

Lotus Project Management Pty Ltd



Flood Assessment and Preliminary Flood Emergency Response Plan (FERP): 1129-1131 Pittwater Road, Collaroy NSW

ENVIRONMENTAL



WATER



WASTEWATER



GEOTECHNICAL



CIVIL



PROJECT
MANAGEMENT



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All enquiries regarding this project are to be directed to the Project Manager.

Executive Summary

Martens & Associates Pty Ltd (MA) have prepared this flood assessment and preliminary flood emergency response plan (PFERP) to support a development application (DA) for a proposed shop top housing development at 1129-1131 Pittwater Road, Collaroy, NSW (the site). This report documents the procedures and findings of hydrologic and hydraulic modelling of the site in existing and proposed conditions.

Assessment concluded that:

1. Proposed flood characteristics are largely consistent with existing conditions, and differences due to the proposed development are negligible.
2. The proposed development would have acceptable offsite flood impacts.
3. Compliance with Council flood planning level requirements for building and car park levels are generally achieved.
4. The proposed development is compatible with the existing floodplain environment.
5. The compliance assessment demonstrates the site can be developed in accordance with Council flood planning requirements.

The PFERP finds that whilst the site is affected by flood water in infrequent events greater than the 1% AEP flood, a range of straightforward mitigation measures can be implemented to reduce the flood risks at the site to acceptable levels. In summary:

1. Warning procedures prior to the flood occurring will significantly reduce the likelihood of persons on site being exposed to a major flood event.
2. Risk to persons on site is managed through a shelter-in-place during major flood events greater than the 1% AEP event.
3. The proposed backup flood warning device ensures that effective warning time and reliable flood-safe egress can occur in the unlikely event that there are no other prior emergency services flood warnings.
4. The PFERP, Preliminary Flood Risk Action Plan (PFRAP) demonstrate that the site can operate safely.

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1 Introduction

1.1 Overview

Martens & Associates Pty Ltd (MA) have prepared this flood assessment and preliminary flood emergency response plan (FERP) to support a development application (DA) for a proposed shop top housing development at 1129-1131 Pittwater Road, Collaroy NSW (the site). Refer to Attachment A for site survey and Attachment B for proposed site layout.

1.2 Project Scope and Objectives

Project scope and objectives are:

1. Prepare a hydrologic model (RAFTS) for the site to determine the peak flow of the 1% annual exceedance probability (AEP) flood and probable maximum flood (PMF) events.
2. Prepare a hydraulic model (TUFLOW) for the site under existing and proposed conditions.
1. Prepare relevant flood maps including flood extents, depths, levels, velocities, hazards and impacts.
2. Comment on flood characteristics and model outcomes in existing and proposed conditions.
3. Prepare a preliminary flood emergency response plan (PFERP) and preliminary flood risk action plan (PFRAP) for the developed site.
4. Prepare a compliance assessment in accordance with NBC floodplain development controls.

1.3 Relevant Guidelines

This report has been prepared in accordance with the following guidelines and policies:

1. Commonwealth of Australia (Geoscience Australia) (2016), *Australian Rainfall and Runoff – A Guide to Flood Estimation*.
2. Northern Beaches Council (2015) *Flood Prone Land Design Standard*.
3. NSW Department of Infrastructure, Planning and Natural Resources (2005), *Floodplain Development Manual*.

4. Warringah Council (2011a), *Warringah Local Environmental Plan (LEP)*.
5. Warringah Council (2011b), *Warringah Development Control Plan (DCP)*.
6. Warringah Council (2014), *Flood Risk Assessment Report Guidelines*.

1.4 Definitions

| | |
|---------|---------------------------------------------------------------------------------------------------------------------------------------------------------|
| AEP | Annual exceedance probability: the probability of a flood event occurring within a year. A 1% AEP flood has a 1% chance of occurring in any given year. |
| ARI | Average recurrence interval: the average time between flood events occurring. A 100 year ARI flood occurs on average once every 100 years. |
| ARR | Australian Rainfall & Runoff |
| BOM | Bureau of Meteorology |
| Council | Northern Beaches Council (NBC) |
| DA | Development application |
| FFL | Finished floor level |
| FPL | Flood planning level |
| IFD | Intensity frequency duration – design rainfall data for frequent and infrequent storm events. |
| MA | Martens & Associates Pty Ltd |
| PFERP | Preliminary Flood emergency response plan |
| PFRAP | Preliminary Flood risk action plan |
| PMF | Probable maximum flood – the most extreme flood event possible for a certain location, with an approximate ARI of 100,000 to 10,000,000 years. |
| PMP | Probable maximum precipitation – design rainfall data for extreme storm events. |

2 Site Description and Background Data

2.1 Location and Site Description

Existing site description summary is provided in Table 1.

Table 1: Existing site description summary.

| Item | Description / Detail |
|-----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Site address | 1129-1131 Pittwater Road, Collaroy, NSW 2097 |
| Legal Identifier | Lot 4 DP 7445 and lot 1 DP 859613 |
| Surveyed area | 814.6 m ² (Land & Engineering Surveyors, 2019) |
| Local Government Area | Northern Beaches Council |
| Current zoning and land use | Zoned B2 – Local Centre (Warringah LEP 2011) Site is currently used for commercial purposes. |
| Proposed land use | Construction of a four storey shop top housing development with a single level basement car park, ground floor retail and apartment units, as shown in Attachment A. |
| Site description | The site was used for commercial purposes. The northeast portion of the site contained a single storey building and southeast portion contained a two-storey building. Western portion of the site was a parking lot and concrete paved areas. |
| Surrounding land uses | Residential dwellings and commercial to the south and north, Pittwater Road to the east and commercial and residential development to the west. |
| Topography | The site is gently sloped with grades <5%. Site elevation ranges between 3.46 mAHD in the southwest corner and 5.2 mAHD in the northeast corner (Land & Engineering Surveyors, 2019). |
| Expected geology | The Sydney 1:100,000 Geological Sheet 9130 describes site geology as Quaternary Holocene quartz sand, minor shell content, interdunal (swale) silt and fine sand, bounded by fine to medium marine sands. The NSW 1:250,000 Statewide Geology describes site geology as sandstone, interbedded sandstone and siltstone, claystone, conglomerate and sandstone (Widden Brook Conglomerate). The NSW Environment and Heritage eSPADE website identifies the site as having aeolian soils of Tuggerah landscape, consisting of gently undulating to rolling coastal dune fields. |
| Surface hydrology | The site grades to the southwest, where waters are collected by a stormwater pit. The southeast corner is a trapped low, with waters in excess of the stormwater infrastructure building up prior to overtopping the wall to the south into the drainage easement and trunk drainage culvert. |

2.2 Site Inspection

Site inspection was conducted on 14 August, 2019 and included:

- General walkover to identify local land forms and site characteristics to understand local drainage behaviour.

- Identification and observation of existing site stormwater infrastructure and natural drainage lines.
- Confirmation of stormwater infrastructure along the trunk drainage line.

2.3 Catchment Description

We note the following regarding the catchment upstream of the site:

- The site is located within the Collaroy Beach catchment.
- Upstream catchment is primarily residential areas, and includes the suburbs of Collaroy and Collaroy Plateau.
- The total catchment area is 38.95 ha and is shown in Attachment F plan PS02-K000.

2.4 Site Flood and Overland Flow Mechanisms

The site is likely affected by the following flood mechanisms:

- Overland flows from the site itself and the local upstream catchment (refer Section 2.3).
- Ponding of waters behind Pittwater Road, with flows being controlled by the trunk drainage culvert running along Collaroy Street and under Pittwater Road discharging to the ocean.

2.5 Previous Flood Studies

A review of previous flood investigations was undertaken to assess likely local flood behaviour and characteristics for the site and the Collaroy catchment. Review identified two previous flood studies relevant to this assessment.

2.5.1 Cardno (2019) Narrabeen Lagoon Floodplain Risk Management Study

Cardno conducted a flood assessment for this catchment on behalf of NBC, and summarised the assessment in the report *Narrabeen Lagoon Floodplain Risk Management Study*, hereafter referred to as the Cardno Narrabeen flood study. As part of their study, Cardno used RAFTS for hydrologic modelling and TUFLOW for hydraulic modelling.

The Cardno Narrabeen flood study adopted a varying curvilinear grid of approximately 4 – 7 m in critical areas, and 15 – 25 m in offshore and within the southern and western lagoon basins for TUFLOW modelling, and included details of model inputs and results. We have relied upon

the Cardno flood study for hydrologic / hydraulic calibration and comparison purposes.

2.5.2 Cardno (2019) Manly to Seaforth Flood Study

Cardno conducted a flood assessment for this catchment on behalf of NBC, and summarised the assessment in the report Manly to Seaforth Flood Study, hereafter referred to as the Cardno Seaforth flood study. As part of their study, Cardno used RAFTS for hydrologic modelling and TUFLOW for hydraulic modelling.

The Cardno Seaforth flood study adopted a 2.5 m topographic grid for SOBEK modelling, and included details of model inputs and results.

2.6 Proposed Development

2.6.1 Overview

Architectural drawings prepared by Barry Rush and Associates (Attachment B) indicate that the proposed development will include:

- Demolition of existing site structures on site.
- Construction of a new four storey residential buildings, including commercial units, carparking and loading area on the ground floor level.
- Construction of a basement carpark beneath new buildings.

The following sections describe various elements of the proposed site layout, which was iteratively and holistically designed to ensure project objectives were met.

3 Hydrology Modelling

3.1 Overview

The DRAINS software package (version 2019.03 – 22 March, 2019) was used with the RAFTS hydrological engine to assess the 1% AEP flood and PMF peak flow rates for a range of storm durations between 10 minutes and 4.5 hours.

3.2 Model Setup

Parameters used in the model are provided in Table 2. Model inputs are as follows:

1. Sub-catchment delineation, flow paths and slopes were developed using LIDAR data provided by Land and Property Information NSW (LPI 2011 and 2013) and site survey (Attachment A) provided by DP Surveying (May 2018). Refer to Attachment F plan PS02-K000 for site catchment plan.
2. Sub-catchment impervious areas were adopted based on recent catchment aerals obtained from Nearmaps (2019).
3. Roughness coefficients were determined using a weighted average based on the XP-RAFTS (1996) *User's Manual* and each sub-catchment's land use as per recent site aerals obtained from Nearmaps (2019).
4. Intensity Frequency Duration (IFD) data and rainfall temporal patterns were based on the Bureau of Meteorology (BOM 2017) *Rainfall IFD Data System* and the Australian Rainfall & Runoff (ARR 2017) *Data Hub*.
5. Probable Maximum Precipitation (PMP) intensities and temporal distributions were determined using the BOM (2006) *Generalised Southeast Australia Method*.
6. RAFTS parameters have been derived from the suggested values in the XP-RAFTS (1996) *User Manual*. Sub-catchment surface soils are assumed to be loam, based on the NSW Government Environment & Heritage (2017) *eSPADE – NSW Soil and Land Information* website.

Table 2: Details of sub-catchments used in RAFTS modelling.

| Sub-catchment ¹ | Area (ha) ¹ | Impervious (%) ² | Catchment Slope (%) ¹ | PERN Roughness Coefficient ³ |
|----------------------------|------------------------|-----------------------------|----------------------------------|-----------------------------------------|
| CAT_01 | 1.91 | 70 | 23 | 0.0217 |
| CAT_02 | 7.41 | 67 | 17 | 0.0281 |
| CAT_03 | 8.56 | 74 | 15 | 0.0195 |
| CAT_04 | 11.89 | 46 | 13 | 0.0521 |
| CAT_05 | 54.53 | 50 | 7 | 0.0391 |
| CAT_Site | 9.18 | 71 | 9 | 0.0190 |
| Total | 93.48 | | | |

Notes

1. Obtained based on survey data provided by DPS (March 2018, Attachment A) and LIDAR data provided by LPI (2011 and 2013). Refer to Attachment F plan PS02-K000 for site catchment plan.
2. Adopted based on recent catchment aerals obtained from Nearmaps (2019).
3. Obtained from the weighted average land use based on recent catchment aerial photographs obtained from Nearmaps (2019) and the XP-RAFTS User Manual (1996).

3.3 Results

3.3.1 Hydrology Results

Results of peak flow rates for catchments arriving at the site for the critical duration 1% AEP flood event and PMF events are summarised in Table 3. The critical storm duration was determined to be 30 minutes for the 1% AEP flood event and 15 minutes for the PMF event.

Table 3: Peak 1% AEP and PMF flow rates for critical duration storms estimated by DRAINS modelling for sub-catchments arriving at the site.

| Catchment | Flood Event Peak Flow Rates (m ³ /s) | |
|--------------------|-------------------------------------------------|------|
| | 1% AEP | PMF |
| CAT_01 | 0.955 | 4.49 |
| CAT_02 | 3.57 | 17.4 |
| CAT_03 | 4.22 | 20.2 |
| CAT_04 | 5.36 | 27.5 |
| CAT_Site | 4.43 | 21.6 |
| Total ¹ | 17.2 | 91.1 |

Notes

1. The offset of the timing of each catchment's hydrograph means the total flow rate is not always equal to the sum of all catchment peak flow rates.

4 Hydraulic Modelling

4.1 Overview

The TUFLOW hydraulic model was used to determine flood characteristics including flood extents, levels, depths, velocities and hydraulic hazard for the critical 1% AEP flood and probable maximum flood (PMF) events for existing and proposed conditions.

4.2 Scenarios

The hydraulic model was setup to represent the following flood condition scenarios:

1. Existing condition: the catchment and site in their current state as described in Sections 2.1, 2.3 and 2.4.
2. Proposed condition: the catchment in its current state and the site in its proposed state as described in Section 2.6.

The hydraulic model was used to assess flooding for the following events:

1. 1% AEP 30 minute (critical duration) event.
2. PMF 15 minute (critical duration) event.

In summary, a total of 4 scenarios were modelled as part of this assessment (2 flood condition scenarios and 2 flood events each).

4.3 Terrain Data

Catchment LIDAR data provided by LPI (2011 and 2013) was merged with site survey data (Attachment A) provided by DPS (May 2018) and local bathymetry data provided by OEH (2011) to create a 3D surface for the existing conditions site and the local floodplain environment used in the TUFLOW model.

The proposed conditions surface also included site design grading as shown in Attachment B.

4.4 Model Setup

4.4.1 Existing Conditions

TUFLOW model construction for existing conditions consisted of:

1. A 1.0 m topographic grid based on the available survey and LIDAR data.

2. The model domain was defined as the upstream catchment of Frazer Street, connecting to the upstream end of Jenkins Street, 9 Fielding Street, 32 Alexander Street, 20 Homestead Avenue, 15 Pittwater Road and connecting to the upstream catchment to the Collaroy Beach Playground. Model boundary extents were generally placed along catchment ridgelines and / or connecting catchment high points surrounding the study area.
3. A direct rainfall boundary condition based on the critical duration 1% AEP and PMF hyetographs from DRAINS. The boundary condition comprised the entire model and enabled automatic flood water routing.
4. Inflow boundary conditions based on the critical duration 1% AEP and PMF hydrographs from DRAINS for each of the four sub-catchments discharging to the study area.
5. Computed water slopes for downstream model extent boundary conditions based on the slopes from available LIDAR data.
6. Ocean water levels for downstream model extent boundary conditions based on DECC (2010). The tailwater condition was taken to be the peak 1% AEP ocean flooding event.
7. Manning's zones based on Nearmaps (2019) aerial photography of the study area, with roughness coefficients adopted as per Table 4.
8. Hydrologic loss coefficients for pervious and impervious catchment materials were consistent with hydrologic modelling (refer Section 3.2) and were adopted as per Table 4.
9. Existing buildings in the catchment were assigned roughness per depth to model as flow obstructions.
10. The finished floor levels (FFLs) at 1129-1131 Pittwater Road were input into the model surface, with a SA rainfall polygon applied to route water around the building.
11. The building at 1125-1127 Pittwater Road was removed from the model domain as to obstruct flow of water through the structure.

12. A 1D network to model the relevant pit and pipe network:

- a. 1D network pipe sizes, invert levels and locations are based on DPS (2018) survey data (Attachment A), site inspection and geographic information system (GIS) data provided by NBC.
- b. Pipe roughness coefficient of 0.013 (concrete) was adopted.
- c. Pipe blockages of 10 – 50% (varying with pipe dimensions) have been adopted based on the assessment procedure in Australian Rainfall and Runoff (Weeks & Rigby, 2016).

Table 4: Manning's roughness and hydrologic loss values for TUFLOW modelling.

| Catchment Material Type | Manning's Roughness Coefficient ¹ | Initial Loss (mm) ² | Continuing Loss (mm/hr) ² |
|-------------------------|----------------------------------------------|--------------------------------|--------------------------------------|
| Roads | 0.02 | 2.0 | 0.0 |
| Medium Vegetation | 0.080 | 10.0 | 2.5 |
| Heavy Vegetation | 0.100 | 10.0 | 2.5 |
| Recreational Land | 0.040 | 10.0 | 2.5 |
| Sand | 0.030 | 10.0 | 2.5 |
| Low Density Residential | 0.050 | 8.0 | 1.875 |
| Buildings | 0.015 when depth ≤ 0.05 m | 0.0 | 0.0 |
| | 0.300 when depth > 0.10 m | | |

Notes

1. Obtained from the Cardno Narrabeen flood study (Table 3-2). Where parameters were not provided in the BMT WBM flood study, roughness coefficients and hydrologic losses were adopted based on typical values from similar catchments.
2. Hydrologic losses were consistent with RAFTS modelling as detailed at Section 3.2.

4.4.2 Proposed Conditions

The existing conditions model was modified as follows to simulate proposed conditions:

1. The 1.0 m topographic grid was updated to include the proposed site grading.
2. Site manning's zones were updated to represent design surfaces.
3. The proposed FFLs of the development at 1129-1131 Pittwater Road were input into the model surface, with a SA rainfall polygon applied to route water around the building's two storey brick wall along the northern boundary.

4. A trench grate (300mm wide) along the driveway entrance at the rear of the site with a 22.8 m³ underground flood mitigation tank in the south western corner of the site have been proposed to capture and detain a portion of the upstream overland flows before discharging into the existing council easement pipe. These features have been incorporated into the model by 1D network and z-polygons in the model. Refer to P1907336PS03 for more details.

All other model construction elements remained consistent with the existing conditions model.

4.5 Results

4.5.1 Flood Results

Flood mapping results (flood levels, depths, velocities and provisional hazard categories) for the critical duration 1% AEP flood and PMF events in existing and proposed conditions are provided in Attachment F, with drawing references summarised in Table 5.

Table 5: Flood map drawing references in Attachment F (MA planset P1907336PS02). ¹

| Flood Condition Scenario | Critical Duration Flood Event | Water Level & Depth | Water Velocity | Provisional Hydraulic Hazard Categories ² | Flood Hazard Categories ³ | Impact / Afflux |
|--------------------------|-------------------------------|---------------------|----------------|------------------------------------------------------|--------------------------------------|-----------------|
| Existing Conditions | 1% AEP | K100 | K101 | K102 | K103 | – |
| | PMF | K110 | K111 | K112 | K113 | – |
| Proposed Conditions | 1% AEP | K200 | K201 | K202 | K203 | K300 |
| | PMF | K210 | K211 | K212 | K213 | K310 K311 |

Notes

1. Flood results have been filtered to show areas of greater than 50 mm depth.
2. Provisional hydraulic hazard categories are based on NSW Floodplain Development Manual (2005) definitions and are shown in Figure 1.

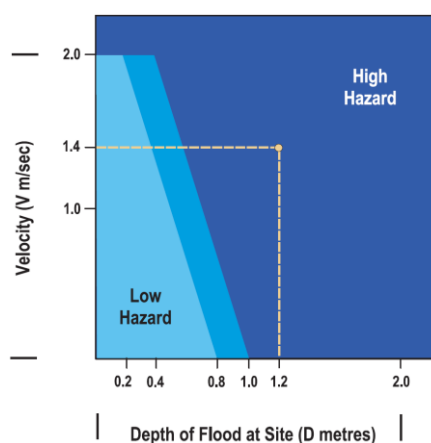


Figure 1: Provisional hydraulic hazard categories (NSW Floodplain Development Manual, 2005).

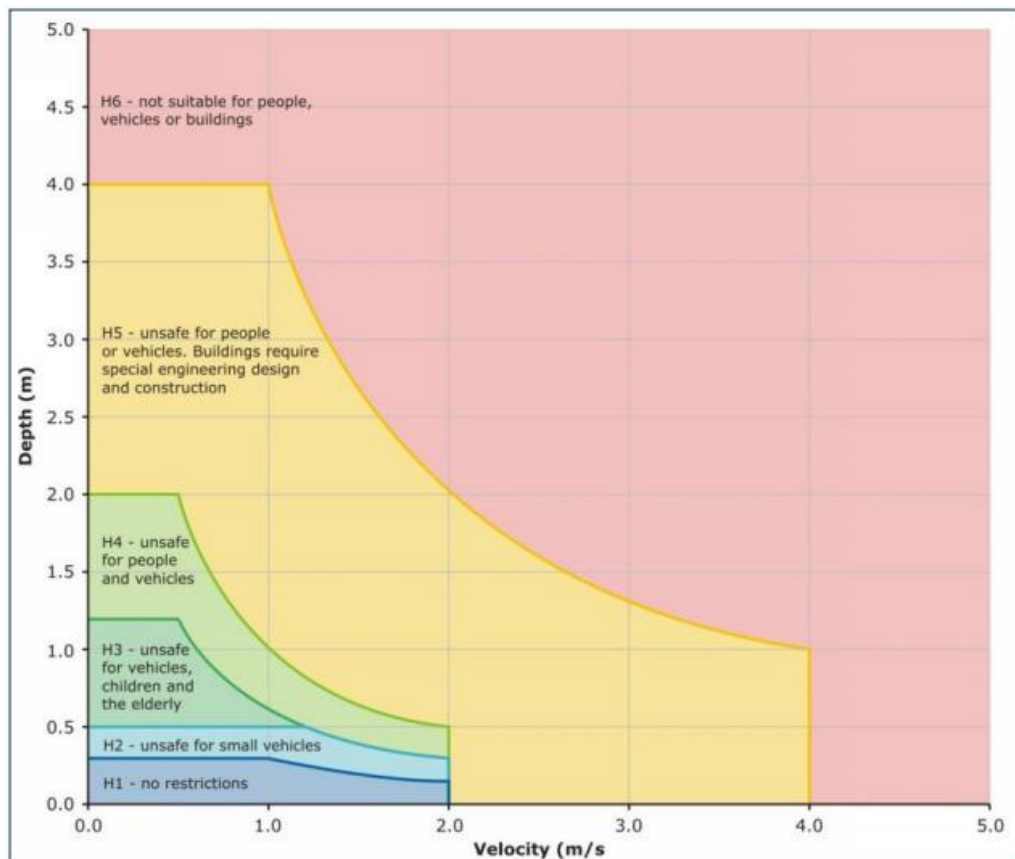


Figure 2: Flood Hazard Curves (Australian Institute for Disaster Resilience, 2014).

4.6 Discussion

We note the following regarding modelled flood behaviour:

4.6.1 Existing Conditions

1. The primary source of site flooding is overland flows from the Collaroy and Collaroy Plateau catchment. Floodwater backs up behind Pittwater Road, causing a tailwater effect on overland flow and pipe flows which further contribute to site flood affectation.
2. Flood waters primarily flow across the site from north-west to south-east towards Pittwater Road.
3. There is little variation in the peak flood levels across the site (typically < 100 mm difference) due to the ponding of water behind Pittwater Road.
4. Flood velocities on-site are generally medium, varying between 0.2 m/s and 1.8 m/s in the 1% AEP event.

5. Hydraulic hazard within the trapped low point on site is high in the 1% AEP flood event due to the depth of ponding, which exceed 1 m. The remainder of the site is predominantly medium hazard, due to water depths between 0.8 – 1.0 m.
6. The proposed development is within the area of medium hydraulic hazard, and therefore is within the medium flood risk precinct.

4.6.2 Proposed Conditions

1. Proposed flooding conditions reduce flood depths within the development and consequentially reduce the hazard at the site.
2. Outside of areas where earthworks occur, flood depths, velocities and hazards on site are very similar to the existing condition.
3. Floor level compliance:
 - a. NBC classifies the site as a medium flood risk planning precinct, and therefore requires that for commercial floor levels, 'New floor levels within the development shall be at or above the Flood Planning Level.' (Warringah DCP 2011).
 - b. The flood planning level (FPL) required to satisfy NBC controls is 5.17 mAHD (PMF level), with the 1% AEP flood level plus a 500 mm freeboard giving a lower level of 5.14 mAHD.
 - c. The proposed commercial ground floor level is 5.20 mAHD, which is higher than the FPL therefore NBC floor level requirements are satisfied.
 - d. The Driveway entrance level has been lifted up to 5.20m which is higher than the PMF level.
4. All site habitable commercial and residential floor levels are at or above the peak PMF level of 5.19 mAHD, which indicates a shelter-in-place evacuation strategy would be appropriate for the site.

4.6.3 Offsite Flood Impacts

1. The proposed development has negligible offsite impacts on the floodplain environment in the 1% AEP and PMF events Proposed flood mitigation with the flood water detention effects has effectively removed the adverse flood impacts on upstream neighbouring properties.

2. There are no material offsite impacts above 20 mm in the 1% AEP flood.
3. There are no material offsite impacts above 50 mm in the PMF.
4. There are minor areas of PMF velocity impact (defined as an excess of 10% increase in PMF peak velocity), however this is confined to the road, and is therefore considered to be immaterial and acceptable.
5. While there is a reduction to flood storage in the site, we note that the loss of storage is in the trapped low in the south west corner of the site. This trapped low would fill in a short period of time during a flood event. Its loss through the development has no material impact on flood levels around the site.

5 Preliminary Flood Emergency Response Plan

5.1 Overview

This PFERP makes recommendations to ensure that in the event of a flood at the site, risk to personal safety and the environment is appropriately managed. The plan provides strategic level advice and is to be refined and finalised following detailed design of site controls prior to issue of construction certificate. Controls are to be implemented as part of the site's construction and on-going operation.

The key elements of the PFERP are as follows:

- Section 5.2 – preliminary flood risk action plan (PFRAP) summary.
- Section 5.3 – flood emergency response procedures.
- Section 5.4 – shelter-in-place details.
- Section 5.5 – flood level indicator (FLI) details.
- Attachment D – PFRAP details.

5.2 Preliminary Flood Risk Action Plan (PFRAP) Summary

The site PFRAP has three phases: the prepare phase, the respond phase and the recovery phase. An overview of the PFRAP is provided in Figure 3 Refer to Attachment D for the full site PFRAP which details phases, triggers, consequences and key actions in case of flooding at the site.

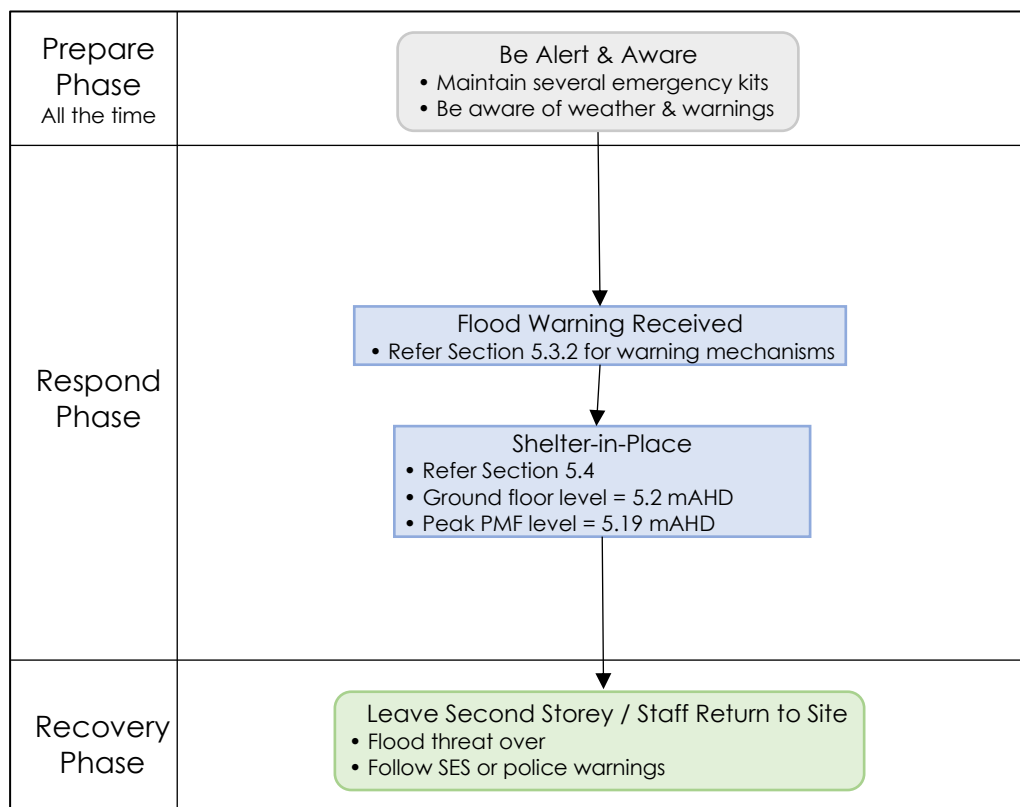


Figure 3: Overview of site preliminary flood risk action plan (PFRAP).

5.3 Flood Emergency Response Procedures

5.3.1 General Risk Management Procedures

In general, there are two primary flood emergency responses available at the site:

1. A responsible flood officer (likely to be building manager) shall be appointed to manage flood education and instructions for site management and all occupants. The officer will be subscribed to all warning systems described in Section 5.3.2.
2. The proposed development ground finished floor level (FFL) is above the peak PMF level of 5.19 mAHD, hence is not affected by flood events up to and including the PMF.

A number of additional general flood risk management procedures are detailed in the FRAP (Attachment D), including procedures and key responsibilities in the 'prepare phase' which occur at all times.

5.3.2 Flood Warning Mechanisms

Site management will be subscribed to the following systems and may be alerted to flood warnings via the following mechanisms:

- SES emergency alert telephone warning system.
- BOM alerts and press releases.
- Weather apps (e.g. 'Early Warning Network').
- Media warnings (TV, radio, internet etc.).
- Visual observation of rising flood waters on site.

If site management receive a flood warning via any of the mechanisms described above, they should undertake the shelter-in-place procedures immediately (refer Section 5.4).

5.4 Shelter-in-Place

The ground floor level of the proposed development is to be constructed at 5.2 mAHD which is located above the PMF flood level of 5.19 mAHD. This would enable shelter-in-place as a flood emergency response for people on site.

The shelter-in-place duration would be around 1 hour based on the critical duration PMF (refer Section 3.3). It is possible that longer duration PMF events will cause a longer isolation time, however we expect this will be less than 3 hours, which is considered an acceptable duration to shelter-in-place.

The following is to be provided to enable safe shelter-in-place:

1. The development is above the PMF, rendering the dwellings safe in a flood event. Furthermore, there is internal access available to the upper levels of the development.
2. A suitable number of trained staff will remain with people who shelter-in-place.
3. Proposed buildings will be designed to resist flood forces (water and debris) and any buoyancy forces up to the PMF level.
4. Facility management should maintain several emergency kits including torch with spare batteries, portable radio with spare batteries, first aid kit, high visibility vest, non-slip footwear and appropriate proper signage.

5. Adequate space on the second storey will be available:
 - a. Architectural plans (Attachment B) indicate the first floor and second floor common room gross floor areas are 27 m² and 26 m² respectively. The common areas on the first floor and second floor are approximately 86 m² and 56 m² respectively.
 - b. Adopting an area of 1 m² / person there is space for 195 additional people on the first and second floors.
 - c. This is considered adequate considering that most occupants would have rooms within the development, and additional occupants from the retail sector would have ample space on the ground floor which is above the PMF.

5.5 Flood Level Indicator (FLI) Details

FLI's should be installed on the site and maintained by site management. These should be:

1. Provided at a level that warns occupants to shelter-in-place in major flood events.
2. Maintained in perpetuity by the owner.
3. Prevented from being removed by way of a restriction on title.

Details of flood levels and timing will be provided at the detailed design stage and will ensure that site occupants have sufficient time to safely shelter-in-place.

6 Compliance Assessment

Compliance of the proposed development with NBC flood planning policies and guidelines relating to flood risk management is outlined in Table 6. NBC requires compliance with the Warringah Council LEP and DCP (2011) for the proposed development. Flood specific controls are provided at clause E11 'Flood Liable Land'. We note that:

1. A High Flood Risk Precinct is defined as the area below the 1% AEP flood level that is either subject to high hydraulic hazard or where there are significant evacuation difficulties.
2. A Medium Flood Risk Precinct is defined as the area below the 1% AEP flood level that is not subject to high hydraulic hazard or where there may be some evacuation difficulties.
3. A Low Flood Risk Precinct is defined as the area between the 1% AEP flood level and the PMF level.
4. Portions of the site (carpark in the west of site) are classified as a 'high flood risk planning precinct' by NBC, however the development lies on 'medium flood risk management precinct'.
5. The proposed development is a mixed-use development and is categorized as Commercial & Industrial, and Residential based on Clause E11 - Matrix 1 of the DCP.

Table 6 assessment demonstrates that the proposed development complies with the Council flood requirements.

Table 6: Compliance with Warringah (Northern Beaches Council) DCP (2011) development matrix prescriptive controls (Clause E11 - Matrix 1).

| Warringah Council DCP Requirement | Compliance |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>A. FLOOD EFFECTS CAUSED BY DEVELOPMENT</p> <p>A.1. Jetty</p> <p>A.3. The applicant shall include in their submission, calculations to illustrate that any fill or other structures that reduce the total flood storage are replaced by Compensatory Works.</p> | <p>(1) NA</p> <p>(2) The loss of flood storage due to filling of the proposed rear carpark is considered insignificant as it fills a trapped low which provided minimal storage. Proposed compensatory works include trench grate (300mm wide) along the driveway entrance at the rear of the site with a 22.8 m3 underground flood mitigation tank in the south western corner of the site to capture and detain a portion of the upstream overland flows before discharging into the existing council easement pipe. The very minor loss in flood storage on site due to the proposed development has no demonstrable effect on 1% AEP and PMF flood levels offsite as shown in our flood modelling results (Attachment F plan PS02-K300 & K310).</p> |
| <p>B. DRAINAGE INFRASTRUCTURE AND CREEK WORKS</p> <p>B.1. Flood mitigation works or stormwater devices that modify a major drainage system, stormwater system, natural water course, floodway or flood behaviour within or outside the development site may be permitted subject to demonstration through a Flood Management Report that they comply with the Flood Prone Land Design Standard found on Council's webpage.</p> <p>The development has been designed and can be constructed so that in a 1% AEP flood event:</p> <p>a) There is no loss of flood storage/floodway.</p> <p>b) There are no adverse effects on surrounding properties.</p> <p>c) The works do not have an adverse impact on the environment. (This includes but is not limited to the altering of natural flow regimes, the clearing of riparian vegetation, artificial modification of the natural stream, such as by relocation, piping etc, in accordance with Council's Protection of Waterways and Riparian Land Policy).</p> <p>Certification shall also be provided in Northern Beaches Council's Standard Certification Form (Form A in Flood Risk Management Policy for Development) to this effect.</p> | <p>(3) No major flood mitigation works or stormwater devices are proposed for the development.</p> <p>(4) As discussed at (2) above.</p> <p>(5) As discussed at (2) above.</p> <p>(6) As discussed at (2) above.</p> <p>(7) Refer to Attachment E.</p> |

| Warringah Council DCP Requirement | Compliance |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B.2. A Section 88B notation under the Conveyancing Act 1919 may be required to be placed on the title describing the location and type of flood mitigation works with a requirement for their retention and maintenance. | (8) As discussed at (3) above. |
| C. BUILDING COMPONENTS AND STRUCTURAL SOUNDNESS | |
| C.1. All buildings shall be designed and constructed as flood compatible buildings in accordance with Reducing Vulnerability of Buildings to Flood Damage: Guidance on Building in Flood Prone Areas, Hawkesbury-Nepean Floodplain Management Steering Committee (2006). | (9) All structural elements, external and internal finishes up to the FPL of 5.12 mAHD are to be constructed from flood compatible building components. Building materials shall be design considering the forces of the floodwater, debris, buoyancy and inundation. Details will be provided at detailed design stage. |
| C.2. All structures must be designed and constructed to ensure structural integrity up to the Flood Planning Level, taking into account the forces of floodwater, wave action, flowing water with debris, buoyancy and immersion. Structural certification shall be provided confirming the above. Where shelter-in-place refuge is to be provided the structural integrity is to be to the Probable Maximum Flood level. | (10) All structures are to be constructed from flood compatible building components and buildings shall be designed considering the forces of the floodwater, debris, buoyancy and inundation up to the PMF level of 5.19 mAHD. Details will be provided at detailed design stage. |
| C.3. All new electrical equipment, power points, wiring, fuel lines, sewerage systems or any other service pipes and connections must be waterproofed and/or located above the Flood Planning Level. All existing electrical equipment and power points located below the Flood Planning Level must have residual current devices installed that turn off all electricity supply to the property when flood waters are detected. | (11) All electrical services, power points, fittings, and equipment are to be placed above the FPL and / or waterproofed. |
| D. STORAGE OF GOODS | |
| D.1. Hazardous or potentially polluting materials shall not be stored below the Flood Planning Level unless adequately protected from floodwaters in accordance with industry standards. | (12) Hazardous or potentially polluting materials are not expected to be stored on site. |
| D.2. Goods, materials or other products which may be highly susceptible to water damage are to be located/stored above the Flood Planning Level. | (13) Products which are highly susceptible to water damage will not be stored below the FPL, and adequate storage room is available at higher levels. |
| E. FLOOD EMERGENCY RESPONSE | |
| E.1. Development shall comply with Council's Flood Emergency Response Planning for Development in Pittwater Policy and the outcomes of any Flood Risk Emergency Assessment Report where it applies to the land. | (14) Minimum floor level of the proposed development is at 5.2 mAHD which is above the PMF level of 5.19 mAHD. (15) The proposed development will enable safe occupation for all occupants and visitors up to and including the PMF event. (16) A flood emergency and evacuation plan will be provided at detailed design stage outlining the shelter-in-place procedures. |

| Warringah Council DCP Requirement | Compliance |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| E.2. New development must provide an appropriately sized area to safely shelter-in-place above the Probable Maximum Flood level and appropriate access to this area should be available from all areas within the development. | (17) Adequate area is available for all occupants and visitors to safely shelter-in-place above the PMF level with appropriate access from all areas in addition to individual commercial spaces and dwellings, there are also communal areas available for occupants to shelter-in-place. |
| E.3. Adequate Warning Systems, Signage and Exits shall be installed to allow safe and orderly evacuation without reliance upon the SES or other authorised emergency services personnel. | (18) A flood warning device and proper signage will be provided at the site to inform site occupants of shelter-in-place timing and instructions (refer Sections 5.4). |
| F. FLOOR LEVELS | |
| F.1. New floor levels within the development shall be at or above, the Flood Planning Level. A reduced Flood Planning Level may be considered only where it is permitted in this Development Control Plan. The structure must be flood proofed (wet or dry) to the Flood Planning Level. This control cannot be applied to critical or vulnerable uses. | (19) Minimum floor level of the proposed building (including balconies and decks) is at 5.20 mAHd which is 580 mm above the 1% AEP flood level of 4.62 mAHd]. (20) The building will be flood proofed up to the FPL of 5.12 mAHd. Details will be provided at detailed design stage. |
| F.2. All development structures must be designed and constructed so as not to impede the floodway or flood conveyance on the site, as well as ensuring no loss of flood storage in a 1% AEP Event. Where the dwelling is located over a flow path it must be elevated on suspended pier/pile footings such that the level of the underside of all floors including balconies and decks within the flood affected area are at or above, or raised to the Flood Planning Level to allow clear passage of the floodwaters under the building. The development must comply with the Flood Prone Land Design Standard: | (21) NA |
| For suspended pier/pile footings, there must also be sufficient openings in perimeter walls located below the 1% AEP flood level to allow for the flood waters to flow through unimpeded: | |
| a) The underfloor area of the dwelling below the 1% AEP flood level is to be designed and constructed to allow clear passage of floodwaters. | (22) NA |
| b) 50-75% of the perimeter of the underfloor area is of an open design between the natural ground level and the 1% AEP flood level. Only 25-50% of the perimeter would be permitted to be solid. | (23) NA |
| c) No solid areas of the perimeter of the underfloor area would be permitted in a floodway. | (24) NA |

| Warringah Council DCP Requirement | Compliance |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|
| F.3. Where the lowest floor has been elevated to allow the passage of flood waters, a restriction shall be imposed on the title of the land, pursuant to S88B of the Conveyancing Act confirming that the undercroft area is not to be enclosed. | (25) NA |
| F.4. A one - off addition or alteration below the Flood Planning Level of less than 30 square metres or an increase of less than 10% of the ground floor area (whichever is the lesser) for residential development may be considered only where: a) It is an extension to an existing room. b) The Flood Planning Level is incompatible with the floor levels of the existing room. | (26) NA |
| This control will not be permitted if this provision has previously been utilised since the making of this Plan. The structure must be flood proofed to the Flood Planning Level. | |
| F.6. Any existing floor level may be retained below the Flood Planning Level when undertaking a first-floor addition provided that: a) It is not located within a floodway. b) It is flood proofed to the Flood Planning Level. c) There is no increase to the building footprint below the Flood Planning Level. | (27) NA (28) NA (29) NA |
| F.8. The minimum floor level of any first-floor additions shall be at or above the Probable Maximum Flood Level. | (30) NA |
| F.9. Foyers – consideration may be given to a minimum floor level of a foyer being set at the 5% AEP flood level, provided it can be demonstrated that it complies with the Flood Prone Land Design Standard. | (31) NA |
| F.10. Consideration may be given to a minimum floor level for the first 5 metres from the street front of new development in business zonings below the Flood Planning Level provided it can be demonstrated that it complies with the Flood Prone Land Design Standard. | (32) NA |

| Warringah Council DCP Requirement | Compliance |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>F.11.A one - off addition or alteration below the Flood Planning Level of less than 100 square metres or an increase of less than 10% of the ground floor area (whichever is the lesser) for non-residential development may be considered only where the required floor level cannot be achieved for the following reason:</p> <ul style="list-style-type: none"> a) It would be incompatible with floor levels of the existing building This control will not be considered if the existing floor level of the additions/alterations are located within a high hydraulic hazard area. b) This control will not be permitted if this provision has previously been utilised since the making of this Plan. c) Any features of the additions or alterations on the floor level must be flood proofed to the Flood Planning Level. | (33) NA |
| <p>G. CAR PARKING</p> <p>G.1. Open carpark areas and carports shall not be located within a floodway.</p> <p>G.2. The lowest floor level of open carparks and carports (unroofed or with open sides) shall be constructed no lower than the natural ground levels.</p> <p>G.3. All enclosed car parks must be protected from inundation up to the relevant flood planning level. For example, basement carparks must be provided with a crest at the entrance, the crest of which is at the relevant Flood Planning Level.</p> <p>All access, ventilation and any other potential water entry points to any enclosed car parking shall be above the relevant Flood Planning Level.</p> <p>Council will not accept any options that rely on electrical, mechanical or manual exclusion of the floodwaters from entering the enclosed carpark.</p> <p>G.4. Vehicle barriers or restraints are to be provided to prevent floating vehicles leaving the site where there is more than 300 mm depth of flooding in a 1% AEP flood event.</p> <p>The minimum height of the vehicle barriers or restraints must be at or above the Flood planning Level.</p> <p>Vehicle barriers or restraints must comply with the Flood Prone Land Design Standard.</p> <p>G.5. Enclosed Garages must be located at or above the 1% AEP level.</p> <p>G.6. Carports must comply with the Flood Prone Land Design Standard.</p> <p>Car ports must:</p> | |
| G.1. Open carpark areas and carports shall not be located within a floodway. | (34) NA |
| G.2. The lowest floor level of open carparks and carports (unroofed or with open sides) shall be constructed no lower than the natural ground levels. | (35) NA |
| <p>G.3. All enclosed car parks must be protected from inundation up to the relevant flood planning level. For example, basement carparks must be provided with a crest at the entrance, the crest of which is at the relevant Flood Planning Level.</p> <p>All access, ventilation and any other potential water entry points to any enclosed car parking shall be above the relevant Flood Planning Level.</p> <p>Council will not accept any options that rely on electrical, mechanical or manual exclusion of the floodwaters from entering the enclosed carpark.</p> | (36) The basement carpark level is protected from floodwater inundation up to and including the 1% AEP flood event by raising the entrance ramp to the basement to 5.20 mAHD, which is 80 mm above the FPL of 5.12 mAHD. |
| <p>G.4. Vehicle barriers or restraints are to be provided to prevent floating vehicles leaving the site where there is more than 300 mm depth of flooding in a 1% AEP flood event.</p> <p>The minimum height of the vehicle barriers or restraints must be at or above the Flood planning Level.</p> <p>Vehicle barriers or restraints must comply with the Flood Prone Land Design Standard.</p> | (37) As discussed at (36). |
| G.5. Enclosed Garages must be located at or above the 1% AEP level. | (38) As discussed at (36). |
| <p>G.6. Carports must comply with the Flood Prone Land Design Standard.</p> <p>Car ports must:</p> | |

| Warringah Council DCP Requirement | Compliance |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|
| a) Be of an open design, where 50-75% of the perimeter walls are 'open' between natural ground level and the Flood Planning Level. Only 25-50% of the perimeter wall would be permitted to be 'solid', openings should permit a 75 mm sphere to pass through, and should not impede the flow of water. | (39) NA |
| b) Constructed of flood compatible material. | (40) NA |
| G.7. Where a driveway is required to be raised it must be demonstrated that there is no loss to flood stage in the 1% AEP flood event and no impact on flood conveyance through the site. | (41) As discussed at (2). |
| H. FENCING | |
| H.1. Fencing, including pool fencing, shall be designed so as not to impede the flow of flood waters and not to increase flood affectation on surrounding land. Appropriate fencing must comply with the Flood Prone Land Design Standard in addition to other regulatory requirements of pool fencing. | (42) NA |
| H.2. Fencing (including pool fencing, boundary fencing, balcony balustrades and accessway balustrades) shall be open for passage of flood waters - All new fencing on the property must be flood compatible with 50-75% of the fence being of an open design between the natural ground level and the Flood Planning Level. Only 25-50% of the perimeter fence would be permitted to be solid. Openings should permit a 75 mm sphere to pass through, and should not impede the flow of water. | (43) NA |
| I. POOLS | |
| I.1. Pools located within the 1% AEP flood extent are to be in-ground, with coping flush with natural ground level. Where it is not possible to have pool coping flush with natural ground level, it must be demonstrated that the development will result in no net loss of flood storage and no impact on flood conveyance on or from the site. | (44) NA |
| All electrical equipment associated with the pool (including pool pumps) is to be waterproofed and/or located at or above the Flood Planning Level. | (45) NA |
| All chemicals associated with the pool are to be stored at or above the flood planning level. | (46) NA |

7 Summary and Recommendations

A detailed hydrologic and hydraulic model has been developed to assess local flood characteristics, this modelling is consistent with the TUFLOW model used in preparation of Council's accepted Cardno Narrabeen flood study.

The models were used to determine the existing and proposed flood conditions in the 1% AEP and PMF events. Modelling concluded that:

1. Proposed flood characteristics are largely consistent with existing conditions, and differences due to the proposed development are negligible.
2. The proposed development would have acceptable offsite flood impacts.
3. Compliance with Council flood planning level requirements for building and car park levels are achieved.

Whilst the proposed development is affected by flood hazards during the PMF event, the site specific PFERP and PFRAP have been prepared to ensure that the site can operate safely in the floodplain environment. In summary:

1. Subscription to a number of warning systems will significantly reduce the likelihood of persons on site during a major flood event.
2. In the scenario that persons are on site during an unanticipated major flood event, risk to persons is managed through the shelter-in-place strategy, with all communal and residential areas having floor levels above the FPL.
3. With the implementation of the FERP procedures the risk to life is reduced to acceptable levels.
4. The proposed commercial and residential floors are to maintain finished floor levels at 5.2 mAHD.
5. The proposed basement carpark is to maintain a crest above the PMF level of 5.20 mAHD.
6. Structures are to be designed by a suitably qualified engineer to withstand the forces of floodwater, debris and buoyancy.

7. Areas below the site FPL of 5.12 mAHD are to be constructed using flood compatible materials in accordance with Council requirements.

The proposed development has been designed to ensure compatibility with the existing floodplain environment. As the proposed development has been designed to achieve Council requirements, no further recommendations are considered necessary.

8

References

Australian Institute for Disaster Resilience (2014), *The Technical Flood Risk Management Guideline: Flood Hazard*

Bureau of Meteorology (2006), *Generalised Southeast Australia Method.*]

Bureau of Meteorology (2017), *Rainfall IFD Data System*, www.bom.gov.au/water/designRainfalls/revised-ifd/?year=2016.

Cardno (2019), *Narrabeen Lagoon Flood Study*.

Cardno (2019), *Manly to Seaforth Flood Study*.

Commonwealth of Australia (Geoscience Australia) (2016), *Australian Rainfall and Runoff – A Guide to Flood Estimation*.

DRAINS (2016), *DRAINS Content Menu*.

Northern Beaches Council (2015) *Flood Prone Land Design Standard*.

NSW Department of Environment, Climate Change & Water (2010), *Flood Risk Management Guide: Incorporating sea level rise benchmarks in flood risk assessments.*]

NSW Department of Infrastructure, Planning and Natural Resources (2005), *Floodplain Development Manual*.

NSW Government Environment & Heritage (2017) *eSPADE – NSW Soil and Land Information*, www.environment.nsw.gov.au/eSpade2WebApp.

Office of Environment & Heritage (2007), *Floodplain Risk Management Guideline: Practical Consideration of Climate Change*.

Warringah Council (2011a), *Warringah Local Environmental Plan (LEP)*.

Warringah Council (2011b), *Warringah Development Control Plan (DCP)*.

Warringah Council (2014), *Flood Risk Assessment Report Guidelines*.

Weeks, W and Rigby, T (2016), *Blockage of Hydraulic Structures*, Chapter 6 of Book 6 in *Australian Rainfall and Runoff – A Guide to Flood Estimation*.

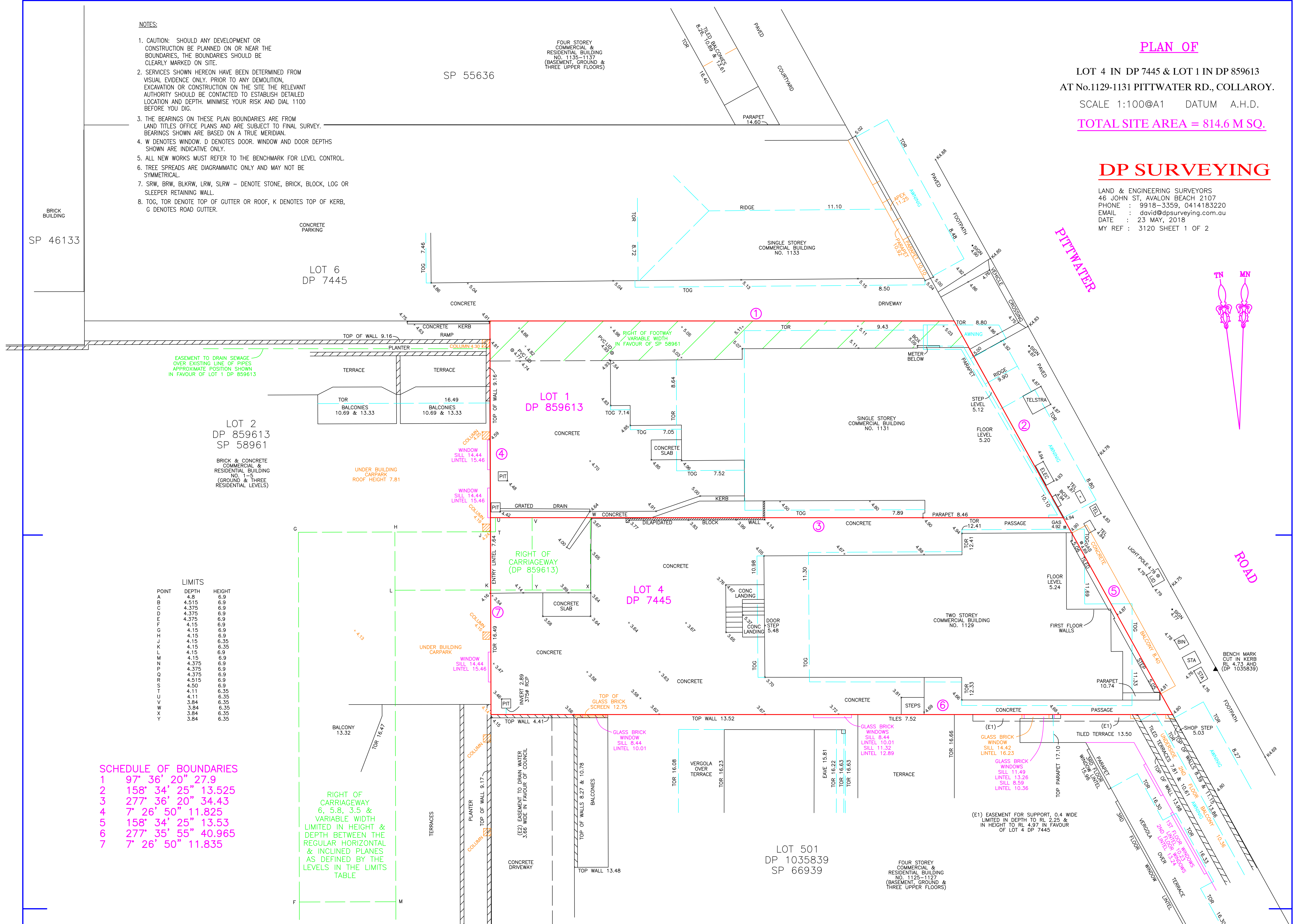
XP-RAFTS (1996), *User's Manual*.

9 **Attachment A: Site Survey**

1. CAUTION: SHOULD ANY DEVELOPMENT OR CONSTRUCTION BE PLANNED ON OR NEAR THE BOUNDARIES, THE BOUNDARIES SHOULD BE CLEARLY MARKED ON SITE.
2. SERVICES SHOWN HEREON HAVE BEEN DETERMINED FROM VISUAL EVIDENCE ONLY. PRIOR TO ANY DEMOLITION, EXCAVATION OR CONSTRUCTION ON THE SITE THE RELEVANT AUTHORITY SHOULD BE CONTACTED TO ESTABLISH DETAILED LOCATION AND DEPTH. MINIMISE YOUR RISK AND DIAL 1100 BEFORE YOU DIG.
3. THE BEARINGS ON THESE PLAN BOUNDARIES ARE FROM LAND TITLES OFFICE PLANS AND ARE SUBJECT TO FINAL SURVEY. BEARINGS SHOWN ARE BASED ON A TRUE MERIDIAN.
4. W DENOTES WINDOW. D DENOTES DOOR. WINDOW AND DOOR DEPTHS SHOWN ARE INDICATIVE ONLY.
5. ALL NEW WORKS MUST REFER TO THE BENCHMARK FOR LEVEL CONTROL.
6. TREE SPREADS ARE DIAGRAMMATIC ONLY AND MAY NOT BE SYMMETRICAL.
7. SRW, BRW, BLKRW, LRW, SLRW – DENOTE STONE, BRICK, BLOCK, LOG OR SLEEPER RETAINING WALL.
8. T_{OG}, T_{OR} DENOTE TOP OF GUTTER OR ROOF, K DENOTES TOP OF KERB, G DENOTES ROAD GUTTER.

FOUR STOREY
COMMERCIAL &
RESIDENTIAL BUILDING
NO. 1135-1137
(BASEMENT, GROUND &
THREE UPPER FLOORS)

LAND & ENGINEERING SURVEYORS
46 JOHN ST, AVALON BEACH 2107
PHONE : 9918-3359, 0414183220
EMAIL : david@dpsurveying.com.au
DATE : 23 MAY, 2018
MY REF : 3120 SHEET 1 OF 2



| LIMITS | | |
|--------|-------|--------|
| POINT | DEPTH | HEIGHT |
| A | 4.5 | 6.9 |
| B | 4.515 | 6.9 |
| C | 4.375 | 6.9 |
| D | 4.375 | 6.9 |
| E | 4.375 | 6.9 |
| F | 4.15 | 6.9 |
| G | 4.15 | 6.9 |
| H | 4.15 | 6.9 |
| I | 4.15 | 6.9 |
| J | 4.15 | 6.9 |
| K | 4.15 | 6.9 |
| L | 4.15 | 6.9 |
| M | 4.15 | 6.9 |
| N | 4.15 | 6.9 |
| O | 4.15 | 6.9 |
| P | 4.15 | 6.9 |
| Q | 4.15 | 6.9 |
| R | 4.15 | 6.9 |
| S | 4.15 | 6.9 |
| T | 4.15 | 6.9 |
| U | 4.15 | 6.9 |
| V | 4.15 | 6.9 |
| W | 4.15 | 6.9 |
| X | 4.15 | 6.9 |
| Y | 4.15 | 6.9 |

| SCHEDULE OF BOUNDARIES | | |
|------------------------|---------------------|--|
| 1 | 97° 36' 20" 27.9 | |
| 2 | 158° 34' 25" 13.525 | |
| 3 | 277° 36' 20" 34.43 | |
| 4 | 7° 26' 50" 11.825 | |
| 5 | 158° 34' 25" 13.53 | |
| 6 | 277° 35' 55" 40.965 | |
| 7 | 7° 26' 50" 11.835 | |

LOT 2
DP 859613
SP 58961

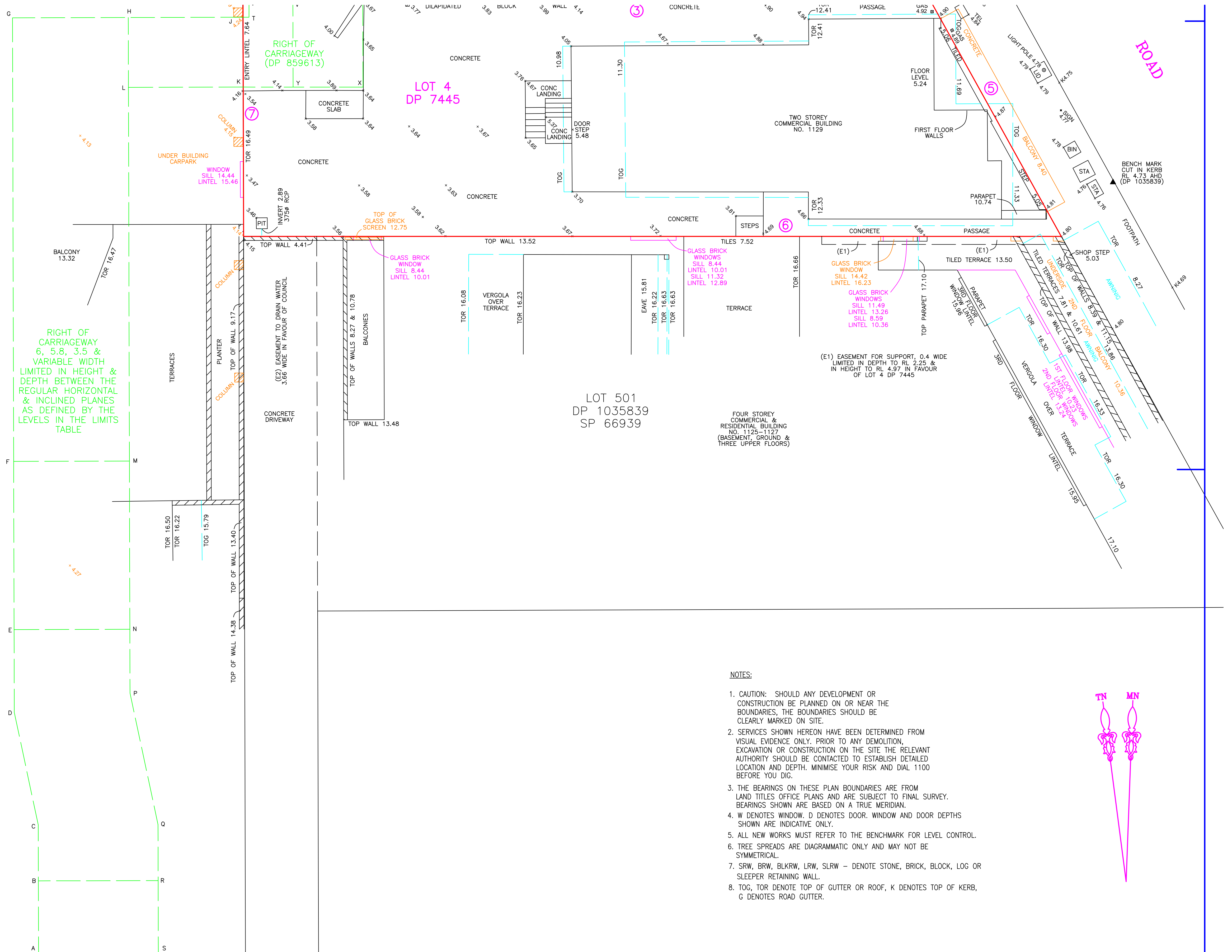
BRICK & CONCRETE
COMMERCIAL &
RESIDENTIAL BUILDING
NO. 1-5
(GROUND & THREE
RESIDENTIAL LEVELS)

PLAN OF

LOT 4 IN DP 7445 & LOT 1 IN DP 859613
AT No.1129-1131 PITTWATER RD., COLLAROY.

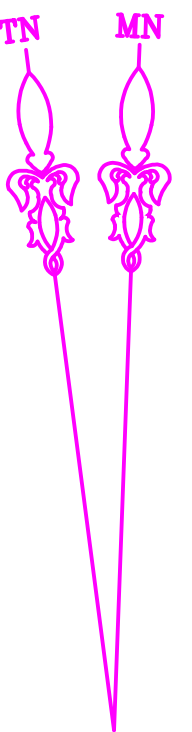
SCALE 1:100@A1 DATUM A.H.D.

TOTAL SITE AREA = 814.6 M SQ.



NOTES:

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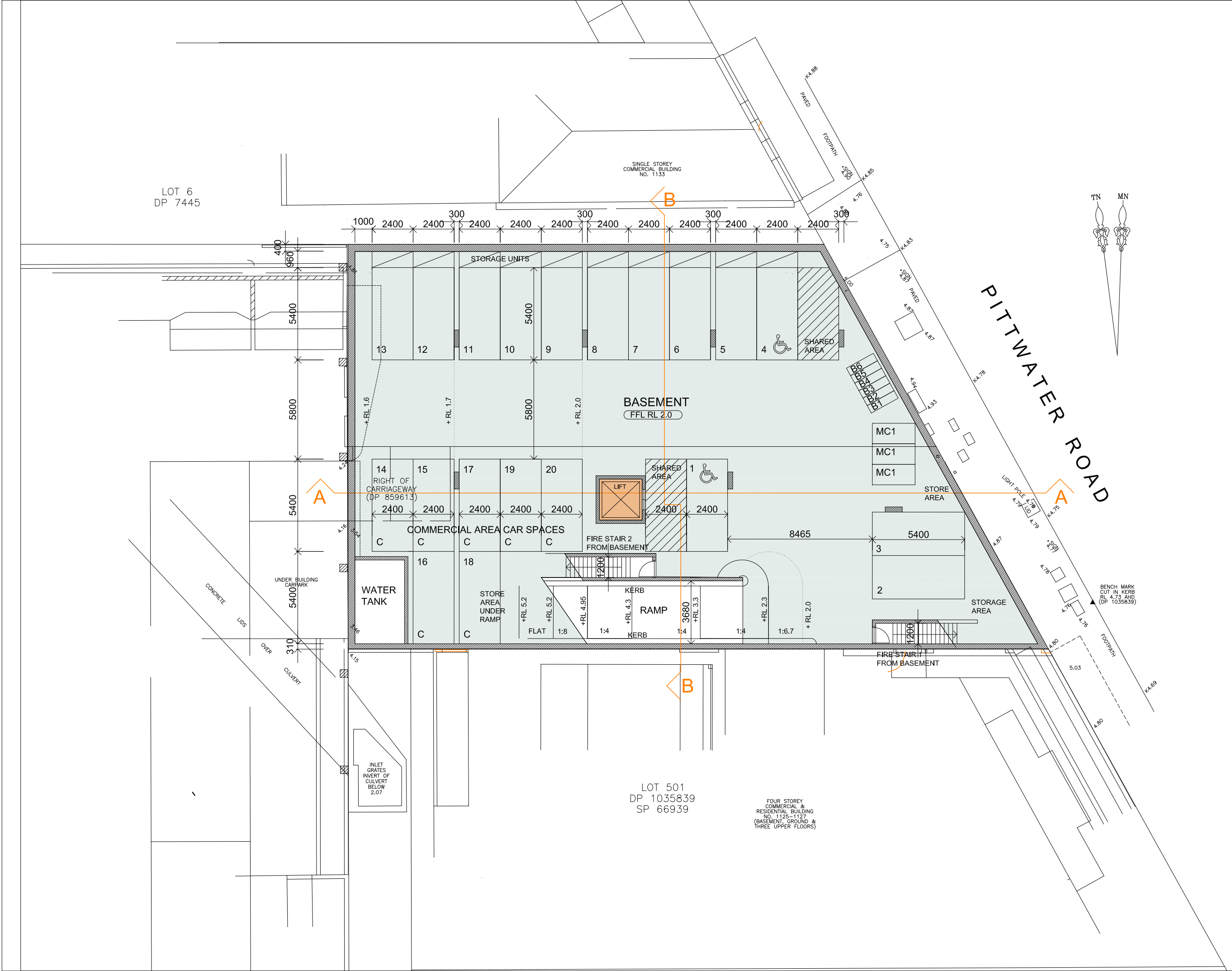
DP SURVEYING

LAND & ENGINEERING SURVEYORS
46 JOHN ST, AVALON BEACH 2107
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EMAIL : david@dpsurveying.com.au
DATE : 23 MAY, 2018
MY REF : 3120 SHEET 2 OF 2

COLLARROY

STREET

10 Attachment B: Proposed Development Architectural Drawings



LEGEND

| ISSUE | DATE | AMENDMENTS |
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Client

LOTUS PROJECTS

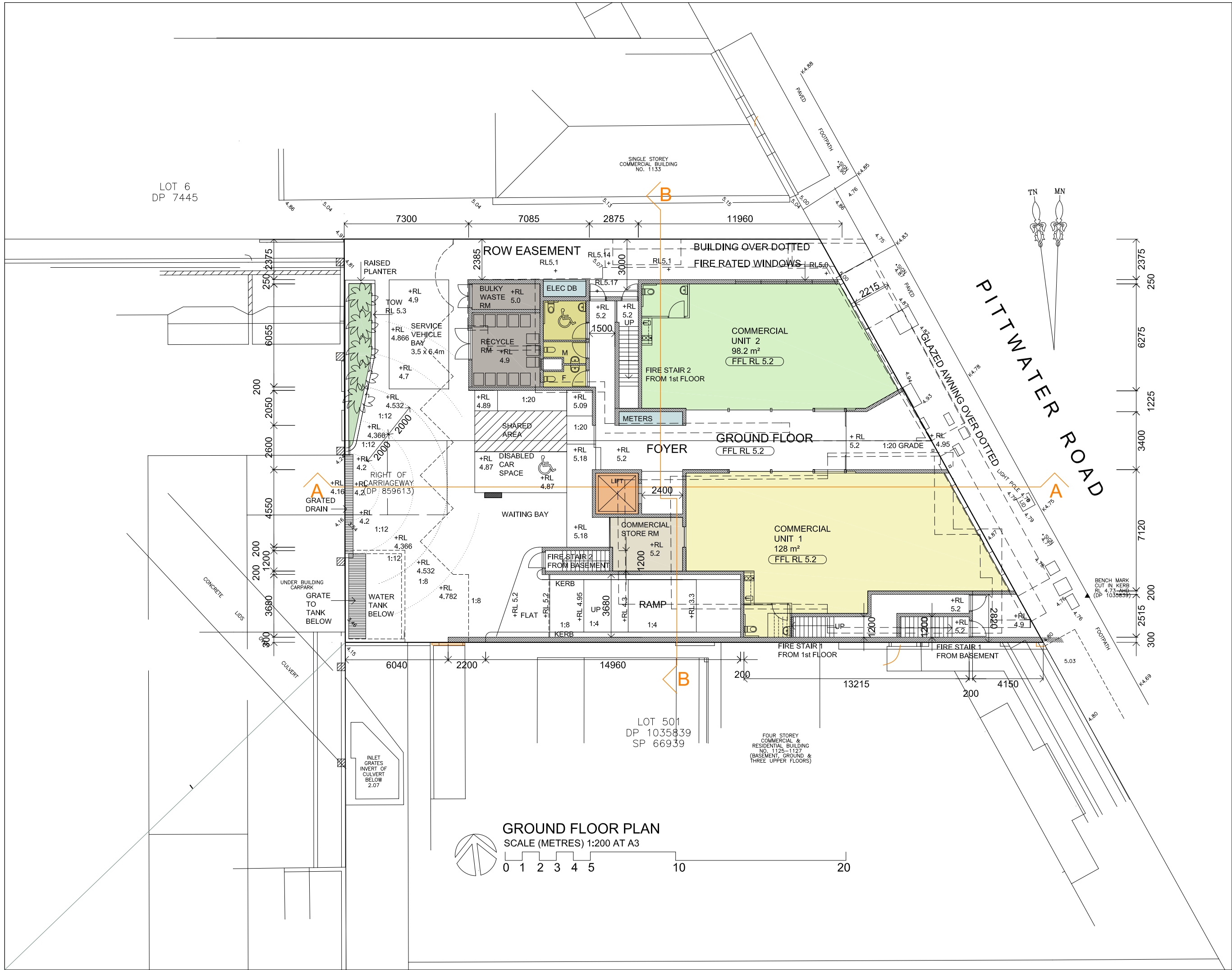
Project
**1129-1131 PITTWATER ROAD
COLLAROY**

Lot 4 IN DP 7445 &
Lot 1 IN DP 859613

Drawing
BASEMENT FLOOR PLAN

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| Plotted | 19/03/2020 3:17 PM | | |
| Job No | 1812 | | |
| Version | DA | Drawing No: | A02 |

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LOTUS PROJECTS

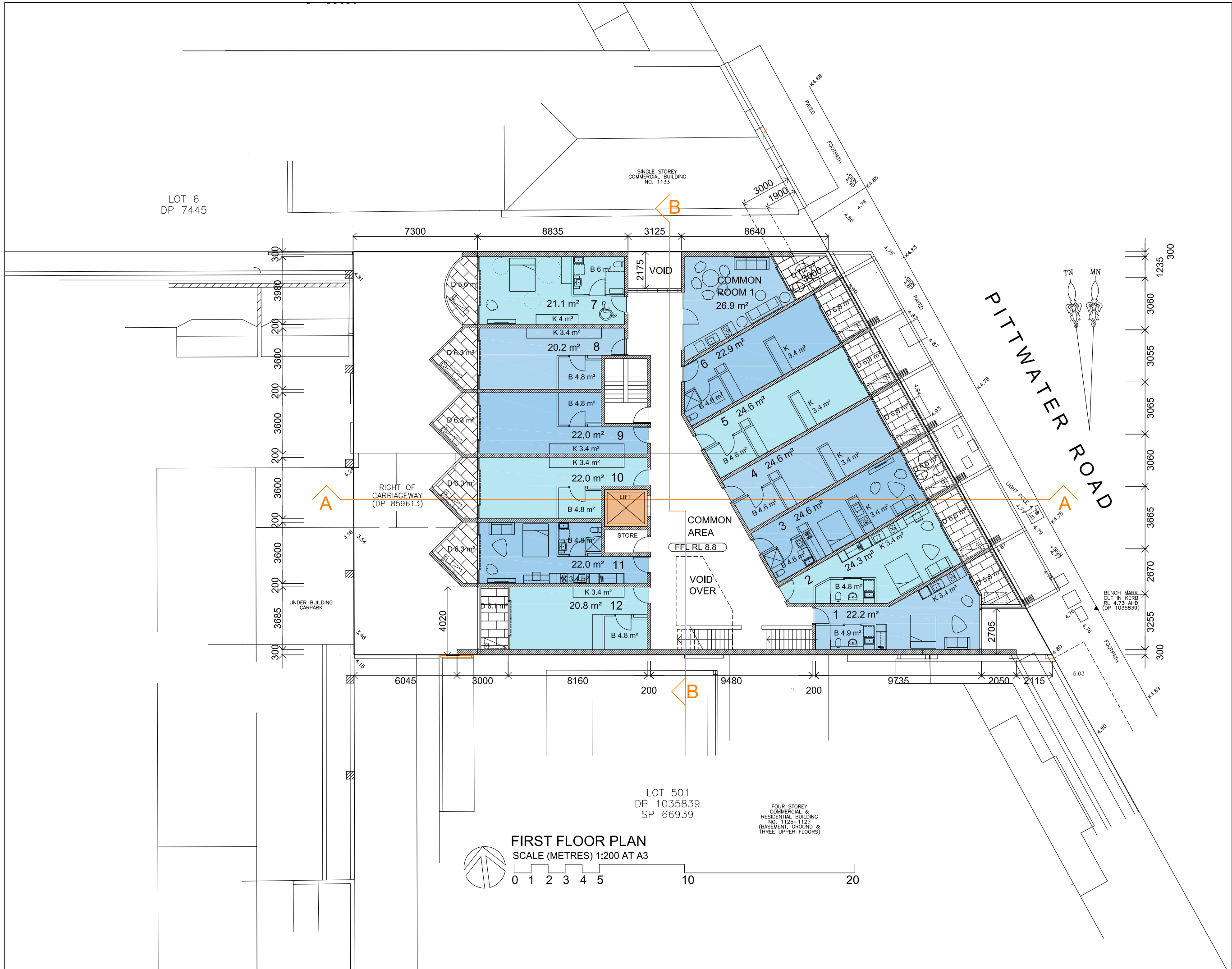
Project
**1129-1131 PITTWATER ROAD
COLLARROY**

LOT 4 IN DP 7445 &
LOT 1 IN DP 859613

Drawing
GROUND FLOOR PLAN

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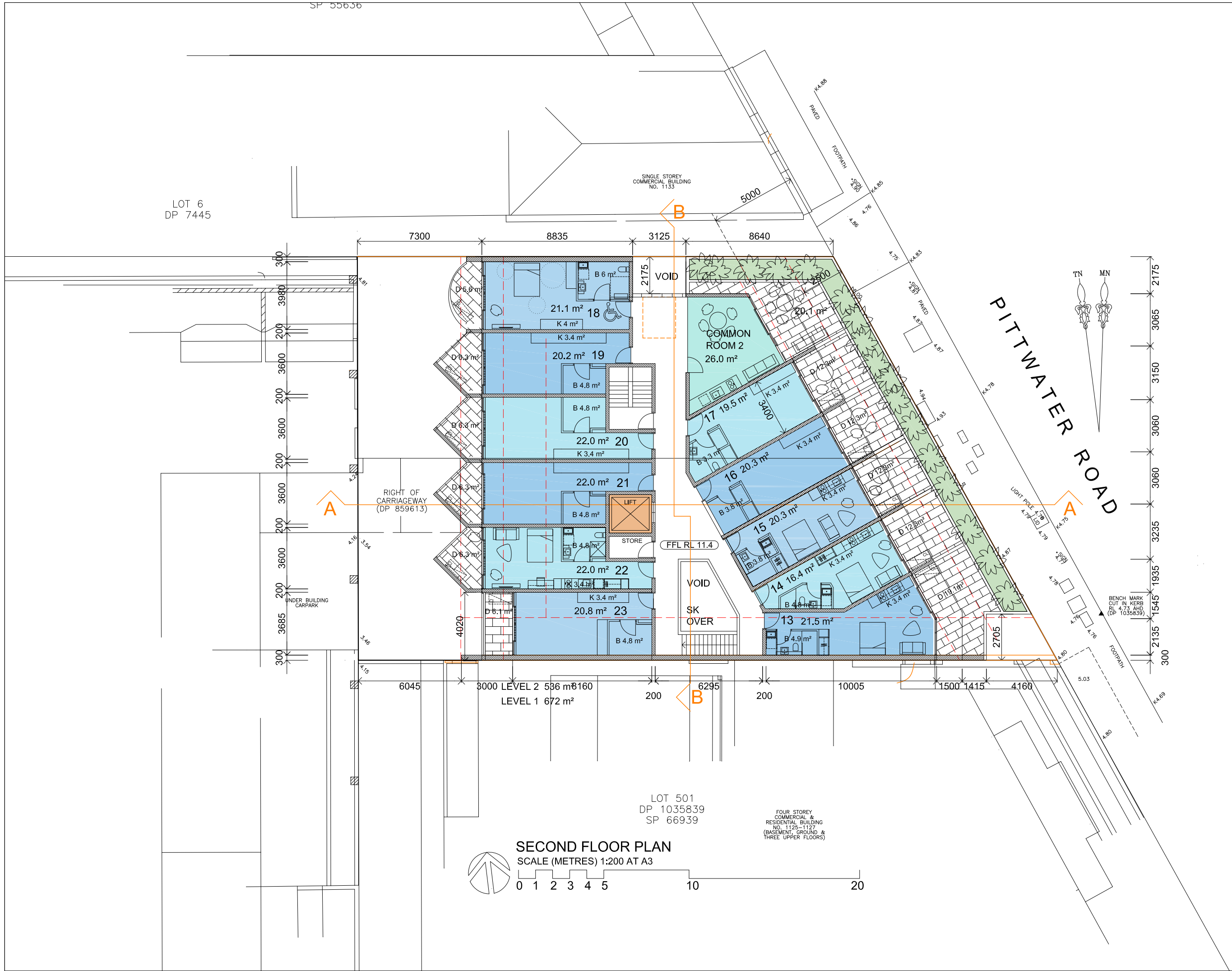
Project
**1129-1131 PITTWATER ROAD
COLLAROY**

LOT 4 IN DP 7445 &
LOT 1 IN DP 859613

Drawing
FIRST FLOOR PLAN

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LOTUS PROJECTS

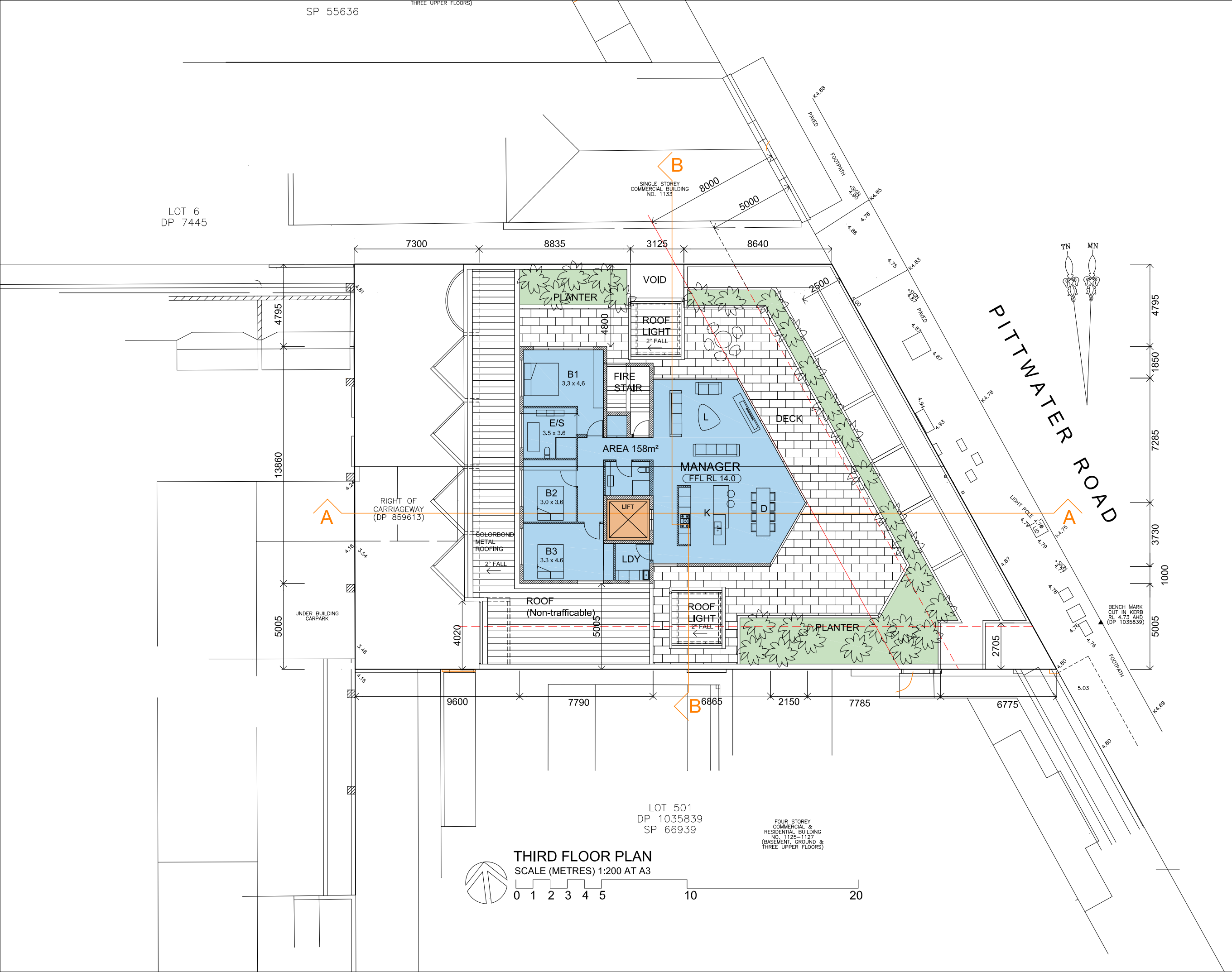
Project
**1129-1131 PITTWATER ROAD
COLLAROY**

LOT 4 IN DP 7445 &
LOT 1 IN DP 859613

Drawing
SECOND FLOOR PLAN

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Client

LOTUS PROJECTS

Project

1129-1131 PITTSWATER ROAD

COLLARROY

Lot 4 in DP 7445 &

Lot 1 in DP 859613

Drawing

THIRD FLOOR PLAN

Scale 1:100

Drawn BR

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Job No 1812

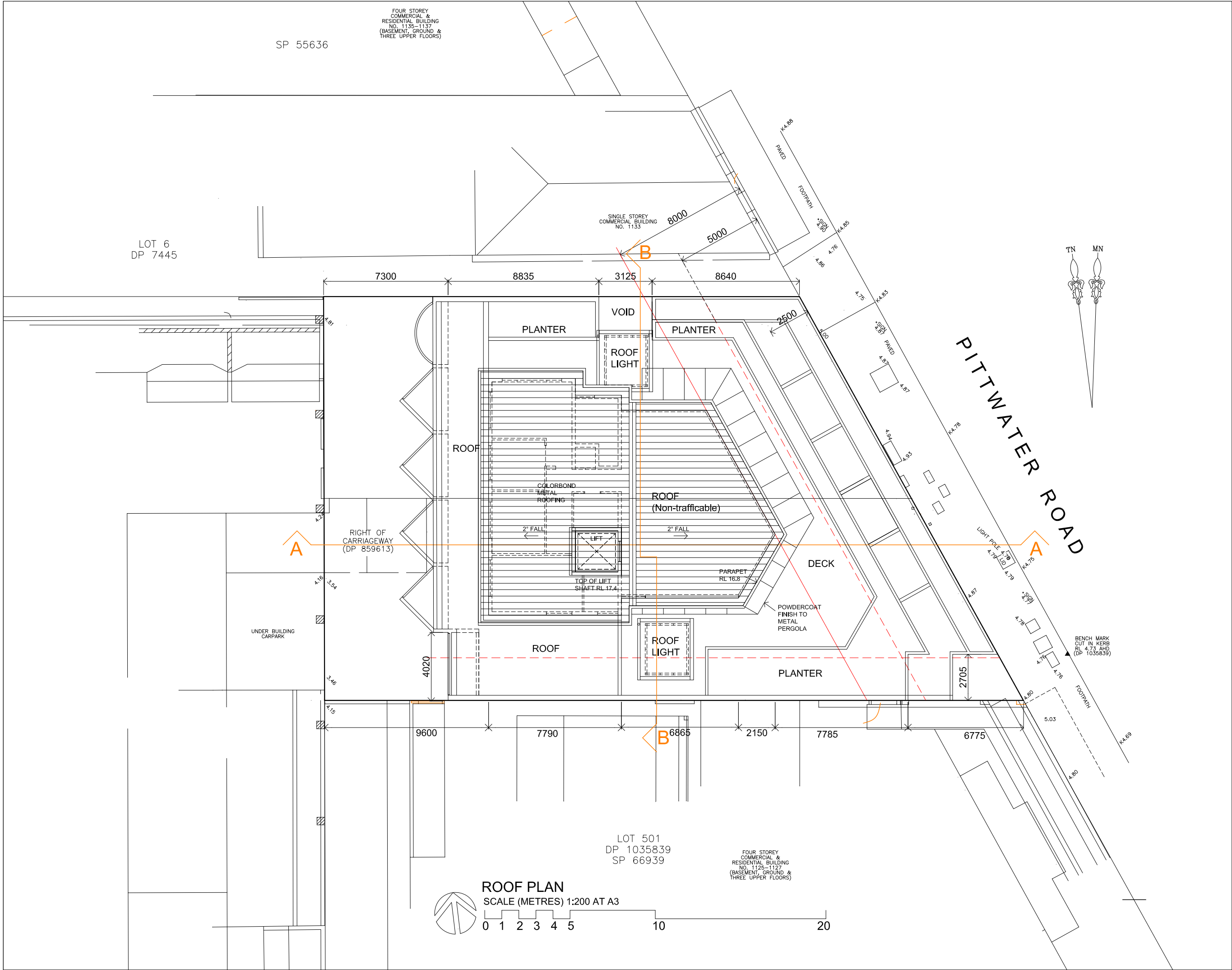
Version DA

Drawing No: A06

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LOTUS PROJECTS

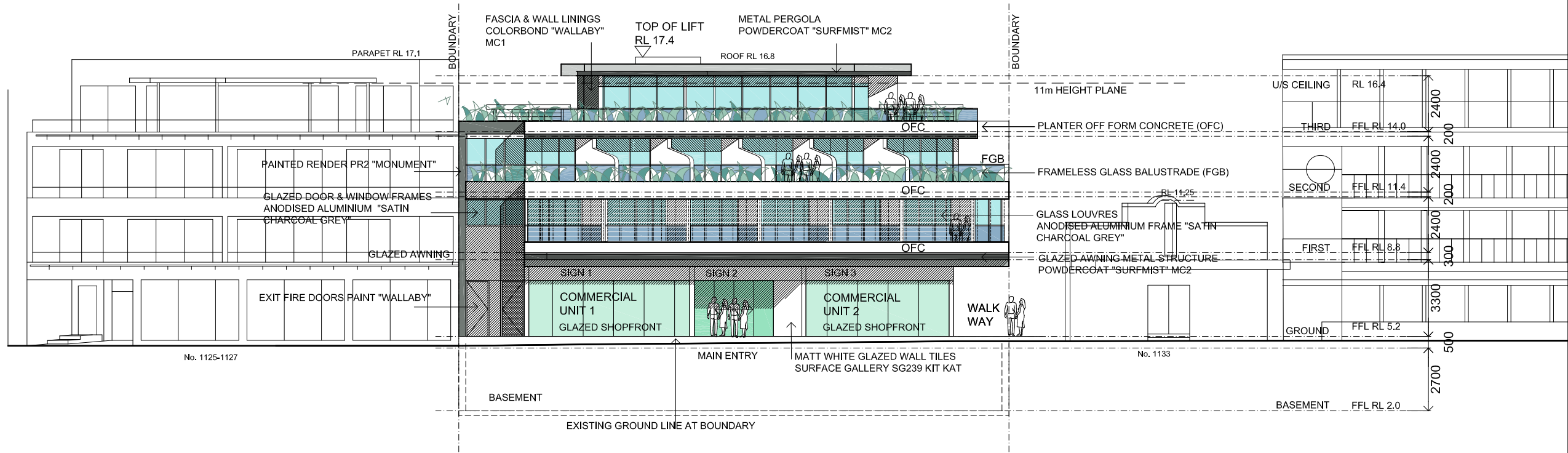
Project
**1129-1131 PITTWATER ROAD
COLLARROY**

LOT 4 IN DP 7445 &
LOT 1 IN DP 859613

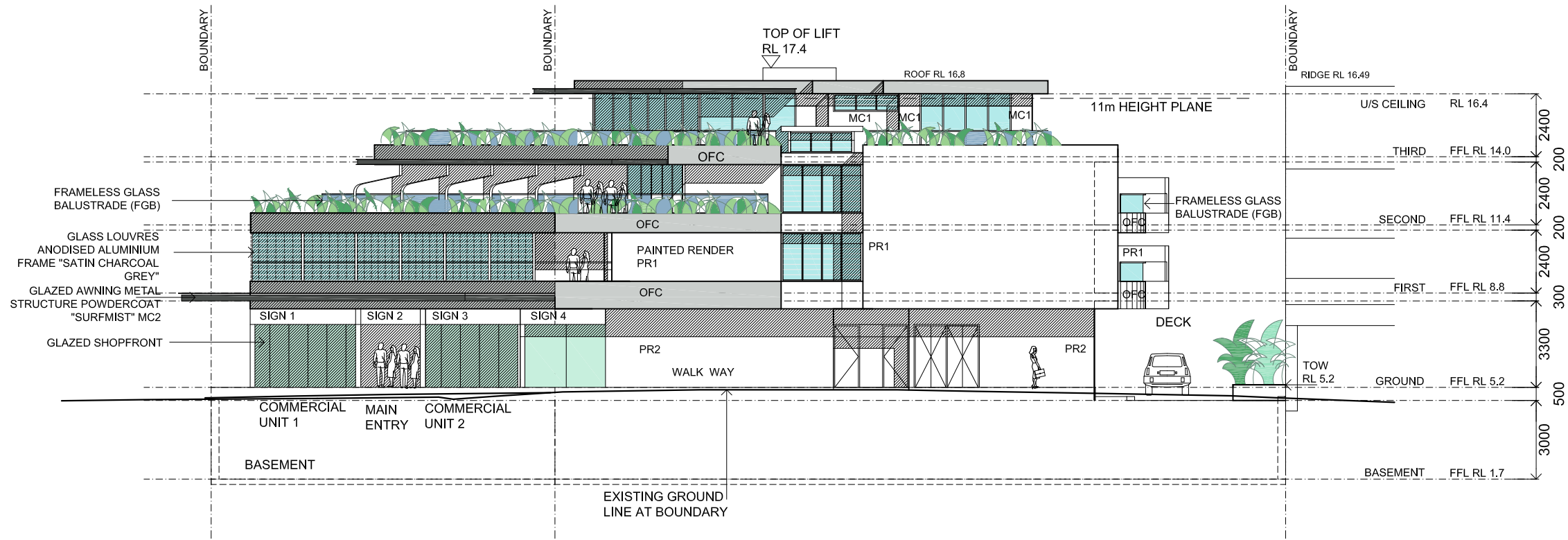
Drawing
ROOF PLAN

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| Version | DA | Drawing No: | A07 |

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EAST ELEVATION (FACING PITTWATER ROAD)



NORTH ELEVATION

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Client

LOTUS PROJECTS

Project
**1129-1131 PITTWATER ROAD
COLLARROY**

LOT 4 IN DP 7445 &
LOT 1 IN DP 859613

Drawing
**ELEVATIONS
EAST & NORTH**

Scale 1:100 Drawn BR

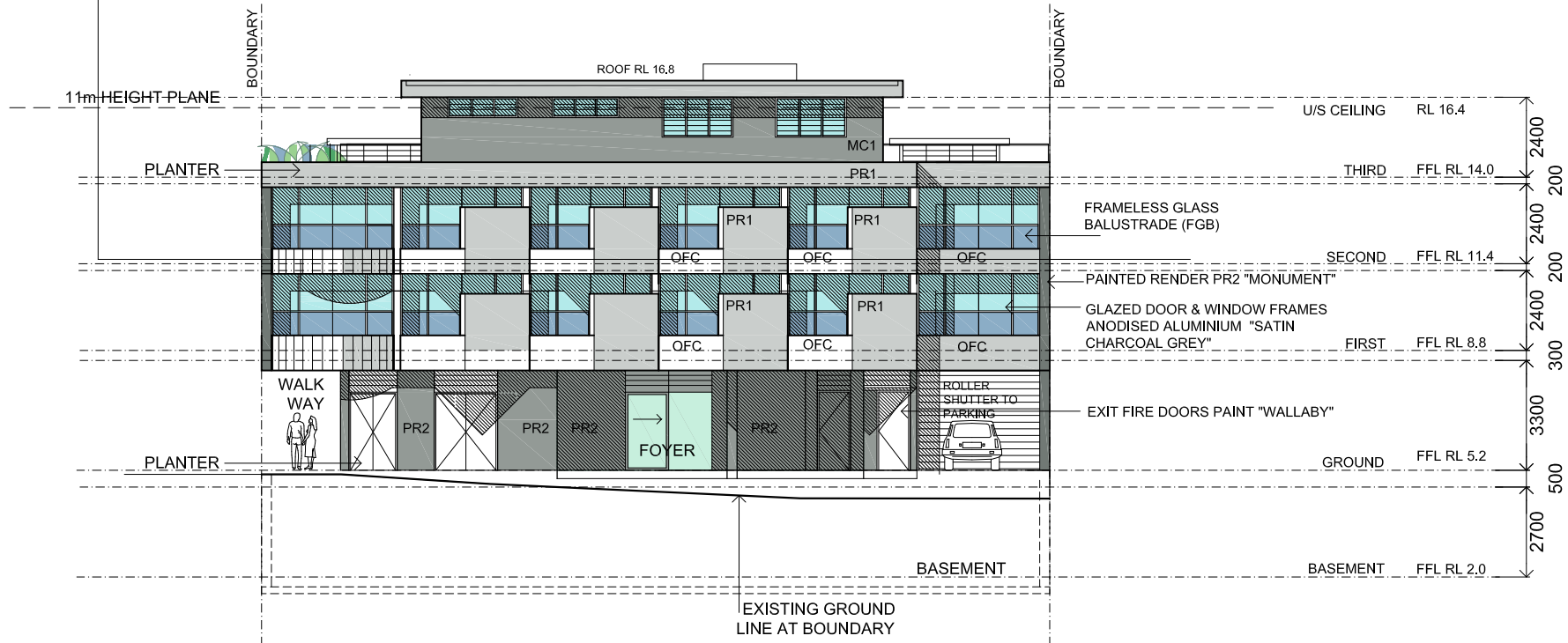
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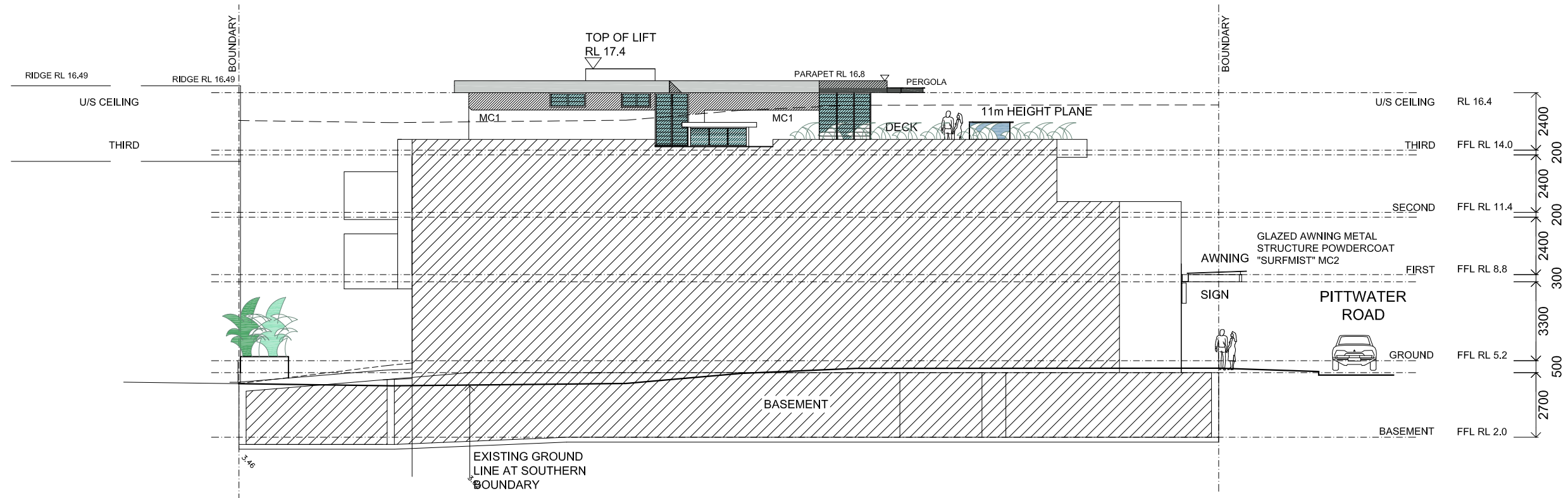
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WEST ELEVATION



SOUTH ELEVATION

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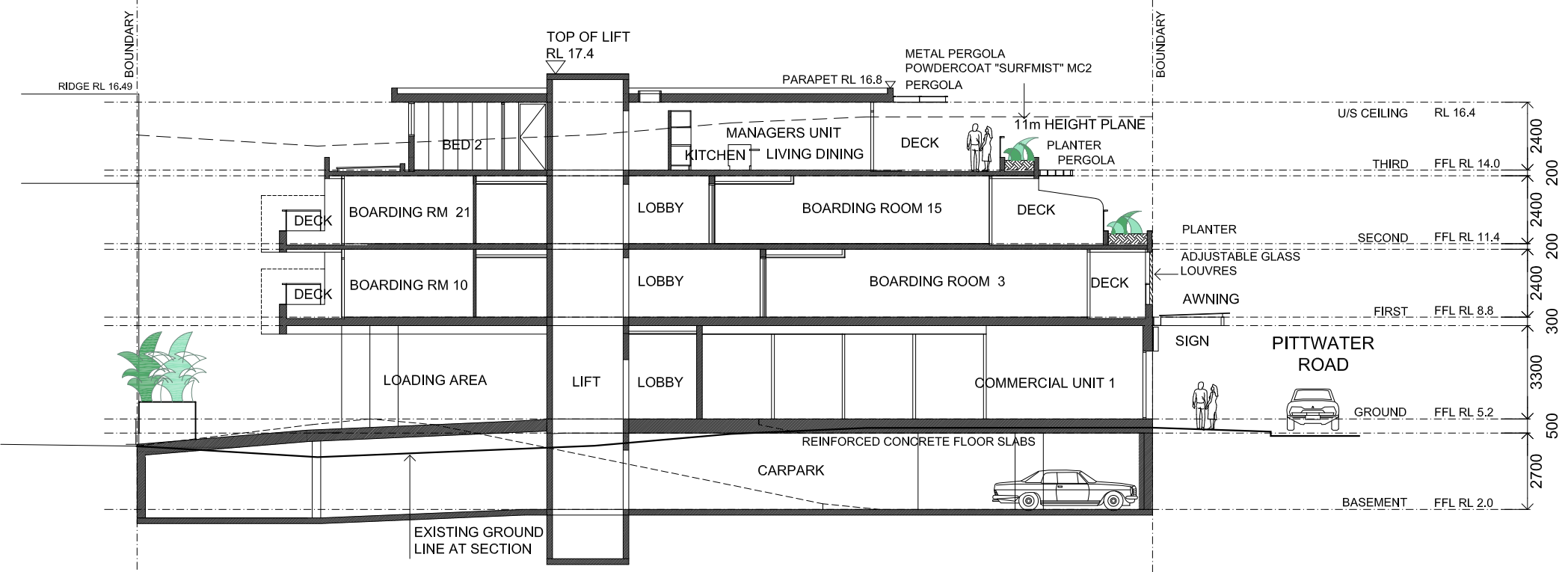
Project
**1129-1131 PITTWATER ROAD
COLLAROY**

LOT 4 IN DP 7445 &
LOT 1 IN DP 859613

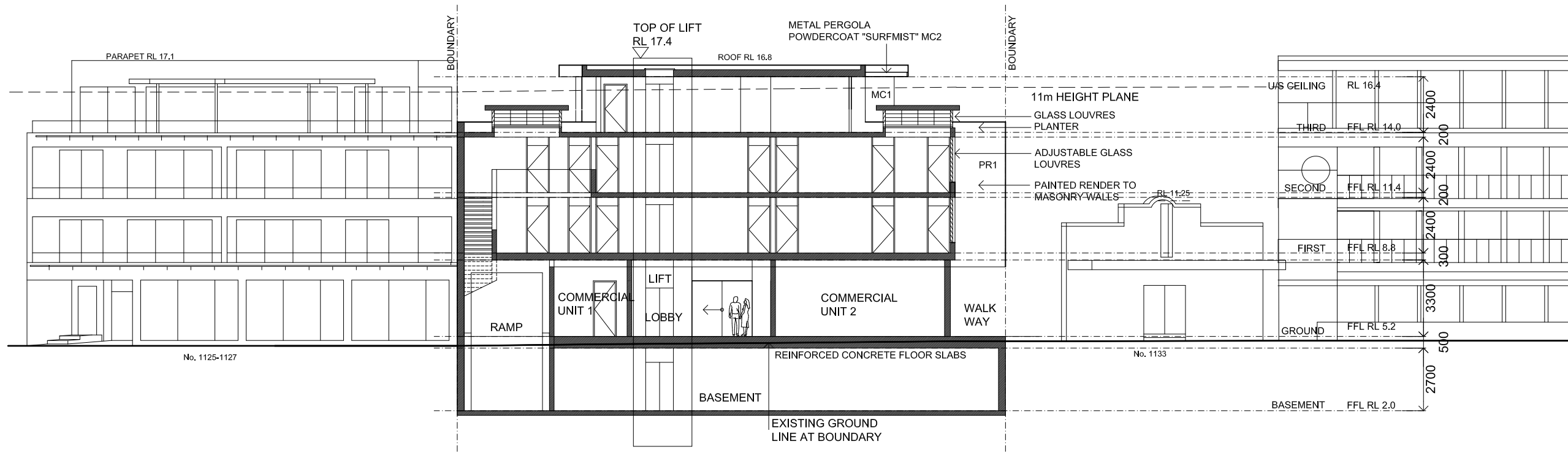
Drawing
**ELEVATIONS
WEST & SOUTH**

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File DADPITTWATER ROAD COLLAROY.dwg
Plotted 19/03/2020 3:17 PM
Job No 1812
Version DA PRELIM Drawing No: **A09**

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SECTION A-A



SECTION B-B

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| 1 | | |

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Client
LOTUS PROJECTS

Project
**1129-1131 PITTWATER ROAD
COLLAROY**

LOT 4 IN DP 7445 &
LOT 1 IN DP 859613

Drawing
SECTIONS A-A & B-B

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| Job No | 1812 | | |
| Version | DA | Drawing No: | A10 |

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11 **Attachment C: NBC Prelodgement Advice**



northern
beaches
council

PRELODGE MENT ADVICE

Application No: PLM2019/0205

Meeting Date: 7/11/2019

Property Address: 1129 & 1131 Pittwater Road COLLAROY

Proposal: Demolition works and the construction of a mixed use development configured as basement carparking, ground floor, commercial and access boarding house (Level 1 and 2) and a managers residence (Level 3).

Attendees for Council: Steve Findlay – Development Assessment Manager
Alex Keller – Principal Planner
Lea Lennon – Urban Design

Attendees for applicant: Greg Boston – Planning Consultant
Barry Rush – Architect
Frank Lucia – Owner

General Comments/Limitations of these Notes

These notes have been prepared by Council on the basis of information provided by the applicant and a consultation meeting with Council staff. Council provides this service for guidance purposes only. These notes are an account of the specific issues discussed and conclusions reached at the pre-lodgement meeting. These notes are not a complete set of planning and related comments for the proposed development. Matters discussed and comments offered by Council will in no way fetter Council's discretion as the Consent Authority. A determination can only be made following the lodgement and full assessment of the development application.

In addition to the comments made within these notes, it is a requirement of the applicant to address ALL relevant pieces of legislation including (but not limited to) any SEPP and any applicable clauses of the Warringah LEP 2011, Warringah LEP 2000 and Warringah DCP 2011 within the supporting documentation of a development application including the Statement of Environmental Effects.

You are advised to carefully review these notes. If there is an area of concern or non-compliance that cannot be supported by Council, you are strongly advised to review and reconsider the appropriateness of the design of your development for your site and the adverse impacts that may arise as a result of your development prior to the lodgement of any development application.



SPECIFIC ISSUES RAISED BY APPLICANT FOR DISCUSSION

Proposal in detail (plans dated 18/9/2019 drawn by Barry Rush & Associates)

- Demolition of the existing buildings (shops) and site preparation works
- **Basement RL 1.70** - Excavation for one basement level of carparking for 19 cars, storage area, lift stairs and vehicle ramp / aisles.
- **Ground Floor RL 5.2** – Two shops, entry foyer, bin / service, common room, lift and stair access, toilets, carparking for 4 cars.
- **First Floor RL 8.8** – Boarding house accommodation (14 rooms) each with bathroom, kitchenette and balcony space, stair and lift access, access area
- **Second Floor RL 11.4** - Boarding house accommodation (12 rooms) each with bathroom, kitchenette and balcony space, common room lift and stair access
- **Third Floor RL14.0** – Boarding house manager's dwelling (4 bedrooms), kitchen / living dining, bathrooms, laundry, storage, lift and stair access, terrace areas.
- **Roof RL 16.8 to 17.4** – Roof, parapet and lift overrun.

| Issue/s Raised | Council Response |
|----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Height | <p>The height limit for the site is 11.0 metres (m) and three storeys.</p> <p>The development proposes a four storey building with maximum height of approximately 12.2m.</p> <p>A fourth storey on this site is possible (consistent with previous advice for shop top housing on the site), however, the managers Unit is to be substantially reduced from what is proposed on the pre-lodgement plans. This is to reduce potential amenity impacts on surrounding sites.</p> <p>Street presentation is also a critical factor in gaining support for a fourth storey. The top two levels of the building must step further away from the street setback than what has been proposed.</p> <p>The application must be accompanied by a clause 4.6 request to vary the height limit. This request must demonstrate why full compliance is unreasonable or unnecessary and why the proposal is a better planning outcome than a fully compliant development.</p> <p>Stating that there are other examples of four</p> |



| | |
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| | <p>storey developments nearby is not sufficient justification for a non-compliance as the request must relate to the particular circumstances of the site.</p> <p>The variation to the height control will not be supported if it results in adverse impacts on residential amenity and views or creates an undesirable precedent. Potential amenity impacts include overshadowing on the property to the south, privacy / overlooking impacts, view impacts from the properties to the west, and streetscape appearance when viewed from public land along Collaroy beachfront reserve.</p> |
| Setbacks | <p>The front setback control requires the ground and first floor to be on the front boundary. Any floors above that must be set back at least 5.0m.</p> <p>The proposed development shows the first floor setback 2.5m with balcony spaces. The dividing walls between the balconies, balustrade and detail should include high quality materials that create visual interest and continuity with adjacent / nearby recent new development in Collaroy for shop top housing.</p> <p>The second floor level is setback 5.0m with the upper floor managers residence at 7.0m. The managers residence is likely to be still prominent and a setback of 8.0m with only lightweight (timber / metal) pergola structures. Privacy screens along the side wall of the boarding rooms and adjacent the side boundaries should be designed with aesthetic considerations for view lines and sunlight as well as providing functional privacy.</p> <p>Particular care must be taken to minimise its street presence and avoiding potential neighbours concern due to excessive deck areas on the upper level. A reduction of the floor area for the “manager’s residence” is therefore required. This should include reducing the trafficable terrace areas along the western, northern and southern setbacks around the manager’s residence. The use of low planter boxes with appropriate screen native planting</p> |



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| | for balcony areas should consider view lines, safety and provide a practical means of managing privacy by reducing roof top deck areas. |
| General Form | <p>A list of other issues raised in the pre-lodgement meeting, and anything else that will need to be kept in mind during the redesign, follows:</p> <p>Basement Level:</p> <ul style="list-style-type: none">• There is no storage space for residential units detailed (collective area shown).• No motorcycle or bicycle spaces have been provided require by the SEPP ARH.• If tandem parking spaces are to be used, they must be allocated to single units.• As the upper floors are amended, the lift cores will need to be moved and this will affect the parking arrangement.• The swept paths of the ground floor car parks, ramp and basement car parks will need to be checked and compliance demonstrated in the DA. <p>Ground Floor:</p> <ul style="list-style-type: none">• In line with the waste comments, space for a commercial bin room and bulky goods waste room will need to be provided.• The retail street activation of the current design is a positive element and should be maintained.• Toilet facilities for the retail/restaurant spaces need to be provided.• Floor to ceiling heights are to be adequate to cater for a range of possible future uses. |



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| | <p>First Floor:</p> <ul style="list-style-type: none">• Noise minimisation measures may be required to reduce the impact of Pittwater Road on these units.• Floor to ceiling heights are to comply / with the BCA. <p>Second Floor:</p> <ul style="list-style-type: none">• The units and balconies must be set back further from the street.• This storey may need to be set back from the southern boundary to preserve the amenity of the property to the south.• Similar comments to the first floor units in relation to length, natural light and noise measures.• Floor to ceiling heights are to comply with the BCA. <p>Third Floor:</p> <ul style="list-style-type: none">• This storey will need to be set back from the southern boundary to preserve the amenity of the property to the south.• View loss impacts from this storey are to be considered. <p>Other Matters:</p> <ul style="list-style-type: none">• Business identification signage should be incorporated as part of this application, so that signage is consistent and so future occupants of the retail tenancies already have approval for their signage.• Vehicle access is critical for this development. All options (other than access from Pittwater Road) must be explored.• Details are required to address floor to floor noise penetration to ensure internal residential amenity is protected. |
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| <p>STATE ENVIRONMENTAL POLICY (AFFORDABLE RENTAL HOUSING) 2009 SEPP ARH</p> | <p>The design of the proposal is required to demonstrate the development is compatible with the character of the local area.</p> <p>Consideration should include defining the “relevant area” in the context of the proposal, identifying “consistent elements” of the design and the “local character” to ensure the proposal is a “good fit”. Careful consideration should be made to elements of the proposal that are not consistent with the built form controls (e.g. storeys) so that appropriate design treatment / response is provided.</p> <p>The design of the proposal is to address clauses 29, 30 and 30A as they apply to the site and zone. In addressing these requirements the following details are required:</p> <ul style="list-style-type: none"> • Compliance with floor space requirements of the SEPP. • Addressing building height. (Note that clause 4.6 requires additional consideration if both storeys and the SEPP are breached in addition to the LEP. • Landscape response for terrace areas and any ground floor amenity. • Solar access to common rooms and open space for the common room area • Private open space distribution for each room and the boarding house manager. • Parking provision including the expected usage or balance of parking for the expected maximum occupancy for the building and per room. • Accommodation size (detailed on the plans excluding kitchen and bathroom areas) • Standard for Boarding Houses including |
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| | <p>the adequacy / amenity of communal living space, room floor areas, bicycle / motorbike parking, limitations on capacity and residential use at ground level.</p> <ul style="list-style-type: none"> • Details of managers residence requirements (carparking, open space and the like) <p>The applicant is to nominate / clarify if any “affordable housing” pursuant to SEPP 70 is to be included. This may include details / reasons for not nominating / allocating any units for this specific criteria.</p> <p>A draft Operational Management Plan will need to be submitted with the development application for the boarding house.</p> |
| SEPP 65 and the ADG | <p>Clause 4 (4) of SEPP 65 excludes boarding house development from the SEPP and ADG. WLEP 2011 permits boarding house development within the B2 Local Centre zone.</p> |

WARRINGAH LOCAL ENVIRONMENTAL PLAN 2011 (WLEP 2011)

Note: WLEP 2011 can be viewed at [Council's website](#).

| Zoning and Permissibility | |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Definition of proposed development: (ref. WLEP 2011 Dictionary)</p> | <p>Retail Premises Boarding house means a building that:</p> <ul style="list-style-type: none"> (a) is wholly or partly let in lodgings, and (b) provides lodgers with a principal place of residence for 3 months or more, and (c) may have shared facilities, such as a communal living room, bathroom, kitchen or laundry, and (d) has rooms, some or all of which may have private kitchen and bathroom facilities, that accommodate one or more lodgers, but does not include backpackers' accommodation, a group home, hotel or motel accommodation, seniors housing or a serviced apartment. |



| | |
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| Zone: | B2 Local Centre |
| Permitted with Consent or Prohibited: | Permitted with consent – retail premises and boarding house. |
| Objectives of the Zone | <ul style="list-style-type: none"> • <i>To provide a range of retail, business, entertainment and community uses that serve the needs of people who live in, work in and visit the local area.</i> • <i>To encourage employment opportunities in accessible locations.</i> • <i>To maximise public transport patronage and encourage walking and cycling.</i> • <i>To provide an environment for pedestrians that is safe, comfortable and interesting.</i> • <i>To create urban form that relates favourably in scale and in architectural and landscape treatment to neighbouring land uses and to the natural environment.</i> • <i>To minimise conflict between land uses in the zone and adjoining zones and ensure the amenity of any adjoining or nearby residential land uses.</i> |

| Principal Development Standards: | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 4.3 Height of Buildings | |
| Standard | Proposed |
| 11.0 metres (m) | Approximately 12.2m to lift overrun. Approximately 11.6 to roof parapet |
| <p>Comment</p> <p>Does not comply.</p> <p>A fourth storey on this site is regarded as a variation to the DCP storey limit, and therefore influences the overall height of the building. The height, bulk, setbacks and floor area affects the visibility of the fourth storey element which is a critical issue for any request to vary the height control. However, it must be greatly reduced from what is proposed on the pre-lodgement plans and it must take into account the amenity impacts on surrounding sites.</p> <p>The plans must clearly show the accurate height of the building (using a section through the highest point) and must also accurately demonstrate the height of the neighbouring four storey developments to show how the proposal fits within the desired built form and character with minimal impact on surrounding land.</p> <p>A clause 4.6 request must be submitted with the development application (DA).</p> | |



Note: Building heights are measured from existing ground level.

WARRINGAH DEVELOPMENT CONTROL PLAN 2011 (WDCP 2011)

Note: The WDCP can be viewed at Council's website.

| Part B: Built Form Controls | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| B7. Front Boundary Setbacks | |
| Control/Requirement | Proposed |
| Ground and first floor maintain street front, second floor up 5m. | <p>Ground floor – shops street frontage.</p> <p>First – 2.5m to wall with front balcony edge to the street front.</p> <p>Second – 5.0m to wall with to edge of balcony structure 2.0m</p> <p>Third – 7.0m to wall with edge of balcony structure 4.0</p> |
| <p>Comment</p> <p>Balcony screens / balustrades and framing for the upper levels should include lightweight structures. The use of design element to create visual consistency with the adjacent building floor levels is recommended to create continuity for the desired future streetscape. This will require design details of colours and materials including a photo montage to demonstrate appropriate urban design outcomes.</p> <p>The upper level containing the manager's residence must be reduced in footprint to be well clear of the side and rear elevations and not visible from street level in front of the building to minimise its street presence and the non-compliant height and upper storey.</p> | |
| C3 Parking Facilities | |
| Control/Requirement | Proposed |
| <p>Shop Top Housing requires:</p> <p>Shop</p> <p>1 space per 16.4 m² GLFA (6.1 spaces per 100 m² GLFA)</p> | <p>The proposal is required to demonstrate vehicle access for deliveries and service vehicles including the loading dock area.</p> <p>It is considered that the ground floor "common room" and bin room be merged / reconfigures to provide improved "back of house" area for the shops and boarding house, including residential waste, bulk waste, commercial waste and loading / delivery dock. Reconfiguration of this area</p> |



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| <p>Boarding House component <i>“Comparisons must be drawn with developments for a similar purpose.”</i></p> <p>Boarding house manager. <i>The managers unit (4 bedroom Unit) on the top floor should be allocated 2 parking spaces.</i></p> | <p>may also include disabled persons parking and changes to be foyer areas.</p> <p>Any parking allocation for the shops and managers dwelling should include an appropriate balance of carparking spaces for staff and customers. The floor area of the existing shops may be factored in to the provision of parking, however the boarding house should not be subject to a separate allocation / cost that would cause lodgers to park elsewhere. Details will need to be addressed in Traffic and Parking Report, including appropriate mechanism to ensure that boarding house lodgers that have cars will fully utilize the available basement residential parking.</p> <p>Carparking should only be compared with applications made under WDCP 2011 and that were for the construct of a new boarding house building. The SEPP requires 0.5 spaces per boarding room. However, a reasonable minor variation will be considered on merits of the subject site having convenient and safe access to the “B-line” bus stop and other frequent bus services along Pittwater Road.</p> <p>Parking spaces for the boarding house rooms (including the Manager’s dwelling) cannot be Strata titled to separate the individual spaces.</p> |
| <p>Comment</p> <p>The Traffic and Parking report submitted with the application will need to analyse the existing parking situation in the surrounding area and the level of non-compliance with the parking controls under the WDCP 2011 and the RMS guide. The development application will require referral to the NSW RMS due to proximity to a main road (MR)</p> | |

| Specialist Advice | |
|-------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Referral Body | Comments |
| Development Engineering | <p><u>Stormwater management</u></p> <p>All stormwater runoff from the site must be discharged to Pittwater Road. As Pittwater Road is under <i>Roads Maritime Services</i></p> |



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| | <p>(RMS) care and control, the applicant is to liaise with RMS with respect to stormwater drainage requirements. All requirements of RMS must be complied with. The proposal will be referred to the RMS' and concurrence is required for the stormwater drainage plan(s) for the Development Application.</p> <p>Under the Government Information (Public Access) Act 2009 (NSW) (GIPA Act), the applicant may view the easement details from Council's Records Team. This may need to be confirmed by contacting NSW Land Registry Services.</p> <p>Indicative location and dimensions of Council's pipelines are shown on the attached pdf. The location and dimensions of Council's pipeline will need to be confirmed by survey and/or inspections.</p> <p><u>Vehicle access</u></p> <p>Sufficient details must be submitted demonstrating that access via the existing right of carriageway to the development site complies with Australian Standards with respect to vehicle swept paths, driveway gradients, headroom clearances, etc, based on the types of vehicles (commercial and non-commercial) that are expected to access the development.</p> <p><u>Flood protection</u></p> <p>Council has not undertaken a formal flood study for this catchment. However, Council is aware of historical flooding in the very near vicinity of this location. It is noted that a draft flood assessment has been prepared by <i>Martens & Associates</i> (Ref #P1907336JR02V01)</p> <p>In particular for this development, the applicant should take note of the following development controls:</p> <ul style="list-style-type: none">• The minimum habitable floor levels are to be set at or above the Flood Planning Level (FPL).• The development must not reduce flood storage in any flood event up to the 1% AEP event.• The ramp design / crest of the ramp into the basement car park area must be set at or above the FPL to prevent floodwaters entering the car park. All potential water entry points for the basement car park (e.g: driveway, stair access, ventilation points) are to be set at or above the FPL <p>The Applicant is advised to submit with DA application the following details:</p> <ol style="list-style-type: none">1. On-Site Detention (OSD) is to be provided in accordance with Council's OSD Technical Specification. Section 2.7 of |
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| | <p>this Specification states, “OSD will not be required where the site of the development is located within a Council established 1 in 100 year ARI flood plain, and that it can be demonstrated that lesser storm events will also flood the site. Otherwise it will be necessary to provide OSD to control the runoff for the minor storm events.”</p> <ol style="list-style-type: none">2. The Applicant shall determine application of Part C4 of WDCP to the development, and justify any concession in the provision of OSD. Development Engineering will undertake a detailed assessment of submitted information at the time of Development Application.3. As per Council's best current information, the proposed stormwater discharge from the site can be connected to the existing Council pit, located within the established drainage easement (E2) SP66939 of DP1035839. The proposed connection to a local existing pit, as shown on the plan PS03-E100, is to be revised to Council satisfaction. The Applicant shall demonstrate that all adjoining properties are not worse off post-development and that Council' drainage system can accept the proposed additional drainage form a new development. Prior to submission of the Development application further discussion will be required with Council's Development Engineers to establish any OSD requirements based on the draft flood study information provided.4. The proposed basement parking area is to be permanently tanked or piped seepage to the nearest Council stormwater system. The tanking shall be acknowledged on the stormwater drainage design plans submitted with DA application. A detailed geotechnical report is required to address engineering methods of construction, potential dilapidation risks, acid sulphate soils management and hydraulic risks. Any dewatering impact on the water table will require integrated referral to the <i>Department of Primary Industries</i>.5. Council's records indicate that the subject property is adjacent to the Council stormwater pipeline located within the property at 5 Collaroy Street - SP 58961. In this regard, the applicant is required to demonstrate compliance with Council's Building Over or Adjacent to Constructed Council Drainage Systems and Easement technical specification - For any work in close proximity to a Council pipeline, this technical specification must be considered and is available on the webpage via the link below: |
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<https://files.northernbeaches.nsw.gov.au/sites/default/files/documents/general-information/engineering-specifications/building-over-or-adjacent-constructed-council-drainage-systems-and-easements-technical-specification.pdf>

This consists of accurately locating, confirming dimensions and plotting Council's stormwater pipelines and associated infrastructure to scale on the DA plans which show the proposed works. This should be carried out by a service locating contractor and registered surveyor. (The applicant will need to provide evidence of methodology used for locating).

Northern Beaches Council has public stormwater drainage maps online. Please follow the relevant link below and select the 'Stormwater' map from the 'No Overlay Map' drop down menu. You can then search by address and use the zoom functionality to see pipe diameters and asset id numbers.

<https://services.northernbeaches.nsw.gov.au/icongis/index.html>

All structures are to be located clear of any Council pipeline or easement. Footings of any structure adjacent to an easement or pipeline are to be designed in accordance with the above-mentioned policy. Structural details prepared by a suitably qualified Civil Engineer demonstrating compliance with Council's policy are to be submitted with the development application.

6. The flood hydraulic report and model showing the 100 Year Average Recurrence Interval (ARI) stormwater flow over the subject site, is to be submitted for the DA. All calculations are to be carried out in accordance with the guidelines provided in "Australian Rainfall and Run Off", a publication of the Institution of Engineers, Australia. All levels are to be shown in Australian Height Datum (AHD). It is to be noted that no development is permitted over Council's drainage system which includes the established 1 in 100 ARI storm water overland flow path for the subject site. The flood study must be taken upstream and downstream beyond the subject site and shall include surrounding properties in the current shape and size, affected by the overland flow.

Furthermore, the study is to consider any potential flooding of the site from the floodwaters. Cross sections



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| | <p>detailing the 1 in 100 year ARI water surface level are to be provided at appropriate intervals.</p> <p>Any flood levels of the receiving water must be indicated on the drainage layout plan (if applicable). Water surface profiles are to be detailed for the existing and proposed conditions for the development site as well as for the both upstream and downstream of the development site. The <i>Hec-Ras</i> computer program is preferred for this application.</p> <p>The proposed development must comply with all requirements of Council's Section 9.3, <i>Overland Flow of Council's PL 850 Water: Water Management Policy</i>. Runoff from the developed site must not cause a detrimental effect on any property. This may require the retention (and possible expansion) of existing surface flow paths.</p> |
| Water Management | <p>As this lot is already 100% impervious and is under 1000 square metres (sqm), the water quality controls do not apply. The owner is encouraged to at least install a sediment control pit that captures coarse sediments prior to discharging stormwater from the lot, as this will help reduce siltation of Collaroy Beach. The pit must be accessible for maintenance purposes.</p> |
| Traffic Engineering | <p>A Traffic Impact Assessment is to be submitted identifying the following;</p> <ul style="list-style-type: none"> • Parking Numbers. The applicant should be providing suitable parking for the residents as well as retail/restaurant component. Any shortfalls must be justified. • Traffic generation and traffic safety control devices. • Ventilation from the basement area • Details of legal access and compliant right of carriageway widths for the cars and delivery vehicle to the development. <p><u>Onsite Servicing</u> The servicing of waste and loading/unloading must be accommodated within the site. The applicant shall review the largest possible truck that can utilise the ROW. They must then make provisions within the site boundaries to enable a forward in/forward out movement.</p> <p><u>Footpath</u> As part of the development, an upgrade of the footpath along the site frontage will be required, to maximise pedestrian safety when</p> |



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| | accessing the site or crossing the frontage. Details of footpath regrading (long section and cross sections will be required.) |
| Natural Environment & Climate Change Water Management | The development application should include provision to install a sediment control pit that captures coarse sediments prior to discharging stormwater from the lot, as this will help reduce siltation of Collaroy Beach. The pit must be accessible for maintenance purposes. |
| Urban Design | <p>Built Form Context</p> <p>The site is bounded on three sides by four storey development. A laneway to the north and right of carriageway and back of house zone to the rear of the site is congested with service areas and rubbish collection zones with access to commercial tenancies to the rear of the site as well.</p> <p>The site frontage is located on Pittwater Road in a B2 Local neighbourhood comprising mixed use, commercial and residential areas with a distinctive built to lines character fronting Collaroy Beach.</p> <p>The proposed development exceeds the (LEP) height of buildings control and (DCP) 3 storey limit. See further comments B2 Number of Storeys.</p> <p>The form and bulk, including building line setbacks at upper levels should relate favourably in scale and architecture to the adjoining properties, in particular the building to the south of the proposed development.</p> <p>Front setbacks at upper storeys should reflect the precedent set by this building in order to preserve existing view line corridors of residential apartments and to provide for a level of privacy. Zero lot alignment at ground and level 1 with a 5 metre front setback at level 2.</p> <p>The Manager's apartment at the top level 3 needs to be considered in terms of generous setbacks so as to not obstruct view line corridors and greater aspects from street level and broader immediate views. Refer additional comments</p> <p>Building Side and Rear Setbacks</p> <p>Side setbacks and stepping in of the built form from the side boundaries at the upper levels will assist in achieving the 7.2 metre wall height compliance. Ground level and level one with a setback that maintains the current alignment and the upper two levels setback from the side boundary to achieve view and cross breeze amenity to the apartments to the rear is preferred.</p> <p>Number of Storeys</p> |



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| | <p>The current design shows 4 storeys including ground level commercial/retail.</p> <p>Level 2 and 3 storey setbacks should reflect the precedent set by the neighbouring property to the south with the 4th level setback to provide for future separation of buildings. Refer <i>Additional Comments - Floor to Ceiling Heights</i> at the end of this commentary.</p> <p>Front Boundary Setback</p> <p>Ground level is to maintain street frontage alignment with neighbouring properties.</p> <p>2nd Level to maintain a 5m setback from the external face of the building on the front boundary.</p> <p>The context of the neighbouring properties sets a precedent for the upper levels.</p> <p>The proposed building line setback at the upper levels to the balconies should align with the neighbouring properties in order to maintain view line corridors to the existing apartments.</p> <p>It is council preference for the upper level apartment of the development to provide a level of view/aspect amenity to adjacent apartments to the south and to the rear of the property. Setback of the upper level a further 5 metres minimum would assist to minimise the bulk and scale as viewed from a public space.</p> <p>ADDITIONAL URBAN DESIGN COMMENTS</p> <p>Manager's Apartment and Rooftop Amenity</p> <p>The circulation; fire stair and elevator are distinct constraints in the planning of the development. As such these elements access the unit directly with no foyer or relative threshold. Whilst this is not a major concern Council's preference would be to move the current building line of enclosure back from the frontage to align with the eastern line of the lift and fire stair. Consideration to the planning of the spaces to maximise solar amenity and a possible reduction in number of bedrooms is a preferred outcome in terms of the broader view aspects and impacts on neighbouring properties' amenity.</p> <p>Ventilation</p> <p>Ventilation through the levels should be demonstrated to the satisfaction of council.</p> <p>The applicant noted the ventilation strategy but clearer description and annotation on the drawings to demonstrate the passive/active ventilation strategy will be required.</p> <p>Floor to Ceiling Heights/Slab and Servicing Allocation</p> <p>The drawings show a dimension of 2400 from floor to ceiling with</p> |
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| | <p>a slab depth of 200mm. Nominally a dimension of at least 2700 mm is the preferred floor to ceiling height to provide a decent level of amenity to residents with an additional 300-400 to allow for ceiling services. Alternative solutions needs to demonstrate reduced floor to ceiling levels and minimum slab depths can achieve the minimum requirements for amenity under the relative clauses of the NCC/BCA.</p> <p>Floor Heights Relative to Elevation and Streetscape Resolution</p> <p>Relative to and in consideration of the 2400mm floor to ceiling heights, it is noted that the streetscape elevation that assumes the same datum levels of both adjacent 4 storey buildings and reflects this in the design response articulated through the façade.</p> <p>General Note on Pittwater Road Entry Commercial</p> <p>The general arrangement of the two commercial tenancies at ground level could be further explored so that there is inbuilt flexibility for future tenancies division of spaces r potential for larger single tenancy.</p> <p>A more generous porte cochere into the building proper with entrances to tenancies from this central corridor could also be explored.</p> |
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Relevant Council Policies

You are advised of the following (but not limited to all) Council's policies available at Council's website:

- Development Application Management Policy
- Stormwater drainage for low level properties PDS-POL 135
- Vehicle access to all roadside development: LAP-PL 315
- Waste PL 850

Documentation to accompany the Development Application

- Electronic copies (USB)
- Statement of Environmental Effects
- Request to vary a development standard (Clause 4.6)
- Cost of works estimate/ Quote
- Site Plan
- Floor Plan
- Elevations and sections
- A4 Notification Plans



- Survey Plan (Boundary Survey required)
- Site Analysis Plan
- Demolition Plan
- Excavation and fill Plan
- Waste Management Plan (Construction & Demolition)
- Waste Management Plan Ongoing
- Engineering plans (stormwater, vehicle access and footpath areas)
- Shadow Diagrams (certified by Architect)
- See NSW Department of Planning changes to BASIX Certificates for “large” boarding houses.
- Boarding house operational management plan
- Schedule of colours and materials
- Landscape Plan (for landscaping integrated to the architectural design)
- Photo Montage
- Model
- Advertising (generic) Sign Plan
- Erosion and Sediment Control Plan / Soil and Water Management Plan
- Stormwater Management Plan / Stormwater Plans and On-site Stormwater Detention (OSD) Checklist
- Geotechnical Report (including groundwater assessment, protection / engineering support for adjoining properties)
- Acid Sulfate Soil Report
- Acoustic Report (including BCA, lift plant, A/C location noise, and noise protection)
- Flood Risk Assessment Report
- Traffic and Parking Report
- Construction Traffic Management Plan
- Construction Methodology Plan
- Access Report
- Evidence of Legal Right of Access to the land (ROW)
- Fire Safety Measures Schedule
- Solar access diagrams demonstrating the proposed development protects the solar access for the adjoining property to the south
- View Sharing / Loss Assessment (especially for developments to the south and west)
- Integrated development fee (Department of Primary Industries) if dewatering, or water table impacts are identified with the geotechnical report.

Please refer to Development Application Checklist for further detail.

Concluding Comments

These notes are in response to a pre-lodgement meeting held on 7 November 2019 to discuss a proposal for mixed use development at No. 1129-1131 Pittwater Road. The notes reference preliminary plans prepared by *Barry Rush & Associates Pty Ltd*, dated 18 September 2109.



The proposed development exceeds the 11m height limit and therefore a variation under Clause 4.6 will need to be adequately detailed to address the objectives and merit assessment. While there are other examples of four storey developments in the vicinity, each circumstance is considered on its individual merits and pursuant to the current planning controls (including desired future character / streetscape).

In order to receive support from Council for any height breach, the upper levels, particularly the fourth floor, must be set much further back from the boundaries and be sympathetic to the streetscape. This include appropriate design response to address potential view and privacy concerns, continuity, visual interest, and external colours and finishes that create an attractive streetscape character for the local centre of Collaroy beach.

The proposal, as submitted for the pre-lodgement meeting, requires some redesign to critical areas of the building prior to submission. This includes the ground floor (parking, loading, service /waste facilities & foyer) as well as elements of the upper floor and boarding room balconies and common areas. The location of a common room for the level 2 is recommended, similar to that shown for Level 1 in the NE corner of the floor with an aspect toward the beach / street frontage. Additionally, details of the pedestrian access along the northern boundary to create an attractive residential access / foyer area and also configuration of shop entry area will require further design changes.

Based upon the above comments you are advised to satisfactorily address the matters raised in these notes prior to lodging a development application. Prior to lodgement of the DA revised plans may be submitted to assist with addressing particular issues raised in these notes for further comment or a second pre-lodgement held to present further design changes to Council.

12 Attachment D: Flood Response Action Plan (FRAP)

Details

| PHASE /TRIGGER | CONSEQUENCE | KEY ACTIONS | | | |
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| | | Flood Monitoring | Site Management | Education and Warnings | Residents wishing to Shelter-in-Place |
| Prepare Phase | | | | | |
| All the time | <ul style="list-style-type: none">• NA | <ul style="list-style-type: none">• Be aware of weather forecasts and warnings.• Subscribe to weather app such as Early Warning Network.• Subscribe to SES, Council and other relevant flood warning systems. | <ul style="list-style-type: none">• Organise contractor to conduct annual check of drainage system performance, flood related signage and flood warning device.• Maintain several emergency kits including torch with spare batteries, first aid kit, high visibility vest, portable radio with spare batteries and megaphone are available and accessible in several public places on the site.• Update OH&S procedures associated with flooding. | <ul style="list-style-type: none">• Display A3 version of this plan in commercial tenancies and common spaces of residential areas.• Install evacuation maps displaying the route from the site to the protected area in public areas.• Install permanent flood warning signage on site.• Regular flood response operations trainings for staff. | <ul style="list-style-type: none">• Maintain emergency kit including torch with spare batteries, portable radio with spare batteries, first aid kit, high visibility vest, non-slip foot ware, megaphone.• Read and understand the site flood risk 'education pack'. |
| Any rainfall | <ul style="list-style-type: none">• NA | <ul style="list-style-type: none">• As above. | <ul style="list-style-type: none">• Routine inspection of external areas after heavy rainfalls. | <ul style="list-style-type: none">• Ensure all staff are on alert for flood warning.• Be prepared to follow evacuation procedure. | <ul style="list-style-type: none">• Be on alert for flood warning device in heavy rainfall. |
| Respond Phase | | | | | |
| Severe weather warning / preliminary flood warning / flood watch / flood bulletin | Flooding at site is possible. | <ul style="list-style-type: none">• Monitor flood and weather threat via BOM radar.• Regularly check for visible signs of flooding on flood level indicator on site. | <ul style="list-style-type: none">• Inform site occupants. | <ul style="list-style-type: none">• Listen to advice from media (e.g. TV, radio, phones, SMS, etc.) or through the SES 'Emergency alert system'.• Be on alert for flood warning device.• Continue to monitor broadcast SES local warning announcements. | <ul style="list-style-type: none">• Residents can leave the site if safe to do so. |

| PHASE /TRIGGER | CONSEQUENCE | KEY ACTIONS | | | |
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| | | Flood Monitoring | Site Management | Education and Warnings | Residents wishing to Shelter-in-Place |
| Evacuation warning / SES evacuation order | <ul style="list-style-type: none"> Flooding at site will likely occur. Evacuation route unsafe, evacuation not possible. | <ul style="list-style-type: none"> NA | <ul style="list-style-type: none"> Order shelter-in-place. People to shelter-in-place once warning to given. | <ul style="list-style-type: none"> Continue to monitor broadcast SES local warning announcements. Follow SES or police warnings. Ensure people and staff are informed of the flood warnings and evacuation order. Ensure people are informed of the evacuation route / shelter-in-place location. | <ul style="list-style-type: none"> Follow warning device instructions to shelter-in-place. Residents should remain in their residences, with any remaining customers within the shopping floor to remain in the commercial area or move to the upstairs common rooms via the internal stairs. <p>Shelter-in-place duration is expected to be short (1 hour) due to flash flooding nature of flooding in area.</p> |
| Recover Phase | | | | | |
| Warnings cancelled / rain ceased and flood water receded from area / flood warning device alarm 4 triggered | Flood threat over. | <ul style="list-style-type: none"> Confirm flood waters have receded. Liaise with SES and police regarding safety of accessing the site. | <ul style="list-style-type: none"> Organise contractor to clear drainage system and any debris from site. Ensure flood emergency device is operational. Check and repair structures / infrastructure as needed. | <ul style="list-style-type: none"> Follow SES or police warnings. Ensure the procedures are followed. | <ul style="list-style-type: none"> Do not enter flood waters. Check if it is safe to leave building before doing so. Keep clear of fast flowing waters (i.e. drains and culverts). Check the safety of gas or electrical appliances which have been in flood waters. Clean debris from site and surface drainage features. Check and repair fences / structures as needed. |

**13 Attachment E: Northern Beaches Council Standard
Hydraulic Certification Form**

Attachment A

NORTHERN BEACHES COUNCIL
STANDARD HYDRAULIC CERTIFICATION FORM
FORM A/A1 – To be submitted with Development Application

Development Application for

Address of site: 1129 - 1131 Pittwater Road, Collaroy, NSW

Declaration made by hydraulic engineer or professional consultant specialising in flooding/flood risk management as part of undertaking the Flood Management Report:

I, Paul Dinh on behalf of Martens and Associates
(Insert Name) (Trading or Business/ Company Name)

on this the 01/04/2020 (Date) certify that I am engineer or a

professional consultant specialising in flooding and I am authorised by the above organisation/ company to issue this document and to certify that the organisation/ company has a current professional indemnity policy of at least \$2 million.

Flood Management Report Details:

Report Title:

Flood Assessment and Flood Emergency Response Plan

Report Date: 01/04/2020

Author: Paul Dinh

Author's Company/Organisation: Martens and Associates

I: Paul Dinh
(Insert Name)

Please tick all that are applicable (more than one box can be ticked)

☒ have obtained and included flood information from Council (must be less than 12 months old)
(This is mandatory)

☒ have followed Council's Guidelines for Preparing a Flood Management Report

☒ have requested a variation to one or more of the flood related development controls. Details are provided in the *Flood Management Report*.

Signature 

Name Paul Dinh

14 **Attachment F: Flood Assessment Planset**