

DOCUMENTATION OF COASTAL PROTECTION WORKS

NEW ROCK REVETMENT

AT 1126 TO 1144 PITTWATER ROAD, COLLAROY, NSW

HORTON COASTAL ENGINEERING PTY LTD

18 Reynolds Cres Beacon Hill NSW 2100

TEL: +61 (0)407 012 538

peter@hortoncoastal.com.au www.hortoncoastal.com.au

DRAWING LIST

SHEET No	SHEET NAME
S.01	GENERAL NOTES
S.02	EXISTING SITUATION PLAN
S.03	NEW REVETMENT PLAN WITH CONCURRENT COUNCIL WORKS AT NORTH & SOUTH ENDS
S.05	LANDSCAPE PLAN
S.06	EROSION AND SEDIMENT CONTROL PLAN AND WASTE MANAGEMENT PLAN
S.07	SECTION 1
S.08	SECTION 2

REFERENCE DOCUMENTS

- SURVEY DRAWING PREPARED BY:
CMS SURVEYORS PTY LIMITED
Ph. (02) 9971 4802
REF No. 15947detail
DATED: 08.02.2017
BASIS OF CURRENT PROFILES ON DWG S.07 & S.08
- SURVEY DRAWING PREPARED BY:
AAM
Ph. (02) 8354 8600
REF No. 26722
DATED: 01.07.2016
- PRE-STORM PROFILES
DERIVED FROM OEH PHOTOGRAMMETRIC
DATA DATED: 05.04.16
- POST-STORM PROFILES
DERIVED FROM UNSW WATER RESEARCH
LABORATORY DATA
DATED: 10.06.16
- CEMENTED SAND OUTCROPS
DERIVED FROM UNSW WATER RESEARCH
LABORATORY SURVEY
DATED: 10.06.16

THIS PLAN TO BE READ IN
CONJUNCTION WITH

DA2017/0591

NORTHERN BEACHES COUNCIL

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 2,850kg, MAXIMUM MASS OF 4,750kg, AND THE MEDIAN MASS OF ALL ROCKS SHALL EXCEED 3,800kg (NOMINAL MINIMUM DIAMETER OF 1200mm, MAXIMUM DIAMETER OF 1400mm AND 50%ILE DIAMETER OF 1300mm)
- R5. THE TWO TOE ROCKS IN EACH SECTION ARE 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)
- R6. SECONDARY ARMOUR ROCK SHALL HAVE A MASS GRADING AS FOLLOWS: MINIMUM MASS OF 270kg, MAXIMUM MASS OF 500kg, AND THE MEDIAN MASS OF ALL ROCKS SHALL EXCEED 380kg (NOMINAL MINIMUM DIAMETER OF 530mm, MAXIMUM DIAMETER OF 660mm AND 50%ILE DIAMETER OF 600mm)
- R7. SECOND UNDERLAYER ROCK SHALL HAVE A MASS GRADING AS FOLLOWS: MINIMUM MASS OF 9kg, MAXIMUM MASS OF 28kg, AND THE MEDIAN MASS OF ALL ROCKS SHALL EXCEED 19kg (NOMINAL MINIMUM DIAMETER OF 180mm, MAXIMUM DIAMETER OF 250mm AND 50%ILE DIAMETER OF 220mm)
- R8. 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
- R9. ROCK SHALL HAVE A MINIMUM SATURATED POINT LOAD STRENGTH INDEX $I_{s(50)}$ OF 5.0MPa
- R10. ROCK SHALL HAVE A MAXIMUM LOS ANGELES ABRASION VALUE OF 30%
- R11. ROCK SHALL HAVE A MAXIMUM SODIUM SULFATE WEIGHT LOSS OF 12%
- R12. 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
- R13. ROCK SHALL HAVE NOT MORE THAN 15% (BY VOLUME) OLIVINE AND SHALL EXHIBIT NO ZONES OF SECONDARY ALTERATION SUCH AS CHLORITISATION
- R14. ROCK SHALL SHOW NO SIGNS OF STRESS-RELIEF
- R15. ROCK SHALL NOT BE ROLLED OR DROPPED INTO POSITION, IT SHALL BE PLACED
- R16. PLACED ROCKS SHALL BE WEDGED AND LOCKED TOGETHER SUCH THAT THEY ARE NOT FREE TO MOVE

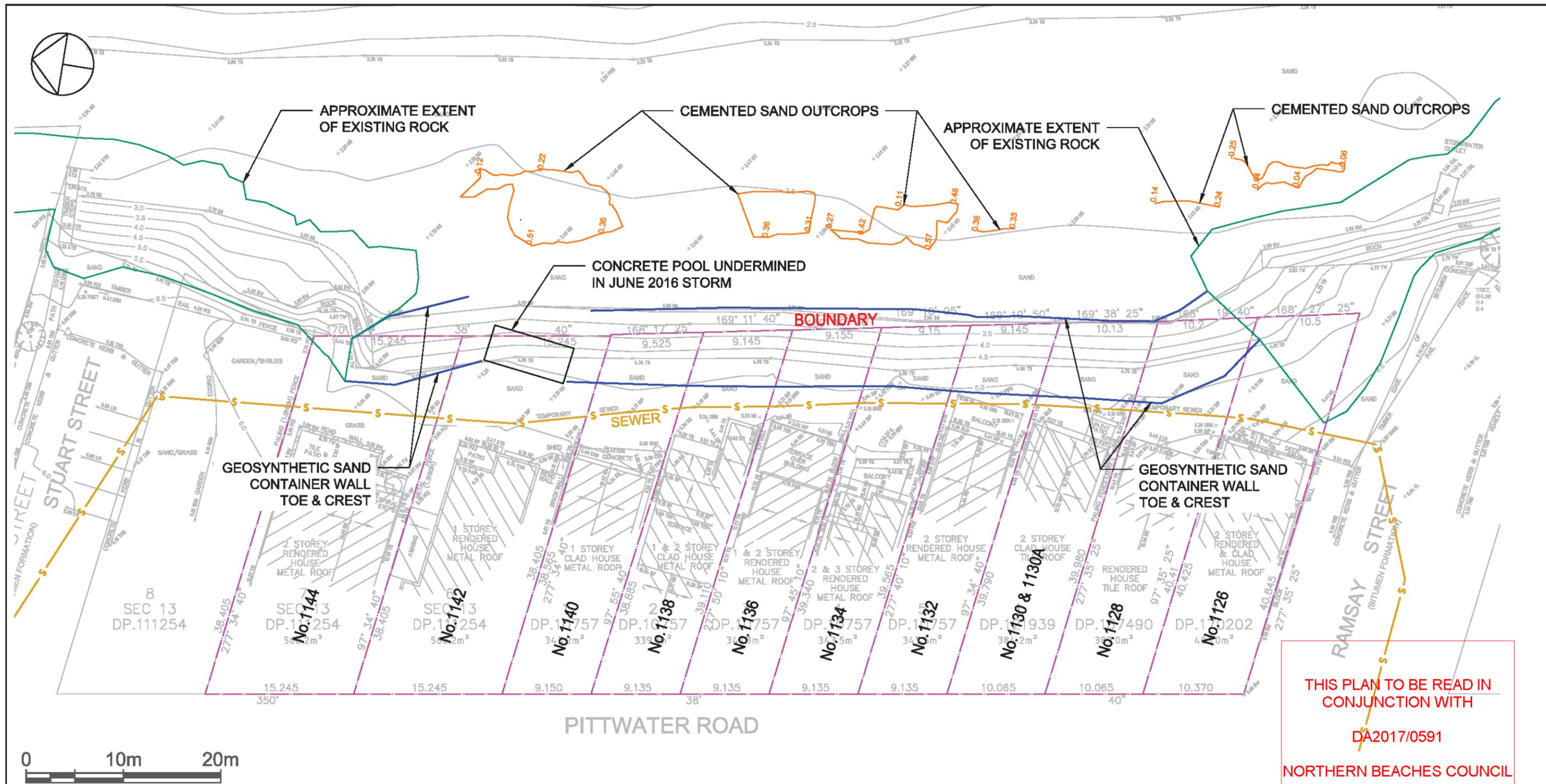
FILTER LAYERS

- F1. GRADING OF FILTERS LAYERS SHALL BE CONFIRMED IN DETAILED DESIGN AFTER ADDITIONAL ASSESSMENT OF THE GRADING OF THE UNDERLYING NATIVE SANDY BASE OF THE REVETMENT
- F2. FILTER GRADING OUTLINED BELOW COMPLIES WITH FILTER RULES (FOR LOSS OF CORE MATERIAL LEACHING THROUGH THE FILTER LAYER, ACCEPTABLE PERMEABILITY, AND ACCEPTABLY NARROW GRADING TO PREVENT LOSS OF FINE PARTICLES THROUGH THE FILTER), FOR AN ASSUMED SAND CORE WITH d_{15} OF 0.3mm, d_{50} OF 0.4mm AND d_{85} OF 0.5mm
- F3. LOWER FILTER LAYER COMPRISES FINE-MEDIUM GRAVEL WITH d_{15} OF 2mm, d_{50} OF 3mm AND d_{85} OF 7mm
- F4. UPPER FILTER LAYER COMPRISES COARSE GRAVEL AND COBBLES WITH d_{15} OF 35mm, d_{50} OF 120mm AND d_{85} OF 190mm

NOT FOR CONSTRUCTION

BY	CHKD	DESCRIPTION	DATE	REV
P.P.	R.Y.	REVISED DA	26.07.18	B
P.P.	R.Y.	ISSUED FOR DA	19.06.17	A

NEW ROCK REVETMENT COASTAL PROTECTION WORKS 1126 TO 1144 PITTWATER ROAD, COLLAROY, NSW	HORTON COASTAL ENGINEERING PTY LTD 18 Reynolds Cres Beacon Hill NSW 2100 TEL: +61 (0)407 012 538 peter@hortoncoastal.com.au www.hortoncoastal.com.au	DRAFTING BY: James Taylor & Associates	DESIGN P.H.	DRAWN P.P.	PROJECT NO.	
			CHKD. R.Y.		5990	
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			SCALE	DATE JULY 2018	S.01	B



1. BASE INFORMATION FROM CMS SURVEYORS SURVEY UNDERTAKEN 31/1/2017 AND ISSUED 8/2/2017 (REFERENCE 15947)
2. ELEVATIONS ARE IN METRES RELATIVE TO AUSTRALIAN HEIGHT DATUM (AHD)
3. TEMPORARY SEWER EXISTS SEAWARD OF 1126-1144 PITTWATER ROAD DWELLINGS, WHICH TRANSITIONS TO SYDNEY WATER SEWER MAINS AT EACH END (SEWER MAIN LOCATIONS WERE PLOTTED FROM SYDNEY WATER DIAGRAM AND ARE APPROXIMATE)
4. GEOSYNTHETIC SAND CONTAINER WALL LOCATION (CONSTRUCTED JUNE-JULY 2016) DERIVED FROM AAM SURVEY UNDERTAKEN 1/7/2016 (REFERENCE 26722) AND DESIGN CROSS SECTION
5. CEMENTED SAND OUTCROPS DERIVED FROM UNSW WATER RESEARCH LABORATORY SURVEY UNDERTAKEN 10/6/16

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1126 TO 1144 PITTWATER ROAD, COLLARROY, NSW

EXISTING SITUATION PLAN

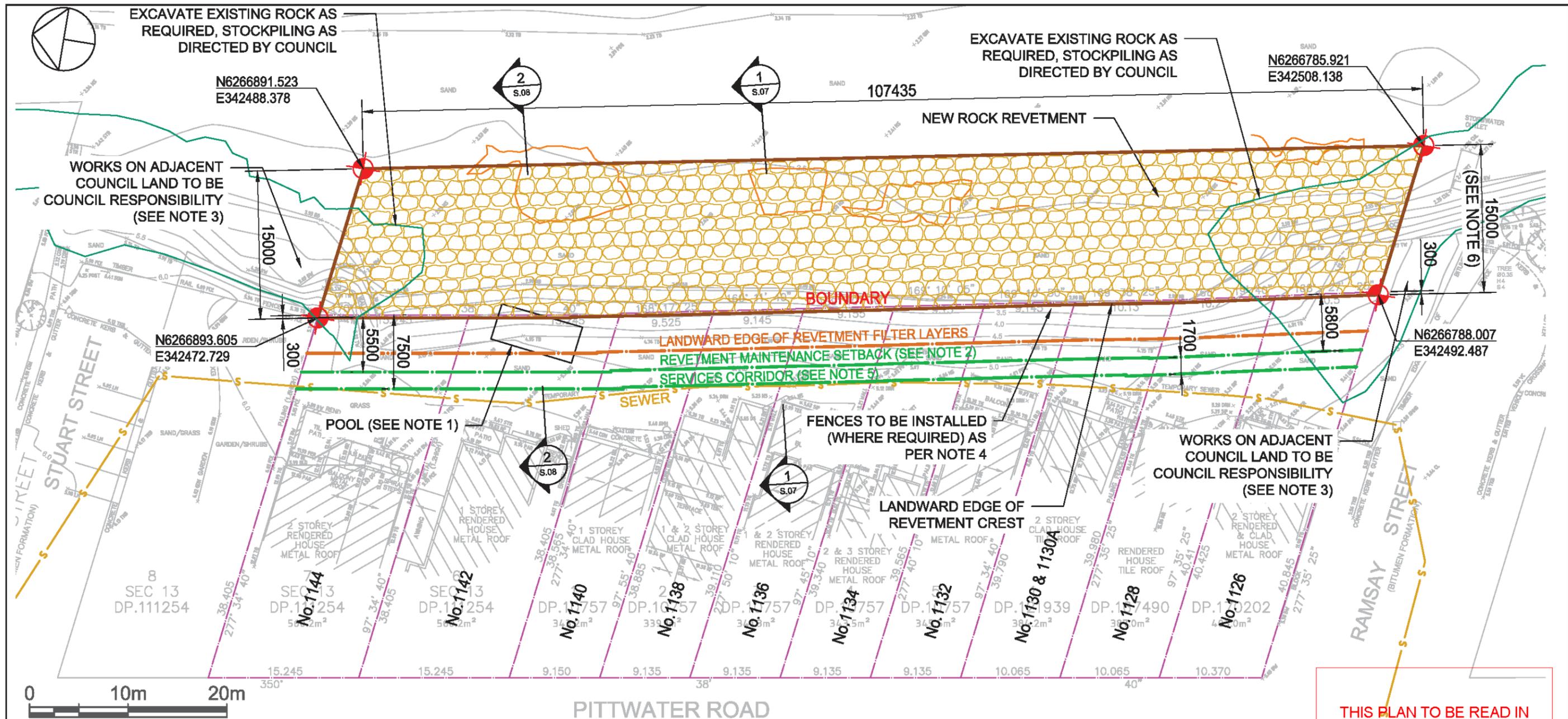
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APPRD.	P.H.		
SCALE 1 : 400	DATE	JULY 2018	

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DRAWING NO.	REV
S.02	B



1. UNDERMINED CONCRETE POOL AT NO. 1142 TO BE REMOVED OR BROKEN UP AS REQUIRED SO AS NOT TO INTERFERE WITH REVETMENT CONSTRUCTION. ALSO SEE NOTE 9 ON DWG S.06
2. NO FUTURE STRUCTURES (EG DWELLINGS, DECKS, POOLS), EXCEPT DEVELOPMENT THAT CAN BE READILY RELOCATED OR REMOVED IF REQUIRED, TO BE CONSTRUCTED SEAWARD OF "REVETMENT MAINTENANCE SETBACK" LINE, TO ENABLE CLEAR PASSAGE OF CONSTRUCTION PLANT AS REQUIRED FOR FUTURE REVETMENT MAINTENANCE. THE REVETMENT MAINTENANCE SETBACK IS 5.8m LANDWARD OF THE SEAWARD PROPERTY BOUNDARY, AND ABOUT 5.5m LANDWARD OF THE LANDWARD EDGE OF THE REVETMENT CREST
3. IT IS ASSUMED THAT COUNCIL UNDERTAKES WORKS ON THEIR LAND (TO THE NORTH AND SOUTH OF THE PROPOSED WORKS) AT THE SAME TIME AS THE PROPOSED WORKS
4. ALL FENCING SHALL COMPLY WITH *STATE ENVIRONMENTAL PLANNING POLICY (EXEMPT AND COMPLYING DEVELOPMENT CODES) 2008*. EASTERN FENCE (WHERE INSTALLED) SHALL BE IMMEDIATELY LANDWARD OF REVETMENT, AND THUS ABOUT 0.3m INSIDE THE BOUNDARY
5. SEWER AND STORMWATER TO BE INSTALLED BY SYDNEY WATER IN SERVICES CORRIDOR. THE LANDWARD EDGE OF THE SERVICES CORRIDOR (7.5m SETBACK FROM THE SEAWARD PROPERTY BOUNDARIES) IS THE RECOMMENDED MOST SEAWARD ALLOWABLE POSITION FOR FUTURE DEVELOPMENT THAT CANNOT BE READILY RELOCATED OR REMOVED
6. REVETMENT FOOTPRINT SHOWN IS FOR A TOE LEVEL ON CEMENTED SAND OF 0m AHD. THE SEAWARD EXTENT OF THE REVETMENT WOULD INCREASE BY ABOUT 1.5m IF THE MINIMUM TOE LEVEL OF -1m AHD WAS ADOPTED, OR REDUCE BY ABOUT 0.8m IF THE CEMENTED SAND LEVEL (AND TOE LEVEL) WAS 0.5m AHD

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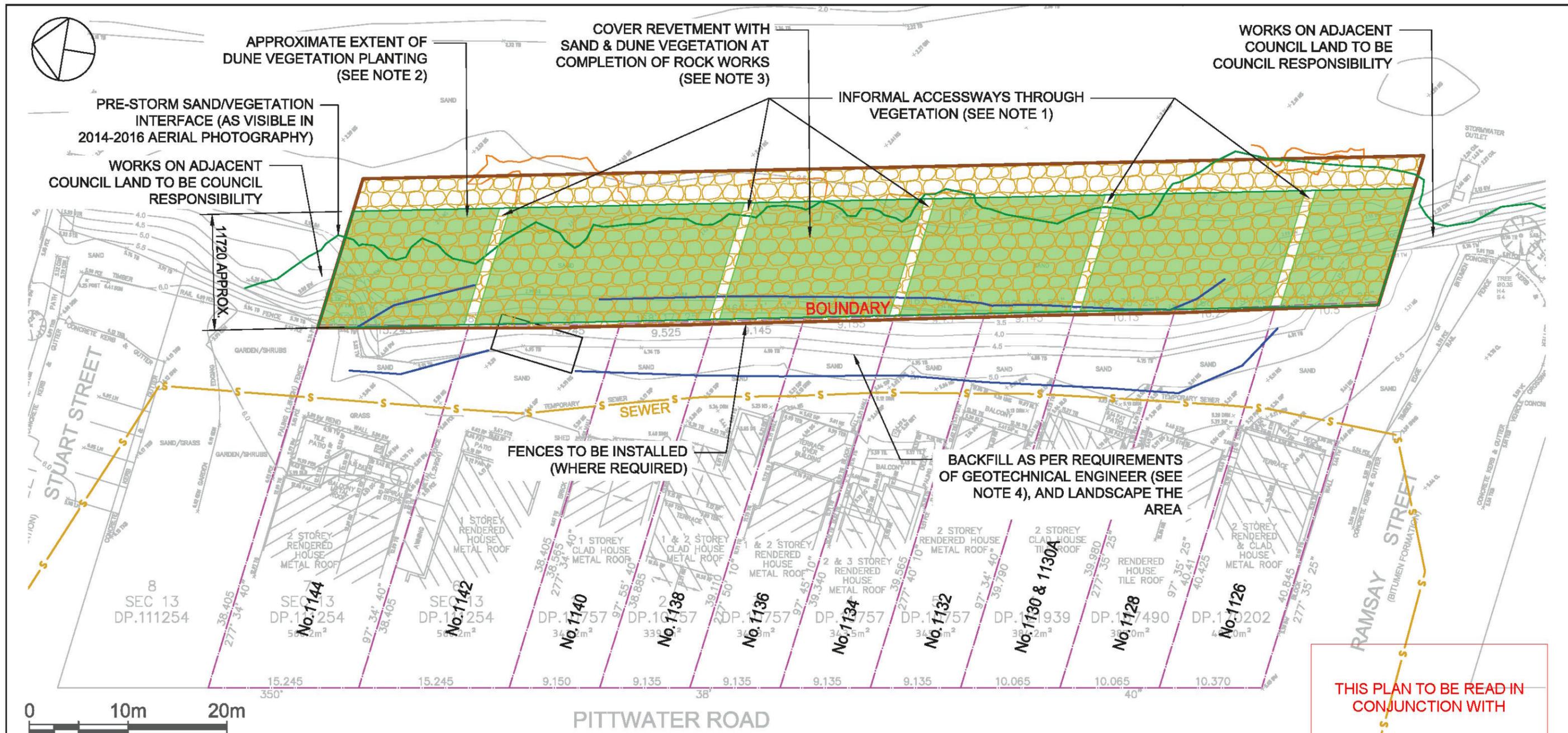
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- ACCESSWAYS ARE TO BE INFORMAL SANDY GAPS (LESS THAN 1m WIDE) BETWEEN DUNE VEGETATION
- PLANTING DENSITY EXPECTED TO BE 4 TUBESTOCK PLANTS PER m². POTENTIAL VEGETATION SPECIES ARE DISCUSSED IN A REPORT PREPARED BY DIANE WIESNER AND DATED 6 JUNE 2017. SEAWARD EXTENT OF VEGETATION PLANTING TO BE CONFIRMED ON SITE BY COUNCIL (WILL DEPEND ON BEACH STATE AT TIME)
- 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 PROPERTIES MAY BE PLACED OVER THE ROCK REVETMENT, BUT NOT LANDWARD OF IT
- SAND SIZED MATERIAL FOR BACKFILL SHALL NOT BE SOURCED FROM THE BEACH SEAWARD OF THE SUBJECT PROPERTIES. 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 SHALL BE TO THE SATISFACTION OF THE GEOTECHNICAL ENGINEER

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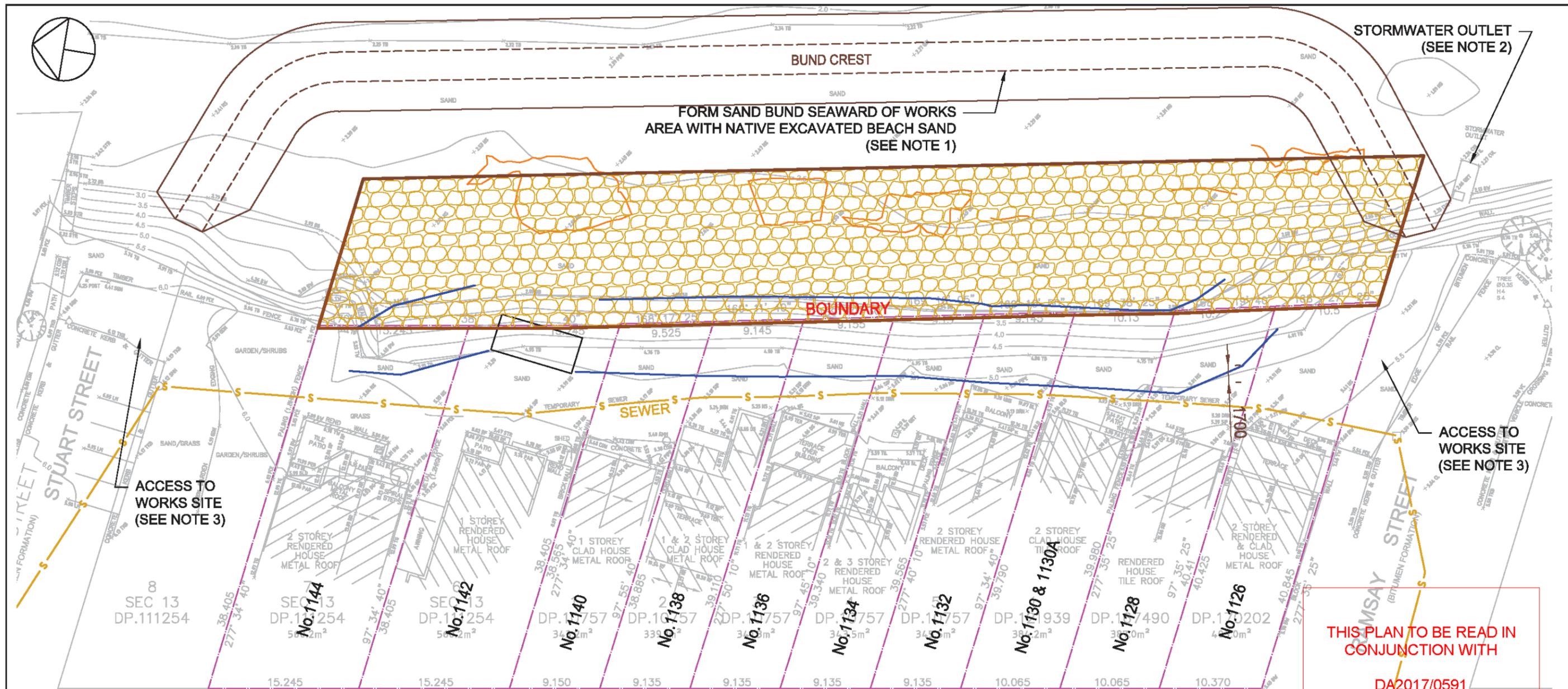
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LANDSCAPE PLAN

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1. 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, AS DIRECTED BY COASTAL ENGINEER OR CONTRACTOR. TEMPORARY STEEL SHEET PILING COULD ALSO BE USED IF PREFERRED BY CONTRACTOR, IN CONJUNCTION WITH A BUND, TO PROVIDE ADDITIONAL PROTECTION TO WORKS AREA AGAINST MILD COASTAL STORMS (SUBJECT TO COUNCIL APPROVAL THROUGH "WORKING ON AND ACCESS TO RESERVES PERMIT")
2. GENERALLY FORM BUND NORTH OF RAMSAY STREET STORMWATER OUTLET, EXCEPT TEMPORARILY WHEN WORKS ARE AT SOUTHERN END
3. ACCESS TO WORKS SITE WILL BE VIA STUART STREET AND/OR RAMSAY STREET, AS AGREED BETWEEN CONTRACTOR AND COUNCIL
4. RUBBLE AND OTHER MATERIALS THAT WOULD BE UNSUITABLE ON A BEACH ARE TO BE SEPARATED AND STOCKPILED WHERE ENCOUNTERED DURING EXCAVATION (POTENTIALLY TO BE REUSED, SEE NOTE 8). EXCAVATED AND/OR IMPORTED ROCK BOULDERS MAY BE TEMPORARILY PLACED ON BEACH, ON LANDWARD SIDE OF BUND, AS DIRECTED BY COASTAL ENGINEER, TO PROVIDE SOME PROTECTION TO EXCAVATED WORKS AREA
5. ALL DELETERIOUS MATERIALS AND EQUIPMENT THAT COULD BE DAMAGED ARE TO BE REMOVED FROM WORK AREA IF BUND OR SHEET PILING CANNOT BE MAINTAINED DUE TO ELEVATED WAVES AND WATER LEVELS. WORKS IN BEACH AREA MAY BE NEED TO TEMPORARILY CEASE UNDER THESE CONDITIONS
6. ALL MATERIAL STOCKPILES ARE TO BE LOCATED LANDWARD OF THE GEOSYNTHETIC SAND CONTAINER WALL, ROCK REVETMENT ON COUNCIL LAND (AT EITHER OR BOTH ENDS OF REVETMENT CONSTRUCTION AREA), OR COMPLETED PORTION OF NEW REVETMENT WORKS AS SUITABLE. ANY STOCKPILE LOCATIONS ON COUNCIL LAND ARE TO BE AGREED BETWEEN COUNCIL AND CONTRACTOR
7. WHEN PLACING SAND OVER THE REVETMENT AT THE COMPLETION OF ROCK WORKS, SCREENING IS TO BE UNDERTAKEN TO REMOVE RUBBLE, ROCK FRAGMENTS AND OTHER MATERIALS THAT WOULD BE UNSUITABLE ON A BEACH
8. ANY WASTE MATERIALS SHALL BE DISPOSED OF AT AN APPROPRIATE WASTE MANAGEMENT FACILITY OFF SITE
9. 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 S.05
10. BUND IS TO BE REMOVED, WITH SAND SHAPED TO A NATURAL PROFILE, PRIOR TO COMPLETION OF THE WORKS

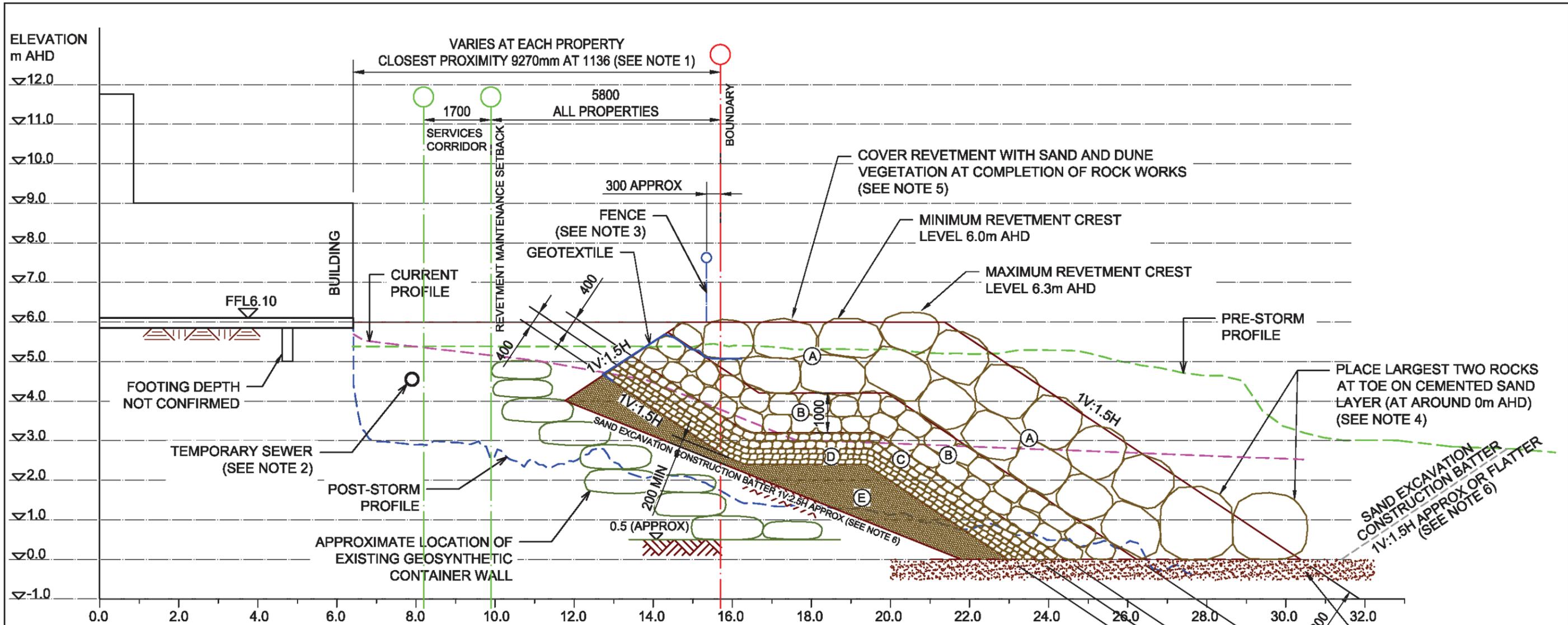
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EROSION AND SEDIMENT CONTROL PLAN AND WASTE MANAGEMENT PLAN	COPYRIGHT: THIS DESIGN AND PLANS ARE NOT TO BE USED OR REPRODUCED WHOLLY OR IN PART WITHOUT WRITTEN PERMISSION FROM HORTON COASTAL ENGINEERING		APPRD. P.H.		DATE JULY 2018
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ROCK REVETMENT LEGEND

- (A) - PRIMARY ARMOUR (2 LAYERS OF APPROX. 1300mm BASALT BOULDERS)
- (B) - SECONDARY ARMOUR (2 LAYERS OF APPROX. 600mm BASALT BOULDERS)
- (C) - SECOND UNDERLAYER (2 LAYERS OF APPROX. 220mm BASALT BOULDERS)

FILTER LAYERS LEGEND

- (D) - UPPER FILTER LAYER (COARSE GRAVEL AND COBBLES)
- (E) - LOWER FILTER LAYER (FINE-MEDIUM GRAVEL)

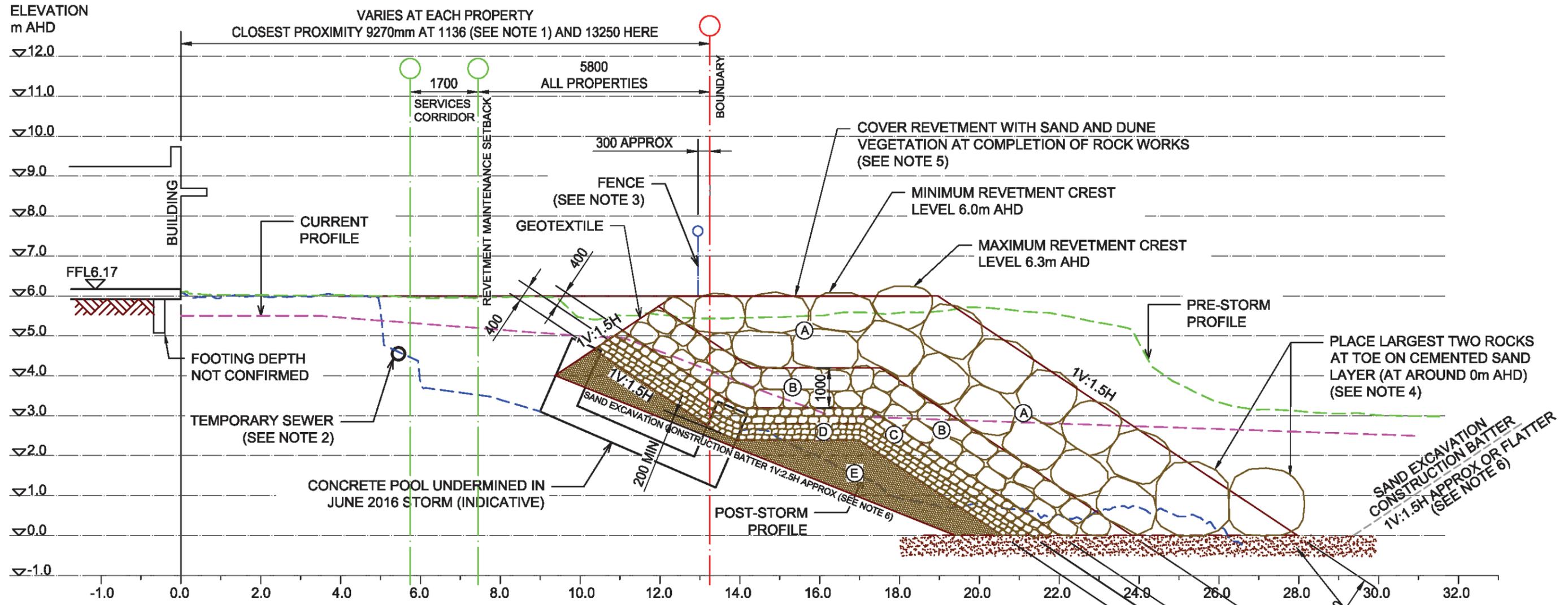
1. DWELLING AT 1136 IS CLOSEST FOUNDED STRUCTURE TO BOUNDARY. CANTILEVERED BALCONY AT 1132 IS CLOSEST STRUCTURE TO BOUNDARY (DISTANCE 7080mm)
2. SEWER LEVEL HAS BEEN ASSUMED AND IS APPROXIMATE
3. ALL FENCING SHALL COMPLY WITH *STATE ENVIRONMENTAL PLANNING POLICY (EXEMPT AND COMPLYING DEVELOPMENT CODES) 2008*. EASTERN FENCE (WHERE INSTALLED) SHALL BE IMMEDIATELY LANDWARD OF REVETMENT, AND THUS ABOUT 0.3m INSIDE THE BOUNDARY
4. SEE NOTE R5 ON DRAWING S.01
5. 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 PROPERTIES MAY BE PLACED OVER THE ROCK REVETMENT, BUT NOT LANDWARD OF IT
6. 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

CEMENTED SAND EXTENTS AND LEVELS T.B.C. ON SITE BY COASTAL ENGINEER
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4. SEE NOTE R5 ON DRAWING S.01
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CEMENTED SAND EXTENTS AND LEVELS T.B.C. ON SITE BY COASTAL ENGINEER

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