

Flooding and Estuarine Risk Management

Boat House, Palm Beach

59916081/R004

Prepared for
London Lakes Partnership

30 August 2021



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1 Introduction

1.1 Background

Cardno (NSW/ACT) Pty Ltd have been engaged by London Lakes Partnership (LLP), who plan to undertake refurbishment and renovations to the restaurant, boat-hire facilities and deck areas (The Superstructure), on their leased property at the Barrenjoey Boat House, Palm Beach. The work will involve an almost complete demolition of the Superstructure and pier replacement under it as required, other than a few piers that are in sound condition.

Appendix A presents architectural plans provided by their Builder, Blue Pacific Constructions Pty Ltd (BPC), and includes a site survey undertaken in February 2018 and updated in August 2019. The survey shows the gazetted Mean High Water Mark (MHW) and that the Superstructure on the seaward side all lies within Crown Lands leased area on the water, whereas the outside seating area east of the main restaurant entrance is located on Council land. The renovation plans were prepared by Canvas Architecture & Design. Other relevant details are presented in Cardno (2021a).

Figure 1.1 provides a locality plan of the site. Note that the survey includes beach levels, which will be needed for design and construction of replacement works, including below and along parts of the building. Note that Council has recently constructed a cut sand-stone block seawall near the back beach area to the south – extending south about 20m from the edge of the southern deck area.

The plan is to demolish and raise the existing facilities such as decks, toilets, a stairway and food processing areas to improve the overall restaurant, seaplane and boat hire operations and improve the satisfaction of patrons and employees. No areas are intended for accommodation and the upstairs areas provide office facilities for general operation. The remaining wharf and boat-berth areas lying seaward of the Boat House outer deck/wharf itself are not included in these proposed works except for raising of the large wharf immediately in front of the Superstructure by 200mm; noting that recent repairs have been made to those separate facilities following the major ocean storm in June 2016. The section of the wharf on the southern side of the building needs to be demolished and reinstated because of the poor condition of the joists and bearers; noting that the balcony on the first floor is supported by it.

Appendix B of Cardno (2021a) provides some history of the site and includes condition reports prepared by Blue Pacific Constructions Pty Ltd – before June 2016. The building is old and was developed in a piece-meal fashion. The seaward deck level is 1.8m AHD and hence is currently not affected by the 50-years average recurrence interval (ARI) storm tide level of 1.47m AHD; but occasionally by high tides and ocean swell, such as in June 2016, when some damage to the structure, together with shoreline erosion, occurred. Deck boards have been loosened by wave action in the past – they are currently nailed to the deck beams/bearers below; with some nails obviously lifted. A higher upper-deck at 2.5m AHD and closer to the restaurant and along the southern side to the back of the building is accessed from the lower, seaward deck by steps and also the arrival area.

Northern Beaches (formerly Pittwater) Council requires that the lessees must submit an independent wave action and tidal inundation report and assessment to Council in the form of adequate qualitative and quantitative detail addressing estuarine planning level information, the management of estuarine risk and other criteria (where applicable), as they affect the subject building, land and its surroundings. The report is to address the issues presented in Council's P21 DCP Part B, see Appendix C of Cardno (2021). A definition of estuarine planning levels (EPL) is presented on Page 7 of Appendix 7 of P21 DCP prepared by the then Pittwater Council, see Appendix D of Cardno (2021a).

Cardno (2021a) has been prepared to address these matters and it is based on site visits first undertaken at 1530 hours on 17 November 2015, and subsequent visits following the June 2016 storm damage, in early March 2018 and on 28 January 2020; together with the Cardno report 'Pittwater Foreshore Floodplain Mapping of Sea level Rise Impacts' prepared for Pittwater Council – Report LJ2882/R2658v4-Final Report, 30 January, 2012. This risk management report has been prepared in accordance with Pittwater Council's P21 DCP and includes all of the required data. It also addresses inundation issues. However, this report (R004), has been prepared as a separate site flooding report.

1.2 Site Visits

The initial site visit occurred at a time near mid-tide – +0.8m LAT as recorded by the Manly Hydraulics Laboratory web-site; in the company of BPC – Mr Peter Heber. The dominant swell wave conditions that affect the shoreline will, on average, have wave crests near-parallel to the shoreline (near the shoreline) – with little net longshore transport to the south; except during major storms; noting that future storms may affect the building and cause inundation by wave overtopping the lower deck and the area landward of the building.

There is no present day evidence of wave run-up and overtopping of the back-beach area, albeit there is evidence of back-beach storm erosion.

1.3 Other Reporting

Cardno (2021a) addresses a range of other coastal processes matters at this site.

Cardno (2021b) addresses catchment flooding of the site.

2 Review of Existing Information and Assessment

2.1 General

LLP, through Blue Pacific Constructions, have requested that the EPL for re-design and re-construction of the Superstructure at the Boat House Wharf be based on 2070, including projected sea level rise. This has been interpolated from the 2050 and 2100 data presented in Cardno (2012). This planning period is based on the likely design life of some of the proposed marine works. Design principals have been based on AS 4997-2005 for Design of Maritime Structures because the Superstructure is seaward of the gazetted MHWL and is classified as a normal commercial wharf structure. The design criterion of 50 years operational life has been adopted to limit access issues to the building and any effects on three significant Norfolk Island pines; noting that by 2100 a 100-years ARI storm would intermittently inundate the access roadway by wave overtopping of the back-beach area to the north and south of the building.

As per AS4997, Section 3.1:

'For wharves and jetties in locations subject to local river flooding or storm surge situations, the design may allow for periodic inundation during such events. Such structures should be able to withstand lateral loads and uplift from elevated water levels including flood effects from the design flood event.'

'Where overtopping of deck structures by waves would result in disproportionate level of damage to the superstructure above main deck level, means to prevent water damage to the property should be incorporated into the design.'

Note also that the rebuilt Superstructure could be raised after 50 years, above the new piers, bearers and joists that would be installed – if the building is still in use at 2070.

2.2 EPL Assessment

In terms of the Lawson and Treloar (now Cardno)/Cardno (2004, 2012) reports, the site is on Station/Barrenjoey Beach. That report provides estuary planning levels (EPL) and the nominally appropriate case for this project is the 50-years (from 2020) ARI storm and water level conditions for 2070. This level is 2.1m AHD (2.05m) at the Boat House – excluding freeboard and wave run-up and overtopping, which are addressed separately. This is the closest example site included in Cardno (2004, 2012). This level includes 0.6m of projected sea level rise to 2070.

Cardno's (2004, 2012) EPL study for Pittwater Council provided general planning level advice based on precincts and a range of back-beach types and crest levels for 2010, 2050 and 2100, including the related projected sea level rises. Wave data for 100-years ARI conditions were included also. These are intended for on-land development, generally, but can be applied to boat-sheds, for example.

Because of the type of structure at the Boat House, a planning period to 2070 has been adopted and agreed with NBC Coastal Section. Furthermore, there is a mixture of back beach types and a back-beach level of about 2.5m AHD; considering also the fact that the main structure is predominantly over water and is not intended for habitable space.

Hence, Cardno has taken the responsible course of determining a site/project specific EPL analysis, coupled with site specific wave overtopping and run-up levels and overtopping wave heights.

Hence an appropriate still water EPL of 2.05m at 2070 has been determined and then wave overtopping and uplift/horizontal forces determined. The equivalent EPL on the land near the front entrance then is 2.05m AHD + 0.4m (overtopping) + 0.3m (freeboard) = 2.75m AHD. This is just below the sealed top of the waste-water pump-out and holding tank (2.9m AHD). It is the appropriate 2070 planning period for this re-development project and is consistent with the 3.05m AHD 2100 EPL – see below.

2.3 Estuarine Risk Management

The EPL assessed above complies with Appendix 7 of Pittwater 21 DCP. Note that:

- This is not a residential development under Appendix 7 and Pittwater 21 DCP clauses 3.8 and 3.9.
- The storage of dangerous goods and sewerage systems are all above the EPL.

2.4 Flooding

2.4.1 Estuarine Inundation

In terms of estuarine flooding at 2100, the EPL is 2.35m AHD (still water level) + 0.4m (overtopping) + 0.3m (freeboard) = 3.05m AHD; noting that the building is not habitable. Note that the foot-print of the proposed re-development will not change and the works will not affect nearby sites any more than they might do at present – less so because floor levels are being raised. The surrounding land area would be inundated by intermittent wave overtopping, including the access road in this design 2100 estuarine flooding scenario. Note that the new restaurant access decks will be above the existing ground level and allow flow beneath them, thereby allowing overtopping seawater to return seaward partially below the new deck. If needed, refuge could be taken in the upstairs office area, but this flooding could only occur at high tide and there would be ample storm warning – likely a major ECL and a high spring tide. The interior restaurant floor level at 2.9m AHD will not flood at 2070, noting that the front and back doors to the restaurant must be sealed – EPL at 2070 is 2.75m AHD, to prevent minor wave wetting that might be caused by wave overtopping. The doors may be sealed by keeping available a plank that has rubber seals along the bottom and side edges and which can be firmly fixed to the insides of the door-frames when needed. Some minor leakage would still likely occur.

The lower deck and some other service areas would be inundated. Electrical outlets to be at 1.5m above floor levels on the lower deck and 1m above floor levels at other locations below 2.8m AHD. For levels at 2.9m AHD or above, outlets should be set 200mm above floor level. The main meter box will be installed at about 1.5m above ground level – about 4m AHD and will include automatic circuit breakers.

Moreover, the proposed development, having the same foot-print will not change the current coastal processes or flood levels – no change in foot-print. Removal of the marina facilities on the northern side may reduce the small salient at the site.

The seaward deck, raised to 2.14m AHD from 1.8m AHD, will be marginally inundated in this design EPL condition, but with significant wave overtopping. This area may suffer damage in rare severe storms, but can be repaired after storm abatement. The rear, or upper deck, restaurant interior and entrance area on the eastern side are all to be at 2.9m AHD, which is above the 2070 EPL, but can be marginally affected by severe storms – uplift addressed separately. The separate boat-hire office (floor level 2.6m AHD) and store shed (floor level 2.9m AHD) also will not be directly inundated. It is not practical to raise the front deck more than the proposed 0.3m up to 2.14m for overall access reasons.

The back beach level shown on the site survey is about 2.5m AHD. Hence the car park, outdoor seating and outdoor kitchen facilities area would not be inundated by 'still water' at 2070 in the design storm event; but wave overtopping would cause some inundation, which could flow back into the restaurant area. Hence the front door of the restaurant will need to be sealed well.

The related design wave condition is $H_s=1.5\text{m}$ with a zero crossing period of 10.2 seconds. This is an ocean wave that may propagate from the Tasman Sea to the site in a rare storm, most likely with an offshore direction of east to east north-east. These waves could cause considerable uplift force on the floors and decks of the building, and wave overtopping north and south of the building would extend up to 40m inland. The overtopping flow may be up to 0.4m deep at the shoreline with speeds in the order of 0.6 to 0.8m/s; and would be dangerous. However, ample warning of these storm conditions would be available, and in these circumstances the building and site would need to be vacated.

The access road to the north and south has levels of about 2.4 to 2.6m AHD and will flood in a future very severe storm with projected sea level rise.

The property boundary between Crown Lands and Council is defined by the gazetted MHWL, which is 1.17m AHD – based on the astronomical tide, that is, it excludes SLR and meteorological effects.

Existing levels on the bitumen and packed sand in front of the Boat House building vary from about 2.5m AHD at the landward side of the restaurant building and rise to 2.8m AHD towards the access road.

The redevelopment project includes a wastewater pump-out and holding tank, as well as a grease trap located in the facilities area east of the entrance to the restaurant. It has a sealed opening/access-point that is set at 2.9m AHD and is needed for maintenance access. The site specific EPL for this area is 2.75m AHD, including 0.3m freeboard. The area will be affected by intermittent wave overtopping in the 50-years planning period design scenario to 2070. Although some splashing would occur at the access point, there will be no identifiable sea water influx to the tanks. Setting these openings higher is not

appropriate or needed. In due course this 'manhole' entry point can be raised as projected SLR may occur.

Hence, the nearshore/onshore design EPL is 2.75m AHD = (2.1m AHD + 0.3m freeboard + 0.4m inundation by wave overtopping). This is a site specific calculation, noting that the back-beach level is higher than the 2m AHD included in Cardno (2004, 2012) for wave overtopping calculations.

None of these areas is habitable.

Hence 'shelter in place' is the advised flood safety measure, as well as early closure of the facilities.

2.4.2 Catchment Flooding

Cardno (2021b) provides a detailed catchment flooding report for this site, including all of the design changes – raised floor levels and increased flow area under the building for discharge back to the sea.

That study concluded that the development would not be affected adversely by the 2100 1%AEP flood event.

More details are presented in Cardno (2021b).

3 Conclusions and Recommendations

The proposed additions and modifications/demolition and rebuild works at the Boat House, Palm Beach, will have little effect on estuarine/shoreline processes. No habitable areas are proposed.

This building has been developed in stages and some existing deck levels are lower than Council's estuary planning levels. However, all floor areas are being raised by about 0.3m. Some still water and wave inundation of the lower deck area would occur in a future very severe ocean storm, noting that storm damage occurred at the site and to the building in June 2016.

In a future design storm (2070), wave overtopping of the shoreline and back-beach areas to the north and south of the refurbished Boat House would lead to potential intermittent and short term inundation and minor water ingress to the building.

Note that the lower deck facilities could suffer significant damage and the restaurant could suffer some minor water ingress during a major ocean storm at 2100; and would be vacated in the event of an imminent, future very severe storm. The Boat House would be closed in these predicted storm conditions, with ample warning time available to advise closure. However, shelter in place is viable for both coastal inundation and catchment flooding.

In the longer term, based on projected sea level rises, the access road may become inundated by storm tide to a depth of about 0.3 to 0.4m; posing evacuation concerns; albeit adequate warning should be available, as well as sheltering in place and in the upstairs area of the building.

The development will not be affected adversely by catchment flooding, nor would the proposed works cause obstruction of runoff flows back to sea.

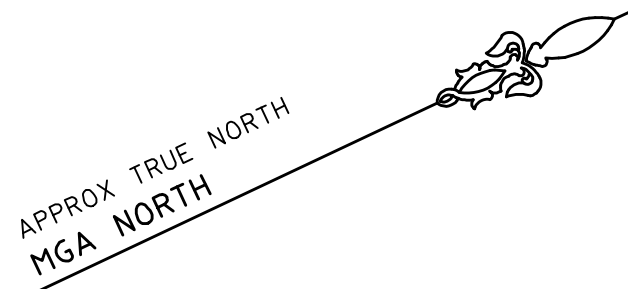
4 References

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APPENDIX

A

RENOVATION ARCHITECTURAL PLANS



PITTWATER

PITTWATER

TITLE INDICATES THAT LOT 7005 & 7006 IN D.P.721522 IS SUBJECT TO:
- THE LAND IS A RESERVE WITHIN THE MEANING OF PART 5 OF THE CROWN LANDS ACT 1989 AND THERE ARE RESTRICTIONS ON TRANSFER AND OTHER DEALINGS IN THE LAND UNDER THAT ACT, WHICH MAY REQUIRE CONSENT OF THE MINISTER.
- LIMITED TITLE, LIMITATION PURSUANT TO SECTION 28(10) OF THE REAL PROPERTY ACT, 1900, THE BOUNDARIES OF THE LAND COMPRISED HEREIN HAVE NOT BEEN INVESTIGATED BY THE REGISTRAR GENERAL.

TITLE INDICATES THAT LOT 298 IN D.P.721522 IS SUBJECT TO:
- 3942964 LAND EXCLUDES MINERALS (S171 CROWN LANDS ACT 1989)
- 3942965 CROWN LEASE TO CARMEL EUGENE WALTON, RUSSELL WALTON, WENDY WALTON, CHRISTOPHER HOGG & JOANNE HOGG (LE 30506), EXPIRES: 30/4/2022.
- 3942966 LEASE NO. LE 30506 (3942965) MAY NOT BE TRANSFERRED, MORTGAGED, SUB-LEASED OR DEALT WITH IN ANY SPECIFIED MANNER WITHOUT THE CONSENT OF THE MINISTER ADMINISTERING THE CROWN LANDS ACT 1989
- A8365809 LEASE OF LEASE 3942965 TO AIRPORT PTY LIMITED OF SHOP 3, BARRENJOEY BOATHOUSE, GOVERNOR PHILLIP PARK, PALM BEACH, EXPIRES: 19/9/2009, OPTION OF RENEWAL: FIVE YEARS.
- A8879636 TRANSFER OF LEASE A8365809 LESSEE NOW KRUG AGENCIES PTY. LIMITED.
- A192396 LEASE OF LEASE 3942965 TO DAWSON BROWN ARCHITECTURE PTY LIMITED OF SHOP 4, BARRENJOEY BOATHOUSE, GOVERNOR PHILLIP PARK, PALM BEACH, EXPIRES: 28/2/2007, OPTION OF RENEWAL: 1 YEAR.
- AC251936 LEASE OF LEASE 3942965 TO BARRENJOEY BOATING SERVICES PTY LIMITED OF SHOP 1, BARRENJOEY BOATHOUSE, GOVERNOR PHILLIP PARK, PALM BEACH, EXPIRES: 28/2/2011, OPTION OF RENEWAL: 5 YEARS.
- AC52286 TRANSFER OF LEASE 3942965 LESSEE NOW ISLAND GETAWAY PTY LIMITED, NITOLA PTY LIMITED & N B T PTY LIMITED
- AFT0815 TRANSFER OF LEASE AC251936 LESSEE NOW BIGGEST PTY LIMITED & NORTH SUMMER BAY INVESTMENTS PTY LTD
- AF495746 TRANSFER OF LEASE 3942965 LESSEE NOW ISLAND GETAWAY PTY LTD, NOT PTY LTD, NITOLA PTY LTD & CHAMPAMES LAKES PTY LTD
- AH20977 VARIATION OF LEASE AC251936 EXPIRY DATE NOW 28/2/2016.

NOTES

- WALL TO BOUNDARY DIMENSIONS SHOWN HEREON MUST NOT BE USED FOR CONSTRUCTION. IF CONSTRUCTION IS INTENDED TO BE UNDERTAKEN ON OR ADJACENT TO PROPERTY BOUNDARIES THE BOUNDARIES OF THE LAND MUST BE MARKED.
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- AREA IS APPROXIMATE ONLY AND HAS BEEN CALCULATED BY TITLE DIMENSIONS. ALL TITLE DIMENSIONS OF THE LAND HAVE NOT BEEN CONFIRMED BY SURVEY. IF AREAS ARE CRITICAL, WE RECOMMEND A BOUNDARY SURVEY FOR PUBLIC RECORD.
- IF CONSTRUCTION ON OR NEAR BOUNDARIES IS REQUIRED IT IS RECOMMENDED THAT THE BOUNDARIES OF THE LAND BE MARKED.
- THIS PLAN HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF BLUE PACIFIC CONSTRUCTIONS PTY LTD.
- RELATIONSHIP OF IMPROVEMENTS TO BOUNDARIES IS DIAGRAMMATIC ONLY. WHERE OFFSETS ARE CRITICAL THEY SHOULD BE CONFIRMED BY FURTHER SURVEY.
- EXCEPT WHERE SHOWN BY DIMENSION LOCATION OF DETAIL WITH RESPECT TO BOUNDARIES IS INDICATIVE ONLY.
- ONLY VISIBLE SERVICES HAVE BEEN LOCATED. UNDERGROUND SERVICES HAVE NOT BEEN LOCATED. DIAL BEFORE YOU DIG SERVICES (DBYD) SHOULD BE USED AND A FULL UTILITY INVESTIGATION, INCLUDING A UTILITY LOCATION SURVEY, SHOULD BE UNDERTAKEN BEFORE CARRYING OUT ANY CONSTRUCTION ACTIVITY IN OR NEAR THE SURVEYED AREA.
- CRITICAL SPOT LEVELS SHOULD BE CONFIRMED WITH SURVEYOR.
- THIS PLAN IS ONLY TO BE USED FOR THE PURPOSE OF DESIGNING NEW CONSTRUCTIONS.
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LEGEND:

- BB = BOTTOM OF BANK
- BBQ = BARBEQUE
- BIT = BITUMEN
- BLD = EXTERNAL BUILDING
- BOL = BOLLARD
- BW = BOTTOM WALL
- CHI = CHIMNEY
- CON = CONCRETE
- DD = DISH DRAIN
- DK = DECK
- FCE = FENCE
- FL = FLOOR LEVEL
- GDN = GARDEN
- JET = JETTY
- LID = MISCELLANEOUS PIT LID
- NS = NATURAL SURFACE
- PAV = PAVING
- PIL = PILE
- RF = TOP OF ROOF
- RMP = RAMP
- RR = ROOF RIDGE
- STR = STAIRS
- TB = TOP OF BANK
- TG = TOP OF GUTTER
- TR = TREE
- TW = TOP OF WALL
- = ELECTRICITY OVERHEAD
- - - = SEWER UNDERGROUND
- TREE SPREAD-DIAMETER-HEIGHT

HORIZONTAL DATUM:
CO-ORDINATE SYSTEM: M.G.A.
MARKS ADOPTED: PM1657 & PM140338

VERTICAL DATUM:
DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
B.M. ADOPTED: PM1657
R.L. 2.71 (ORDER L2)
SOURCE: S.C.I.M.S. (02/02/18)

I FIRST ISSUE 21/08/19

CLIENT: BLUE PACIFIC CONSTRUCTIONS PTY LTD
74 CABARITA ROAD,
AVALON NSW 2108

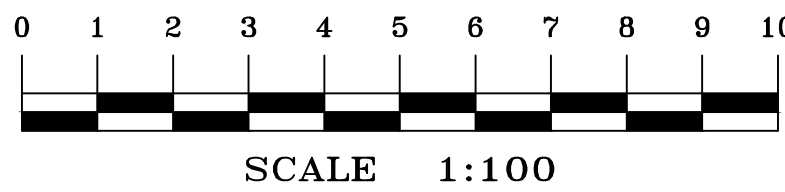
SURVEY PLAN
SHOWING DETAIL & LEVELS
OVER LOT 298 IN D.P.721522
"THE BOATHOUSE"
GOVERNOR PHILLIP PARK
PALM BEACH NSW 2108

C.M.S. Surveyors
Pty Limited

ACN: 096 240 201
PO Box 463 Dee Why
NSW 2099
2/29A South Creek Road,
Dee Why NSW 2099
Telephone: (02) 9671 4802
Facsimile: (02) 9671 4802
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LGA: NORTHERN BEACHES SHEET 2 OF 2

SURVEYED L.J.L.	DRAWN R.N./GP	CHECKED L.J.L.	APPROVED S.M./MDL
SURVEY INSTRUCTION 17534C	SCALE 1:500 AS AD	DATE OF SURVEY 12/06/19	ISSUE I
DRAWING NAME I7534detail	CAD FILE I7534Cdetail.Ldwg		



ADJOINS SHEET I

ADJOINS SHEET I

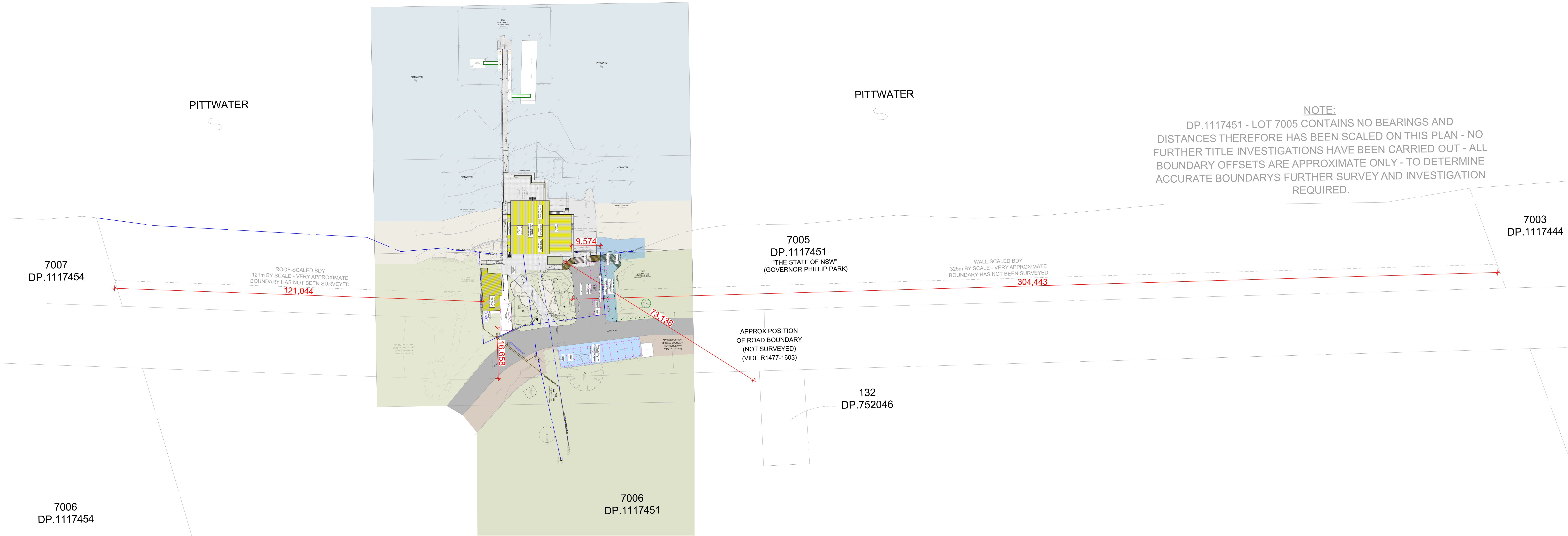
SHEET NUMBER	SHEET NAME
DA00	Addendum as requested by BCA Consultant
DA00	COVER
DA01	SITE ANALYSIS PLAN
DA01(A)	SEDIMENT CONTROL PLAN
DA02	SITE PLAN
DA03	DEMOLITION PLAN
DA04	SITE & GROUND PLAN
DA05	SITE & GROUND PLAN 1:200
DA06	PROPOSED GROUND FLOOR PLAN - A3
DA07	PROPOSED ANCILLARY BUILDING GROUND FLOOR PLAN - A3
DA08	PROPOSED FIRST FLOOR PLAN
DA09	NORTH / EAST ELEVATIONS
DA10	SOUTH / WEST ELEVATIONS
DA11	THE BOATHOUSE LONG & CROSS SECTION
DA12	PROPOSED PUBLIC ACCESS ON CROWN LEASE LAND
DA13	WASTE MANAGEMENT PLAN
DA14	PROPOSED OUTLINE NEW & EXISTING SERVICES
DA15	WINTER SOLSTICE 9 AM
DA16	WINTER SOLSTICE 12 PM
DA17	WINTER SOLSTICE 3 PM
DA18	NOTIFICATION PLANS SHEET 1
DA19	NOTIFICATION PLANS SHEET 2

THE BOATHOUSE

PALM BEACH

NOTE:
LOT 7005 IN DP.1117451 AND ROAD RESERVE HAVE BEEN ADDED BY SCALE ONLY AND IS VERY APPROXIMATE - NO SURVEY OF THESE BOUNDARYS HAS BEEN UNDERTAKEN AT THIS DATE.

IF ACCURATE SURVEY BOUNDARY OFFSETS ARE REQUIRED THEN FURTHER SURVEY MUST BE UNDERTAKEN.



NOTE:
DP.1117451 - LOT 7005 CONTAINS NO BEARINGS AND DISTANCES THEREFORE HAS BEEN SCALED ON THIS PLAN - NO FURTHER TITLE INVESTIGATIONS HAVE BEEN CARRIED OUT - ALL BOUNDARY OFFSETS ARE APPROXIMATE ONLY - TO DETERMINE ACCURATE BOUNDARYS FURTHER SURVEY AND INVESTIGATION REQUIRED.

LOCALITY PLAN

NOT TO SCALE

NOTES (NOT FOR CONSTRUCTION)
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CLIENT: LONDON LAKES PARTNERSHIP
THE BOATHOUSE
PALM BEACH

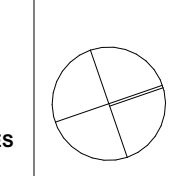
Canvas Architecture & Design
ABN 46 64 251 014
BEACON HILL NSW 2100
Rachyn Miller
NSW REG 9453 BARCH (HONS 1)
rml@canvasarch.com.au 0405 60 11 33

Drawing Name
Addendum as requested by
BCA Consultant

Drawing Scale
1:500

Layout ID
DA00
30/1/2021 DEVELOPMENT APPLICATION
09/1/2021 PRELIM LEVELS CHANGES
06/06/2021 REV. PRELIM LEVELS CHANGES

Drawn
RM





7006
DP.1117451

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THE BOATHOUSE
PALM BEACH

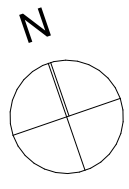
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Roslyn Miller
NSW REG. 9453 BARCH (HONS I)
roslyn@canvasarch.com.au 0405 60 11 30

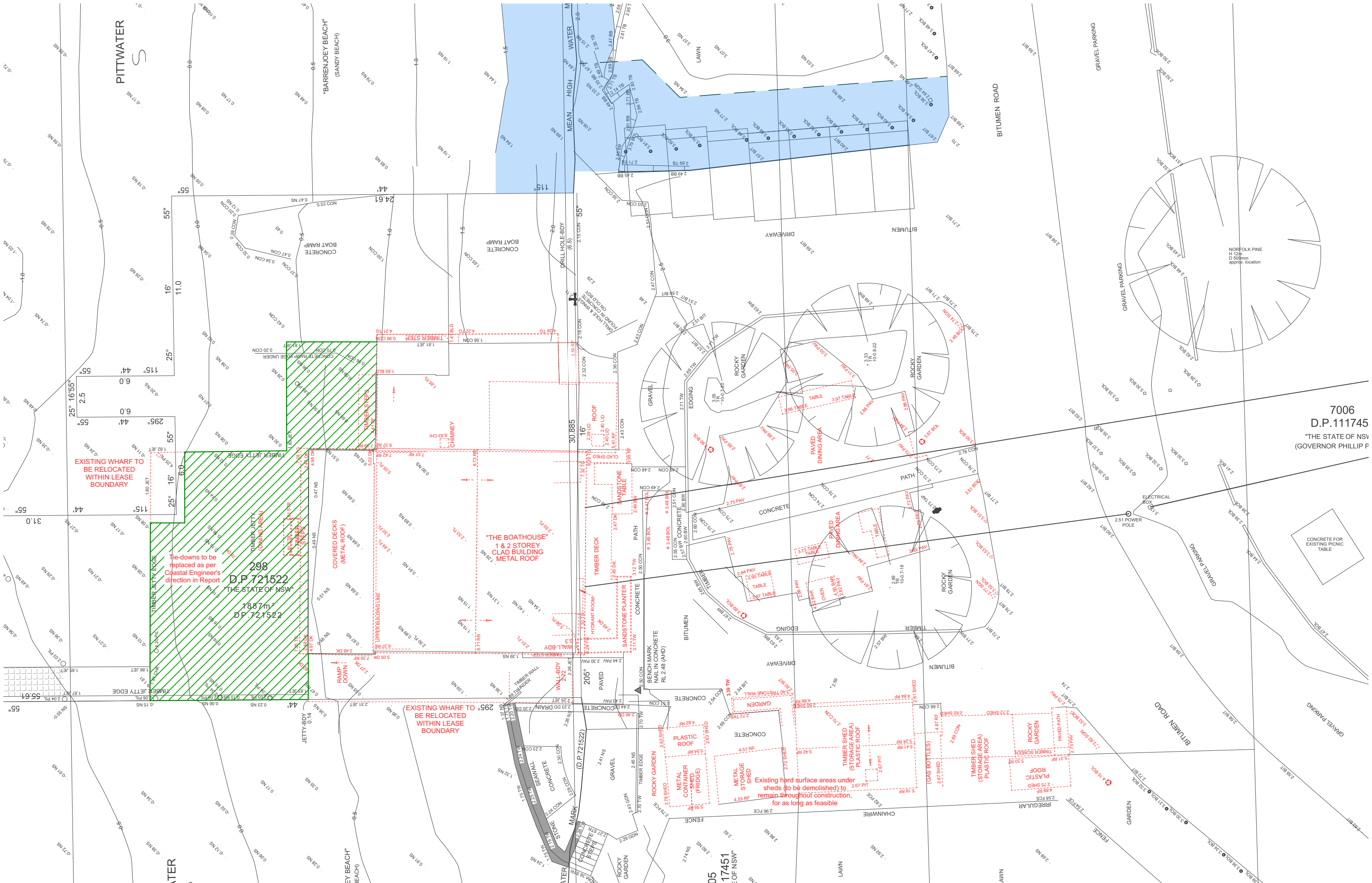
Drawing Name
SITE PLAN

Drawing Scale
1:200

Drawn
RM

Layout ID
DA02
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES





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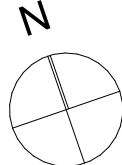
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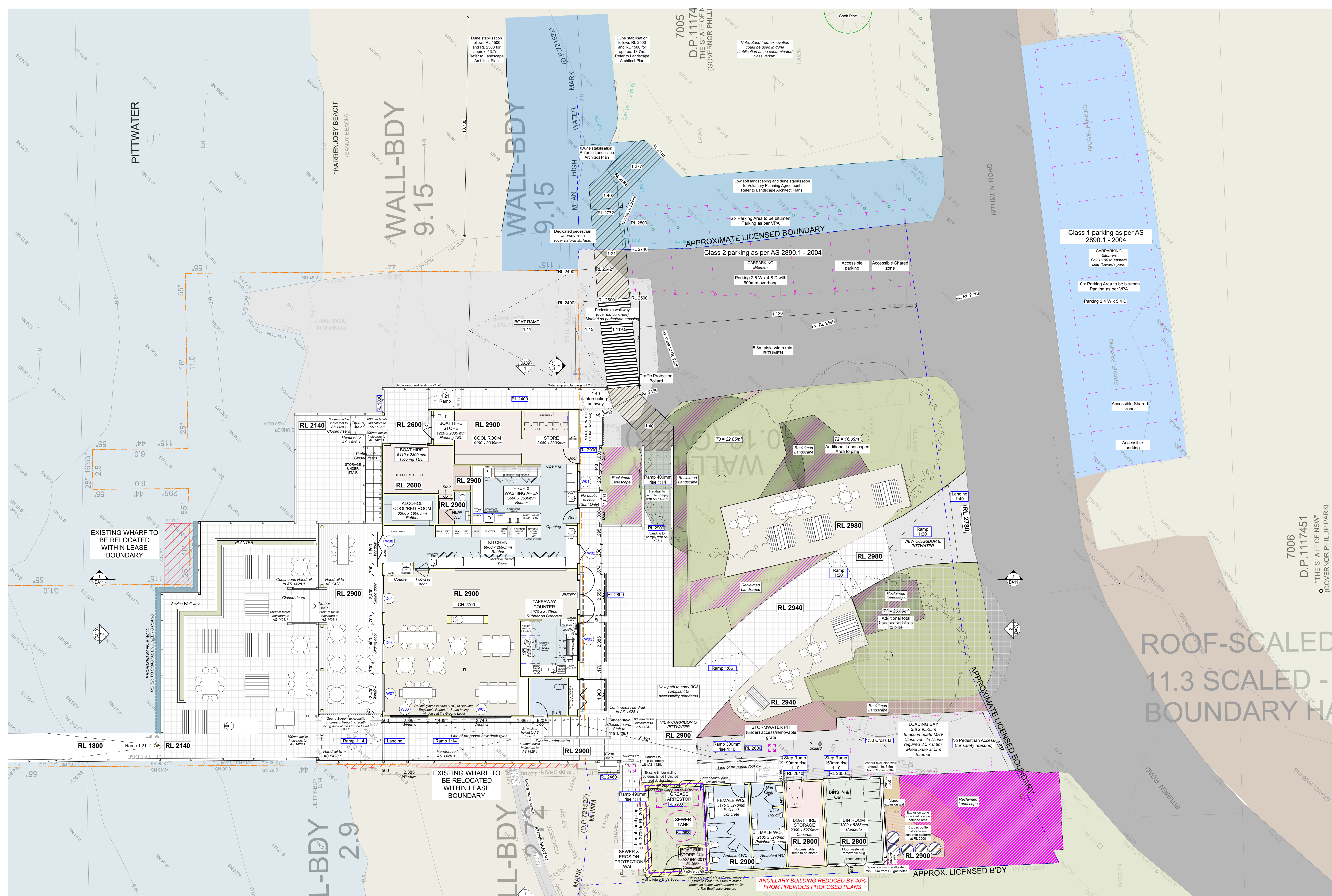
Drawing Name
DEMOLITION PLAN

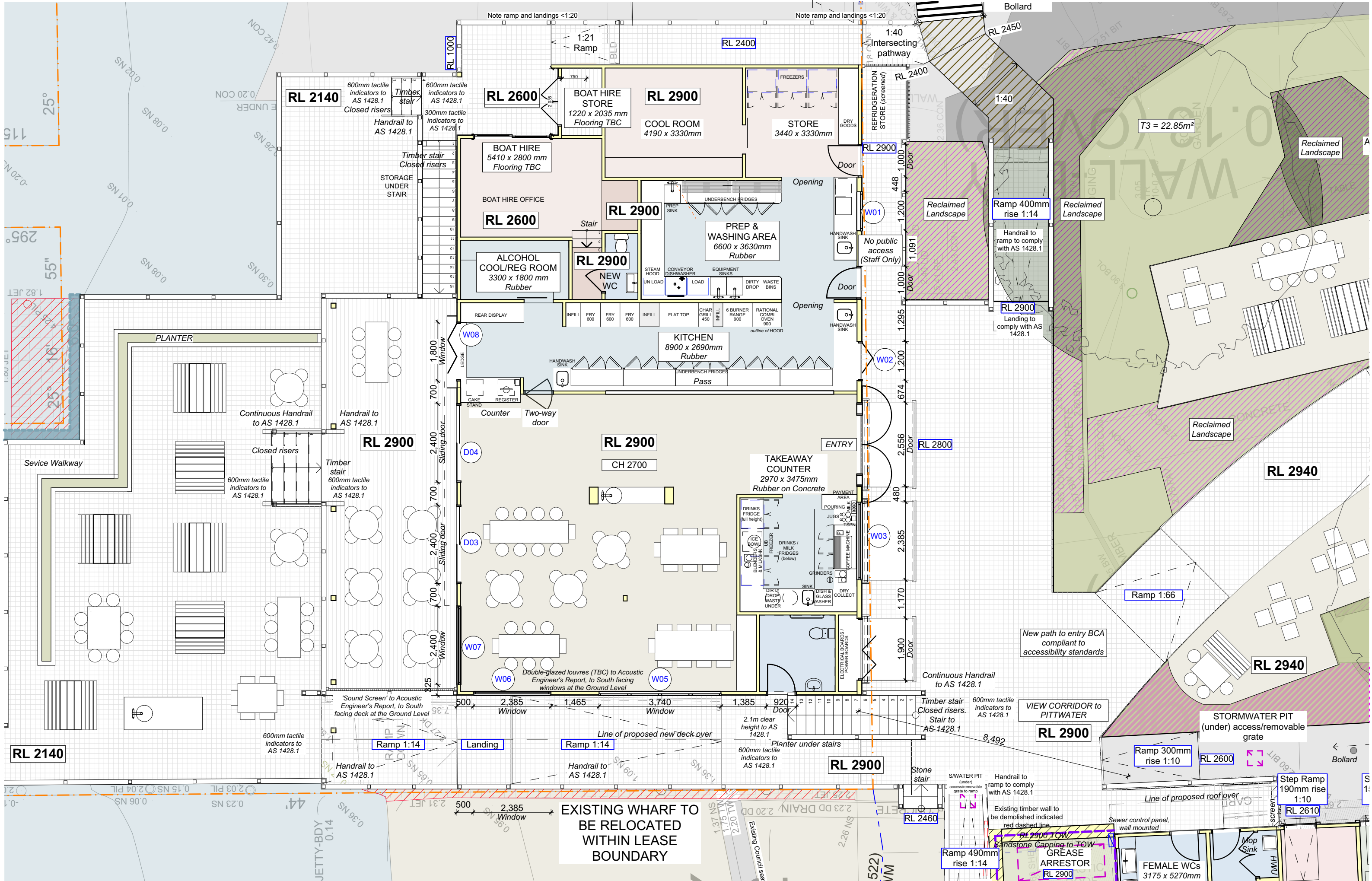
Drawing Scale
1:200

Drawn
RM

Layout ID
DA03
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES







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PALM BEACH

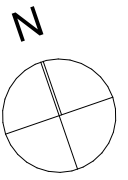
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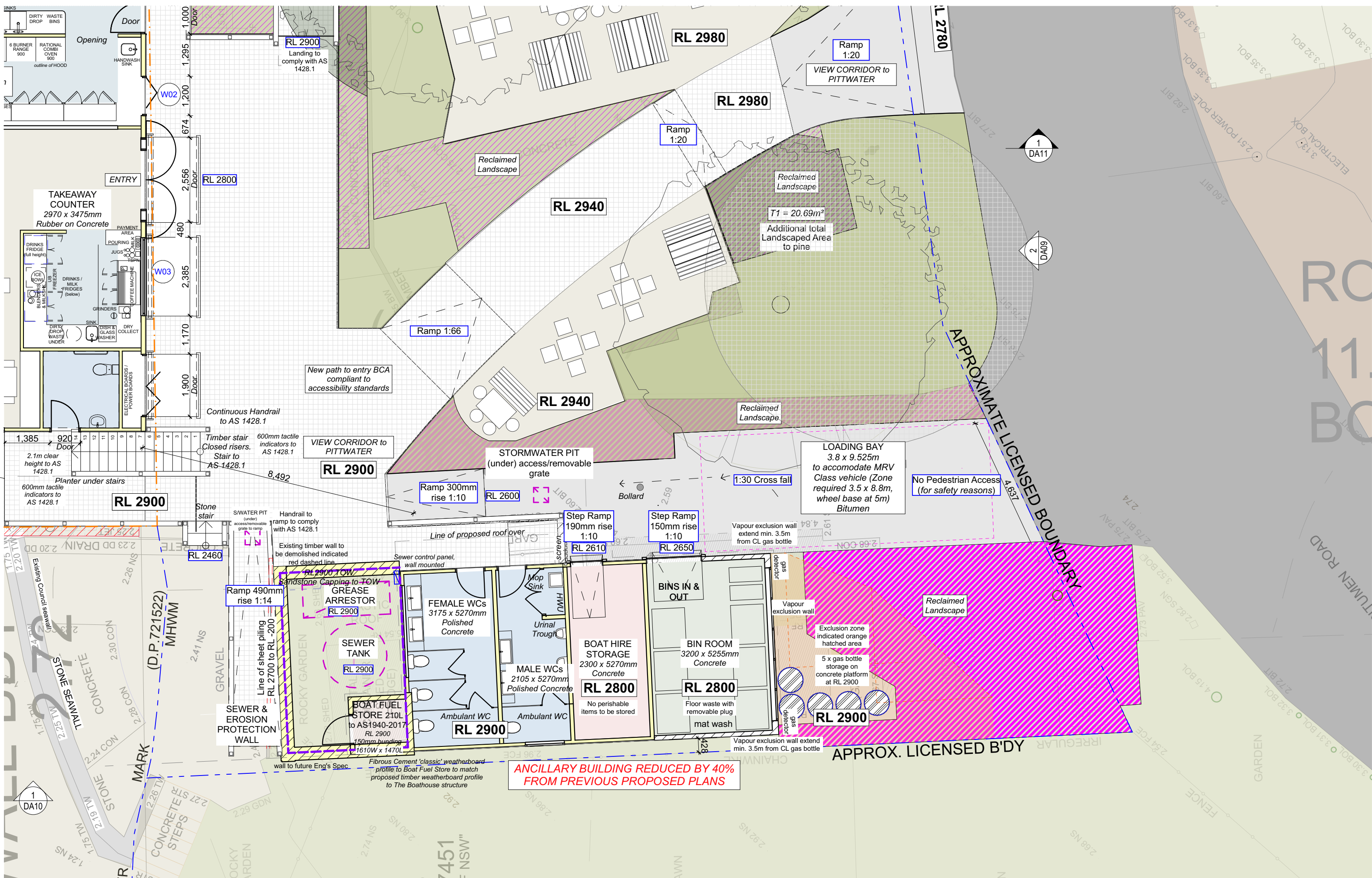
Drawing Name
**PROPOSED GROUND FLOOR
PLAN - A3**

Drawing Scale
1:100

Drawn
RM

Layout ID
DA06
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES





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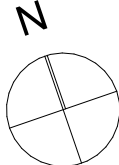
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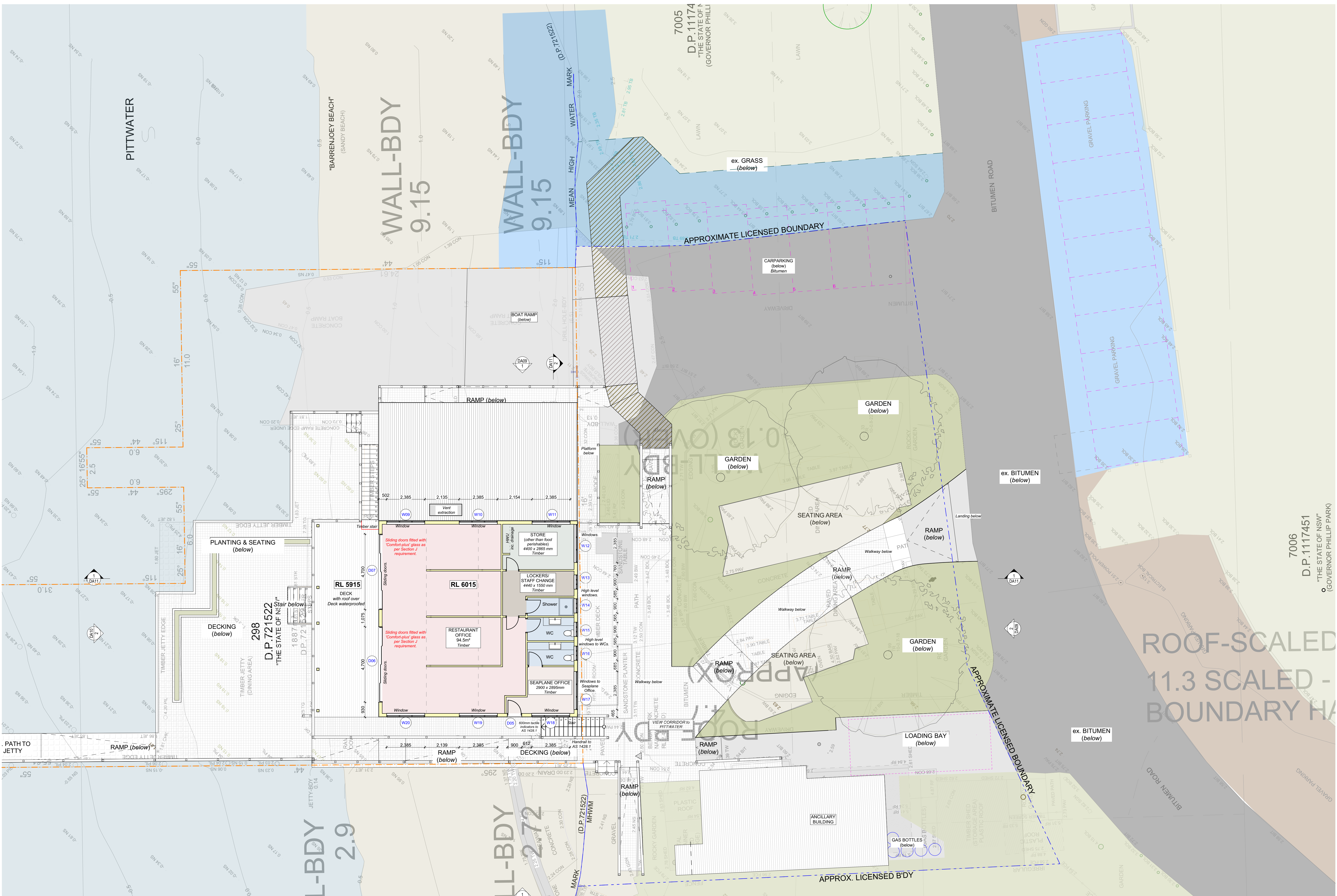
Drawing Name
**PROPOSED ANCILLARY
BUILDING GROUND FLOOR
PLAN - A3**

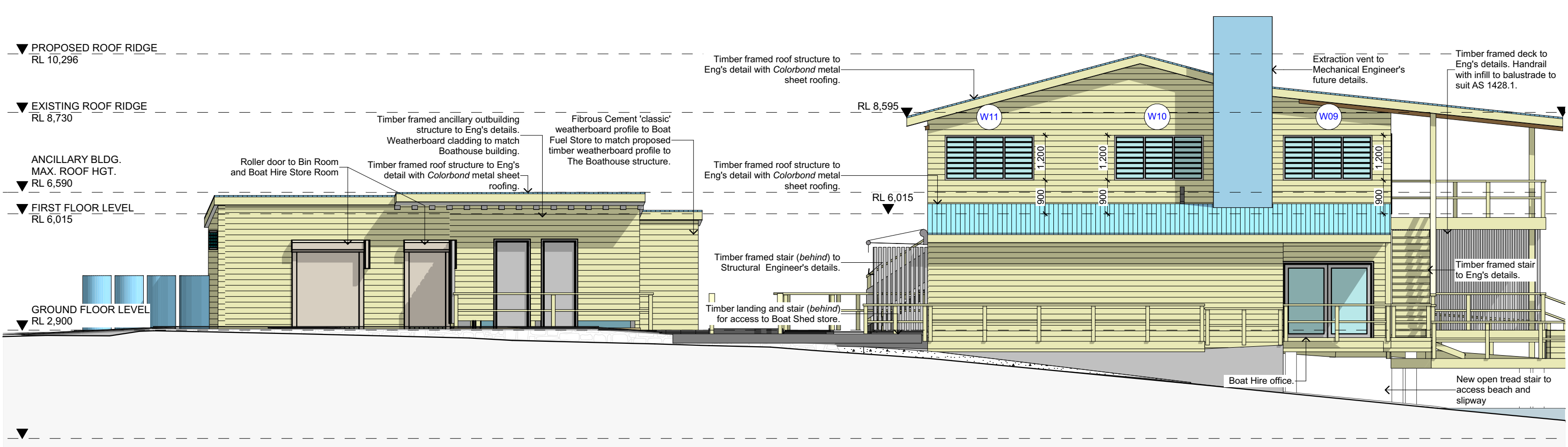
Drawing Scale
1:100

Drawn
RM

Layout ID
DA07
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES







NORTH ELEVATION

1:100

1



EAST ELEVATION

1:100

2

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PALM BEACH

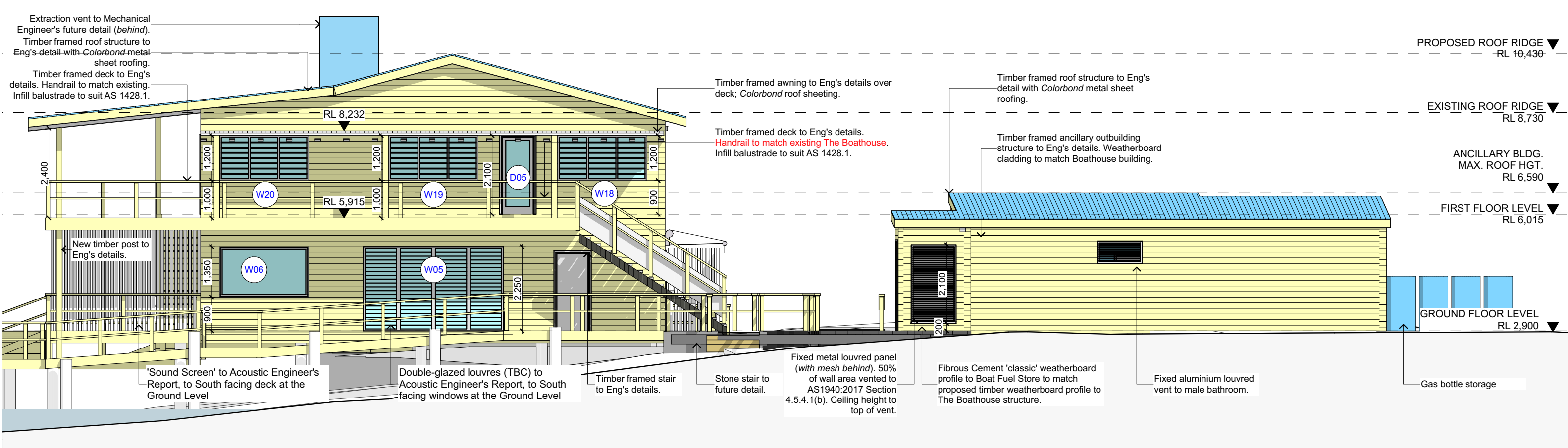
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Drawing Name
NORTH / EAST ELEVATIONS

Drawing Scale
1:100

Drawn
RM

Layout ID
DA09
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES



SOUTH ELEVATION

1:100



WEST ELEVATION

1:100

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THE BOATHOUSE
PALM BEACH

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roslyn@canvasarch.com.au

0405 60 11 30

Drawing Name

SOUTH / WEST ELEVATIONS

Drawing Scale

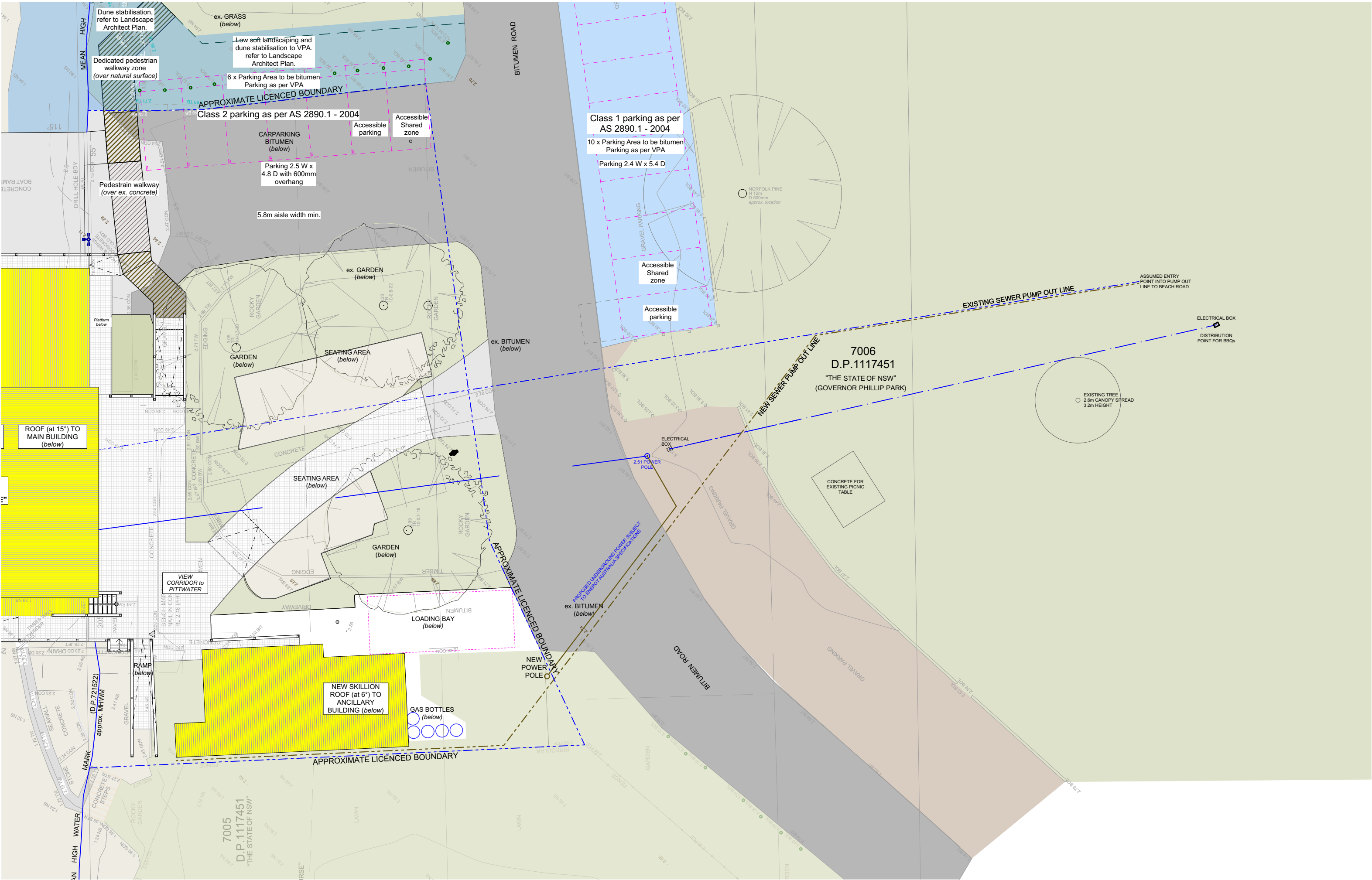
1:100

Drawn
RM

Layout ID

DA10

30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES



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PALM BEACH

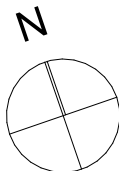
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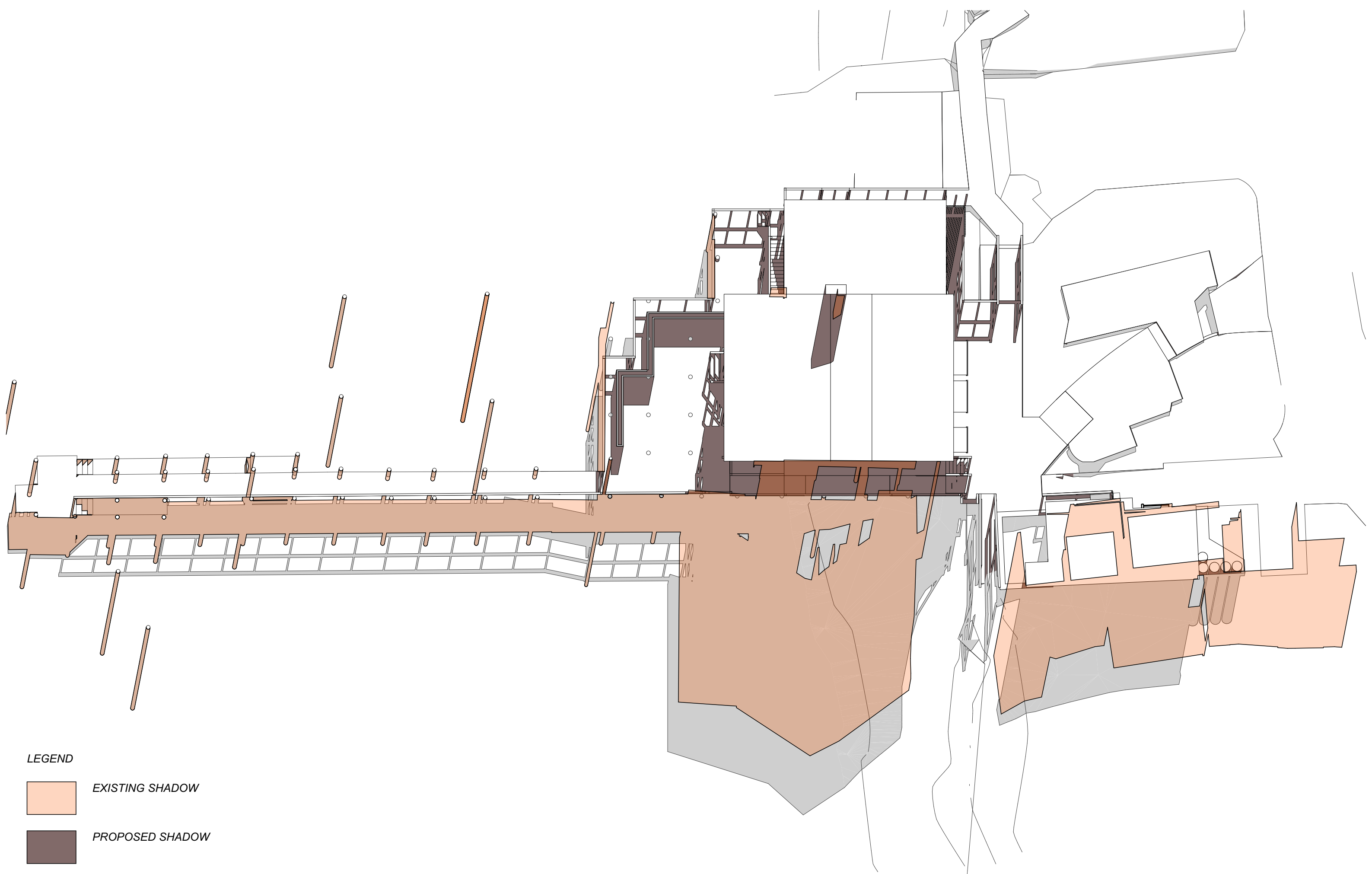
Drawing Name
PROPOSED OUTLINE NEW & EXISTING SERVICES

Drawing Scale
1:200

Drawn
RM

Layout ID
DA14
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES





LEGEND



EXISTING SHADOW



PROPOSED SHADOW

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THE BOATHOUSE
PALM BEACH

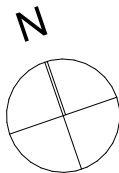
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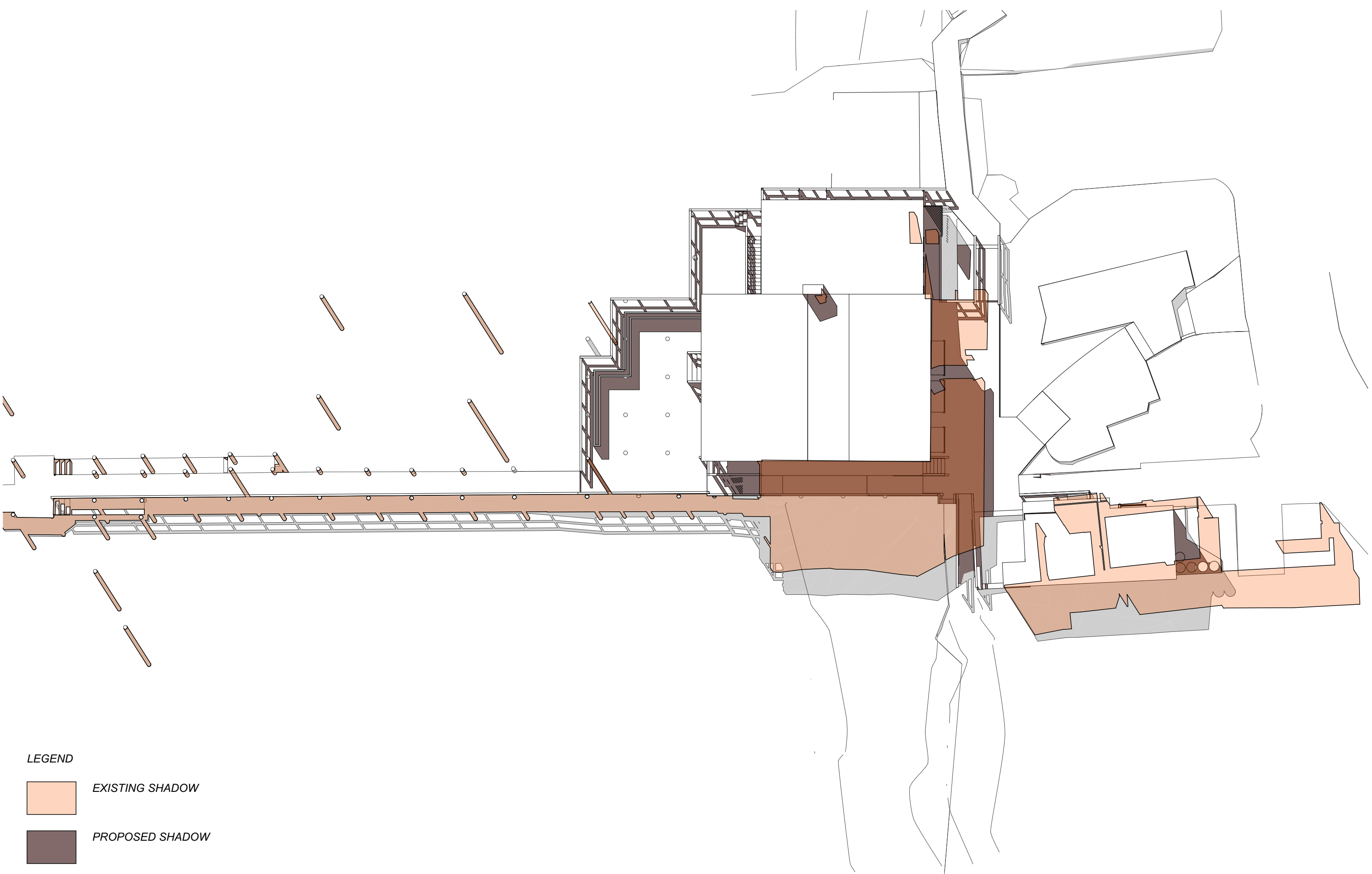
Drawing Name
WINTER SOLSTICE 9 AM

Drawing Scale
1:250

Drawn
RM

Layout ID
DA15
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES





LEGEND

- EXISTING SHADOW
- PROPOSED SHADOW

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PALM BEACH

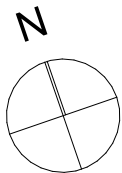
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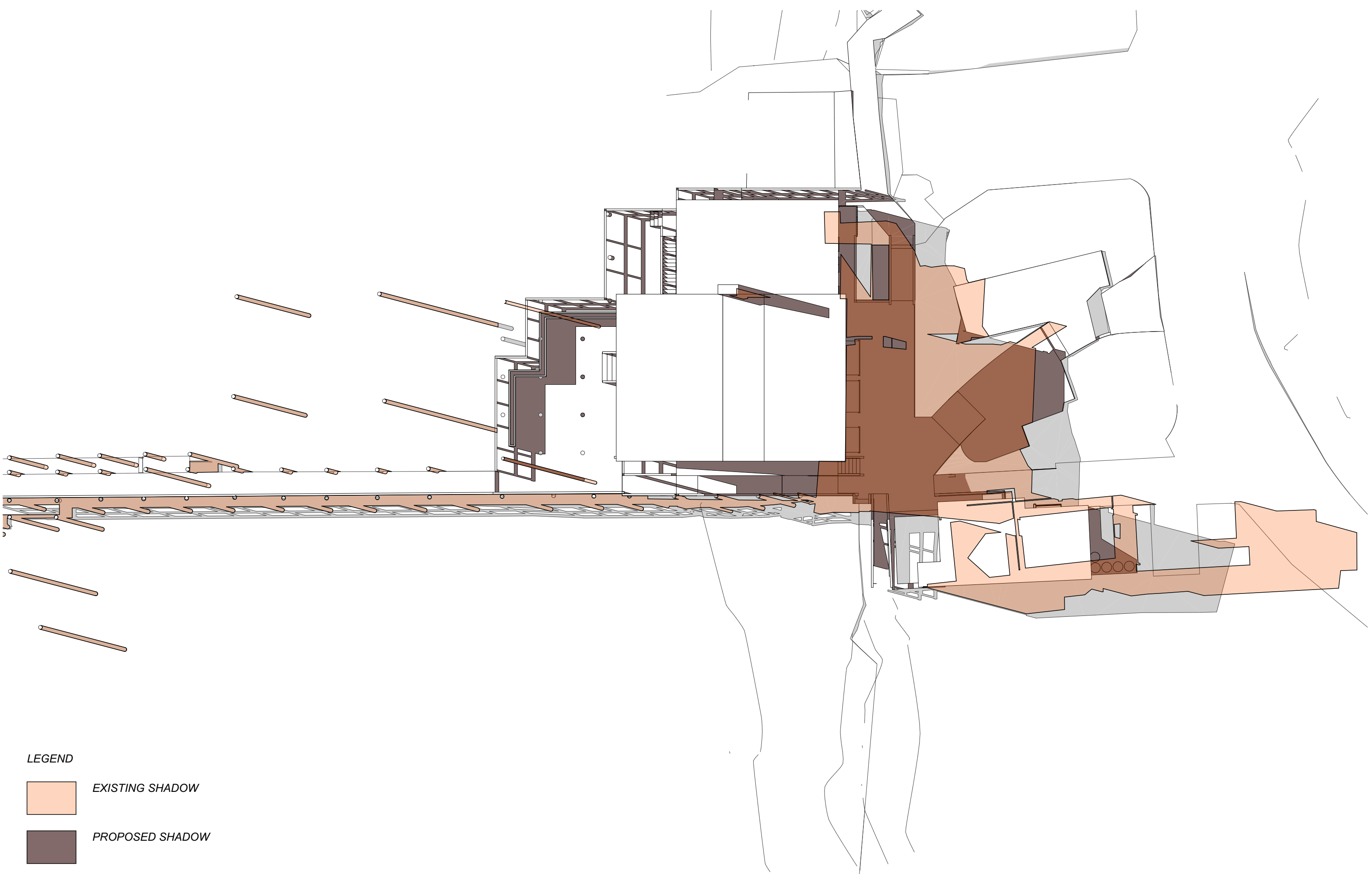
Drawing Name
WINTER SOLSTICE 12 PM

Drawing Scale
1:250

Drawn
RM

Layout ID
DA16
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES

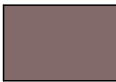




LEGEND



EXISTING SHADOW



PROPOSED SHADOW

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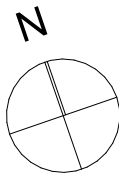
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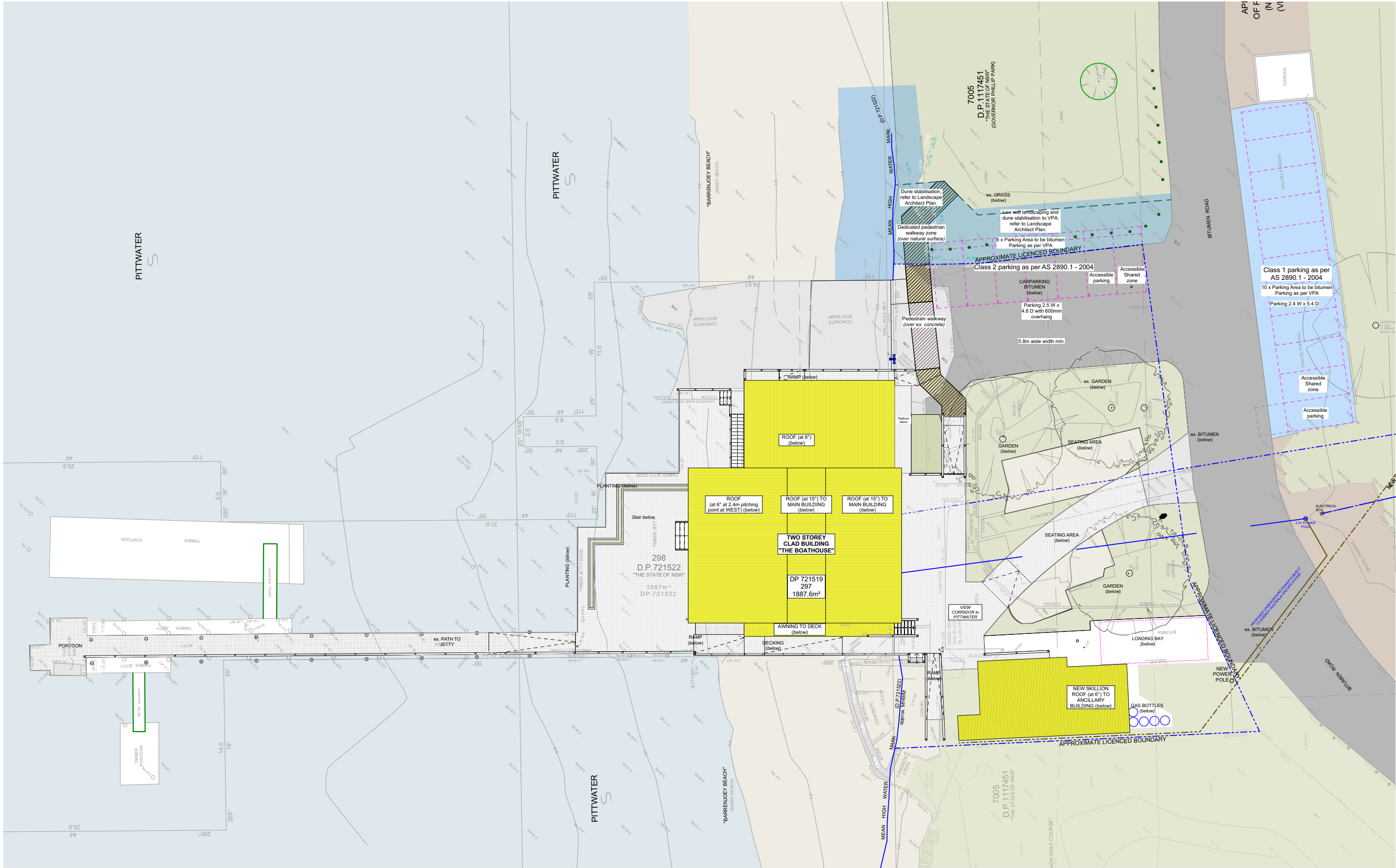
Drawing Name
WINTER SOLSTICE 3 PM

Drawing Scale
1:250

Drawn
RM

Layout ID
DA17
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES





1 SITE / ROOF PLAN 1:300

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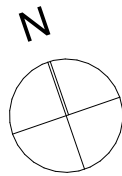
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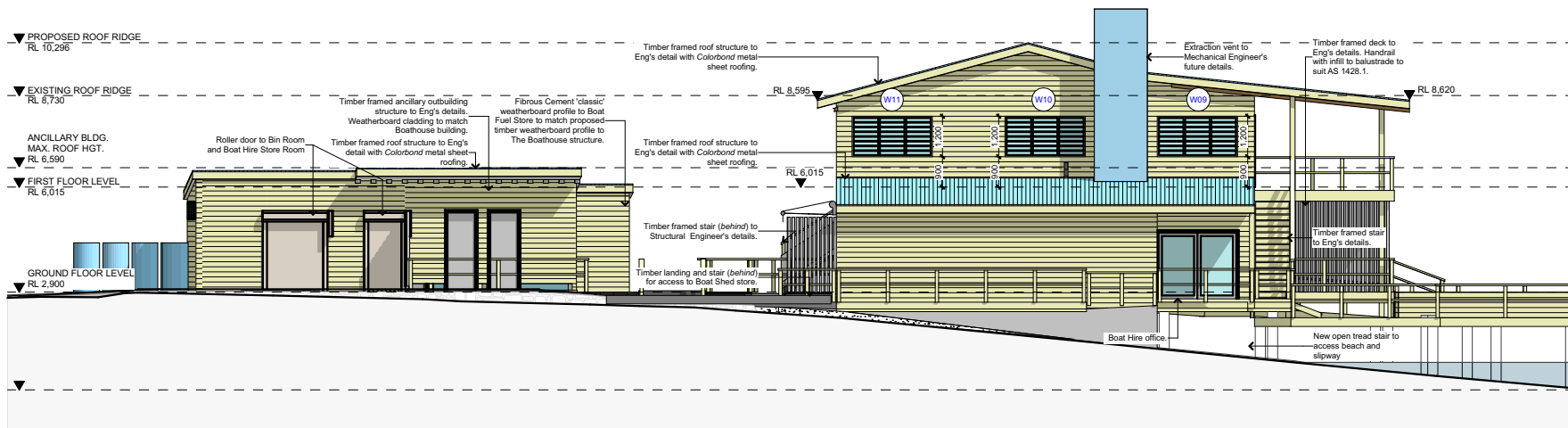
Drawing Name
NOTIFICATION PLANS SHEET 1

Drawing Scale
1:300

Drawn
RM

Layout ID
DA18
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES

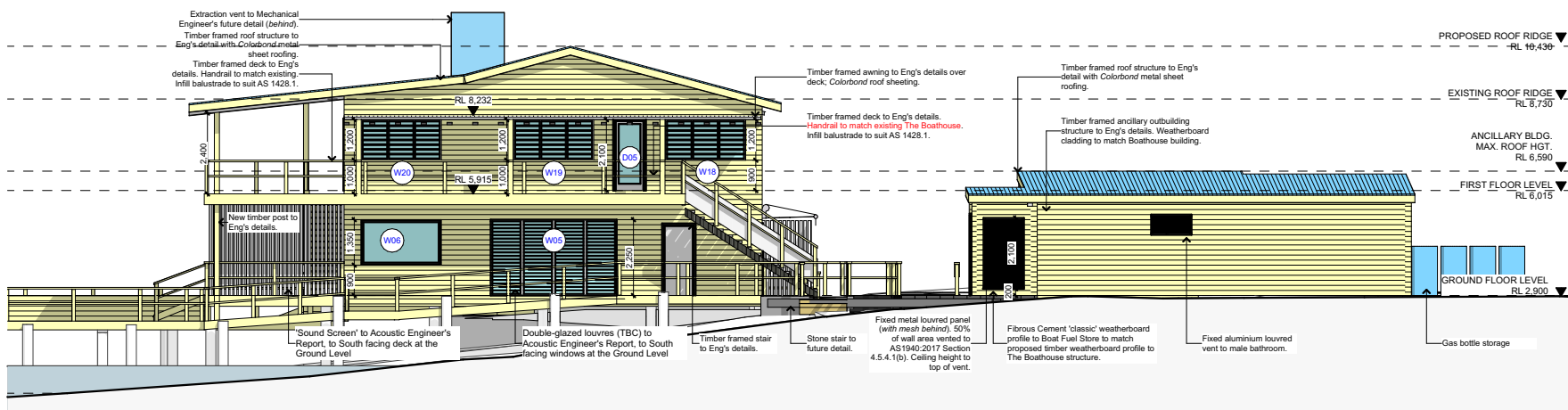




1 NORTH ELEVATION
1:200



2 WEST ELEVATION
1:200



3 SOUTH ELEVATION
1:200



4 EAST ELEVATION
1:200

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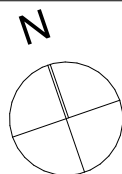
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Drawing Name
NOTIFICATION PLANS SHEET 1:200
2

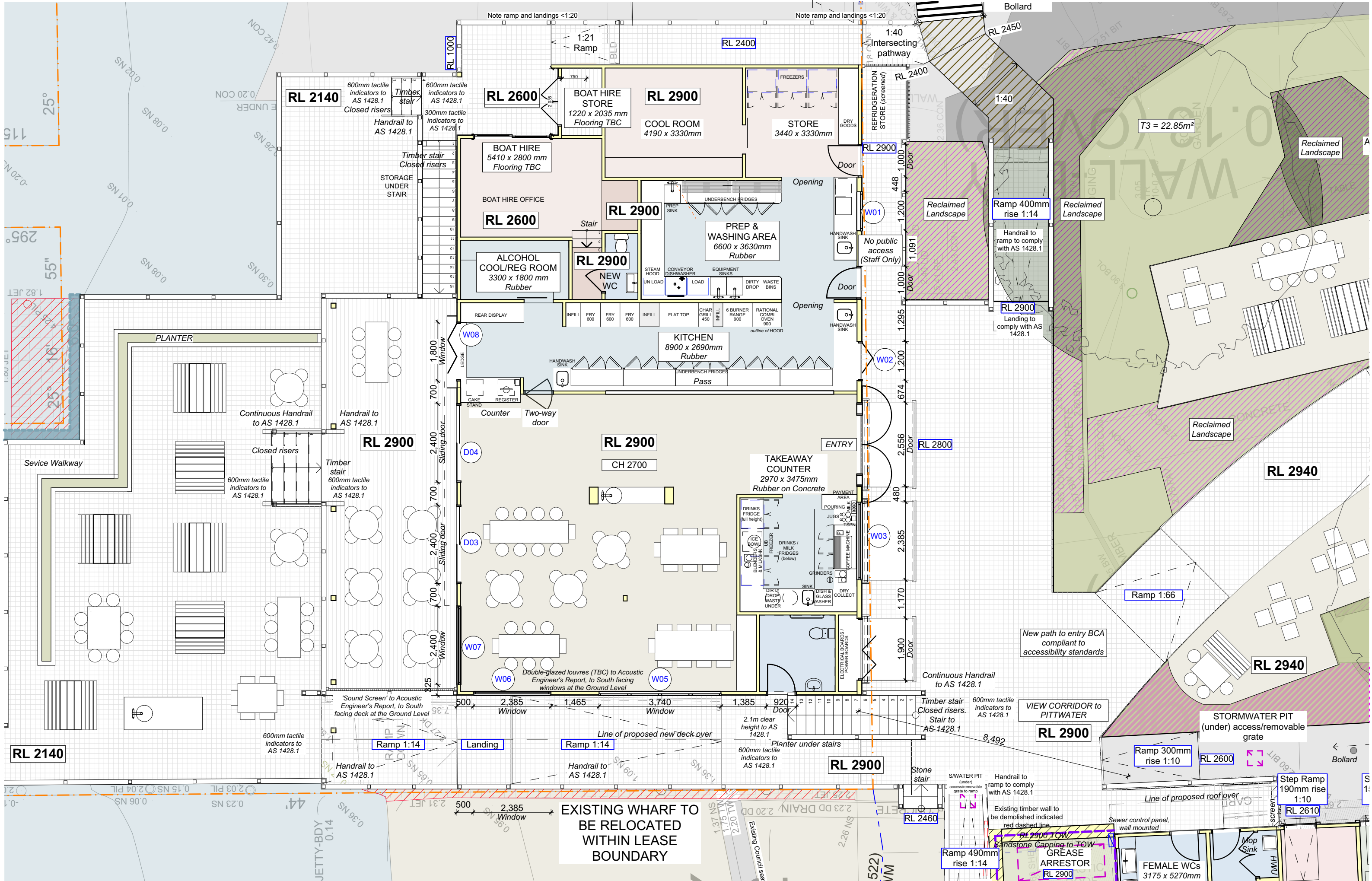
Drawing Scale
1:200

Drawn
RM

Layout ID
DA19
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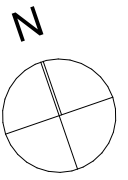
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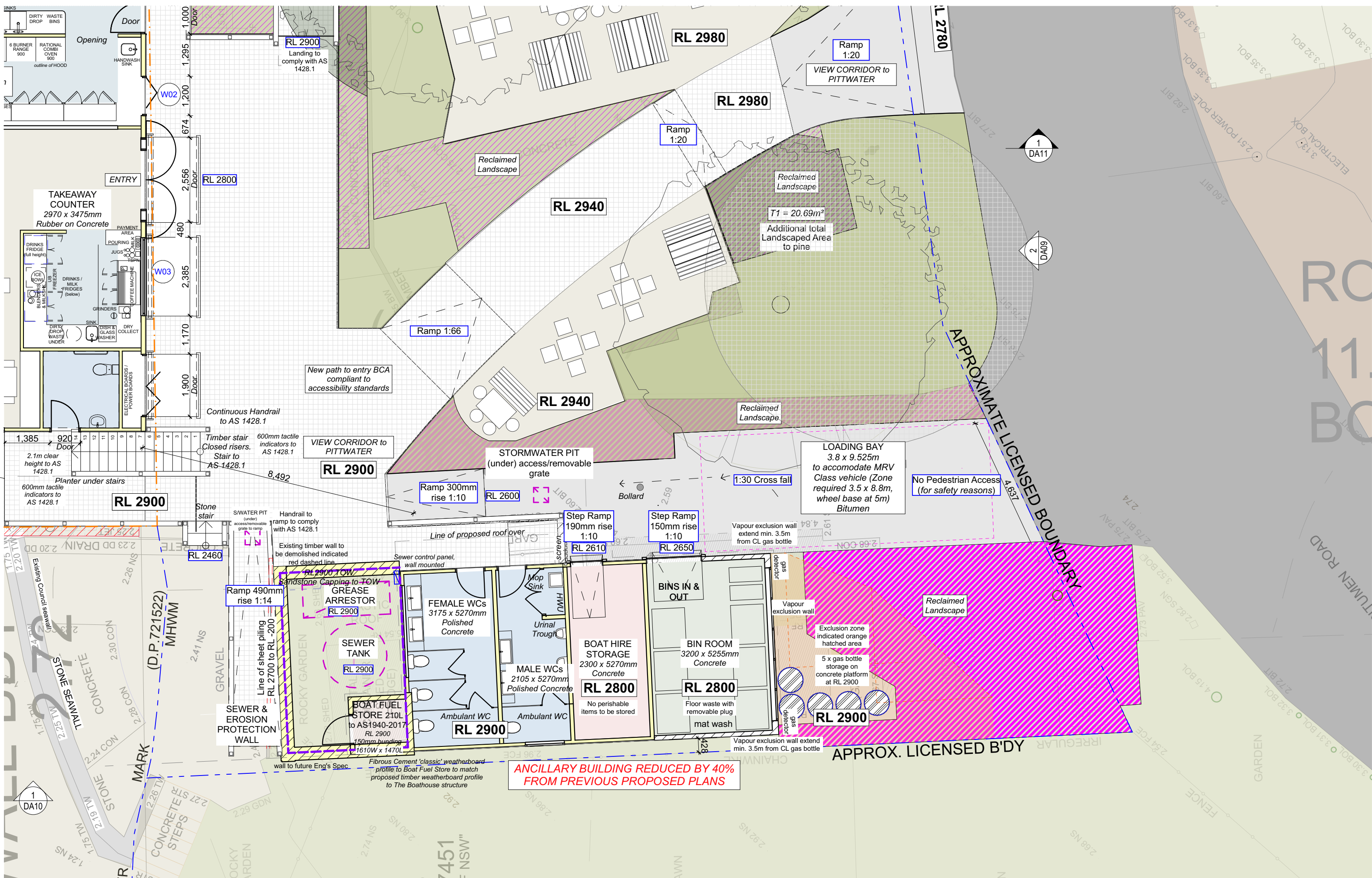
Drawing Name
PROPOSED GROUND FLOOR
PLAN - A3

Drawing Scale
1:100

Drawn
RM

Layout ID
DA06
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
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Drawing Name
**PROPOSED ANCILLARY
BUILDING GROUND FLOOR
PLAN - A3**

Drawing Scale
1:100

Drawn
RM

Layout ID
DA07
30/01/2021 DEVELOPMENT APPLICATION
09/07/2021 PRELIM LEVELS CHANGES
06/08/2021 REV. PRELIM LEVELS CHANGES

