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TONY WALLS C/- MICHAEL FOUNTAIN ARCHITECTS PTY LTD

Acid Sulfate Soil Management Plan

316 Hudson Parade, Clareville

E25588.E14_Rev1
28 March 2022

Document Control

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Revision	Details	Date	Amended By
0	Original	25 March 2022	-
1	Final (updated to reflect Council's rev.)	28 March 2022	SR

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1. Introduction

1.1 Overview

EI Australia (EI) was engaged by Michael Fountain ('the client') on behalf of Tony Walls C/- Michael Fountain Architects Pty Ltd to prepare an acid sulfate soil management plan (ASSMP) for replacement of the existing marine structures within the property located at 316 Hudson Parade, Clareville ('the site').

The site is located 26km north of the Sydney central business district (CBD), within the Local Government Area (LGA) of Northern Beaches Council, as shown in **Figure 1, Appendix A**. It is further identified as a portion of Lots 1 & 2, in Deposited Plan (DP) 827733 and it is understood that a portion of Crown Land (Pittwater), adjacent to Lot 2 (DP) 827733, is also part site covering an area of approximately 263 m^2. The existing structures and proposed redevelopment occupies a portion of the site, in particular an occupied single level shed, with a boat ramp and a timber jetty, as depicted in **Figure 2, Appendix A**.

This ASSMP has been prepared to satisfy the Northern Beaches Council request to assist with the Determination of Development Application (DA) DA 2020/1762, yet to be determined.

This ASSMP, therefore, was prepared to aid in the management of acid sulfate soil (ASS), should these be encountered during the redevelopment works.

1.2 Proposed Development

Based on the proposed architectural plans, site development will involve the replacement of the existing marine structures by a boat shed, ramp, jetty, slip rails and steps. A copy of these plans is provided in **Appendix B**.

According to the plans, the excavations required for the proposed alterations will be limited to the concrete footings and piers. The finished floor level of the new boat shed is expected to be at a reduced level (RL) of 1.72 metres Australian Height Datum (mAHD).

1.3 Project Objectives

The objectives of this document were as follows:

- Provide methods and procedures to be implemented for the management of ASS that may be encountered during the redevelopment works.

1.4 Scope of Works

In order to achieve the above objectives, the following scope of works was completed:

- Review of relevant topographic, geological and soil landscape maps, including the relevant ASS risk maps;
- Review of previous geotechnical reports;
- Preparation of this plan detailing the framework for the on-going management and monitoring of the impacts of ASSs throughout the construction and operation phases of the project, in lieu of an Acid Sulfate Soil Assessment.

1.5 ASS Guidance

A general definition of ASS is provided in **Section 4**.

The following guidance documents and mapping databases were relied on and referred to during the preparation of this report:

- Sullivan L, et al (2018) *National Acid Sulfate Soils Guidance: National acid sulfate soils sampling and identification methods manual*. Department of Agriculture and Water Resources, Canberra ACT;
- ASSMAC (1998) *Acid Sulfate Soil Manual*, comprising the ASS Assessment Guidelines and the ASS Planning Guidelines;
- Naylor SD, et al (1998) *Guidelines for the Use of Acid Sulfate Soil Risk Maps* (2nd Edition); and
- Pittwater Local Environmental Plan 2014, *Acid Sulfate Soils Map* - Sheet ASS_017.

2. Site Description

The site identification details and associated information are presented in **Table 2-1**. Site location and layout plans are shown in **Appendix A**.

Table 2-1 Site Identification, Location and Zoning

Information	Detail
Street Address	316 Hudson Parade, Clareville
Lot and Deposited Plan (DP)	Lots 1 and 2, in Deposited Plan (DP) 827733 and a portion of adjacent Crown Land
Local Government Authority	Northern Beaches Council
Site Description	The site is currently occupied by a single level shed, with a boat ramp and a timber jetty.
Site Surroundings	West: Pittwater East: Residential dwellings within a Zone C2 – Environmental Conservation North: Zone C4 – Environmental Living South: South Beach - Zone C4 – Environmental Living
Site / redevelopment area	Approximately 263 m^2 (Ref: Survey plan, **Appendix B**).

2.1 Extent of Soil Disturbance during Proposed Development

Based on the provided documents, EI understands that the proposed development will involve the demolition of the existing site structures and construction of a single level boat shed with a timber jetty and a concrete boat ramp and slip rails. The finished floor level of the boat shed is expected to be at RL 1.72 mAHD.

3. Desktop Review

3.1 Map Information

Site topography, geology and soil landscape information, derived from available maps for the region, are summarised in **Table 3-1**.

Table 3-1 Topographical, Geological, Hydrogeological and Soil Landscape Information

Attribute	Description
Existing site Topography	The site slopes to the west. The sites surface elevation varies from 1.5m AHD on the east to 0.0m AHD on the south corner as detailed on the survey plan in **Appendix B**.
Geology	With reference to the Department of Mineral Resources Geological Map Sydney 1:100,000 Geological Series Sheet 9130 (DMR 1983) indicates the site is underlain by Newport Formation (Rnn) of the Upper Narrabeen Group. Newport Formation (Upper Narrabeen Group) is of middle Triassic Age and typically comprises interbedded laminite, shale and quartz to lithic quartz sandstones and pink clay pellet sandstones.
Soil Landscapes	The Soil Conservation Service of NSW Soil Landscapes of the Sydney 1:100,000 Sheet (Chapman and Murphy, 1989) indicates that the site is underlain by colluvial Watagan (wn) soil, which typically includes rolling to very steep hills on fine-grained Narrabeen Group sediments.
ASS Risk Map	With reference to the Pittwater Local Environmental Plan 2014 Acid Sulfate Soils (ASS) map (ASS-017) the site is mapped as *Class 5* Acid Sulfate Soils with a portion of the development (jetty) within a *Class 1* Area (Pittwater) with respect to ASS.
Typical Soil Profile	Based on the historical investigations completed onsite, the site soil profile comprises exposed sandstone bedrock.
Depth to Groundwater	Groundwater table is expected to be present in depth in the sandstone bedrock.
Nearest Surface Water Feature	Pittwater Bay, adjacent to the site to the west.
Groundwater Flow Direction	Inferred to flow westerly towards Pittwater Bay.

3.2 Geomorphic and Site Characterisation

Observations compiled during previous investigation (Crozier, 2021) were compared against various geomorphic and site characteristics outlined in ASSMAC (1998) indicating possible ASS occurrence. A comparison of site specific and geomorphic features with those indicative of potential ASS presence are presented in **Table 3-2**.

Table 3-2 Summary of Geomorphic and Site Features

Geomorphic Features	Presence on Site
Holocene Sediments	Not present onsite.
Soil horizons less than 5 mAHD	Present onsite, as detailed in the survey[1] in **Appendix B**. The site plans show that the proposed excavation ground level is to be at the same elevation as the existing level, i.e. limited excavations are expected to occur.
Marine / estuarine sediments or tidal lakes	Potentially present
Coastal wetland; backwater swamps; waterlogged or scaled areas; inter-dune swales or coastal sand dunes.	Potentially present
Dominant vegetation is mangroves, reeds, rushes and other swamp or marine tolerant species	Potentially present
Geologies containing sulphide bearing material	Unlikely
Deep older (Pleistocene) estuarine sediments	Unlikely

The table above notes that the potential presence of ASS is plausible, triggering the need of the development of an acid sulfate soil management plan detailed in **Section 4**.

3.3 Site survey plan

According to the sites survey plan (Refer to **Appendix B**), the following attributes were found to be present:

- The site drops down steeply to the Pittwater Bay direction through a series of relatively low height but closely spaced sandstone cliff lines;
- Plants noted along the cliff included small to large trees and shrubs. The diversity of vegetation indicated that phytotoxicity was not a concern for site soils;
- The site is south of Refuge Cove and north of south Beach.
- The site connects to the property at lot 1 DP827733 via existing timber stairs within the cliff.
- Retaining wall also found to be present between the site and the neighbouring property at lot 1 DP827733.
- Concrete wall located west of the mean high water mark.

[1] MFA Architects Pty, Ltd, Drawing number: 1605, Dated 01/09/2021

4. Acid Sulfate Soil Management

ASS are naturally occurring sediments containing iron sulphides, which have been deposited in estuarine conditions. As ASS comprise natural materials, their occurrence is not related to site boundaries or anthropogenic contamination and may extend across regions suitable for formation.

When ASS are exposed to air (e.g. due to bulk excavation or dewatering), oxygen reacts with the iron sulphides, producing sulphuric acid (and iron oxides). The acid may be produced in large quantities causing the leaching of metals from soils and associated adverse groundwater quality impacts. The problem is exacerbated as impacted groundwater discharges to waterways causing severe short and long term socio-economic and environmental impacts, including damage to manmade structures and natural ecosystems.

ASS can be classified as

- Actual acid sulphate soils (AASS) within which there is material that has already reacted with oxygen to produce acid; or
- Potential acid sulfate soils (PASS), within which there is material that contains iron sulphide that has not yet been exposed to oxygen (e.g. PASS that is currently below the water table). Therefore, PASS has the capacity to produce sulphuric acid should soil disturbance or groundwater drawdown occur.

4.1 Overview

Potential ASS may be present onsite as the current ground levels are below 5m AHD. Based on the plans for the proposed development (**Section 1.2**), it is assumed that less than 1,000 tonnes of coarse textured (sands to loamy sands etc) soils would be potentially disturbed as part of the pilling works to be conducted below 5 mAHD to support the marine structures inclusive of the boat shed. This PASS material, if present, may represent a risk of acid generation upon disturbance.

The following construction activities, expected to occur during the proposed development, may have an impact on ASS if present on site:

- Localised excavation for pile works (piling works) where this occurs to deeper than 5 mAHD; and
- Localised groundwater dewatering (if required, should groundwater be encountered).

The extent of any associated adverse impacts will depend on the following factors:

- The volume of excavated soil identified as being ASS;
- Physical characteristics of the ASS, such as grain size and natural buffering capacity;
- Time that ASS is exposed to air; and
- Rate of oxidation and transport of the oxidation products.

Soils identified as PASS will require appropriate management to minimise environmental impacts that may result from soil disturbance during the development process. Soil management options commonly adopted for ASS comprise (WA DER, 2015):

- Avoidance, or minimisation of ASS disturbance;
- Soil neutralisation (typically with lime);
- Strategic reburial under water;

- Off-site ASS treatment and disposal.

No ASS should be used for structural or general filling above the groundwater table without prior neutralisation and validation of successful neutralisation.

Should ASS be identified in material to be excavated, all disturbed ASS should either be neutralised and disposed off-site to a licensed facility, or disposed to a licensed waste handling facility and placed below water table. Management and treatment requirements are further discussed in **Section 4.2** and **Section 4.3**.

EI understands that the principal contractor, or duly appointed representative, shall be responsible for the implementation and actioning of this ASSMP.

4.2 Disposal of Potential Acid Sulfate Soils below the Water Table

In accordance with the NSW EPA (2014) *Waste Classification Guidelines: Part 4*, potential ASS may be disposed of by burial below the permanent water table, provided:

- This occurs before significant oxidation occurs, i.e. within 24 hours of excavation;
- The material meets the definition of 'virgin excavated natural material' (VENM) under the Protection of the Environment Operations Act 1997, even though it contains sulfidic ores or soils; and
- The receiving landfill must be licensed by NSW EPA to accept potential ASS for disposal below the water table.

Potential ASS must be disposed of within 8 hours of its arrival at the receiving landfill facility, and kept wet at all times until burial at least 2 m below the lowest historical level of the water table at the disposal site.

4.2.1 Process for Excavation of PASS

Excavation shall proceed in stages as follows:

- The site surface shall be stripped and prepared; any existing fill materials shall be excavated and removed or stored separately in covered stockpiles;
- Surface fill shall be stripped and removed and care must be taken to ensure that no surface fill material is mixed with PASS material below. The sides of the excavation shall also be stripped a further 200 mm laterally to ensure potential fill soils do not fall into the excavated pit and cross contaminate PASS materials below;
- Once fill material is removed, the surface shall be inspected by a qualified environmental consultant and a representative of the receiving landfill facility, prior to excavation of PASS;
- When surface clearance is granted, PASS materials shall be excavated to the required depth and loaded directly onto waiting trucks. Each truckload shall be inspected and verification testing for pH shall be carried out to confirm soil pH does not fall below pH 6.0 prior to leaving the site; and
- Verification testing is required to demonstrate that materials with existing acidity are not being reburied. Should field pH fall below pH 6.0 the materials from that truck shall remain on-site and lime neutralisation techniques shall proceed as discussed in **Section 4.1**.
- Note: PASS that has dried out, undergone any oxidation of its sulfidic minerals, or which has a pH of less than pH 6.0 must be treated by neutralisation and disposed of at a landfill that can lawfully accept it.

4.2.2 Transportation

Transport of PASS material to the receiving landfill facility shall take place immediately. If this is not possible, PASS soils shall be stockpiled and immediately covered. Stockpiled PASS

materials must leave the site within 24 hours of excavation; otherwise, lime neutralisation techniques shall proceed as discussed in **Section 4.1**.

4.2.3 Documentation

Documentation must be provided to the occupier of the landfill for each truckload of PASS received, indicating that the soil excavation, transport and handling have been in accordance with NSW ASSMAC (1998), thus preventing the generation of acid.

The occupier of the disposal site must also test the pH of each load of soil received immediately prior to its placement under water using the test method(s) in NSW ASSMAC (1998) (Methods 21A and/or 21AF). These details, together with the pH of the soil recorded at the time of its extraction, must be retained by the occupier of the landfill site.

4.3 Disposal of PASS above the Water Table

Should disposal of PASS above the water table be necessary the all PASS to be excavated or disturbed during the development program shall be stockpiled separately within designated areas, and treated (limed) immediately. More specifically, the management procedures are:

- For treatment of large volumes of material by mechanical application of neutralisation materials, treatment should be carried out on a treatment pad, with adequate sediment erosion control measures in place;
- Excavated PASS shall be stockpiled upon the treatment pad area. The treatment pad should consist of a minimum 300 mm thickness of compacted crushed limestone, or other appropriate neutralisation material. The level of compaction used should produce an appropriately low permeability base to prevent infiltration of leachate. The treatment pad should be bunded with a minimum 150 mm high perimeter of compacted, crushed limestone to contain potential leachate runoff within the treatment pad area and prevent surface water runoff from entering the treatment pad area. Lime (hydrated or agricultural lime) shall be spread evenly upon the excavated materials, and thoroughly mixed; and
- Following treatment, soils should be waste classified for offsite disposal in accordance with the NSW EPA (2014) *Waste Classification Guidelines*.

In addition, the following management strategies shall also be considered and implemented, as required, to manage risk:

- Installation of leachate collection and treatment systems;
- Construction of supplementary erosion and sediment control structures.

If lime treatment of freshly excavated ASS/PASS cannot be performed immediately, plastic sheeting shall be placed over the stockpile to reduce oxidation, and the following shall be adopted:

- For every day a stockpile remains on-site, representative samples of the stockpiled material will be monitored for pH; where pH falls below pH 6, lime will be applied for neutralisation purposes; and
- On-site neutralisation of acidic soils (<pH 6) will be carried out using powdered agricultural lime.

4.3.1 Determination of Lime Requirement

Intrusive soil investigation should be carried out prior to commencement of any excavation, to establish the quantity of lime required to neutralise any ASS present on site. This ASSMP should be update once this data becomes available.

4.3.2 **Method of Neutralisation**

In order to facilitate mixing, the soils should be thinly spread (<0.5 m). Lime should be added by hand and/or excavator bucket, followed by mixing using light-weight rotators and/or shovels.

Field pH testing on representative samples should be performed to ensure that sufficient neutralisation of soil has occurred (i.e. pH >6), prior to disposal.

4.4 Management of In-situ Acid Sulfate Soils

Potential ASS which becomes exposed (oxidised) in-situ may produce acid. For every day that an in-situ excavated surface is in an exposed state, pH values shall be monitored from representative samples. Where soil pH levels fall below pH 6, lime will be applied to the potential ASS horizon(s) following the methodology presented in **Section 4.1**. Plastic sheeting can be placed over the corresponding surface (where possible) to reduce the oxidation rate.

4.5 Groundwater Management and Disposal

4.5.1 Groundwater Management

The excavation of the proposed development is not expected to intersect groundwater. In the unlikely event that groundwater is encountered and active dewatering is required then the following procedures shall be implemented.

The removal (pumping) of any groundwater from an excavation area may cause alterations to the existing groundwater table. Extracted groundwater should be pumped to a holding vessel for assessment of pH characteristics during the dewatering process. Extracted water should be treated with powdered agricultural lime to display a pH level of pH 6-8, prior to off-site disposal. Powdered lime should be added to the water by hand and/or excavator bucket and mixed. Field pH testing on representative samples should be performed to ensure that sufficient neutralisation has occurred, prior to disposal.

In addition to the above, an appropriately designed truck or barge wash area will be required to capture liquids and solids generated, prior to vehicles exiting the site. Treatment and neutralisation of solids and liquids shall be in accordance with **Section 4.3.2**.

4.5.2 Groundwater Disposal

If dewatering is required then extracted groundwater from the dewatering process will likely be disposed to the municipal stormwater system. Any permits / licences from Council or Sydney Water and Water NSW shall be obtained prior to discharging to the municipal stormwater system.

Extracted groundwater may require treatment in order to satisfy disposal requirements.

Water for disposal will be tested routinely (e.g. weekly intervals) for the duration of dewatering activities, to ensure that no change to the quality of water entering the stormwater system, with the results made available to Council, Sydney Water or Water NSW on request. Should it be found that groundwater quality is not suitable for disposal to the stormwater system, groundwater treatment or a Sydney Water permit to dispose to sewer shall be required prior to disposal.

EI recommends the preparation of a dewatering management plan (DMP) detailing the monitoring procedures, parameters to be monitored, and management measures to be implemented, prior to commencement of site dewatering (if required).

4.6 Risk Management

This ASSMP has been prepared based on review of readily available information including published literature. This management plan should be updated upon completion of an intrusive soil investigation, verifying the presence or absence of ASS materials within the proposed excavation area. If ASS materials are confirmed to be present on site, the following must be determined:

- The horizons and extent of ASS presence;
- Volume of ASS expected to be disturbed / excavated;
- Volume of lime / neutralising agents required to neutralise the ASS materials to be disturbed;
- Extent of in situ ASS likely to be exposed to oxygen due to site dewatering, and whether additional management measures are required.

During the proposed excavations, it is recommended that regular site inspections are conducted by a qualified environmental consultant/engineer, in order to supervise the works. The qualified environmental consultant/engineer should ensure that:

- Any soils indicative of potential ASS materials are adequately managed; and
- Adequate testing of excavated / exposed ASS is performed to establish liming requirements (i.e. should pH be > 6).

All contractors must employ best practices in managing any off-site water and soil quality impacts during site redevelopment, in accordance with the Protection of the Environment Operations Act 1997 and associated regulations. All waste materials must be classified under the NSW EPA (2014) *Waste Classification Guidelines*, prior to off-site disposal to appropriate landfill facilities.

4.7 Contingency Planning

A contingency plan is detailed below in **Table 4-1**. It provides a list of potential events that may arise during excavation and the actions to be undertaken if unexpected conditions occur.

Table 4-1 Contingency Plan

Unexpected Condition	Preventive/Corrective Action
Potential ASS identified at unexpected depths	▪ Stop excavation; ▪ Have material assessed by an environmental consultant for the presence of ASS; and ▪ Follow management procedures adopted in this ASSMP.
Neutralisation of ASS was not effective	▪ Reassess liming rates and add additional lime to material; and ▪ Retest material to check neutralisation effectiveness.
Neutralisation of ASS indicates that too much lime has been added and soils are alkaline	▪ Remediate soils before use; ▪ Remediation comprises mixing additional ASS with the material, i.e. use excess lime to neutralise more ASS; and ▪ Retest material to check neutralisation effectiveness.
Bunded ASS treatment area is damaged	▪ Repair bund as soon as practicable; ▪ Clean-up any ASS that escaped the treatment area and place back into the treatment area; and ▪ Check surrounding area for impact from the ASS or leachate, and

Unexpected Condition	Preventive/Corrective Action
	undertake remedial action as required.
Groundwater level falls below the top of areas defined as containing PASS	▪ Pause / adjust the rate of dewatering to restore groundwater level to above areas defined as containing PASS; ▪ Review PASS exposure by checking the ASS and Non-ASS interface in the affected area; ▪ Determine potential causes by reviewing construction practises, weather, baseline groundwater monitoring data, and performing additional groundwater monitoring as necessary on groundwater monitoring present at the site; and ▪ Review and confirm mitigation measures to be implemented, including: *i. Maintaining PASS soil moisture levels through targeted groundwater recharge;* *ii. Adjusting the construction activities or schedule; and* iii. *Treatment of additional PASS in treatment area.*

4.8 Document Control

The party responsible for the implementation and actioning of this ASSMP should maintain a portfolio documenting all physical and electronic records associated with acid sulfate soil management for the project. Such records shall comprise, but are not limited to:

- Further ASS assessment results;
- Field records of ASS monitoring, such as daily field pH screening results on stockpiled materials, excavation surfaces, application of lime, groundwater level and pH level monitoring;
- Records of ASS transportation, including truck registers, and waste dockets issued by the receiving land fill facility; and
- Environmental incident reports in cases of non-conformance and subsequent mitigation measures adopted.

5. Statement of Limitations

This report has been prepared for the exclusive use of Tony Walls C/- Michael Fountain Architects Pty Ltd , which is the only intended beneficiary of EI's work. The scope of the assessment carried out for the purpose of this report was limited to that agreed with the client.

No other party should rely on the document without the prior written consent of EI, and EI undertakes no duty, or accepts any responsibility or liability, to any third party who purports to rely upon this document without EI's approval.

EI has used a degree of care and skill ordinarily exercised for similar assessments by reputable members of the environmental industry in Australia, as at the date of this document. No other warranty, expressed or implied, is made or intended. Each section of this report must be read in conjunction with the whole of this report, including its appendices.

The findings presented in this report are the result of discrete sampling methodologies, used in accordance with best industry practices. Due to the specific nature of soil sampling from point locations, it is considered likely that all variations in subsurface conditions across a site cannot be fully defined, no matter how comprehensive the field investigation program. Neither EI, nor any other reputable consultant, can provide unqualified warranties, nor does EI assume any liability for site conditions not observed or accessible during the time of the assessment.

While normal assessments of data reliability have been made, EI assumes no responsibility or liability for errors in any data obtained from regulatory agencies (e.g. Council, NSW EPA), statements from sources outside of EI, or developments resulting from situations outside the scope of works of this project.

This report was prepared for the above named client and no responsibility is accepted for use of any part of this report in any other context or for any other purpose or by other third parties. This report does not purport to provide legal advice.

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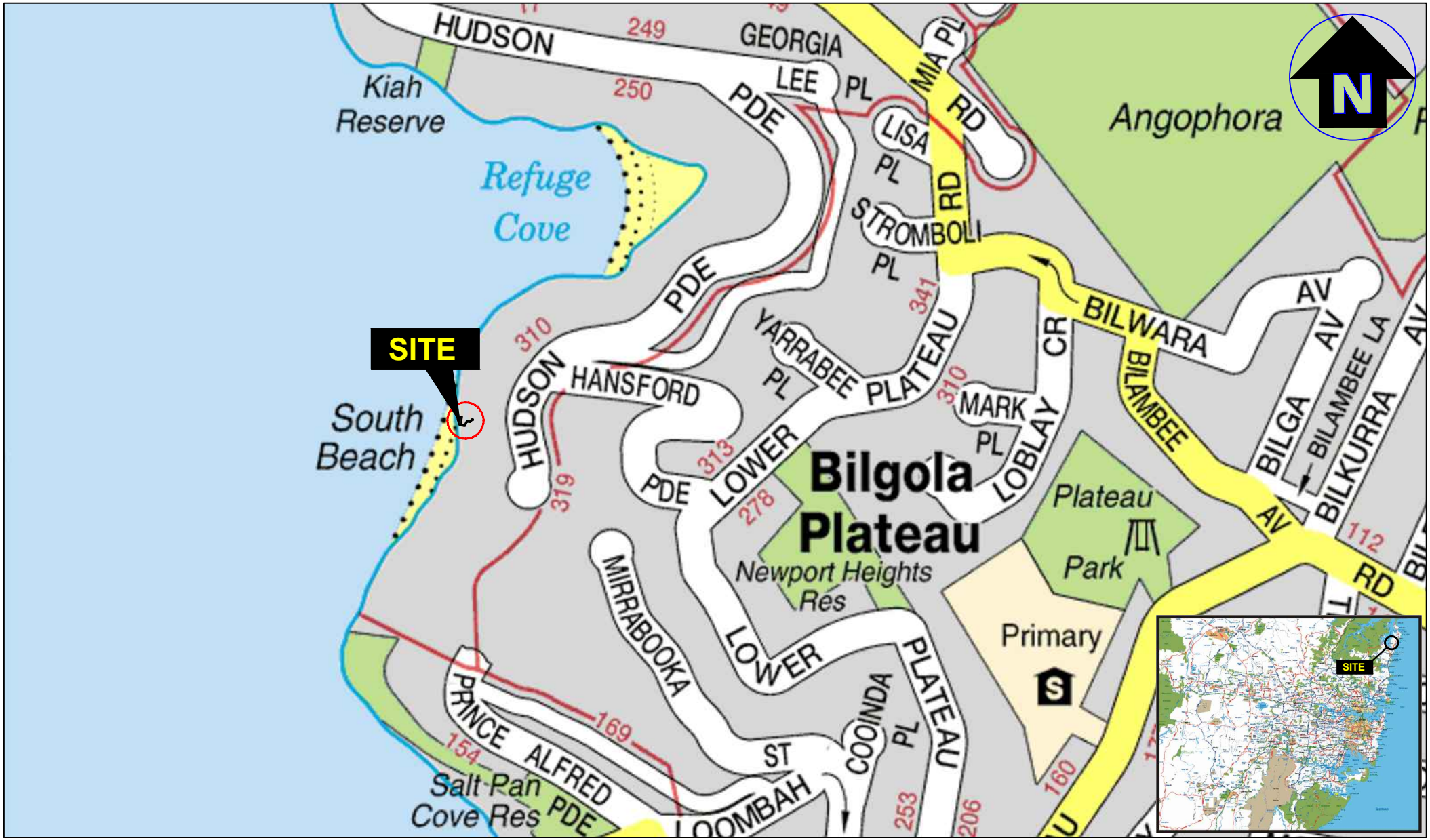
Abbreviations

AASS	Actual Acid Sulfate Soil
ASS	Acid Sulfate Soil
ASSMAC	Acid Sulfate Soil Management Advisory Committee
BEL	Bulk Excavation Level
COC	Chain of Custody
DA	Development Application
DP	Deposited Plan
EC	Electrical Conductivity
NSW EPA	Environmental Protection Authority (of New South Wales)
km	Kilometres
m	Metres
mAHD	metres Australian Height Datum
mBGL	metres Below Ground Level
NA	Not Analysed
NATA	National Association of Testing Authorities, Australia
NC	No Criterion
NGL	Natural Ground Level
NSW	New South Wales
PASS	Potential Acid Sulfate Soil
pH	Potential Hydrogen (a measure of the acidity or basicity of an aqueous solution)
PSH	Phase Separated Hydrocarbons
RL	Relative Level
S_{Cr}	Chromium Reducible Sulfur
SRA	Sample Receipt Advice (document confirming laboratory receipt of samples)
SWL	Standing Water Level
TAA	Total Actual Acidity

Appendix A - Figures

A.1 Figure 1 - Site Location

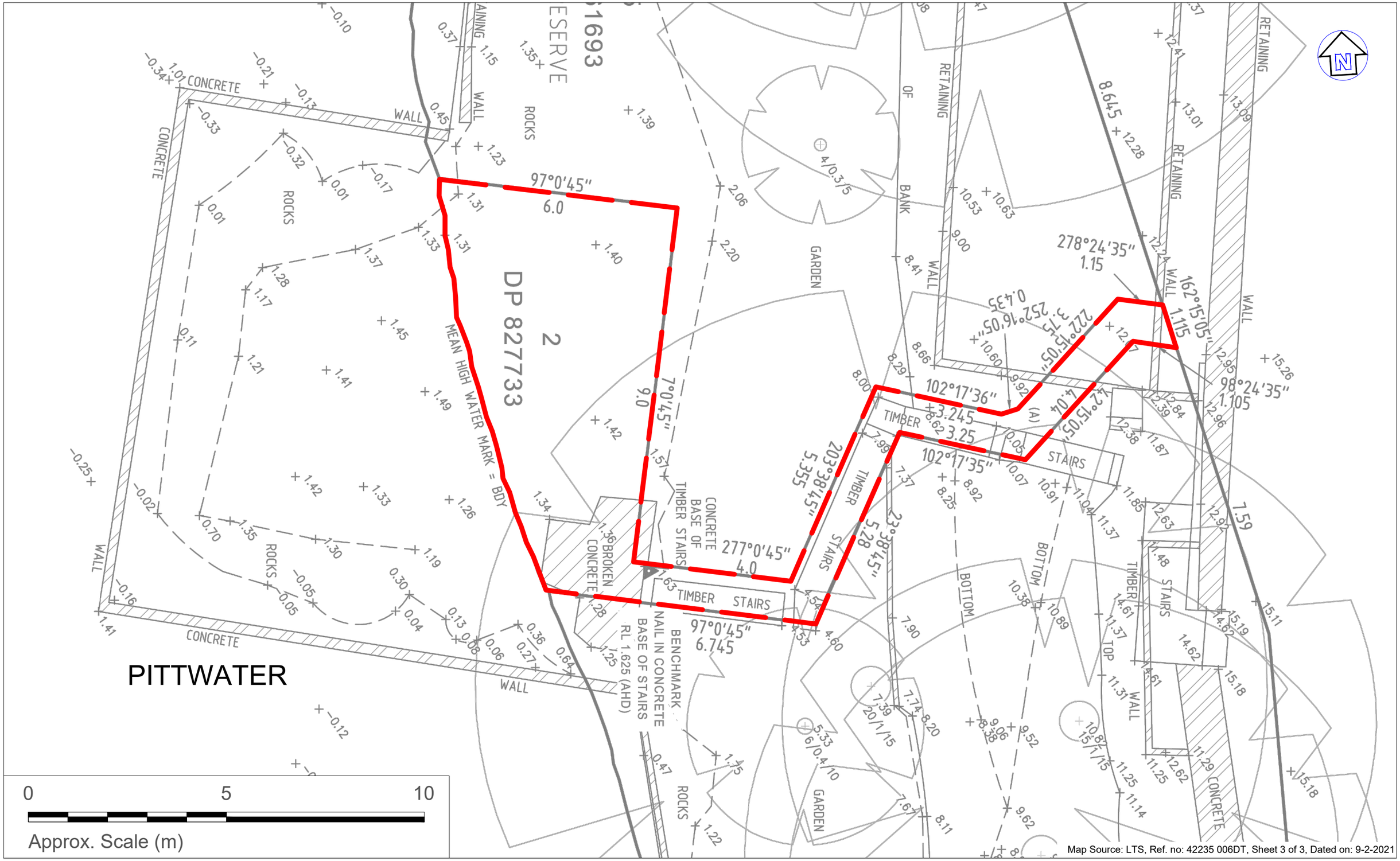
A.2 Figure 2 - Sampling Location Plan



eiaustralia Practical Solutions for Built Environments Suite 6.01, 55 Miller Street, PYRMONT 2009 Ph (02) 9516 0722 Fax (02) 9518 5088	Drawn:	A.N.	**Tony Walls c/- Micheal Fountain Architects Pty Ltd** Acid Sulfate Soil Management Plan 316 Hudson Parade, Clareville, NSW Site Locality Plan
	Approved:	S.R.	
	Date:	24-3-22	
	Scale:	Not To Scale	

Figure:
1

Project: E25588.E14_Rev0



LEGEND (Note: All locations are approximate)

– – – Site boundary*

*Portion of Crown Land in Pittwater detailed in Appendix B - Proposed Development Plan

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Approved:	S.R.
Date:	25-3-22

Tony Walls c/- Micheal Fountain Architects Pty Ltd

Acid Sulfate Soil Management Plan
316 Hudson Parade, Clareville, NSW

Site Layout Plan

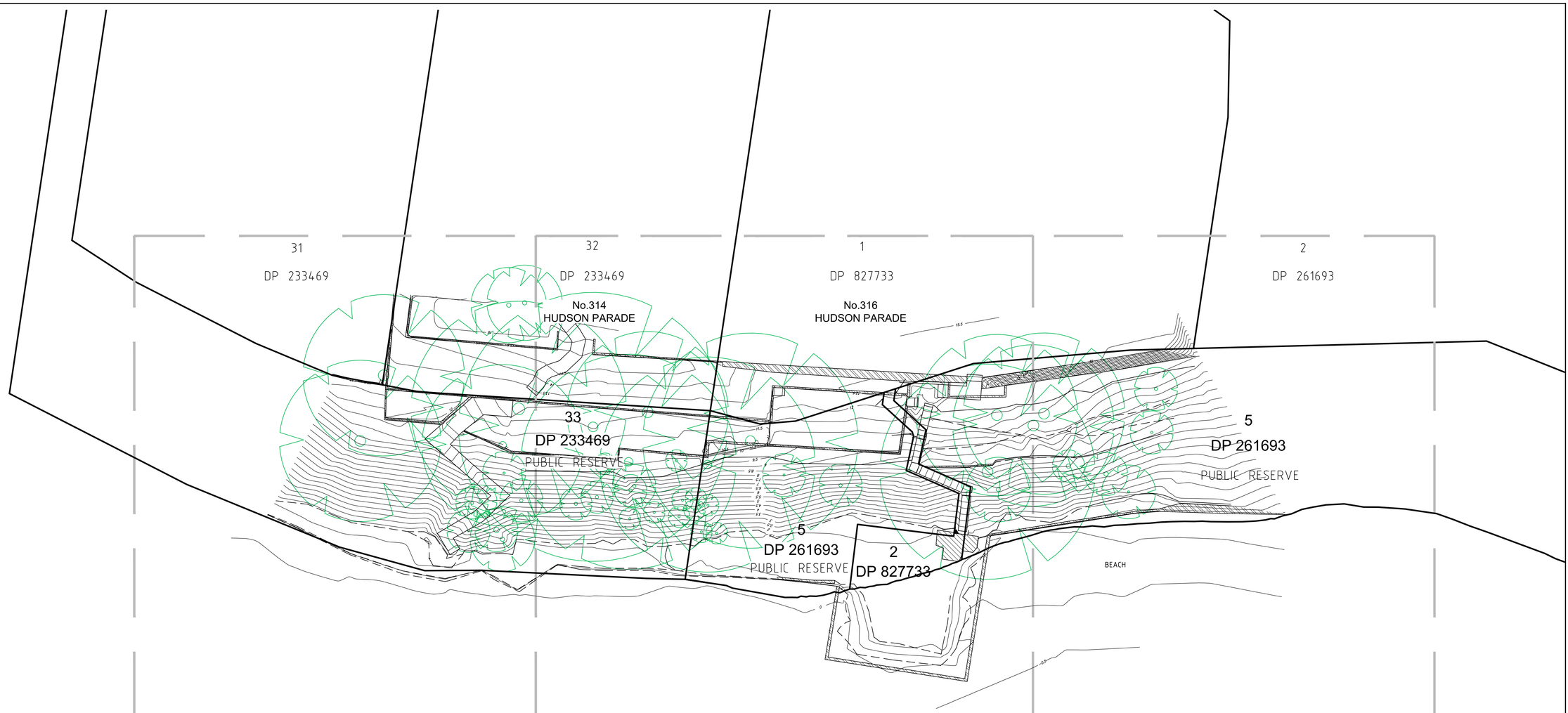
Figure: 2

Project: E25588.E14_Rev1

Appendix B – Proposed Development Plan and Site Survey Plan

MGA

TN APPROX 1.00°



LEGEND

BENCH MARK	▲

NOTES

1. THE BOUNDARIES HAVE NOT BEEN MARKED ON GROUND
2. BOUNDARIES HAVE BEEN INVESTIGATED
3. ORIGIN OF LEVELS ON A.H.D. IS TAKEN FROM **SSM38157** R.L. **31.270** (A.H.D.) IN HUDSON PARADE
4. CONTOUR INTERVAL **0.5 m**
5. CONTOURS ARE INDICATIVE ONLY. ONLY SPOT LEVELS SHOULD BE USED FOR CALCULATIONS OF QUANTITIES WITH CAUTION
6. NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. SERVICES HAVE BEEN PLOTTED FROM RELEVANT AUTHORITIES INFORMATION AND HAVE NOT BEEN SURVEYED. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE
7. NO INVESTIGATION OF UNDERGROUND SERVICES HAS BEEN MADE. ALL RELEVANT AUTHORITIES SHOULD BE NOTIFIED PRIOR TO ANY EXCAVATION ON OR NEAR THE SITE
8. 8/.4/7 DENOTES TREE SPREAD OF 8m, TRUNK DIAMETER OF 0.4m & APPROX HEIGHT OF 7m
9. SHOWS APPROXIMATE POSITION OF ROAD LINEMARKING AND IS INDICATIVE ONLY
10. BEARINGS SHOWN ARE MGA (MAP GRID OF AUSTRALIA) ADD APPROX. 1°00' FOR TRUE NORTH

(A) RIGHT OF WAY 1 WIDE & VARIABLE (DP261693)

DIAL BEFORE YOU DIG www.1100.com.au

GDA2020

0 4 8 12 16 20

SCALE 1: 200 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00

Revision	Date	Description	Reference
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	09/02/21	- PLAN NOTES AMENDED	006

LTS CONFIDENCE TOGETHER
www.ltsi.com.au | P 1300 587 000

JASON RAIC
Registered Surveyor NSW
Surveyor ID: 8255

Client TONY WALLS

Drawing title
PLAN OF DETAIL AND LEVELS OVER PART OF LOTS 32 & 33 IN DP 233469, LOT 5 IN DP 261693 AND LOTS 1 & 2 IN DP 827733 AT No 314-316 HUDSON PARADE, CLAREVILLE

datum	AHD
site Area	N/A
LGA	NORTHERN BEACHES
reference number	42235 006DT
scale	1:200 @A1
date of survey	13/08/2020
SHEET	1 OF 3

MGA

TN APPROX.

31
DP 233469

32
DP 233469

1
DP 827733

No.314
HUDSON PARADE

No.316
HUDSON PARADE

33
DP 233469
PUBLIC RESERVE

5
DP 261693
PUBLIC RESERVE

2
DP 827733

PITTWATER

MEAN HIGH WATER MARK = BDY

BENCHMARK
NAIL IN CONCRETE
BASE OF STAIRS
RL 1.625 (AHD)

ADJOINS SHEET 3

SEE SHEET 1 FOR NOTES & LEGEND

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GDA2020

0 2 4 6 8 10
SCALE 1:100 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	09/02/21	- PLAN NOTES AMENDED	006

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Client TONY WALLS

Drawing title
PLAN OF DETAIL AND LEVELS OVER PART OF LOTS 32 & 33 IN DP 233469, LOT 5 IN DP 261693 AND LOTS 1 & 2 IN DP 827733 AT No 314-316 HUDSON PARADE, CLAREVILLE

datum	AHD	reference number	42235 006DT
site Area	N/A	scale	1:100 @A1
LGA	NORTHERN BEACHES	date of survey	13/08/2020
		SHEET OF	2 OF 3

MGA

TN APPROX -10°

32
DP 233469

1
DP 827733

2
DP 261693

No.314
HUDSON PARADE

No.316
HUDSON PARADE

ADJOINS SHEET 2

33
DP 233469
PUBLIC RESERVE

5
DP 261693
PUBLIC RESERVE

5
DP 261693
PUBLIC RESERVE

2
DP 827733

PITTWATER

98°28'30"
49.68

278°29'45"
21.72

178°33'00"
22.235

175°04'10"
14.65

5.865

98°28'30"
15.85

3°41'30"
27.14

195°02'10"
4.805

8.645

162°15'05"
1.115

98°21'35"
7.105

278°21'35"
1.15

222°15'05"
3.75

42°15'05"
4.014

252°16'05"
0.435

102°17'36"
3.245

102°17'35"
3.25

23°38'45"
5.28

203°38'45"
5.355

277°0'45"
4.0

97°0'45"
6.145

7°0'45"
9.0

97°0'45"
6.0

CONCRETE
BASE OF
TIMBER STAIRS

BENCHMARK
NAIL IN CONCRETE
BASE OF STAIRS
RL 1.625 (AHD)

BROKEN
CONCRETE

MEAN HIGH WATER MARK = BOY

BEACH

SEE SHEET 1 FOR NOTES & LEGEND

DIAL BEFORE YOU DIG www.1100.com.au

GDA2020

0 2 4 6 8 10
SCALE 1:100 @ A1

Revision	Date	Description	Reference
H	00/00/00	-	00
G	00/00/00	-	00
F	00/00/00	-	00
E	00/00/00	-	00

Revision	Date	Description	Reference
D	00/00/00	-	00
C	00/00/00	-	00
B	00/00/00	-	00
A	09/02/21	- PLAN NOTES AMENDED	006

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JASON RAIC
Registered Surveyor NSW
Surveyor ID: 8255

Client TONY WALLS

Drawing title
PLAN OF DETAIL AND LEVELS OVER PART OF LOTS 32 & 33 IN DP 233469, LOT 5 IN DP 261693 AND LOTS 1 & 2 IN DP 827733 AT No 314-316 HUDSON PARADE, CLAREVILLE

datum AHD
site Area N/A
LGA NORTHERN BEACHES

reference number 42235 006DT
scale 1:100 @A1
date of survey 13/08/2020
SHEET 3 OF 3

Pittwater

Hudson Parade

Approximate position of revetment wall (blue) - refer to Figures 1 + 2

Approximate mean low water

PITTWATER

Approximate position of revetment wall (blue) - refer to Figure 1

Grey hatch area - not subject of this DA

DP 827733

No.316 HUDSON PARADE

Figure 1

PLAN - Location
NTS

ISSUE	AMENDMENT	DATE
D	Issued for 3d	26.08.20
E	Issued for Development Application	07.12.20
F	Issued for Review	05.05.21
G	Issued for Review	03.06.21
H	Issued to Council	09.06.21
i	Issued for Review	02.07.21
J	Issued for Review	06.07.21

CLIENT: Tony Walls

PROJECT: Replacement of Marine Structures
316 Hudson Parade
Clareville NSW 2107

DRAWING: PLAN - Location

DRAWN	CHKD	APPROVED
RJC		
SCALE	DATE	CAD FILE No
Not to Scale	SEP 2019	
JOB NO	DRAWING NO	ISSUE
1605	DA -000	J

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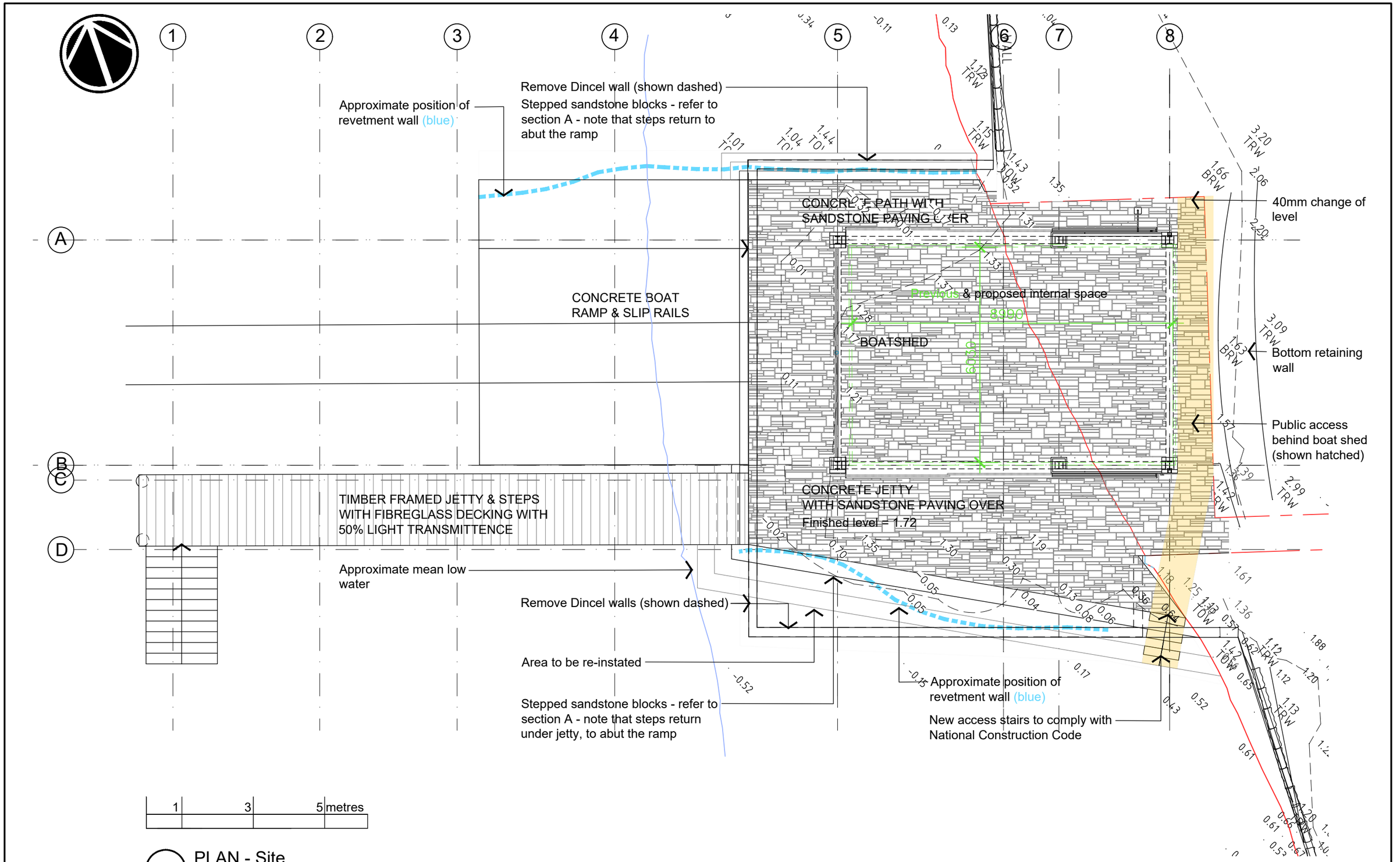

PLAN - Site
1: 100

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ISSUE	AMENDMENT	DATE
Q	Issued for Review	23.06.21
R	Issued for Review	24.06.21
S	Issued for Review	02.07.21
T	Issued for Review	06.07.21
U	Issued for Review	26.07.21
V	Issued for Review	28.07.21
W	Issued for Review	01.09.21

CLIENT: Tony Walls

PROJECT: Replacement of Marine Structures
316 Hudson Parade
Clareville NSW 2107

DRAWING: PLAN - Site + Floor

DRAWN	CHKD	APPROVED
RJC		
SCALE: 1 : 100 @ A3	DATE: SEP 2019	CAD FILE No
JOB NO: 1605	DRAWING NO: DA -001	ISSUE: W

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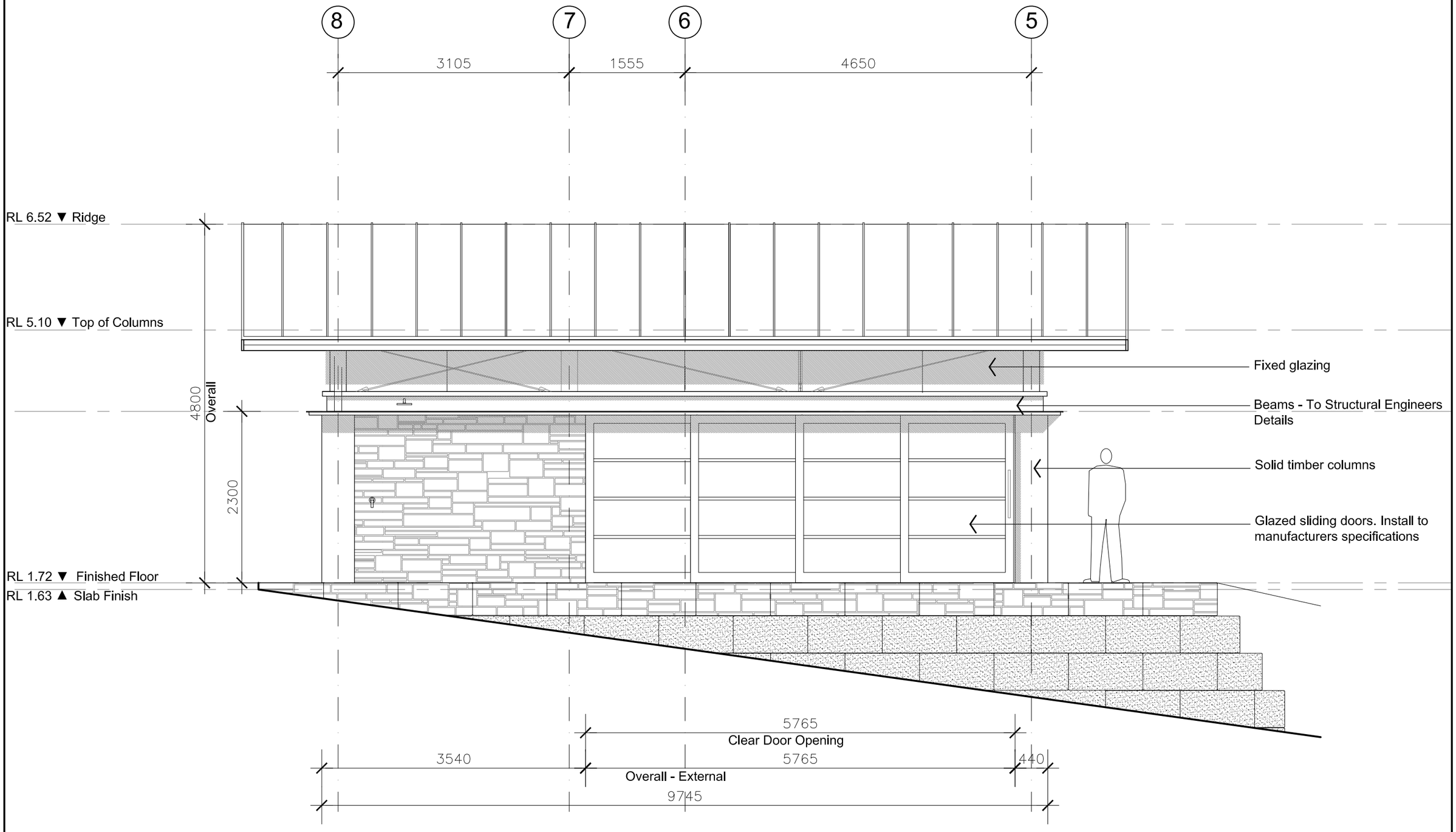

Elevation - North
1: 50

ISSUE	AMENDMENT	DATE
C	Issued for Review	18.08.20
D	Issued for 3d	26.08.20
E	Issued for Development Application	07.12.20
F	Issued for Review	03.06.21
G	Issued to Council	09.06.21
H	Issued for Review	02.07.21
i	Issued for Review	06.07.21

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CLIENT: Tony Walls

PROJECT: Replacement of Marine Structures
316 Hudson Parade
Clareville NSW 2107

DRAWING: ELEVATION - North

DRAWN	CHKD	APPROVED
DMS		
SCALE: 1 : 50 @ A3	DATE: Sept 2019	CAD FILE No
JOB NO: 1605	DRAWING NO: DA- 010	ISSUE: i

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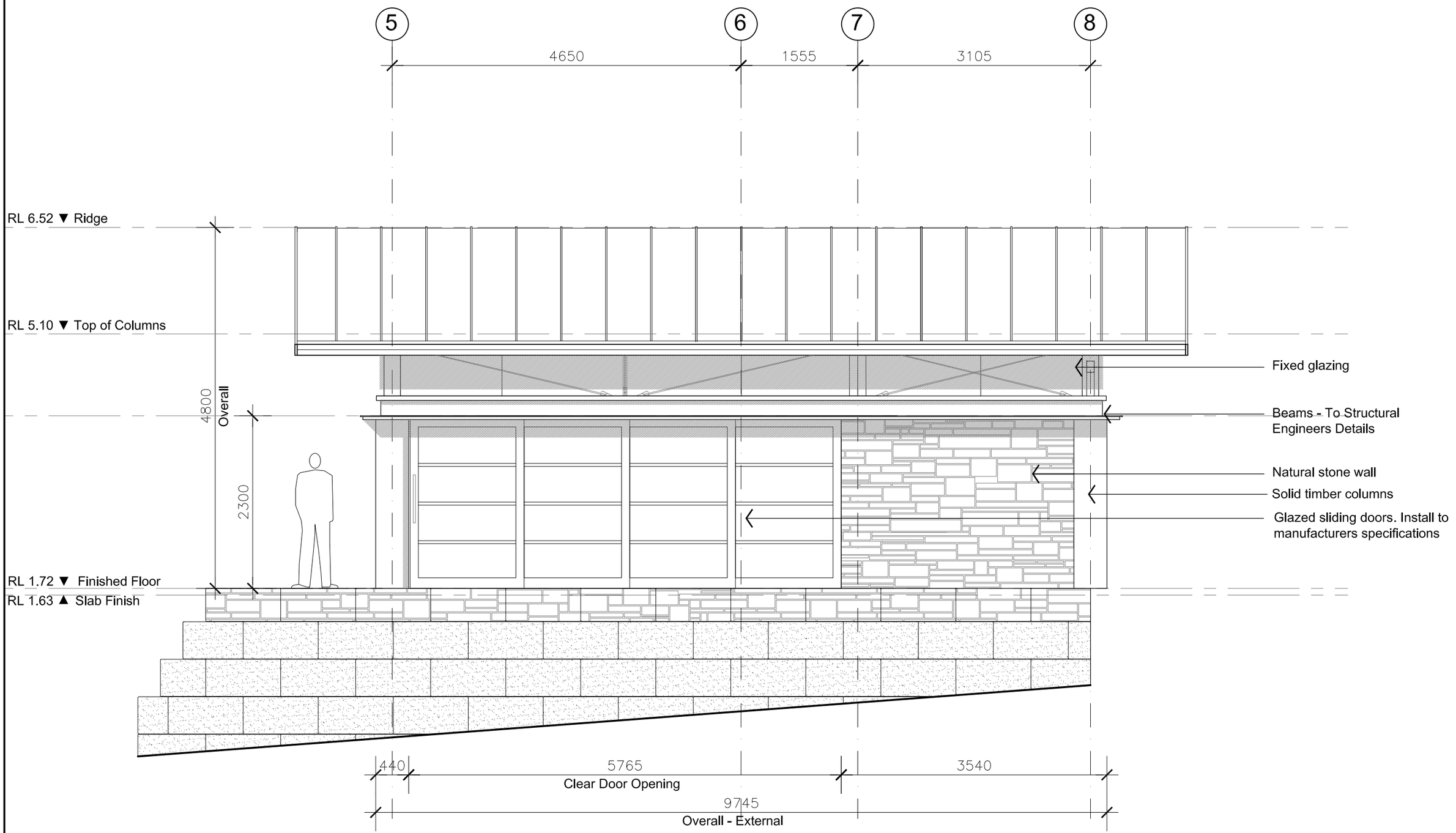

Elevation - South
1: 50

ISSUE	AMENDMENT	DATE
E	Issued for Development Application	07.12.20
	Roof height reduced	
F	Issued for Review	07.05.21
G	Issued for Review	03.06.21
H	Issued to Council	09.06.21
i	Issued for Review	02.07.21
J	Issued for Review	06.07.21

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CLIENT: Tony Walls

PROJECT: Replacement of Marine Structures
316 Hudson Parade
Clareville NSW 2107

DRAWING: ELEVATION - South

DRAWN	CHKD	APPROVED
DMS		

SCALE	DATE	CAD FILE No
1 : 50 @ A3	Sept 2019	

JOB NO	DRAWING NO	ISSUE
1605	DA- 011	J

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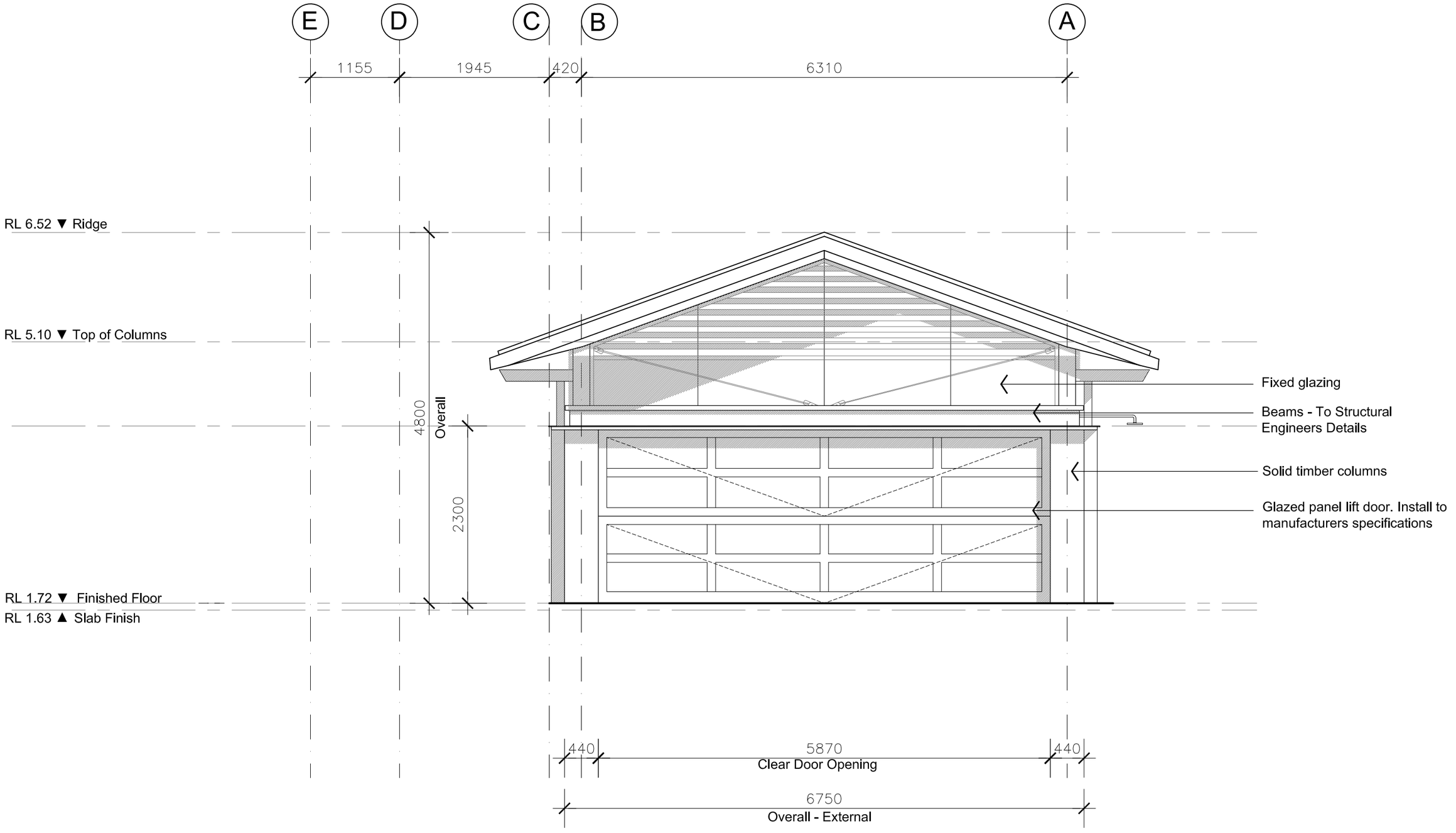

Elevation - East
1: 50 @ A3

ISSUE	AMENDMENT	DATE
D	Issued for 3d	26.08.20
E	Issued for Development Application	07.12.20
	Roof height reduced	
F	Issued for Review	07.05.21
G	Issued for Review	03.06.21
H	Issued to Council	09.06.21
i	Issued for Review	02.07.21

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CLIENT: Tony Walls

PROJECT: Replacement of Marine Structures
316 Hudson Parade
Clareville NSW 2107

DRAWING: ELEVATION - East

DRAWN	CHKD	APPROVED
DMS		
SCALE: 1 : 50 @ A3	DATE: Sept 2019	CAD FILE No
JOB NO: 1605	DRAWING NO: DA- 012	ISSUE: i

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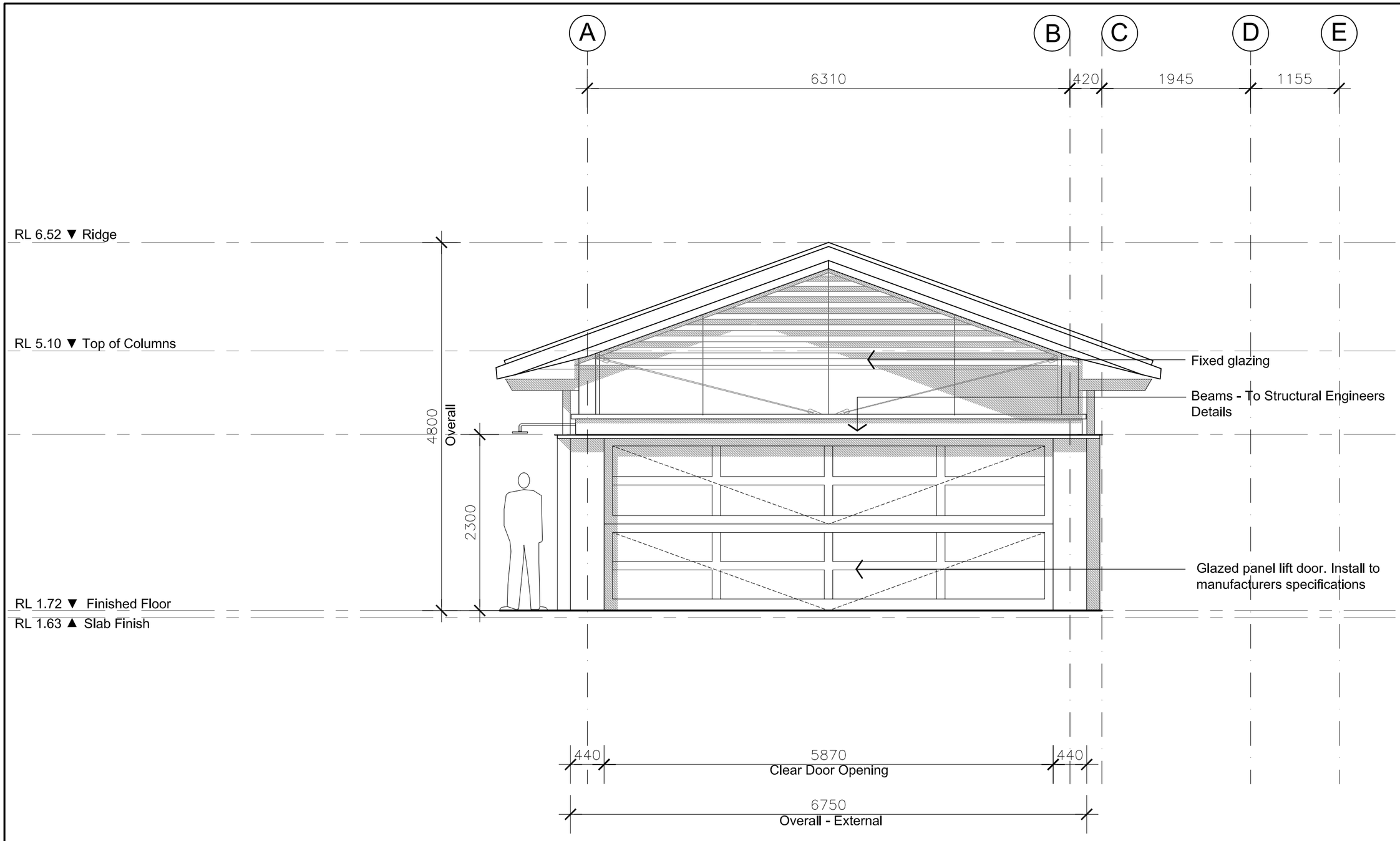

Elevation - West
1: 50 @ A3

ISSUE	AMENDMENT	DATE
D	Issued for 3d	26.08.20
E	Issued for Development Application	07.12.20
	Roof height reduced	
F	Issued for Review	07.05.21
G	Issued for Review	03.06.21
H	Issued to Council	09.06.21
i	Issued for Review	02.07.21

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CLIENT: Tony Walls

PROJECT: Replacement of Marine Structures
316 Hudson Parade
Clareville NSW 2107

DRAWING: ELEVATION - West

DRAWN	CHKD	APPROVED
DMS		
SCALE: 1 : 50 @ A3	DATE: Sept 2019	CAD FILE No
JOB NO: 1605	DRAWING NO: DA- 013	ISSUE: i

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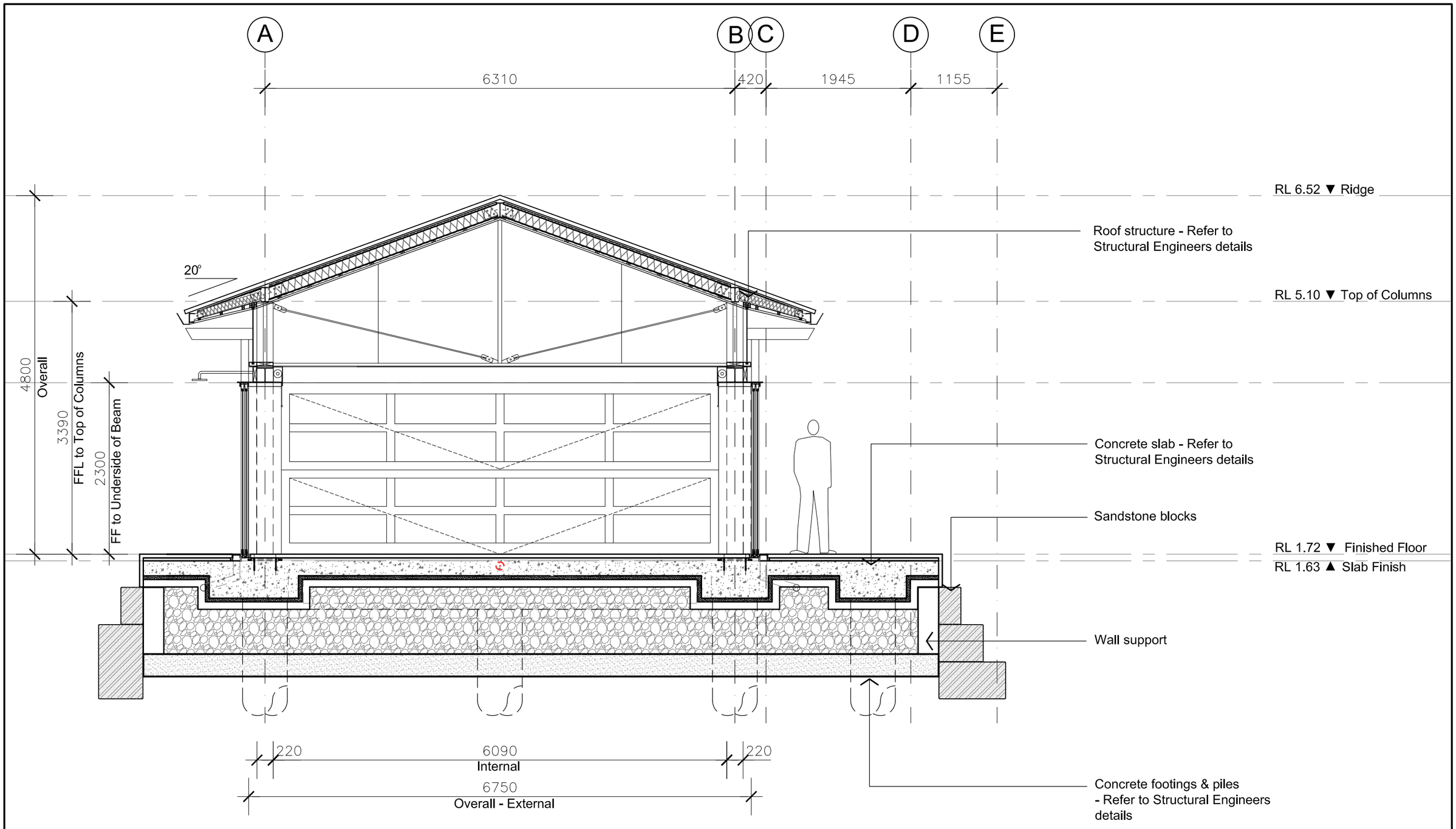

Section AA
1: 50 @ A3

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ISSUE	AMENDMENT	DATE
E	Issued for 3d	26.08.20
F	Issued for Development Application	09.12.20
G	Estuarine Planning Levels added	10.12.20
H	Issued for Review	03.06.21
i	Issued to Council	09.06.21
J	Issued for Review	02.07.21
K	Issued for Review	06.07.21

CLIENT: Tony Walls

PROJECT: Replacement of Marine Structures
316 Hudson Parade
Clareville NSW 2107

DRAWING: SECTION AA

DRAWN	CHKD	APPROVED
RJC & DMS		
SCALE: 1 : 50 @ A3	DATE: Sept 2019	CAD FILE No
JOB NO: 1605	DRAWING NO: DA- 020	ISSUE: K

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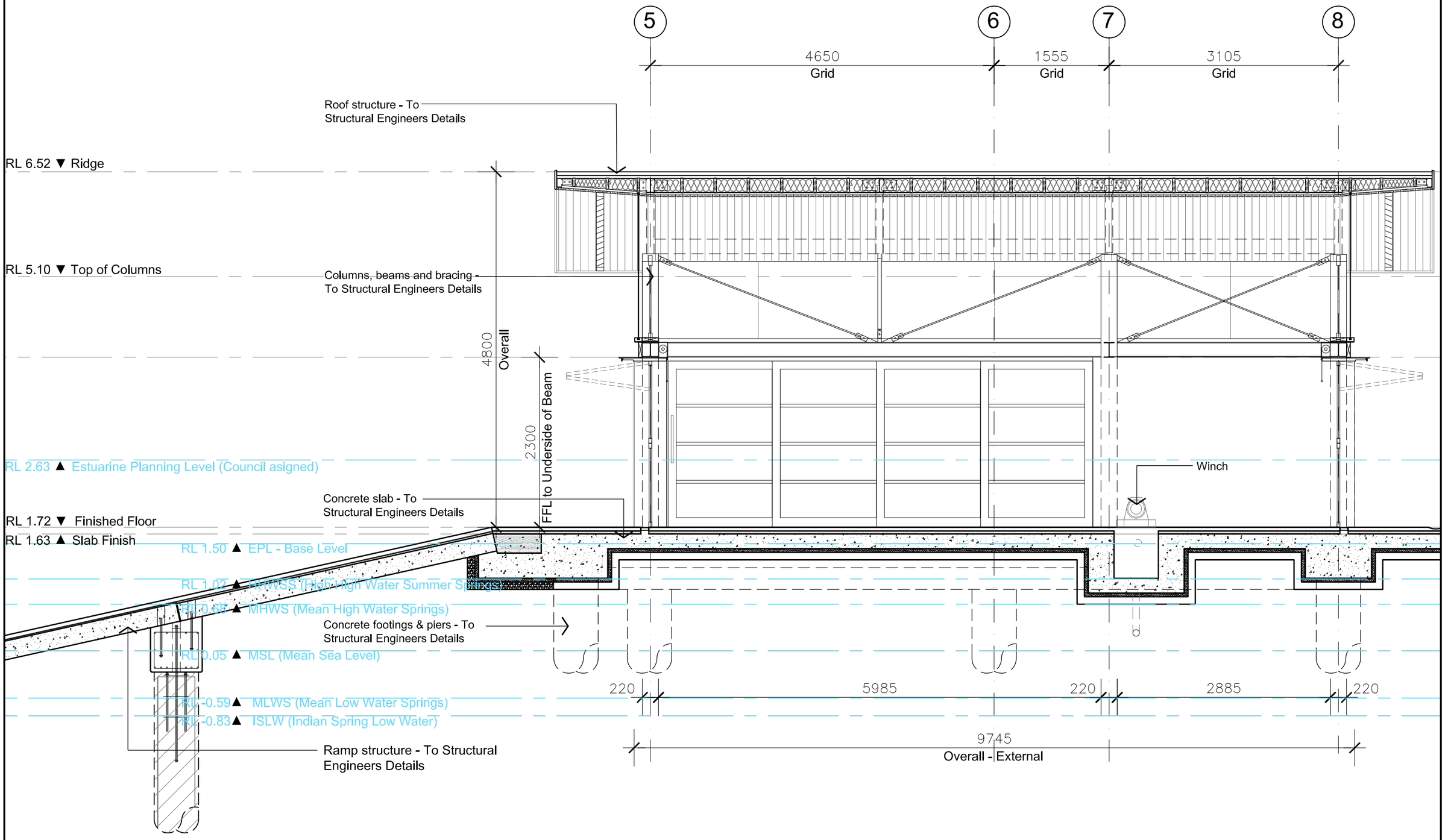

Section BB
1: 50 @ A3

ISSUE	AMENDMENT	DATE
A	Issued for Review	14.10.19
B	Issued for Information	27.07.20
C	Issued for Review	18.08.20
D	Issued for 3d	26.08.20
E	Issued for Development Application	09.12.20
H	Issued for Review	03.06.21
i	Issued to Council	09.06.21

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CLIENT: Tony Walls

PROJECT: Replacement of Marine Structures
316 Hudson Parade
Clareville NSW 2107

DRAWING: SECTION BB

DRAWN	CHKD	APPROVED
RJC & DMS		
SCALE: 1 : 50 @ A3	DATE: Sept 2019	CAD FILE No
JOB NO: 1605	DRAWING NO: DA- 021	ISSUE: i

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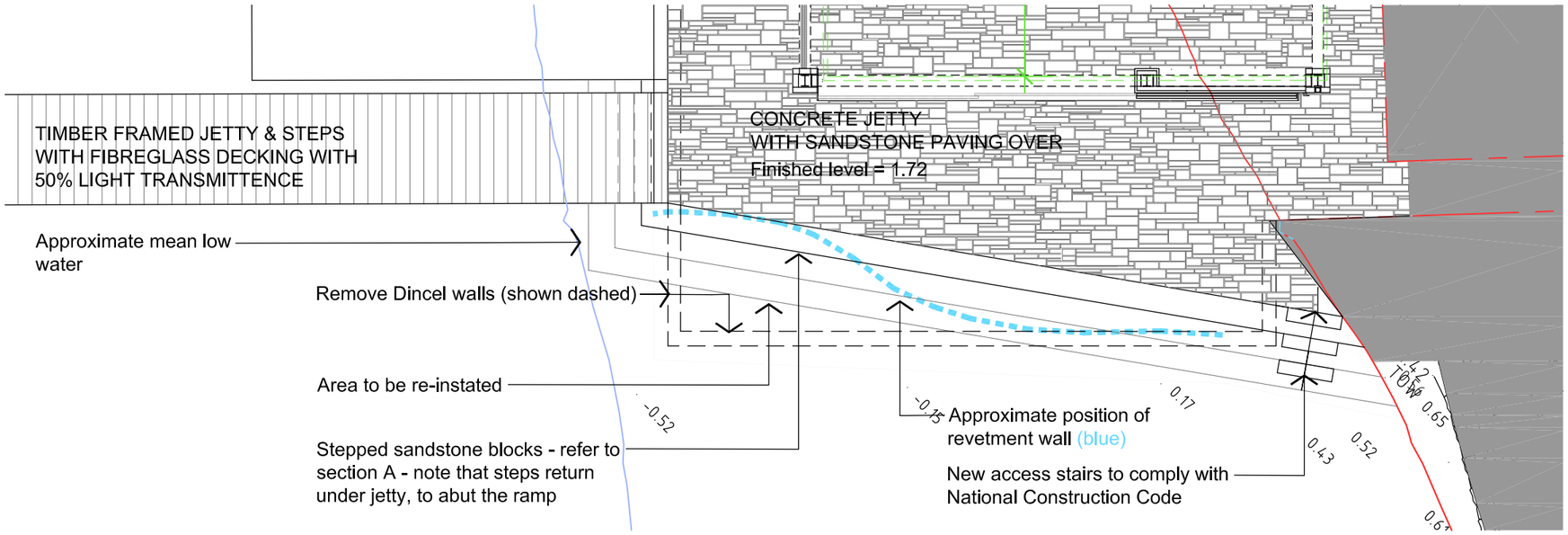
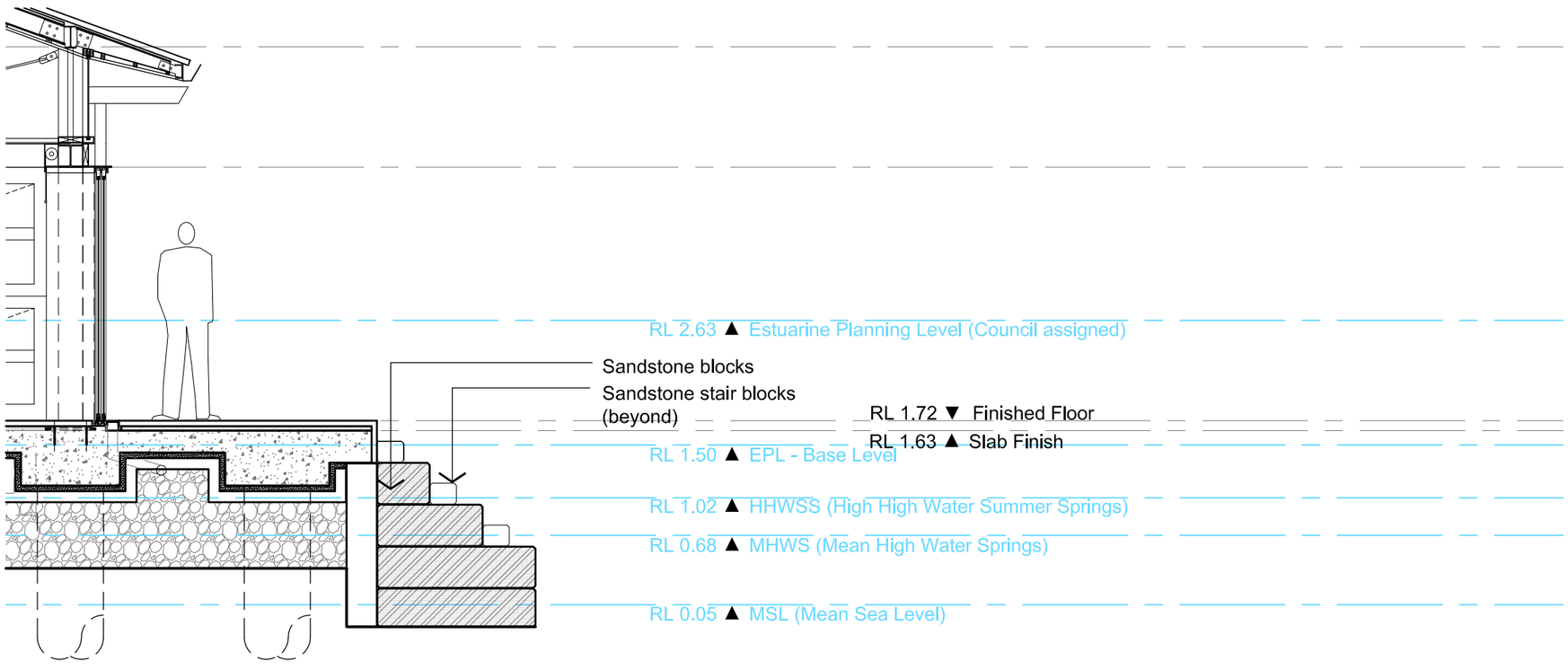


PLAN
1: 100



SECTION
1: 50

ISSUE	AMENDMENT	DATE
A	Issued to Council	16.08.21

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CLIENT: Tony Walls

PROJECT: Replacement of Marine Structures
316 Hudson Parade
Clareville NSW 2107

DRAWING: DETAIL - plan & section

DRAWN	CHKD	APPROVED
RJC		
SCALE	DATE	CAD FILE No
As shown	AUG 2021	
JOB NO	DRAWING NO	ISSUE
1605	DA -040	A

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