior to commencement of works. Development consent is not required for Category 2 remediation works; however the consent authority should be given 30 days' notice prior to commencement of works. Under Clause 4.14 of Resilience and Hazards SEPP, a notice of completion of remediation work is to be given to council within 30 days of completion of the work. The notice of completion of remediation works must be in accordance with Clause 4.15 of Resilience and Hazards SEPP.
<u>Duty to Report Contamination</u>	There is currently no requirement to notify NSW EPA of site contamination, this requirement should be reassessed should remedial goals not be met.
<u>POEO Regulations (2014) Waste</u>	Part 7 of the POEO Waste Regulation 2014 set outs the requirements for the transportation and management of asbestos waste and Clause 79 of the POEO Waste Regulation requires waste transporters to provide information to the NSW EPA regarding the movement of any load in NSW of more than 10 square meters of asbestos sheeting, or 100 kilograms of asbestos waste. To fulfil these legal obligations, asbestos waste transporters must use WasteLocate. Clause 78 of the POEO Waste Regulation requires that a person who transport asbestos waste must ensure that:

- Any part of any vehicle in which the person transports the waste is covered, and leakproof, during the transportation;
 - If the waste consists of bonded asbestos material—it is securely packaged during the transportation;
 - If the waste consists of friable asbestos material—it is kept in a sealed container during transportation; and
 - If the waste consists of asbestos-contaminated soils—it is wetted down.
- Asbestos waste in any form cannot be re-used or recycled.

SafeWork NSW

Sites with asbestos become a 'workplace' when work is carried out there and require a register and AMP. Appropriate SafeWork NSW notification will be required for asbestos removal works or handling. Contractors are also required to be appropriately licensed for the asbestos works undertaken (i.e. Class A licence for friable asbestos work).

11. Statement of Limitations

This report has been prepared for the sole use of the client (defined above). Waratah take no responsibility for the use of this document by any third party. This report does not provide any legal advice and has been prepared under the direct instructions of the client.

Waratah accepts no liability for the incorrect implementation of recommendations made in this report.

Should any suspected hazardous materials be encountered at any stage of the development, a suitably qualified environmental scientist should be engaged to manage the material.

This report should be read in its entirety, this report should not be separated or read in part as this has the potential to affect the findings of the report.

This report has been prepared by a suitably trained professional with a degree of care and diligence considered to be in conjunction with industry standards. Waratah, however, does not accept any responsibility or liability for the loss, damage, injury or death suffered by any party arising from the use of this report.

This report has been developed to guide the construction process, Waratah does not accept any liability for the quality or standard of work produced by any third party throughout the duration of this project.

References

- Chapman, G.A & Murphy, C.L (1989) Soil Landscapes of the Sydney 1:100 000 sheet, Soil Conservation Service, Sydney September 1989;
- DMR (1983) Sydney 1:100 000 Geological Series Sheet 9130 (Edition 1) *Geological Survey of NSW*; Department of Mineral Resources;
- EPA (2014) *Waste Classification Guidelines*
- SafeWork NSW (2019) *How to manage and control asbestos in the workplace*;
- SafeWork NSW (2019) *How to safely remove asbestos*
- Waratah (2023) Preliminary Site Investigation; 142-146 Pitt Road, North Curl Curl NSW ref: WEC121.PSI_v1.0 dated 23 June 2023;
- Waratah (2023) Detailed Site Investigation; 142-146 Pitt Road, North Curl Curl NSW ref: WEC121.DSI_v1.0 dated 3 November 2023
- Warren and Mahoney Living Australia Pty Ltd (2023) Development Plans; 42-146 Pitt Road, North Curl Curl NSW ref: 10146, dated 17/11/2023

Abbreviations

ACM	Asbestos Containing Material
ASS	Acid Sulfate Soils
ANZECC	Australian & New Zealand Environment Conservation Council
ARMCANZ	Agriculture & Resource Management Council of Australia & New Zealand
B(α)P	Benzo(α)pyrene
BH	Borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
CoC	Chain of Custody
cVOC	Chlorinated volatile organic compound
DA	Development Application
DECC	Department of Environment & Climate Change (see OEH)
DECCW	Department of Environment & Climate Change & Water (see OEH)
DNAPL	Dense non-aqueous phase liquid
DO	Dissolved Oxygen
DP	Deposited Plan
EC	Electrical Conductivity
EIL	Environmental Investigation Level
EPA	Environmental Protection Authority
ESA	Environmental Site Assessment
ESL	Environmental Screening Level
GIL	Groundwater Investigation Level
GME	Groundwater Monitoring Event
HIL	Health-based Investigation Level
HM	Heavy Metals
HSL	Health-based Screening Levels
Km	Kilometre
LNAPL	Light non-aqueous phase liquid
LOR	Limit of report
mAHD	metres Australian Height Datum
mBGL	metres below ground level
mg/L	Milligrams per litre
µg/L	Micrograms per litre
mV	Millivolts
NATA	National Association of Testing Authorities, Australia
NEPC	National Environmental Protection Council
NEPM	National Environmental Protection Measures
NSW	New South Wales
OCP	Organochlorine pesticides
OEH	Office of Environment and Heritage
OPP	Organophosphorus pesticides
PAHs	Polycyclic Aromatic Hydrocarbons
PCB	Polychlorinated Biphenyls
pH	per Hydrogen (measurement of acidity / alkalinity)
PQL	Practical Quantitation Limit
QAQC	Quality Assurance / Quality Control
RAP	Remedial Action Plan
SAQP	Sample, Analysis & Quality Plan

SIL	Soil Investigation Level
SRA	Sample Receipt Advice
SWL	Standing Water Level
TDS	Total dissolved solids
TCLP	Toxicity Characteristics Leachate Procedure
TRH	Total recoverable hydrocarbons
UCL	Upper Confidence Limit
USEPA	United State Environmental Protection Agency
UPSS	Underground Petroleum Storage System
UST	Underground Storage Tank
VOCs	Volatile organic compounds
WADOH	Western Australia Department of Health

Appendix A – Figures



Site Boundary

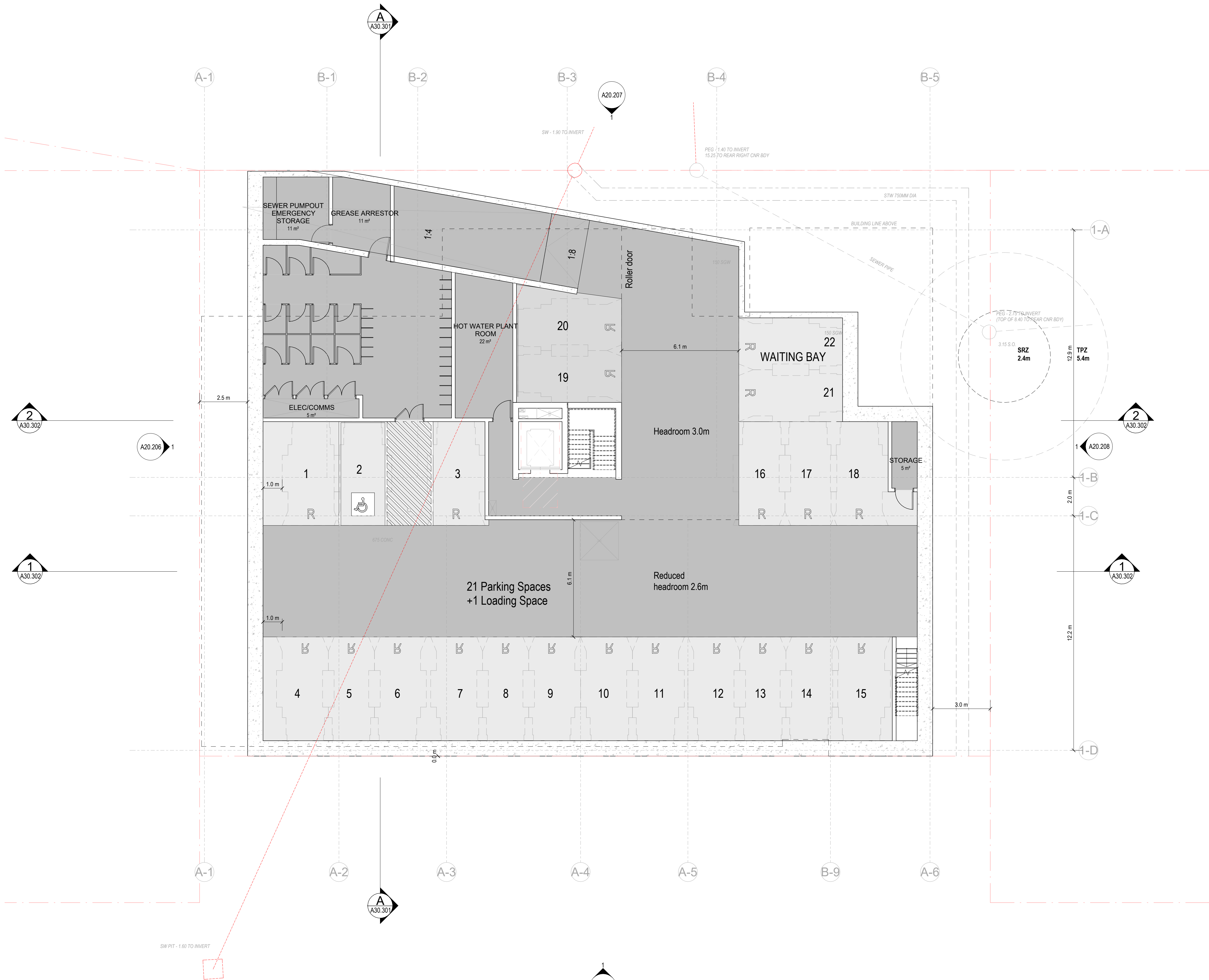
*All locations are approximate

Balito Investments
142-146 Pitt Road,
North Curl Curl NSW
Figure 1 –Site Location

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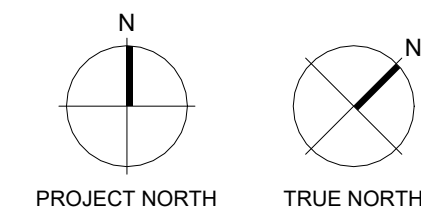
Appendix B – Development Plans



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Revisions

Notes



Consultants

Project Manager
Structural Engineer
Mechanical Engineer
Fire Engineer
Electrical Engineer
Client
Grant Price - Balito Investments

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Registered Architects and Designers
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Project Title

142-146 PITT ROAD

North Curl Curl, NSW, 2099

Drawing Title

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Drawing Status

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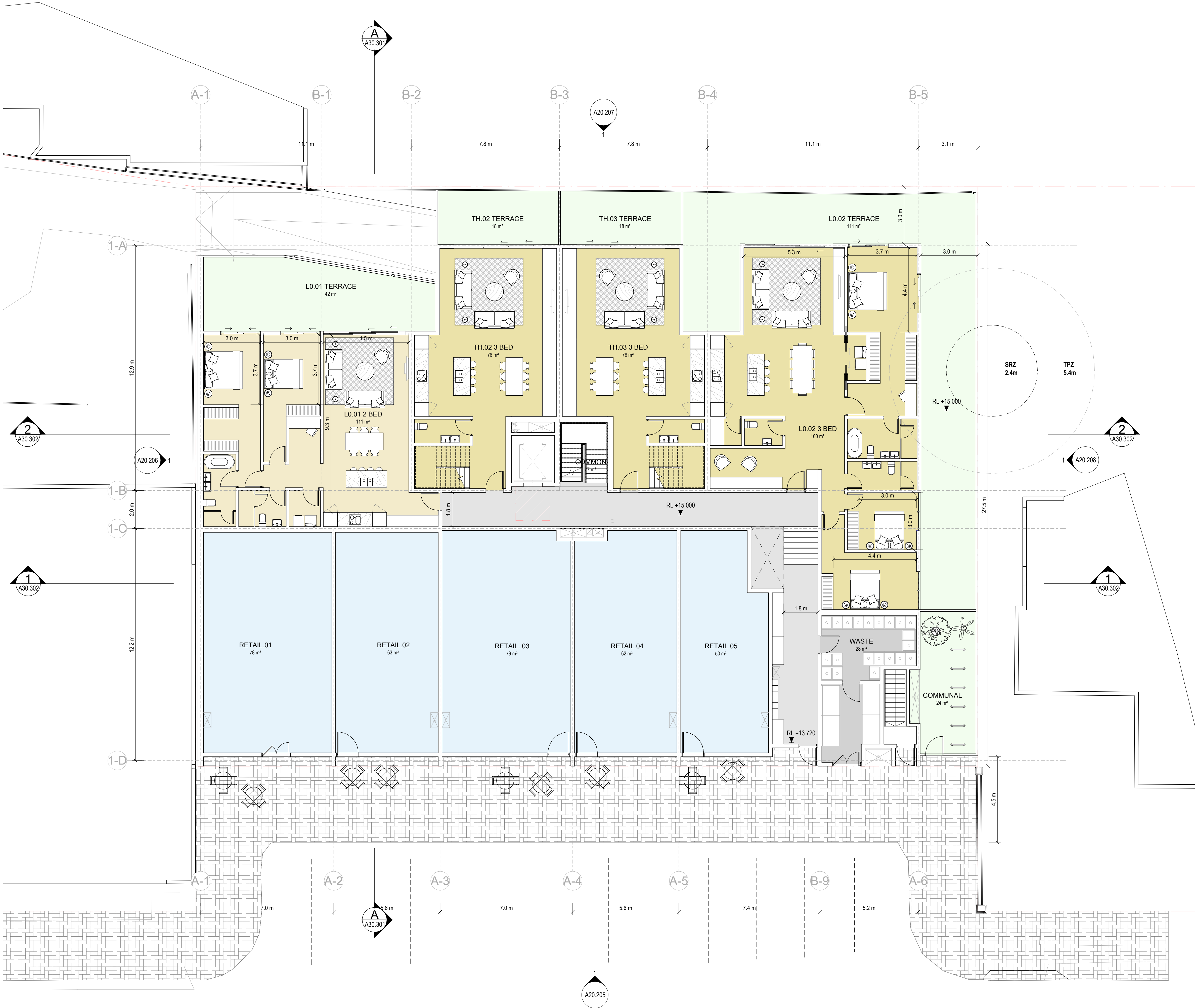
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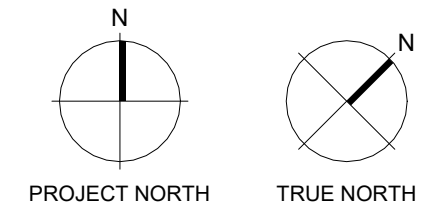
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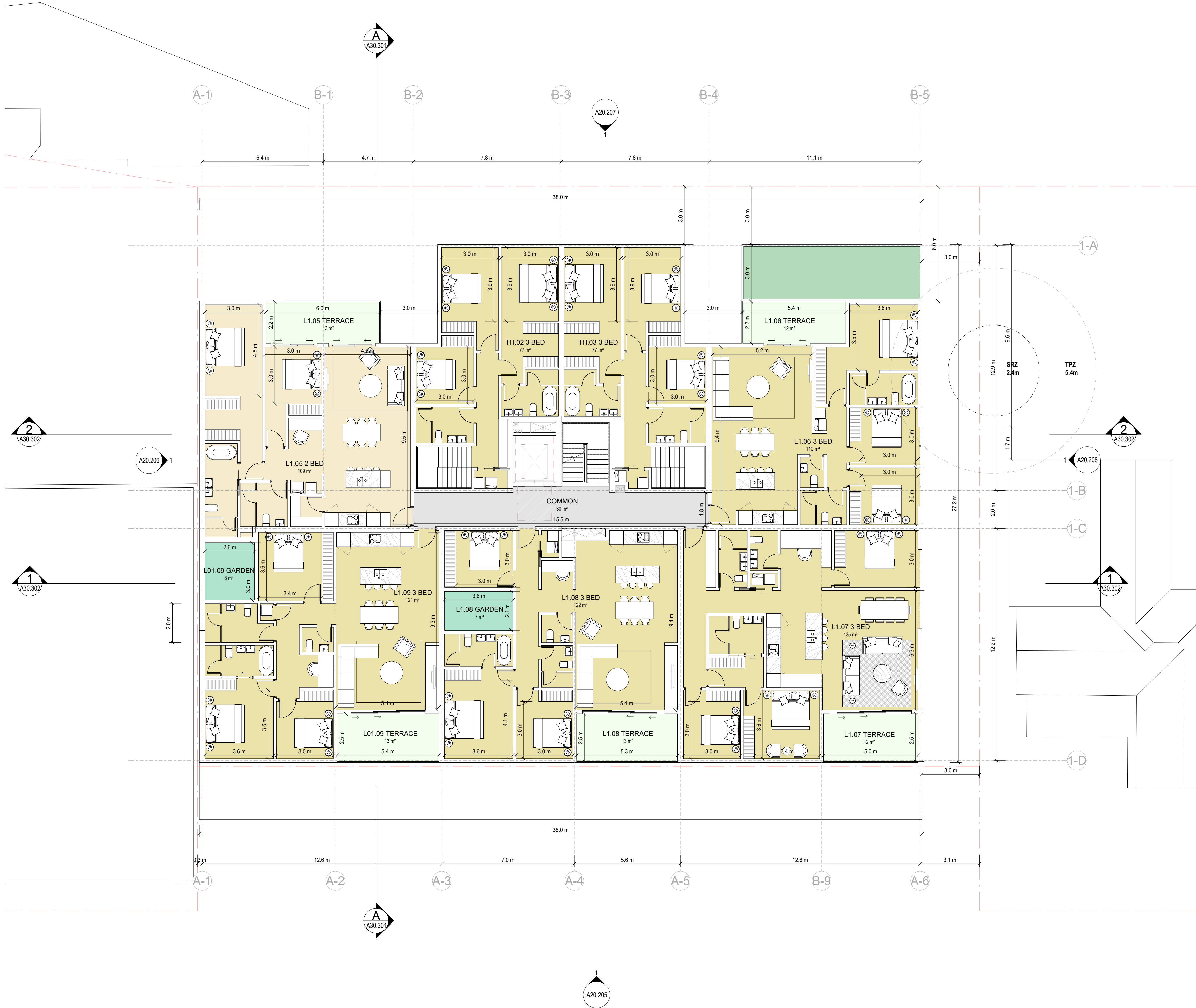
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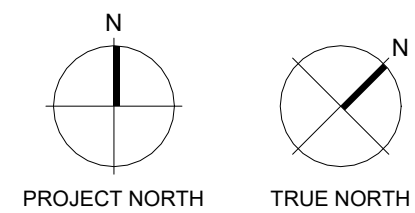
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Drawing Title

Level 01

Drawing Status

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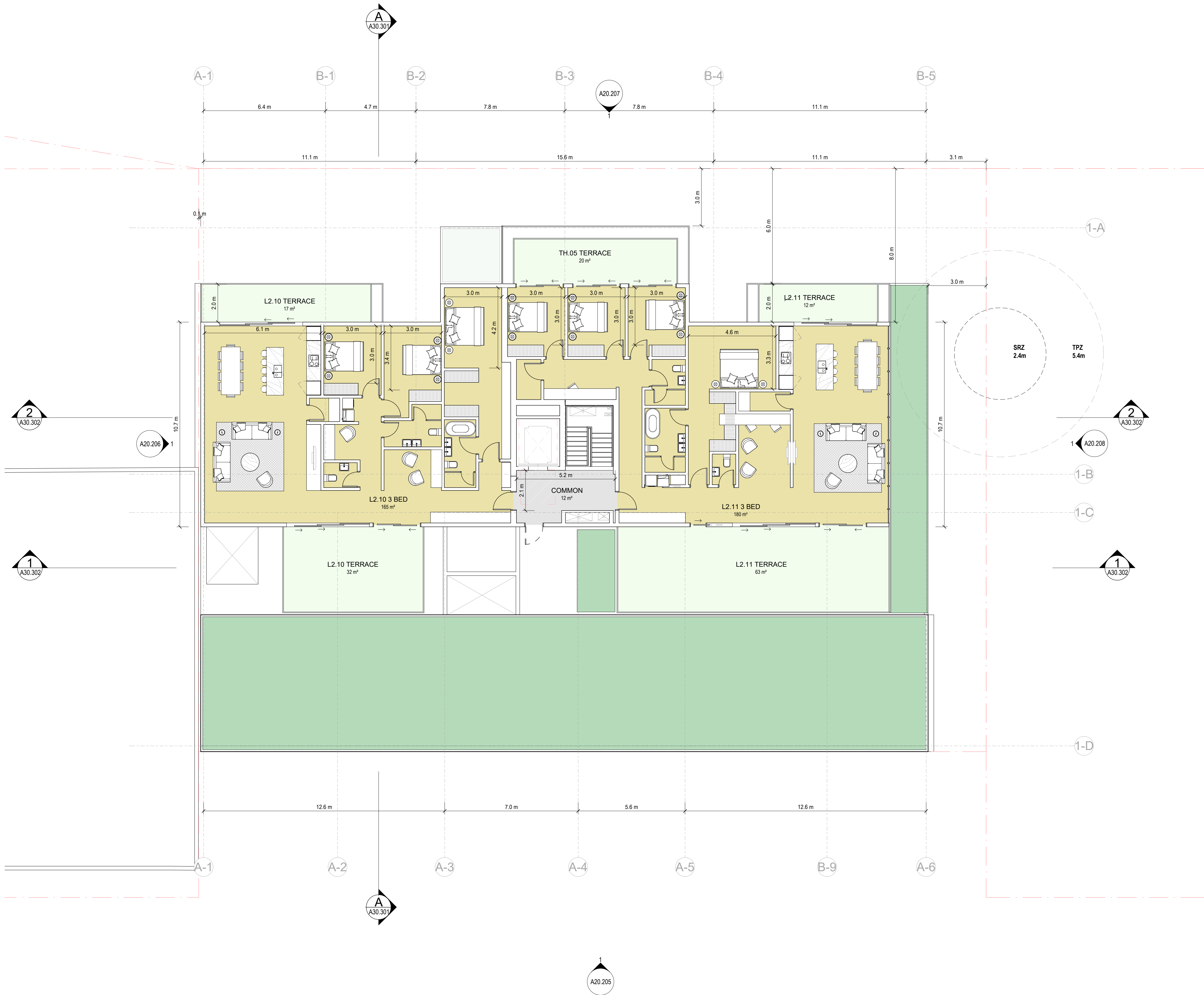
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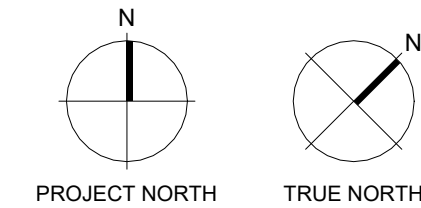
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- Fire Engineer
- Electrical Engineer
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Project Title

142-146 PITT ROAD

Drawing Title

Level 02

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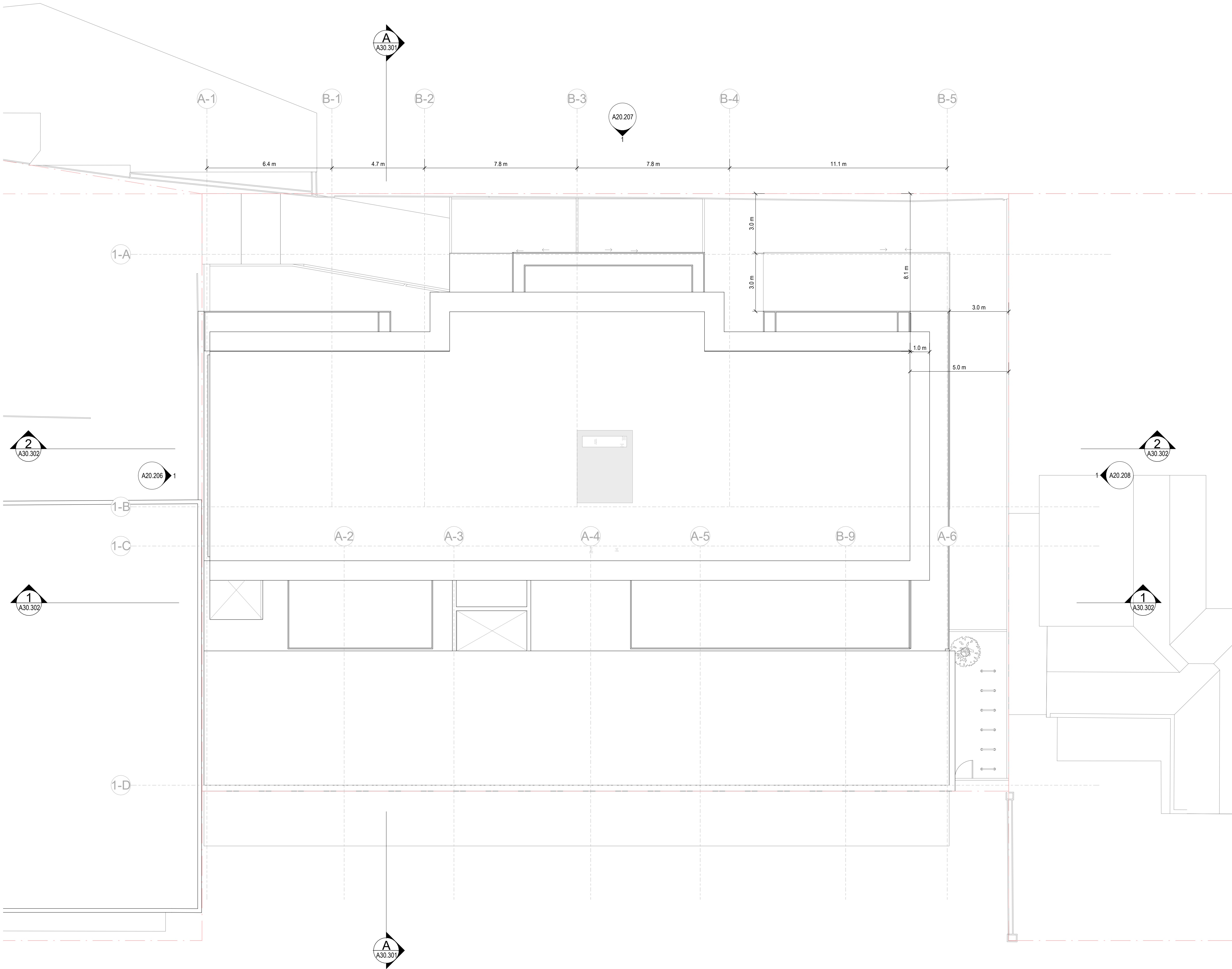
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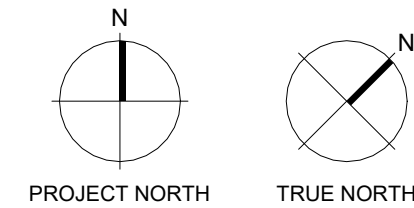
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Structural Engineer
Mechanical Engineer
Fire Engineer
Electrical Engineer
Client
Grant Price - Balito Investments

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142-146 PITT ROAD

North Curl Curl, NSW, 2099

Drawing Title

Roof Level

Drawing Status

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Drawing Details

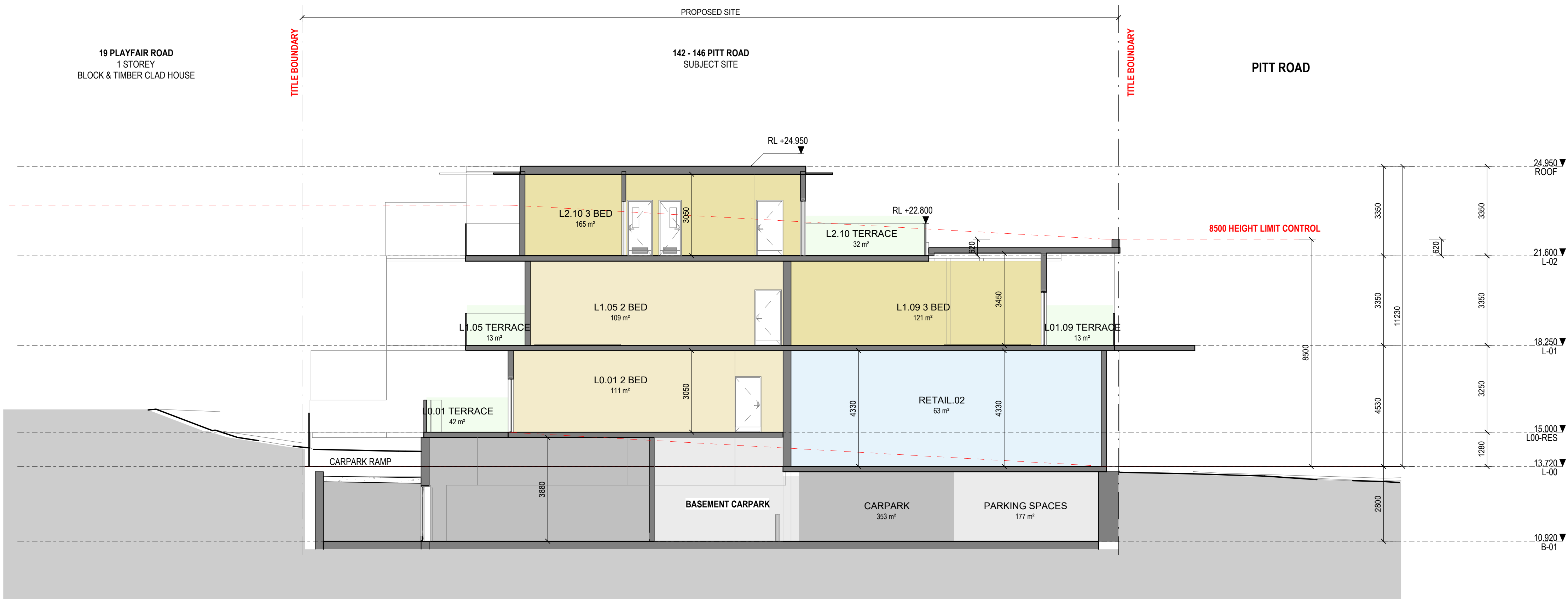
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- Mechanical Engineer
- Fire Engineer
- Electrical Engineer
- Client
- Grant Price - Balito Investments

Warren and Mahoney Living Australia Pty Ltd

Suite 13.03, Plaza Building
Australia Square, 95 Pitt Street
Sydney, NSW 2000
Australia
Phone + 61 2 8021 9809
Nominated Architect:
Sven Ollmann ARB NSW 11123
Registered Architects and Designers
www.warrenandmahoney.com

Project Title

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SECTION - A

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Revision

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