Waterfront Surveys
AUSTRALIA

Marine Habitat Survey

Address | 187 Riverview Road, Avalon Beach

Owner | Adam Richards and Vanessa Lenthall

Survey Date | 24 July 2023

Report Date | 1 August 2023

Job Number 23-061-08

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1. Report Background

1.1 Purpose of the Report

Crown Lands require that all proposed waterfront development works involving load-bearing structures located below the Mean High Water Mark be reviewed for compliance with environmental regulations. The aim of these regulations is to protect the marine environment, in particular the local fauna and flora such as seagrasses, mangroves and macroalgae.

However, the installation of a timber deck, stone ramp, and jetty steps and landing at 187 Riverview Road, Avalon Beach ("The Property"), were never authorised in this process. As such, Crown Lands have requested that a Building Certificate application be lodged for the unauthorised structures at The Property.

A Marine Habitat Survey is required to assess the effects, if any, that the installation of the unauthorised structures may have had on the marine environment and the new development may have on the marine environment.

1.2 On-Site Survey Methodology of The Property

The on-site survey of The Property was conducted at 11:00 on 24 July 2023 by Rick Johnson of Waterfront Surveys Australia. Weather conditions at the time of the survey were overcast with minimal breeze. The water surface was calm and underwater visibility was approximately 2 m. At the time of the survey the tide was rising, with a tidal height of approximately 1.1 m.

The on-site survey area included the footprint of the unauthorised structures and extended a further 10 m in all directions. The survey was conducted from the shore and inspection of the seabed was done on snorkel. Photos of each habitat were taken using an underwater digital camera and a description of each differing habitat, and species list of aquatic flora and fauna observed within the survey area, was recorded. A tape measure was used to obtain the distance of seagrass from structures/shoreline.

Seagrass species were given the following codes:

Hal – *Halophila ovalis* (paddleweed)

Pos – *Posidonia australis* (strapweed)

Zos – *Zostera capricorni* (eelgrass)

The level of patchiness was also estimated using three categories:

A – Individual strands or small clumps (< 2 m diameter);

B – Medium sized patches (2 - 10 m diameter); or

C – Beds of relatively even distribution (> 10 m diameter).

Estimates of seagrass density were made by ranking each observation point using three categories:

1 – Low density (< 15% seabed cover);

2 – Medium density (15% - 50% seabed cover); or

3 – High density (> 50% cover).

Leaf length of seagrass was categorised as follows:

Halophila – S (short < 1 cm), M (medium 1 cm – 3 cm), L (long > 3 cm);

Posidonia – S (short < 15 cm), M (medium 15 cm – 30 cm), L (long > 30 cm); or

Zostera – S (short < 5 cm), M (medium 5 cm – 15 cm), L (long > 15 cm).

These codes provide a description of the seagrasses within an area and are useful in determining the nature and ecological value of any seagrasses likely to be affected by the proposed works. For example, seagrass with shorter leaves and a lower density (e.g. ZosC1S) may have less ecological value compared with seagrass with longer leaves and a higher density (ZosC3L).

2. Existing Property Details

2.1 Existing Structures at The Property

The Property is located halfway along the western shoreline of the Avalon headland at Pittwater - approximately 750 m north of Paradise Beach Wharf. The Property faces in a westerly direction.

The existing structures (Photos 1 - 4) present at The Property at the time of the on-site survey included:

- an unauthorised timber deck (5 x 3.5 - 6 m) on the southern side of The Property;
- an authorised timber jetty (27 x 1.4 – 1.7 m) on the southern half of The Property, supported on timber piers, ending in a 2.7 m wide jetty head;
- an unauthorised mesh landing ramp and small mesh pontoon (4.3 x 1.2 m) on the northern side of the jetty end;
- an authorised 9 x 4.5 m berthing area on the northern side of the jetty head and landing; and
- an unauthorised stone ramp covered in a mesh ramp (7 x 2 m) on the northern side of the jetty start.

2.2 Existing Ecology at The Property

2.2.1 Existing Ecology Based on Observations from the On-Site Survey

a) Intertidal Ecology

The intertidal zone within the on-site survey area of The Property consisted of artificial and natural habitats. There was a low natural sandstone rock face that extended across the width of The Property (Photos 1 and 4). The rock face was fronted by an approximately 4 m wide area of sand on the northern side of the jetty (Plate 4) and by a 4 m wide flat rock shelf on the southern side of the jetty and offshore of the unauthorised deck. The sandstone block sides of the unauthorised stone ramp and the timber jetty piers provided artificial intertidal habitat.

The base of the natural rock face (Photos 1 and 4) was colonised by a narrow, high density cover of Sydney rock oysters (*Saccostrea glomerata*), along with scattered periwinkles (*Bembicium auratum*). The timber jetty piers were colonised by a medium density cover of oysters.

The unauthorised timber deck sat atop an area of natural rock which was colonised by high density cover of oysters (Photo 1) off the front of the deck and in areas of rock that were visible under the decking. The oyster habitat on this area of rock did not appear to be impacted by the installation of the unauthorised deck.

The unauthorised stone ramp was installed on top of the intertidal sand area (Photo 4). This area of intertidal sand would most likely have been unvegetated prior to the installation of the stone ramp, as the sand the same distance offshore on the northern side of The Property is currently unvegetated. The exposed sandstone blocks on the side of the stone

ramp provided artificial intertidal habitat for a high density cover of oysters (Photo 5) and scattered periwinkles (*Bembicium auratum*).

b) Subtidal Ecology

The subtidal zone within the on-site survey area of The Property consisted of a gradually sloping seabed of mixed sand and rocks/boulders (Photos 6 – 8), which continued offshore to almost the end of the jetty head. From there the seabed transitioned to gradually sloping silty sand.

The areas and patches of available sand were colonised over much of the survey area by a non-continuous, medium density bed of mixed *Zostera* and *Halophila* seagrass (see section c below for more details; Photo 6). The rocks and boulders (Photos 7 - 8) on the sandy seabed were colonised by high density cover of brown algae (bubbleweed *Sargassum* sp. and kelp *Ecklonia radiata*). The timber jetty head piles were colonised by a high density cover of brown alga (globeweed *Colpomenia sinuosa* and filamentous), white ascidians (*Styela plicata*), hard bryozoa (*Watersipora* sp.) and barnacles (*Tesseropora rosea*).

The unauthorised mesh landing ramp and small mesh pontoon was located almost entirely over an area of subtidal boulders (Photos 7 - 8), with almost no sand available in its footprint for seagrass to colonise. The rocky substratum and attached biota did not appear to be harmed by the unauthorised mesh landing ramp and small mesh pontoon.

Fish observed during the on-site survey included yellowfin bream (*Acanthopagrus australis*).

c) Seagrass, Mangroves and Saltmarsh

A non-continuous, medium density bed of mixed *Zostera* and *Halophila* seagrass (ZosC2M/HalC2L; Photo 6) colonised much of the sandy seabed, where available in amongst areas of rocks and boulders (see seagrass map in Appendix B). The inshore margin of the bed wrapped around the end of the unauthorised stone ramp (Photo 6). There was no seagrass present in the footprint of the unauthorised mesh landing ramp and small mesh pontoon, as nearly all the seabed in this area was rocky (Photos 7 - 8).

There was no *Posidonia* seagrass present at the site (as confirmed by NSW Fisheries mapping; Creese et al. 2009).

There were no mangroves at the site.

2.2.2 Existing Ecology Based on Government Published Records

NSW Fisheries has done extensive mapping of the aquatic vegetation in Brisbane Water. The latest aquatic vegetation maps (Creese et al. 2009) indicate the presence of seagrass (*Zostera*) at The Property.

3. Assessment of Potential Impacts of the Unauthorised Structures to the Existing Ecology of The Property

In summary, the potential impacts on the aquatic ecology at The Property from the unauthorised installation of a timber deck, stone ramp, and jetty steps and landing have been assessed as very minor to negligible.

The unauthorised timber deck has had no observable negative impacts on the oyster habitat on the underlying area of natural intertidal rock.

The unauthorised stone ramp has had no observable negative impacts on the intertidal sand area. This area of intertidal sand would most likely have been unvegetated prior to the installation of the stone ramp, as the sand the same distance offshore on the northern side of The Property is currently unvegetated. The exposed sandstone blocks on the side of the stone ramp have proved to be beneficial by providing a new artificial intertidal habitat at The Property which has been colonised by oysters and periwinkles.

There was no seagrass present in the footprint of the unauthorised mesh landing ramp and small mesh pontoon, as nearly all the seabed in this area was rocky and therefore not an available habitat for seagrass to colonise.

Appendix A - On-site Survey Photos

The following photographs taken by Rick Johnson during the on-site survey conducted at The Property on 24 July 2023 are provided overleaf:

- Photos 1 - 4. The unauthorised deck, landing, pontoon and stone ramp at The Property.
- Photo 5. Intertidal biota colonising the unauthorised stone ramp.
- Photos 6 - 8. Seagrass habitats on the sand and rocky substrata under the unauthorised mesh ramp and pontoon.

Photo 1. The unauthorised timber deck on the southern edge of The Property, sitting atop the natural rock colonised by oysters.

Photo 2. The authorised timber jetty, with the red arrow indicating the unauthorised mesh landing ramp and small mesh pontoon.

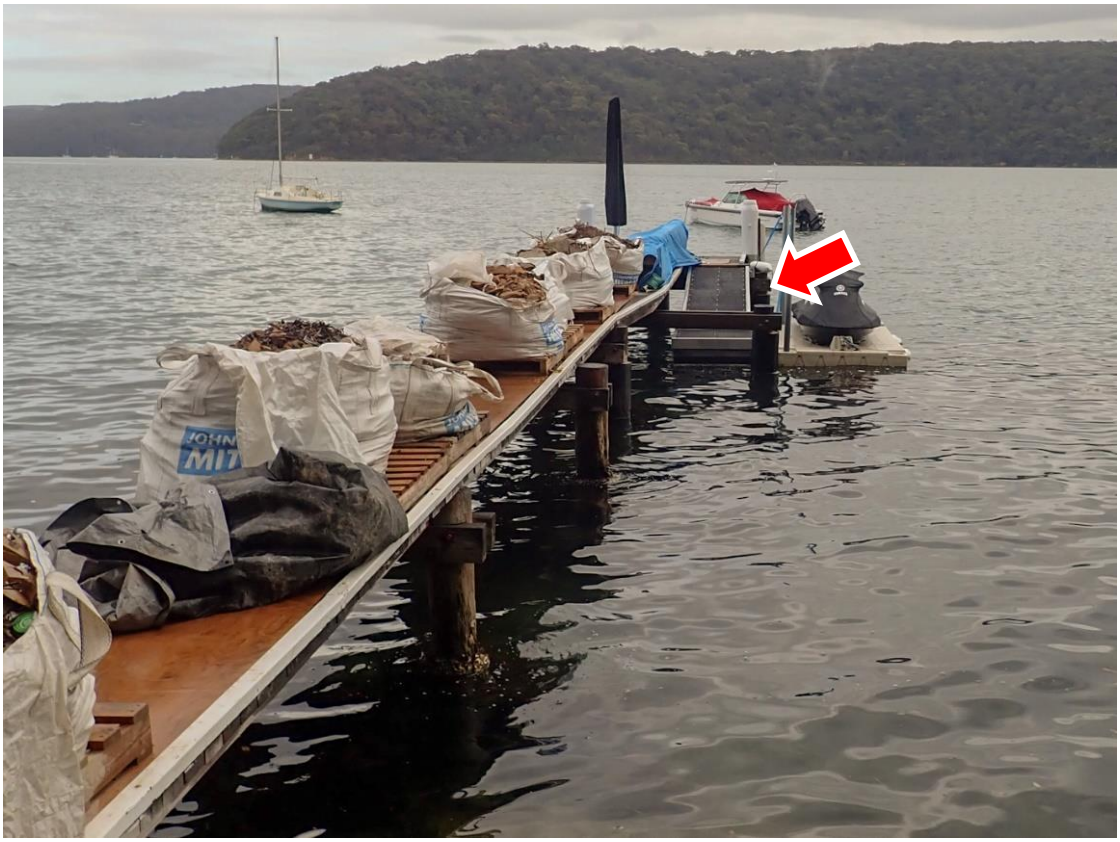


Photo 3. The unauthorised stone ramp covered with a mesh ramp on the northern side of the jetty.

Photo 4. The natural rock face fronted by intertidal bare sand on the northern side of the unauthorised stone ramp.

Photo 5. The intertidal cover of oysters on the submerged side blocks of the stone ramp.

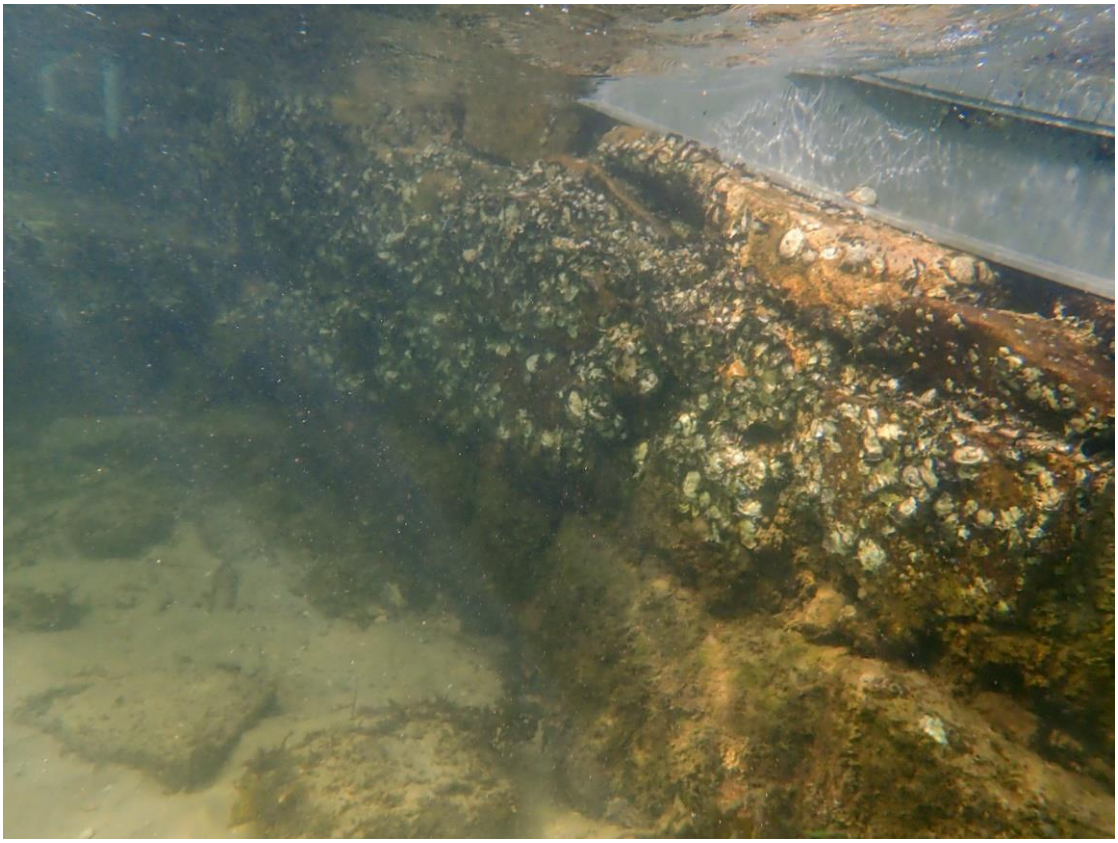


Photo 6. The inshore margin of the mixed *Zostera* and *Halophila* (ZosC2M/HalC2L) seagrass bed off the front of the unauthorised stone ramp.

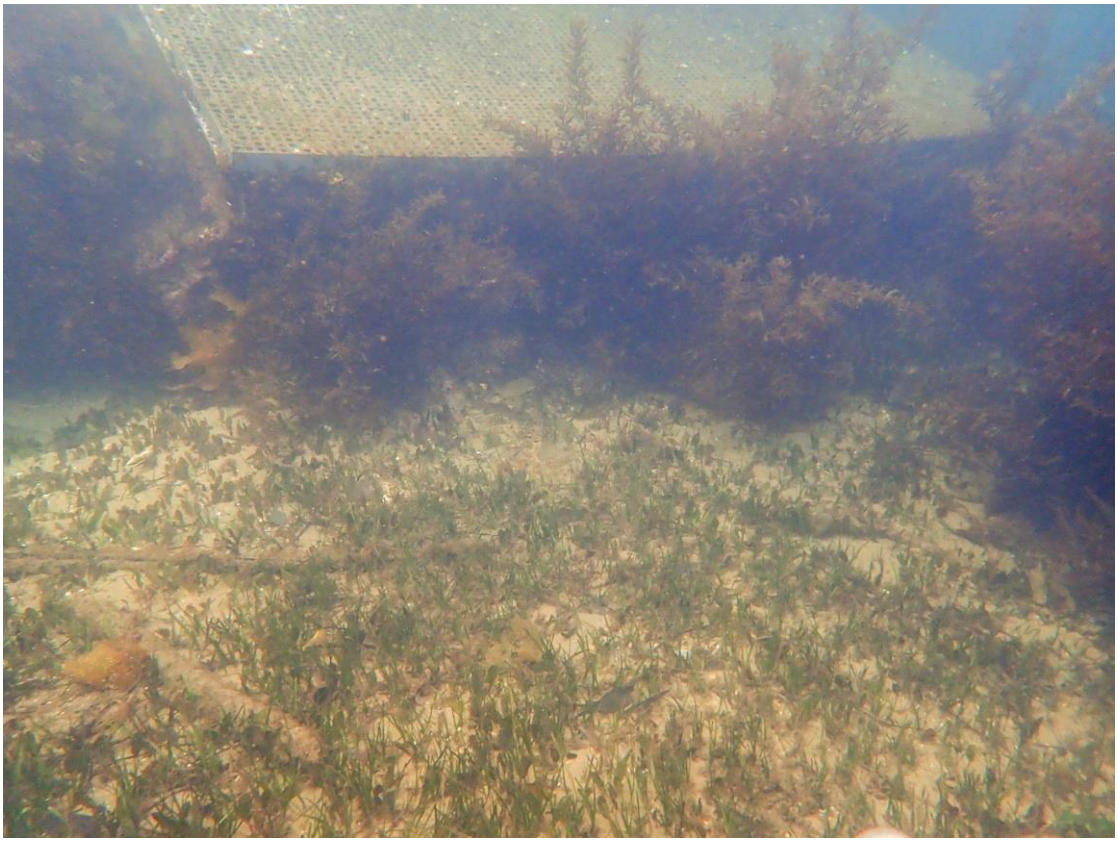


Photo 7. Subtidal rocky substrata under the unauthorised mesh ramp, colonised by bubbleweed and kelp.

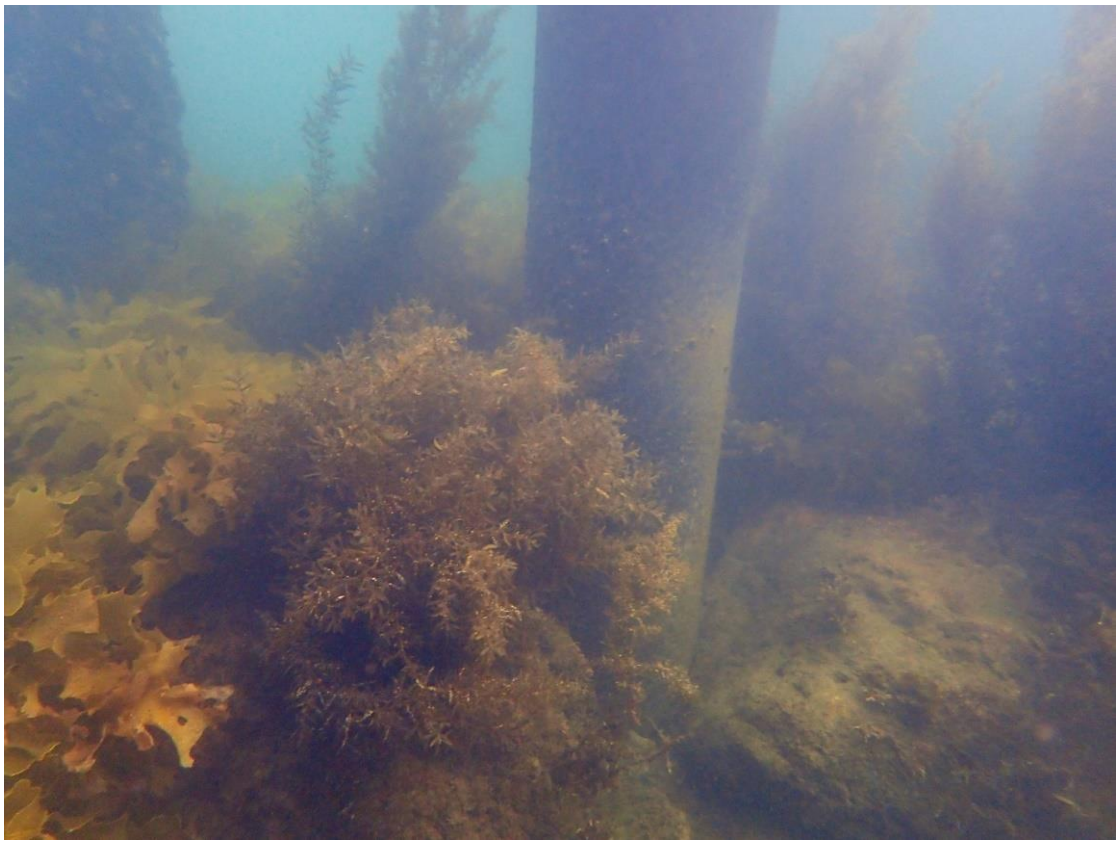
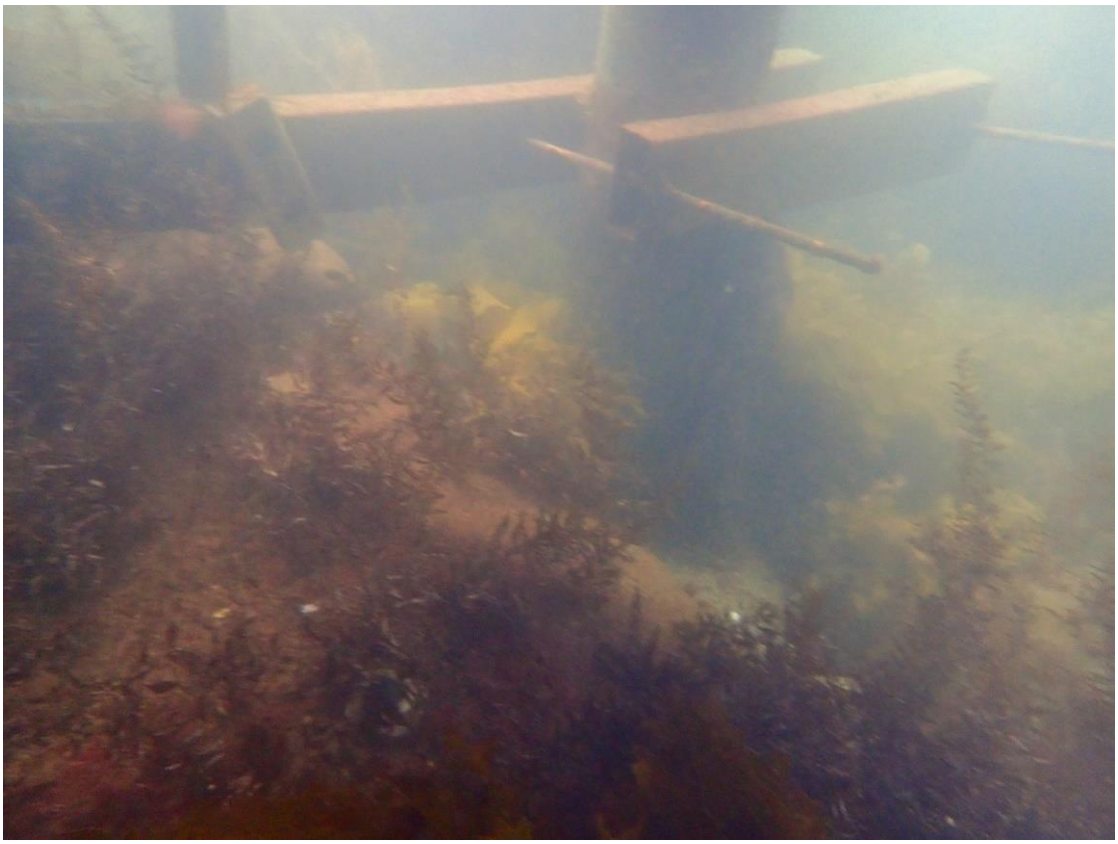
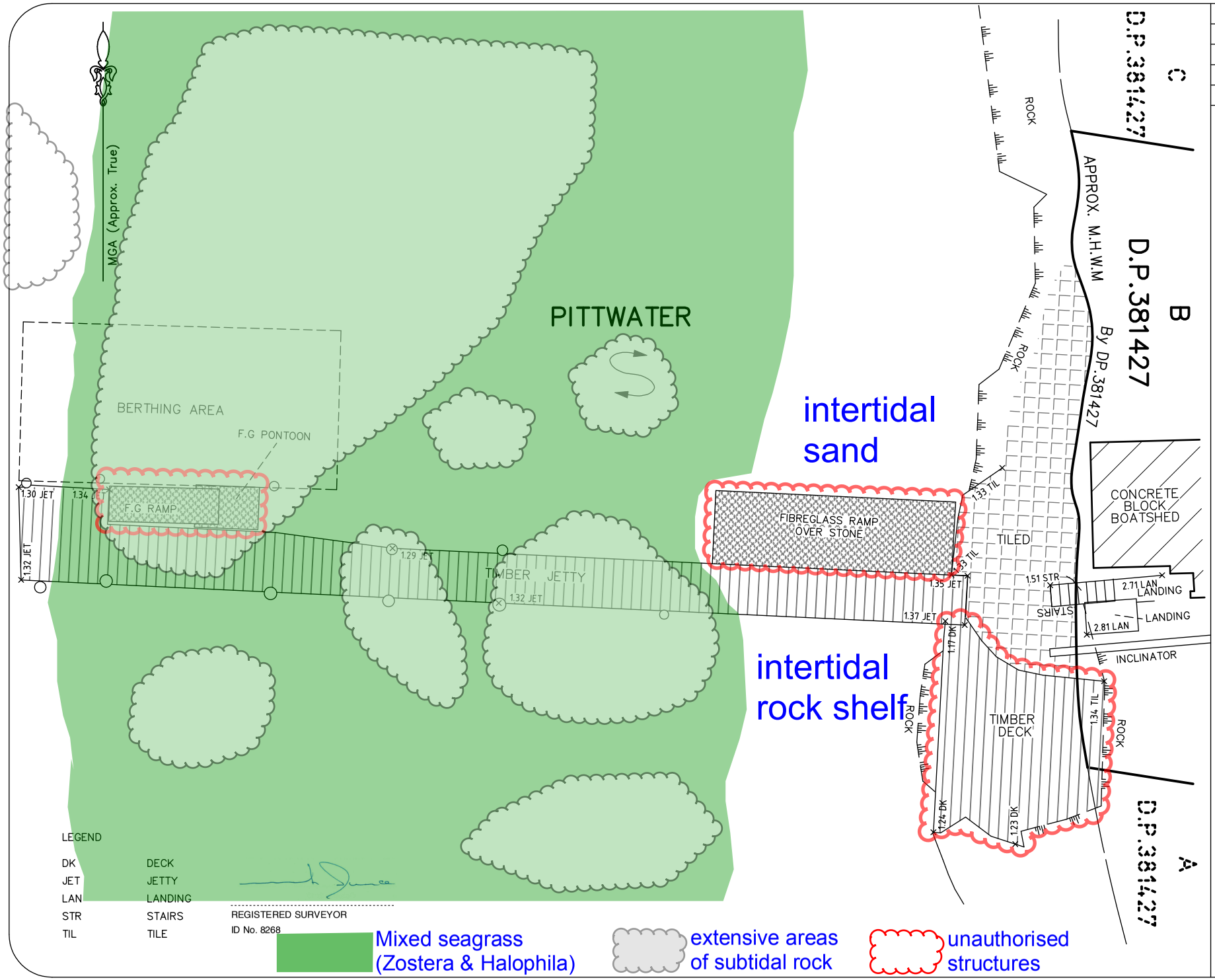


Photo 8. Subtidal rocky substrata under the unauthorised mesh pontoon, colonised by bubbleweed and kelp.



Appendix B - Layout Plan of Unauthorised Structures and Seagrass Map

Layout plan of the authorised and unauthorised waterfront structures and mapped seagrass at 187 Riverview Road, Avalon Beach is provided overleaf.



A	FIRST ISSUE	24/02/23

- A FIELD SURVEY OF THE BOUNDARIES HAS BEEN UNDERTAKEN.
- IF CONSTRUCTION ON OR NEAR BOUNDARIES IS REQUIRED IT IS RECOMMENDED THAT THE BOUNDARIES OF THE LAND BE MARKED.
- TREE SIZES ARE ESTIMATES ONLY.
- THIS PLAN HAS BEEN PREPARED FOR THE EXCLUSIVE USE OF VANESSA LENTHALL
- 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 (ph 1100) 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.
- POSITION OF RIDGE LINES ARE DIAGRAMMATIC ONLY (NOT TO SCALE).
- THE INFORMATION IS ONLY TO BE USED AT A SCALE ACCURACY OF 1:100.
- DO NOT SCALE OFF THIS PLAN / FIGURED DIMENSIONS TO BE TAKEN IN PREFERENCE TO SCALED READINGS.
- IF ACCURATE TRUE NORTH IS REQUIRED A FURTHER SURVEY WOULD BE NECESSARY.
-
- THIS NOTICE MUST NOT BE ERASED.

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Vertical Datum
DATUM: AUSTRALIAN HEIGHT DATUM (AHD)
B.M. PM 60570
R.L. 36.765
SOURCE: S.C.I.M.S.

Client Details
VANESSA LENTHAL
187 RIVERVIEW ROAD
AVALON BEACH NSW 2107

Drawing Title
DETAIL AND LEVELS OVER
187 RIVERVIEW ROAD
AVALON BEACH NSW 2107
BEING LOT B IN DP.381427
& CROWN LAND

PROJECT: 1662	PAGE 1 OF 1
Date of survey 09/02/2023	Drawing No. 1662detail 1
Scale 1:100	Rev. A

Appendix C - References

Creese, R. G., Glasby, T. M., West, G. and Gallen, C. (2009). *Mapping the habitats of NSW estuaries*. Industry & Investment NSW Fisheries Final Report Series 113. Port Stephens, NSW, Australia. 95pp.