

DOCUMENTATION OF COASTAL PROTECTION WORKS
UPGRADED ROCK REVETMENT
 AT FLIGHT DECK, 1114 PITTWATER ROAD, COLLAROY, NSW
HORTON COASTAL ENGINEERING PTY LTD

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S04	EROSION AND SEDIMENT CONTROL PLAN AND WASTE MANAGEMENT PLAN
S10	SECTION 1
S20	ACCESS STAIRS

REFERENCE DOCUMENTS

- SURVEY DRAWING PREPARED BY:
 DETAILED SURVEYS
 Ph. (02) 9913 9525
 REF No. 05/17
 DATED: 01.03.2017
- PRE-STORM PROFILES
 DERIVED FROM OEH PHOTOGRAMMETRIC
 DATA DATED: 05.04.16
- POST-STORM PROFILES
 DERIVED UNSW WATER RESEARCH
 LABORATORY DATA
 DATED: 10.06.16

ROCK

- R1. INDIVIDUAL ROCKS SHALL BE FREE FROM CRACKS, CLEAVAGE PLANES, SEAMS AND DEFECTS WHICH WOULD RESULT IN THE BREAKDOWN OF THE ROCK IN A MARINE ENVIRONMENT
- R2. ROCK SHALL BE ROUGH AND ANGULAR
- R3. ROCK SHALL BE IGNEOUS WITH A MINIMUM DRY DENSITY OF 2,650kg/m³
- R4. PRIMARY ARMOUR ROCK SHALL HAVE A MASS GRADING AS FOLLOWS: MINIMUM MASS OF 2,250kg, MAXIMUM MASS OF 3,750kg, AND THE MEDIAN MASS OF ALL ROCKS SHALL EXCEED 3,000kg (NOMINAL MINIMUM DIAMETER OF 1100mm, MAXIMUM DIAMETER OF 1300mm AND 50%ILE DIAMETER OF 1200mm)
- R5. ROCK SHALL HAVE A MINIMUM SATURATED POINT LOAD STRENGTH INDEX $I_{s(50)}$ OF 5.0MPa
- R6. ROCK SHALL HAVE A MAXIMUM LOS ANGELES ABRASION VALUE OF 30%
- R7. ROCK SHALL HAVE A MAXIMUM SODIUM SULFATE WEIGHT LOSS OF 12%
- R8. ROCK SHALL BE UNWEATHERED, WITHOUT SIGNIFICANT QUANTITIES OF DELETERIOUS MINERALS SUCH AS ANALCIME (HYDRATED SODIUM ALUMINIUM SILICATE) AND EXPANSIVE CLAY MINERALS OR UNFAVOURABLE LINEATIONS WITHIN THE MICROFABRIC
- R9. ROCK SHALL HAVE NOT MORE THAN 15% (BY VOLUME) OLIVINE AND SHALL EXHIBIT NO ZONES OF SECONDARY ALTERATION SUCH AS CHLORITISATION
- R10. ROCK SHALL SHOW NO SIGNS OF STRESS-RELIEF
- R11. ROCK SHALL NOT BE ROLLED OR DROPPED INTO POSITION, IT SHALL BE PLACED.
- R12. PLACED ROCKS SHALL BE WEDGED AND LOCKED TOGETHER SUCH THAT THEY ARE NOT FREE TO MOVE
- R13. THE RATIO OF THE MAXIMUM DIMENSION OF ANY ROCK TO THE MINIMUM DIMENSION, MEASURED AT RIGHT ANGLES TO THE MAXIMUM DIMENSION, SHALL NOT EXCEED 2.5
- R14. THE TOE ROCK IN EACH SECTION IS PERMITTED TO BE LARGER THAN THE MAXIMUM GRADING SPECIFIED ABOVE, AND SHOULD BE AT LEAST THE MAXIMUM MASS. ROCKS WITH A RELATIVELY FLAT BASE ARE PREFERRED, PLACED WITH THE BROADEST DIMENSION ON THE CEMENTED SAND LAYER OR AT -1m AHD (WHATEVER IS HIGHER)

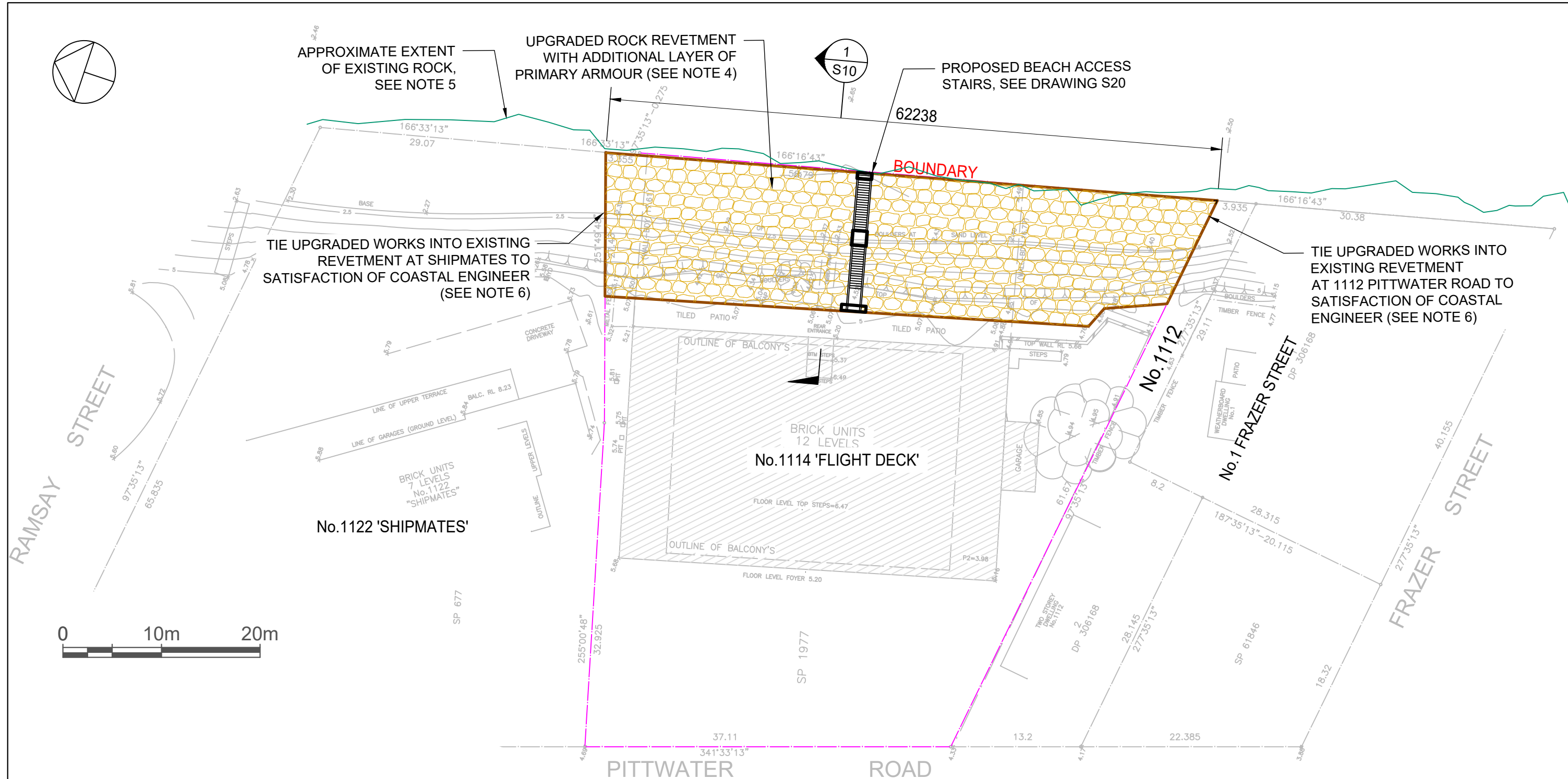
STRUCTURAL

- S1. ALL STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH AS4100
- S2. ALL TIMBER STRUCTURES SHALL BE IN ACCORDANCE WITH AS 1720, AS1684 AS REQUIRED
- S3. ALL PILING AND CONCRETE STRUCTURES SHALL BE IN ACCORDANCE WITH RELEVANT AUSTRALIAN STANDARDS

NOT FOR CONSTRUCTION

P.P.	R.Y.	DA MODIFICATION	DATE	REV
P.P.	R.Y.	REVISED DA	17.01.19	C
P.P.	R.Y.	ISSUED FOR DA	24.08.17	B
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BY	CHKD	DESCRIPTION	DATE	REV

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			SCALE	DATE JAN 2019	S01	D

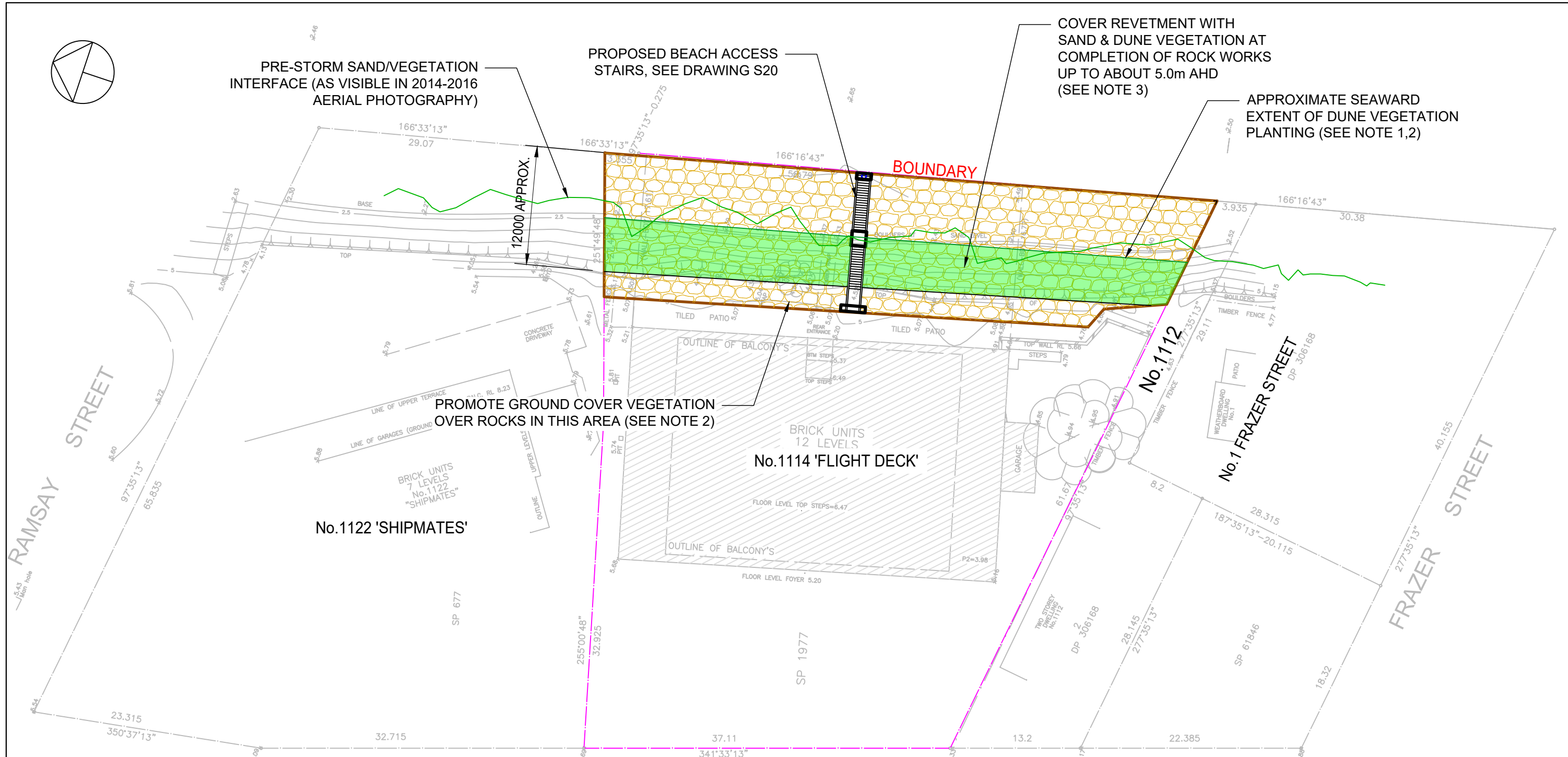


1. BASE INFORMATION FROM SURVEY UNDERTAKEN BY DETAILED SURVEYS DATED 1 MARCH 2017 (REFERENCE 015/17)
2. ELEVATIONS ARE IN METRES RELATIVE TO AUSTRALIAN HEIGHT DATUM (AHD)
3. 2016 ROCK EXTENT DERIVED FROM AERIAL PHOTOGRAPHY DATED 8 AND 10 JUNE 2016 AND CAPTURED BY UNSW WATER RESEARCH LABORATORY
4. FILL GAPS IN EXISTING ROCK ARMOUR WITH NEW ARMOUR AND REMOVE AND REPOSITION EXISTING ROCK AS REQUIRED AND AS DIRECTED BY COASTAL ENGINEER, PRIOR TO PLACING ADDITIONAL PRIMARY ARMOUR LAYER.
5. WHERE PRACTICAL, REPOSITION ANY LOOSE (NON-INTERLOCKED) ROCKS ENCOUNTERED SEAWARD OF TOE, MOVING THESE ROCKS LANDWARD TO BE PART OF UPGRADED REVETMENT
6. A BATTER IN THE ROCK MAY NEED TO BE CREATED TO EFFECTIVELY TIE INTO ADJACENT WORKS, PARTICULARLY TO THE NORTH

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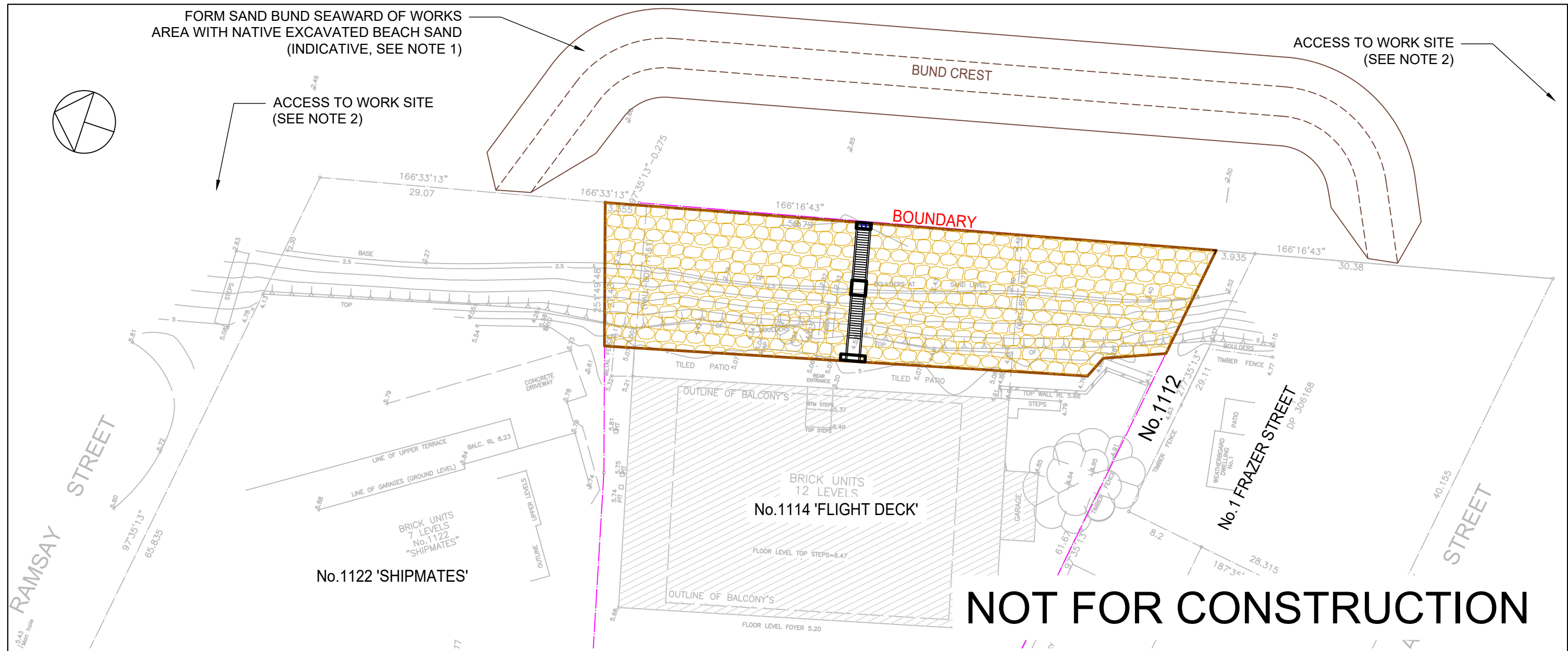


1. PLANTING DENSITY EXPECTED TO BE 4 TUBESTOCK PLANTS PER m². SEAWARD EXTENT OF VEGETATION PLANTING TO BE CONFIRMED ON SITE (WILL DEPEND ON BEACH STATE AT TIME)
2. POTENTIAL VEGETATION SPECIES ARE DISCUSSED IN A REPORT PREPARED BY DIANE WIESNER AND DATED 6 JUNE 2017.
3. WASH SAND THOROUGHLY AND PROGRESSIVELY INTO VOIDS OF THE ROCK REVETMENT TO ENSURE SINKHOLES WILL NOT FORM IN REINSTATED BEACH SURFACE, AND SHAPE SAND SEAWARD OF THE REVETMENT TO A NATURAL PROFILE AT THE COMPLETION OF THE ROCK WORKS. EXCAVATED BEACH SAND SEAWARD OF THE SUBJECT PROPERTY MAY BE PLACED OVER THE ROCK REVETMENT, BUT NOT LANDWARD OF IT
4. SAND SIZED MATERIAL FOR BACKFILL (IF ANY) SHALL NOT BE SOURCED FROM THE BEACH SEAWARD OF THE SUBJECT PROPERTY. BACKFILL MATERIAL IMPORTED TO THE SITE SHALL BE CLASSIFIED AS VIRGIN EXCAVATED NATURAL MATERIAL (VENM), EXCAVATED NATURAL MATERIAL (ENM), OR RECYCLED MATERIALS OBTAINED FROM AN EPA LICENSED FACILITY. ANY BACKFILL MATERIAL MUST BE CONSISTENT WITH SECTION 9(D) OF COUNCIL'S COASTAL EROSION POLICY 2016. FOR ENM AND RECYCLED MATERIALS, SUPPORTING DOCUMENTATION SHOULD BE REVIEWED BY A SUITABLY QUALIFIED ENVIRONMENTAL CONSULTANT WHO IS A MEMBER OF THE AUSTRALIAN CONTAMINATED LAND CONSULTANTS ASSOCIATION INC. ALL BACKFILL (IF ANY) SHALL BE TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER



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LANDSCAPING PLAN							DRAWING NO.	REV
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FORM SAND BUND SEAWARD OF WORKS AREA WITH NATIVE EXCAVATED BEACH SAND (INDICATIVE, SEE NOTE 1)

ACCESS TO WORK SITE (SEE NOTE 2)

ACCESS TO WORK SITE (SEE NOTE 2)

BOUNDARY

No.1114 'FLIGHT DECK'

No.1122 'SHIPMATES'

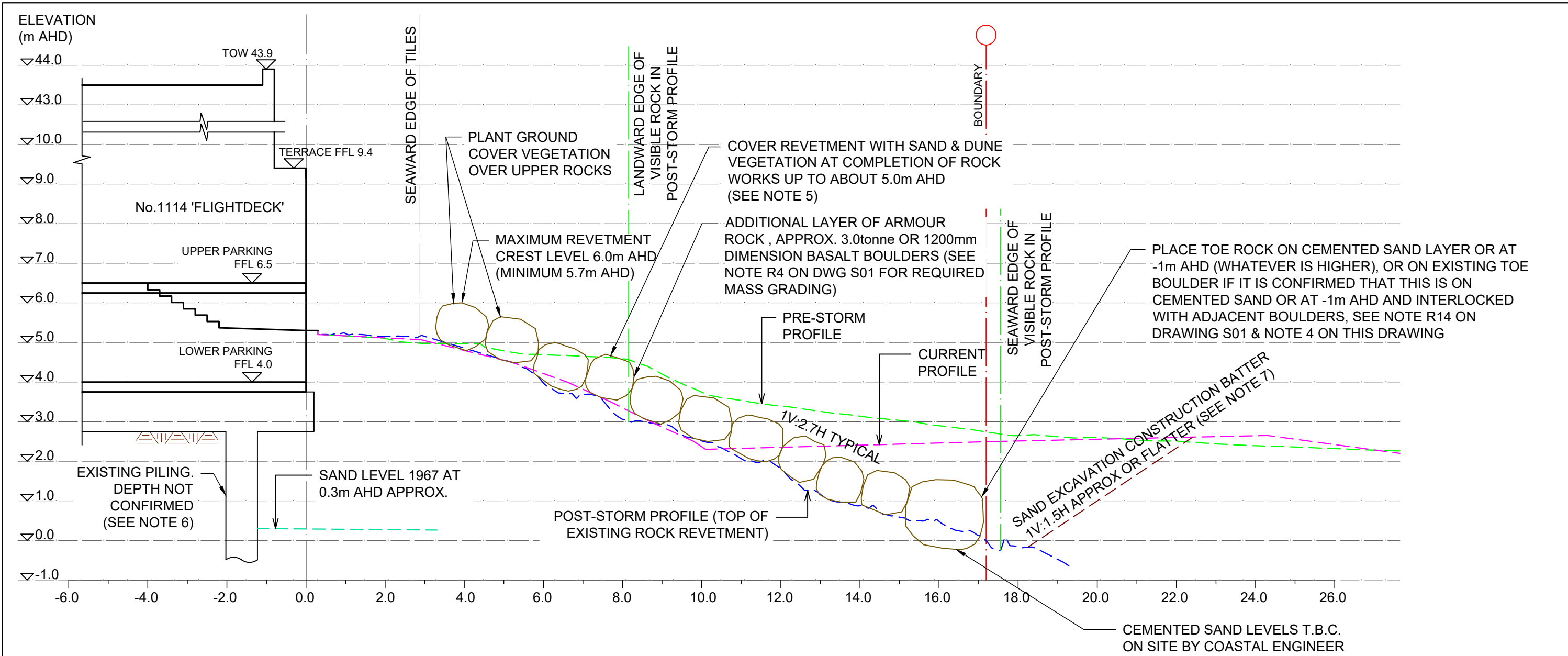
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- TEMPORARY PROTECTION OF PLANT AND THE WORKS AREA FROM WAVE AND WATER LEVEL ACTION DURING CONSTRUCTION, INCLUDING DURING SEVERE WEATHER EVENTS, IS THE RESPONSIBILITY OF THE CONTRACTOR. THE DESIGN OF THE BUND, SETOUT, EXTENT & STAGING SHALL BE DETERMINED BY THE CONTRACTOR. THE BUND MAY BE FORMED OVER A PORTION OR OVER THE ENTIRETY OF THE WORKS AREA DEPENDING ON CONSTRUCTION PROGRAM AND WAVE AND WATER LEVEL CONDITIONS. THE BUND MAY COMPRISE SAND, EXCAVATED ROCK BOULDERS AND IMPORTED MATERIALS THAT WOULD BE TEMPORARILY SUITABLE ON A BEACH SUCH AS BOULDERS TO BE USED IN THE WORKS AND CONCRETE BLOCKS AND THE LIKE. IT IS NOT PERMITTED TO USE SHEET PILING, OR SMALL BOULDERS/COBBLES THAT CAN EASILY WASH AWAY UNDER WAVE ACTION, TO PROVIDE TEMPORARY PROTECTION TO THE WORKS AREA. THE CONTRACTOR SHALL CONSULT WITH THE PRINCIPAL'S COASTAL ENGINEER ON THE METHODOLOGY FOR TEMPORARY PROTECTION TO BE ADOPTED, AND CONSIDER ANY COMMENTS RECEIVED, PRIOR TO AND DURING CONSTRUCTION. THE COASTAL ENGINEER SHALL SPECIFY THE MINIMUM PERMISSIBLE MASS OF MATERIAL (EXCEPT SAND) TO BE USED IN THE BUND. THE BUND WORKS ARE SUBJECT TO COUNCIL APPROVAL THROUGH A "WORKING ON AND ACCESS TO RESERVES APPLICATION". THE BUND AND ALL EXCESS BOULDERS AND IMPORTED MATERIALS SHALL BE REMOVED, WITH SAND SHAPED TO A NATURAL PROFILE, PRIOR TO COMPLETION OF THE WORKS
- ACCESS TO WORKS SITE WILL BE VIA RAMSAY STREET AND/OR FRAZER STREET AND/OR STUART STREET AND/OR FRAZER RESERVE (SOUTH OF 1104 PITTWATER ROAD) OR AN ALTERNATIVE STREET LOCATION, AS AGREED BETWEEN CONTRACTOR AND COUNCIL
- RUBBLE AND OTHER MATERIALS OR WASTE ENCOUNTERED DURING EXCAVATION THAT WOULD BE UNSUITABLE ON A BEACH ARE TO BE SEPARATED AND STOCKPILED AWAY FROM THE BEACH IN A SUITABLE LOCATION AGREED WITH THE COASTAL ENGINEER. THIS MATERIAL SHALL BE DISPOSED OF AS PER NOTE 7, UNLESS IT CAN BE REUSED AS PER NOTE 8. EXCAVATED ROCK BOULDERS MAY BE TEMPORARILY PLACED IN BUND AS PER NOTE 1, IF OF SUFFICIENT MASS AS APPROVED BY PRINCIPAL'S COASTAL ENGINEER, TO PROVIDE SOME PROTECTION TO WORKS AREA
- ALL DELETERIOUS MATERIALS AND EQUIPMENT THAT COULD BE DAMAGED ARE TO BE REMOVED FROM WORKS AREA IF BUND CANNOT BE MAINTAINED DUE TO ELEVATED WAVES AND WATER LEVELS. WORKS IN BEACH AREA MAY NEED TO TEMPORARILY CEASE UNDER THESE CONDITIONS
- ALL MATERIAL STOCKPILES ARE TO BE LOCATED LANDWARD OF THE EXISTING ROCK REVETMENT, UNLESS AGREED BY PRINCIPAL'S COASTAL ENGINEER. ANY STOCKPILE LOCATIONS ON COUNCIL LAND ARE TO BE AGREED BETWEEN COUNCIL AND CONTRACTOR
- WHEN PLACING SAND OVER THE REVETMENT AND RESTORING BEACH SAND LEVELS AT THE COMPLETION OF THE ROCK WORKS, SCREENING IS TO BE UNDERTAKEN TO REMOVE RUBBLE, ROCK FRAGMENTS AND OTHER MATERIALS THAT WOULD BE UNSUITABLE ON A BEACH. ALSO SEE NOTE 3 ON DWG S03
- ANY WASTE MATERIALS SHALL BE DISPOSED OF AT AN APPROPRIATE WASTE MANAGEMENT FACILITY OFF SITE (EXCEPT SEE NOTE 8).
- APPROPRIATE WASTE AND RUBBLE MATERIALS MAY BE BURIED LANDWARD OF THE REVETMENT AS AGREED BY GEOTECHNICAL ENGINEER, SUBJECT TO A WASTE CLASSIFICATION UNDERTAKEN BY A SUITABLY QUALIFIED ENVIRONMENTAL CONSULTANT (WHO IS A MEMBER OF THE AUSTRALIAN CONTAMINATED LAND CONSULTANTS ASSOCIATION INC). ALSO SEE NOTE 4 ON DWG S03
- IF DEWATERING IS REQUIRED, WATER SHALL BE PUMPED INTO A SAND 'SUMP' AND NOT DISCHARGED DIRECTLY TO THE SEA



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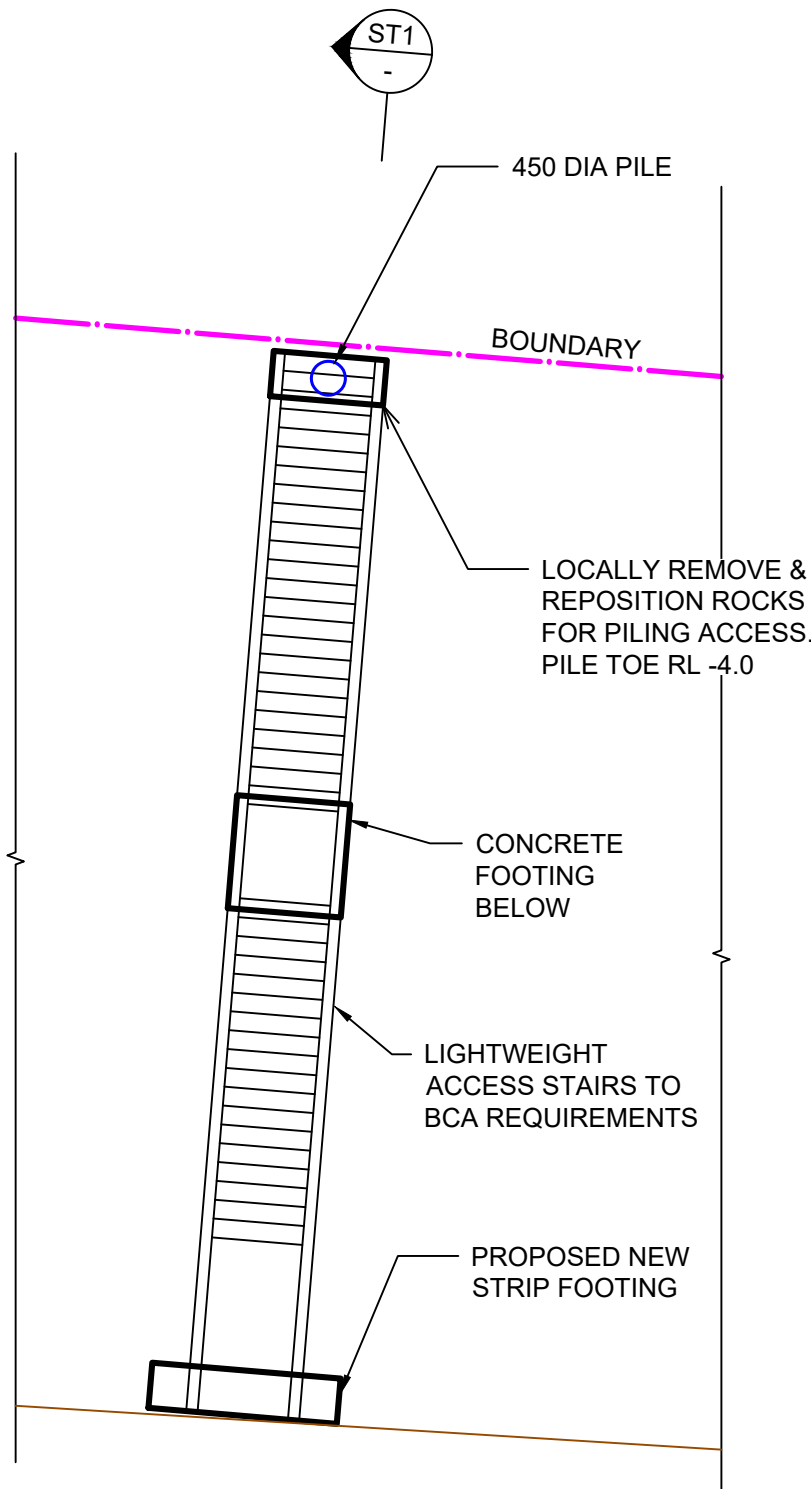


- PRE-STORM PROFILE DATED 5 APRIL 2016, SOURCED FROM OEH
- POST-STORM PROFILE DATED 10 JUNE 2016, SOURCED FROM UNSW WATER RESEARCH LABORATORY
- CURRENT PROFILE FROM DETAILED SURVEYS SURVEY DATED 1 MARCH 2017
- PROGRESSIVELY REMOVE EXISTING ROCK AS REQUIRED TO PROVIDE SPACE FOR TOE ROCK ENTIRELY ON PRIVATE PROPERTY, TAKING CARE TO MAINTAIN STABILITY AND INTERLOCKING OF ADJACENT ROCK BOULDERS. ENSURE TOE ROCK IS INTERLOCKED WITH ADJACENT BOULDERS. REMOVED ROCK SHALL ONLY BE REINSTATED INTO REVETMENT AS AGREED WITH PRINCIPAL'S COASTAL ENGINEER
- WASH SAND INTO VOIDS OF THE ROCK REVETMENT TO ENSURE SINKHOLES WILL NOT FORM IN REINSTATED BEACH SURFACE, AND SHAPE SAND SEAWARD OF THE REVETMENT TO A NATURAL PROFILE AT THE COMPLETION OF THE ROCK WORKS. EXCAVATED BEACH SAND SEAWARD OF THE SUBJECT PROPERTY MAY BE PLACED OVER THE ROCK REVETMENT, BUT NOT LANDWARD OF IT
- THE FLIGHT DECK TOWER IS UNDERSTOOD TO STAND ON APPROXIMATELY 180 CONCRETE PILES DRIVEN TO SOLID ROCK AT DEPTHS OF ABOUT 17.1m (SEE "COASTAL ENGINEERING REPORT FOR CONSTRUCTION OF UPGRADED COASTAL PROTECTION WORKS AT FLIGHT DECK, 1114 PITWATER ROAD COLLAROY", DATED 20 SEPTEMBER 2017)
- IT WOULD BE DIFFICULT TO MAINTAIN A TEMPORARY EXCAVATION BATTER AT 1V:1.5H IN SAND BELOW THE GROUNDWATER LEVEL. THEREFORE, TEMPORARY SUPPORT OF THE EXCAVATION (SUCH AS WITH SAND BAGS) AND/OR USE OF SUITABLE ROCK TO FORM A BATTER OF APPROXIMATELY 1V:2.5H MAY BE REQUIRED BELOW THE GROUNDWATER LEVEL (BAGS AND ROCK TO BE REMOVED OFF BEACH AT COMPLETION OF EXCAVATION WORKS. ALSO SEE NOTE 6 ON DWG S04)

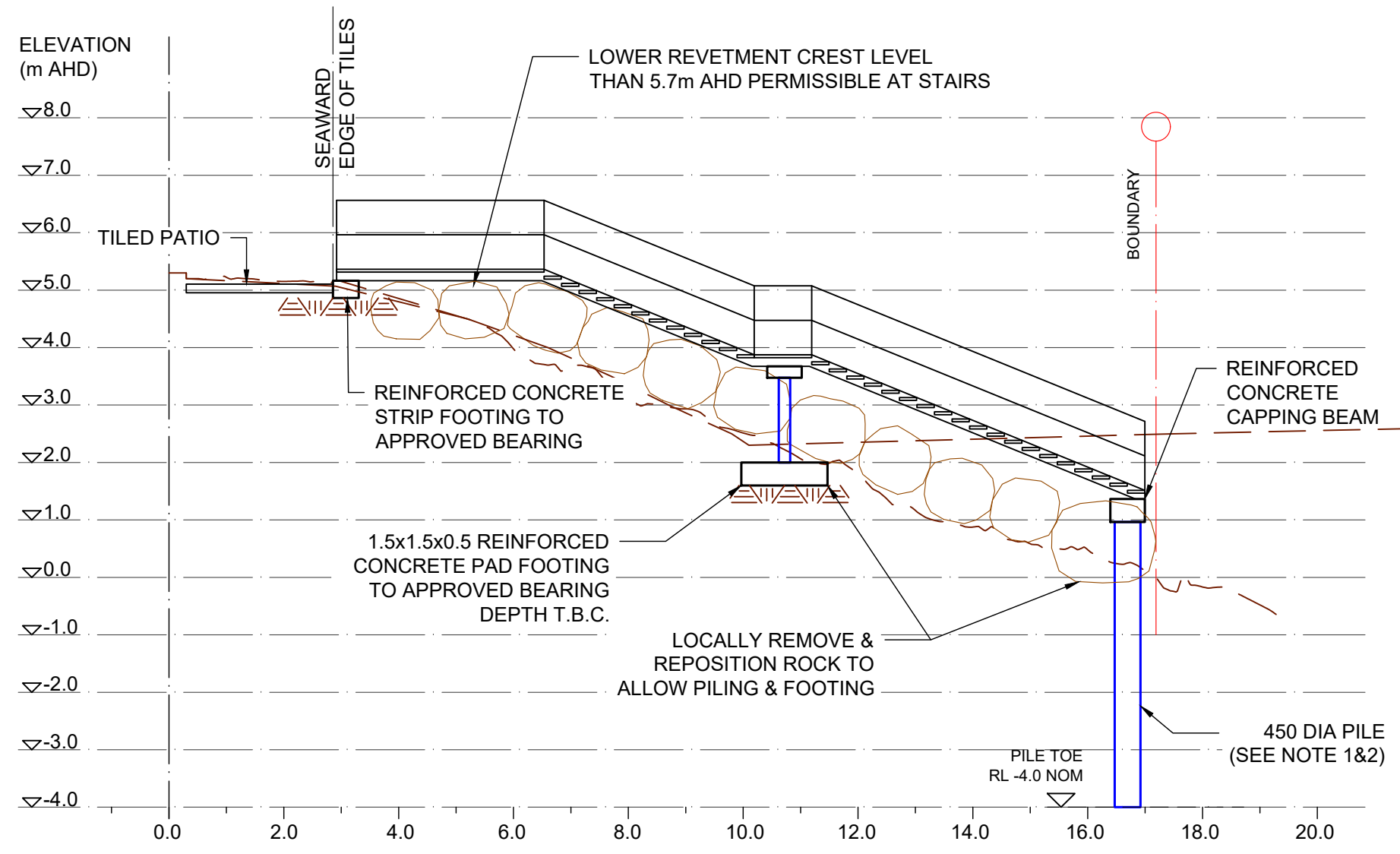
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ACCESS STAIRS
SCALE 1:100



Section ST1
1 : 100

1. IF AGREED BY A COASTAL ENGINEER, PILE MAY BE SUBSTITUTED WITH A CONCRETE FOOTING SITTING ON A SUITABLE SELECTED ARMOUR ROCK BOULDER, WITH VERTICAL STARTER BARS PENETRATING THE BOULDER AND TIED INTO THE FOOTING REINFORCEMENT.
2. SCREW PILES MAY BE SUBSTITUTED FOR 450Ø CFA PILE. ALLOW FOR RAKING PILE.
3. STAIRS AND HANDRAILS SHALL COMPLY WITH BUILDING CODE OF AUSTRALIA

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