

DOCUMENTATION OF
COASTAL PROTECTION WORKS
 AT 1190 TO 1196 & 1204 PITTWATER ROAD, NARRABEEN, NSW

HORTON COASTAL ENGINEERING PTY LTD

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DRAWING LIST

Sheet Number	Sheet Title
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GENERAL NOTES

- N1. ALL LEVELS ARE IN METRES RELATIVE TO AUSTRALIAN HEIGHT DATUM (AHD), UNLESS NOTED OTHERWISE
- N2. FGL REFERS TO FINISHED GROUND LEVEL

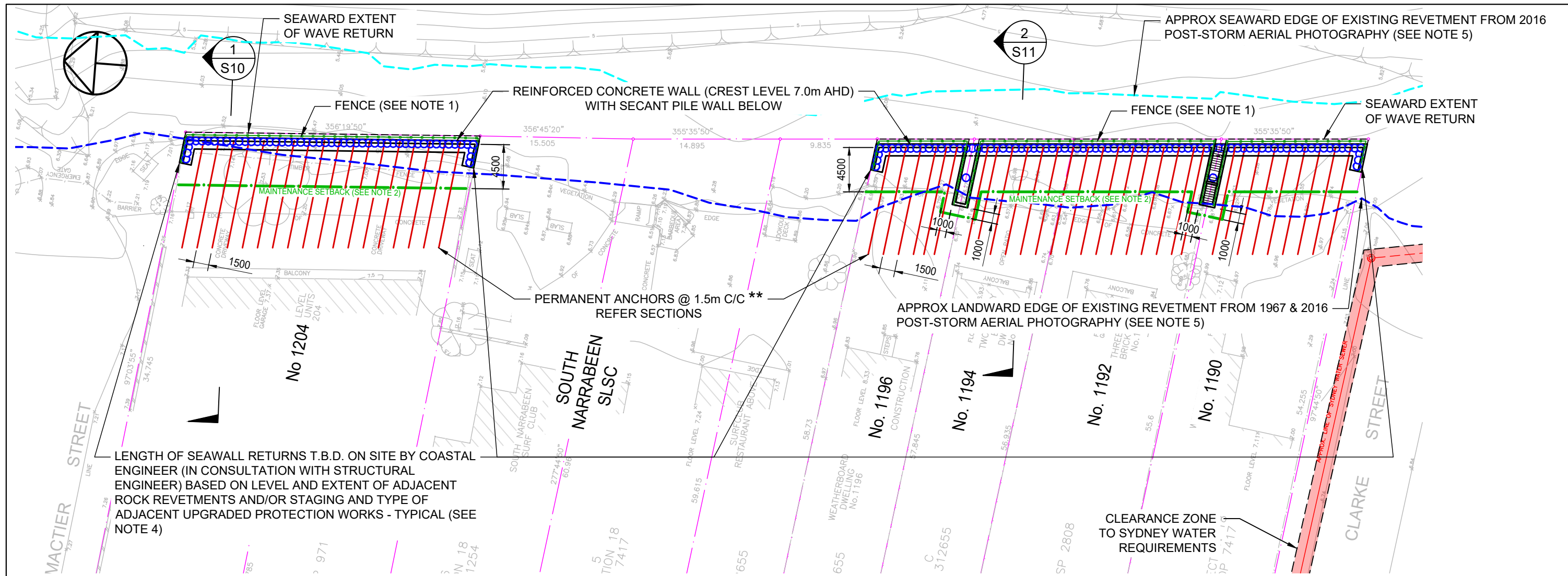
REFERENCE DOCUMENTS

- SURVEY DRAWING PREPARED BY:
 DETAILED SURVEYS
 Ph. (02) 9913 9525
 REF No. 077/17
 DATED: 24 OCT 2017
- PRE-2016 STORM PROFILES
 DERIVED FROM NSW DEPARTMENT OF PLANNING,
 INDUSTRY AND ENVIRONMENT DATA
 DATED 5 APRIL 2016
- POST-2016 STORM PROFILES
 DERIVED FROM NSW DEPARTMENT OF PLANNING,
 INDUSTRY AND ENVIRONMENT, AND WATER
 RESEARCH LABORATORY DATA
 DATED 7 JUNE 2016
- APRIL 2021 PROFILES DERIVED FROM NSW
 DEPARTMENT OF PLANNING, INDUSTRY AND
 ENVIRONMENT DATA
 DATED 14 APRIL 2021

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

PP	RY	REVISED FOR DA	23/07/21	G	COASTAL PROTECTION WORKS AT 1190 TO 1196 & 1204 PITTWATER RD NARRABEEN, NSW	COASTAL ENGINEERING DESIGN: 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	STRUCTURAL ENGINEERING DESIGN: James Taylor & Associates Civil & Structural Consulting Engineers SUITE 301, 115 MILITARY ROAD NEUTRAL BAY NSW 2090 TEL: 02 99691999 EMAIL: mail@jamestaylorassociates.com.au	DESIGN	P.H.	DRAWN	P.P.	PROJECT NO. 6355	
PP	RY	REVISED FOR DA	30/06/21	F				CHKD.	R.Y.				
HL	RY	REVISED FOR DA	28/05/21	E				APPRD.	P.H.	DRAWING NO.	REV		
PP	RY	ISSUED FOR DA	24/05/21	D				GENERAL NOTES	COPYRIGHT: THIS DESIGN AND PLANS ARE NOT TO BE USED OR REPRODUCED WHOLLY OR IN PART WITHOUT WRITTEN PERMISSION FROM HORTON COASTAL ENGINEERING AND JAMES TAYLOR & ASSOCIATES	SCALE	DATE	S01	G
PP	RY	FOR REVIEW	14/05/21	C									
PP	RY	FOR REVIEW	10/05/21	B									
PP	RY	WIP ISSUE	03/05/21	A									
BY	CHKD	DESCRIPTION	DATE	REV									



** A HOLLOW BAR ANCHORING SCHEME HAS BEEN INDICATED ON THESE DRAWINGS. ALTERNATIVE ANCHOR SETOUTS AND/OR TYPES MAY BE SUBMITTED FOR APPROVAL. DEADMAN ANCHOR SYSTEM IS DESCRIBED ON DRAWING S16 AS AN ALTERNATIVE TO THE HOLLOW BAR ANCHORING SCHEME. THE ANCHORING SCHEME SHALL BE AGREED WITH CONTRACTOR SUBJECT TO CONFIRMATION OF STRUCTURAL & GEOTECHNICAL ENGINEERS

1. ALL FENCING SHALL COMPLY WITH STATE ENVIRONMENTAL PLANNING POLICY (EXEMPT AND COMPLYING DEVELOPMENT CODES) 2008 AND BUILDING CODE OF AUSTRALIA (BCA)
2. NO FUTURE STRUCTURES, EXCEPT READILY RELOCATABLE OR REMOVABLE STRUCTURES THAT DO NOT INTERRUPT VIEWS, ARE TO BE CONSTRUCTED SEAWARD OF THIS MAINTENANCE SETBACK LINE, TO ENABLE 4.5m OF CLEAR PASSAGE FOR CONSTRUCTION PLANT AS REQUIRED FOR FUTURE PROTECTION WORKS MAINTENANCE. THIS LINE IS THE RECOMMENDED MOST SEAWARD SETBACK FOR FUTURE DWELLINGS (SEE NOTE 3).
3. FUTURE SETBACKS AND DEVELOPMENT TYPES ADOPTED ARE SUBJECT TO MERIT ASSESSMENT AGAINST OTHER PLANNING CONSIDERATIONS (INCLUDING VIEWS AND OVERSHADOWING) AND SPECIFIC ENGINEERING (COASTAL, STRUCTURAL AND GEOTECHNICAL) ADVICE (INCLUDING POTENTIAL IMPACTS ON THE PROTECTION WORKS)
4. TEMPORARILY REMOVE PORTION OF ROCK REVETMENT AND OTHER MATERIALS (SOIL, GRASS AND THE LIKE) AS REQUIRED AT ADJACENT COUNCIL LAND (MACTIER STREET, SOUTH NARRABEEN SLSC AND CLARKE STREET AS APPLICABLE), AS DIRECTED BY COASTAL ENGINEER, TO ALLOW CONSTRUCTION OF PROPOSED WORKS. REINSTATE ROCK REVETMENT AND LAND IN THESE AREAS TO PRE-WORKS CONDITION AS SOON AS POSSIBLE AFTER CONSTRUCTION OF SEAWALL AT NO. 1190-1196 & 1204, AS DIRECTED BY COASTAL ENGINEER (ALSO SEE DWG S03), UNLESS STAGING AND TYPE OF COUNCIL SEAWALL WORKS MAKES THIS UNNECESSARY AND AS AGREED WITH COUNCIL.
5. LANDWARD AND SEAWARD EXTENTS OF EXISTING ROCK TO BE CONFIRMED IN FUTURE GEOTECHNICAL INVESTIGATION, IF REQUIRED. 2020 AERIAL PHOTOGRAPHY WAS ALSO USED TO ESTIMATE SEAWARD EXTENT OF ROCK AT CLARKE STREET.

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BY	CHKD	DESCRIPTION	DATE	REV

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AT 1190 TO 1196 & 1204 PITTWATER RD
NARRABEEN, NSW

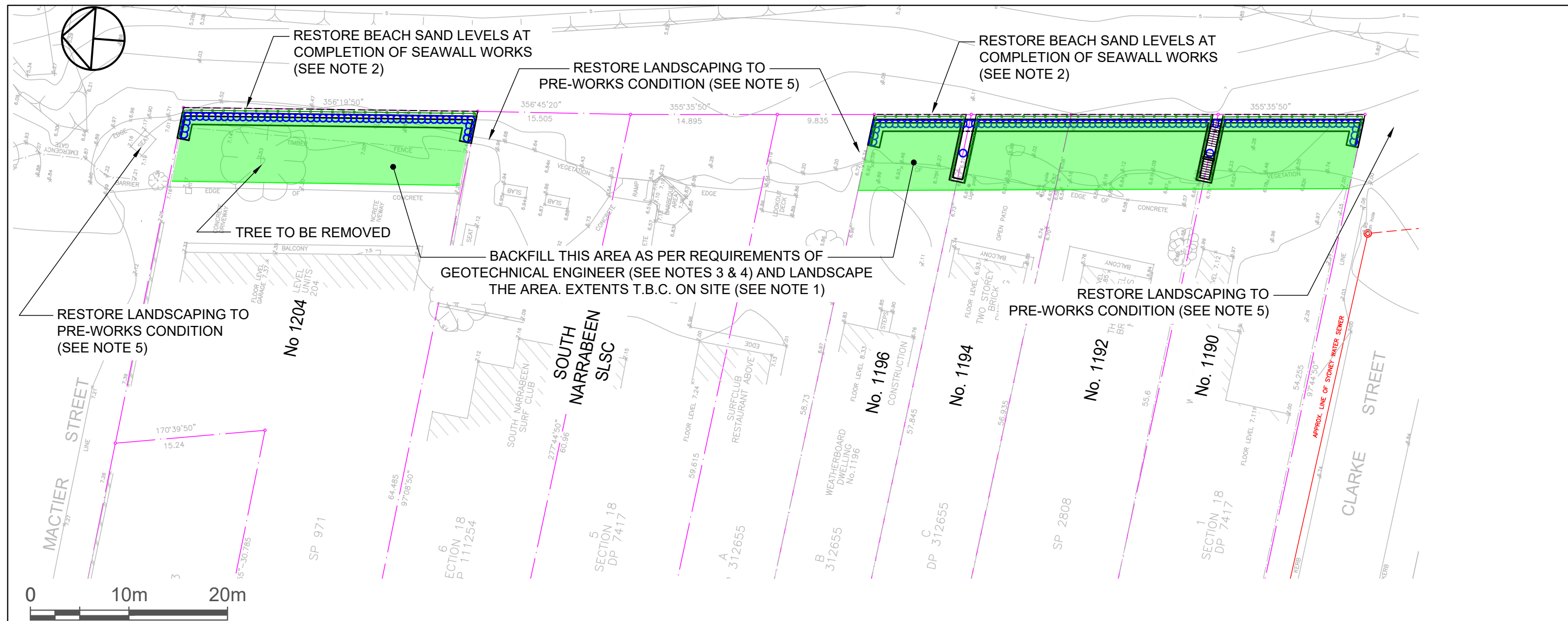
**COASTAL PROTECTION WORKS
PLAN**

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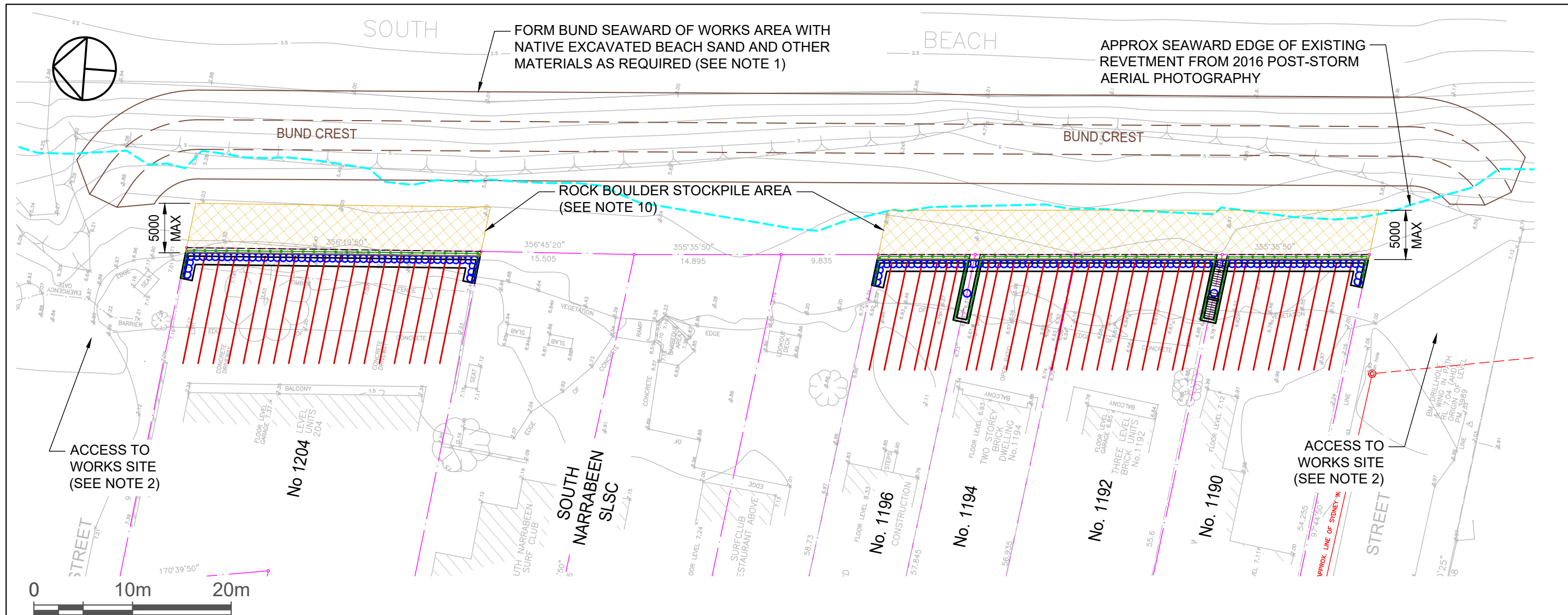
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CHKD.	R.Y.			6355
APPRD.	P.H.			DRAWING NO.
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SCALE		DATE		REV
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1. THE EXTENT OF BACKFILL AND LANDSCAPING DEPICTED ON THIS DRAWING IS INDICATIVE, AND MAY VARY DEPENDING ON THE EXTENT OF AREAS EXCAVATED AND DISTURBED AS PART OF CONSTRUCTION OF THE WORKS
2. SHAPE SAND SEAWARD OF THE SEAWALL TO A NATURAL PROFILE PRIOR TO THE COMPLETION OF THE WORKS. EXCAVATED BEACH SAND SEAWARD OF THE SUBJECT PROPERTIES MAY NOT BE PLACED LANDWARD OF THE CONCRETE WALL (IN PRIVATE PROPERTY)
3. 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.
4. BOULDERS EXCAVATED AS PART OF THE WORKS (EXCEPT BOULDERS FORMING EXISTING COASTAL PROTECTION WORKS AT CLARKE STREET, MACTIER STREET AND SOUTH NARRABEEN SLSC) MAY BE CRUSHED TO USE AS BACKFILL WITH AGREEMENT OF GEOTECHNICAL ENGINEER, OR TAKEN OFF-SITE TO BE USED BY OTHERS OR AS AGREED WITH COUNCIL. ALSO SEE DRAWING S05 FOR POTENTIAL ROCK BOULDER STOCKPILE AREA SEAWARD OF SEAWALL
5. WASH SAND THOROUGHLY AND PROGRESSIVELY INTO VOIDS OF RESTORED ROCK REVETMENT AT MACTIER STREET, SOUTH NARRABEEN SLSC AND CLARKE STREET TO ENSURE SINKHOLES WILL NOT FORM IN REINSTATED BEACH SURFACE (REINSTATE TO PRE-WORKS SAND LEVEL), IF THESE AREAS ARE REQUIRED TO BE RESTORED.

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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 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 BUND WORKS ARE SUBJECT TO COUNCIL APPROVAL THROUGH A "WORKING ON AND ACCESS TO RESERVES APPLICATION". THE BUND AND ALL 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 MACTIER STREET AND/OR CLARKE STREET OR AN ALTERNATIVE STREET LOCATION, AS AGREED BETWEEN CONTRACTOR AND COUNCIL (WITH ALL ACCESSED AREAS RESTORED TO PRE-WORKS CONDITION BEFORE COMPLETION OF WORKS)
- RUBBLE AND OTHER MATERIALS OR WASTE 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 (LARGER FRACTION) ROCK BOULDERS MAY BE TEMPORARILY PLACED ON BEACH, IN BUND, TO PROVIDE SOME PROTECTION TO THE WORKS AREA. THE CONTRACTOR SHALL CONSULT WITH THE PRINCIPAL'S COASTAL ENGINEER ON SUCH ROCK PLACEMENT, AND CONSIDER ANY COMMENTS RECEIVED
- ALL DELETERIOUS MATERIALS AND EQUIPMENT THAT COULD BE DAMAGED ARE TO BE REMOVED FROM WORK 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 EROSION ESCARPMENT. ANY STOCKPILE LOCATIONS ON COUNCIL LAND ARE TO BE AGREED BETWEEN COUNCIL AND CONTRACTOR
- WHEN RESTORING BEACH SAND LEVELS AT THE COMPLETION OF THE SEAWALL WORKS, SCREENING IS TO BE UNDERTAKEN TO REMOVE RUBBLE, ROCK FRAGMENTS AND OTHER MATERIALS THAT WOULD BE UNSUITABLE ON A BEACH
- ANY WASTE MATERIALS SHALL BE DISPOSED OF AT AN APPROPRIATE WASTE MANAGEMENT FACILITY OFF SITE
- WASTE AND RUBBLE MATERIALS MAY BE BURIED LANDWARD OF THE WALL 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 3 ON DWG S03
- IF DEWATERING IS REQUIRED, WATER SHALL BE PUMPED INTO A SAND 'SUMP' AND NOT DISCHARGED DIRECTLY TO THE SEA
- SUITABLE SELECTED EXISTING ROCK BOULDERS ENCOUNTERED IN EXCAVATION (AND NOT CRUSHED TO USE AS BACKFILL, OR PLACED TO RESTORE ADJACENT LAND) MAY BE PLACED AT A STABLE SLOPE AND IN A SAFE AND INTERLOCKED MANNER ON THE CEMENTED SAND LAYER IN THIS STOCKPILE AREA (OR AN ALTERNATIVE STOCKPILE AREA) UNDER THE DIRECTION OF THE PRINCIPAL'S COASTAL ENGINEER, FOR FUTURE COUNCIL USE (IF REQUIRED), AND AS AGREED WITH COUNCIL ON-SITE. ANY ALTERNATIVE STOCKPILE AREA (IF REQUIRED) SHALL BE MUTUALLY AGREED WITH COUNCIL, BE WITHIN 50m OF THE WORKS AREA, AND BE ACCESSIBLE DIRECTLY USING PLANT AND EQUIPMENT ON THE BEACH. ANY MATERIALS ENCOUNTERED THAT WOULD BE INAPPROPRIATE TO LEAVE STOCKPILED ON THE BEACH SHALL BE PLACED AS BACKFILL LANDWARD OF THE SEAWALL (IF APPROPRIATE) OR TAKEN TO A LICENSED WASTE MANAGEMENT FACILITY. WASH SAND THOROUGHLY AND PROGRESSIVELY INTO VOIDS OF BOULDERS PLACED IN STOCKPILE AREA TO ENSURE THAT SINKHOLES WILL NOT FORM IN REINSTATED BEACH SURFACE, AND SCREEN AS PER NOTE 6

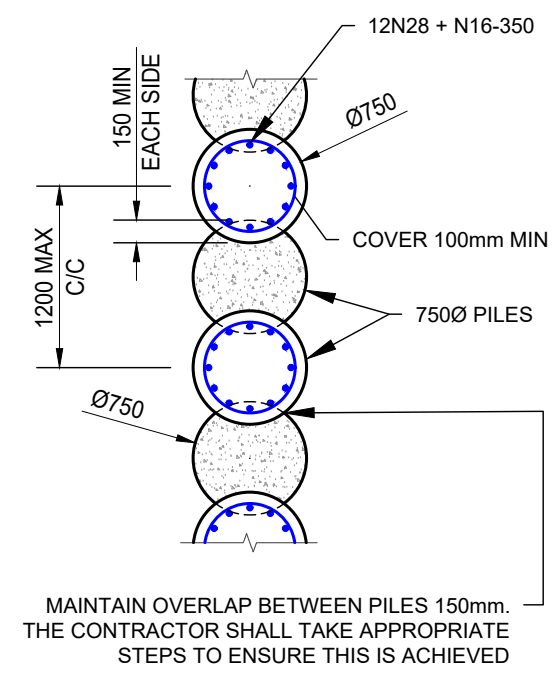
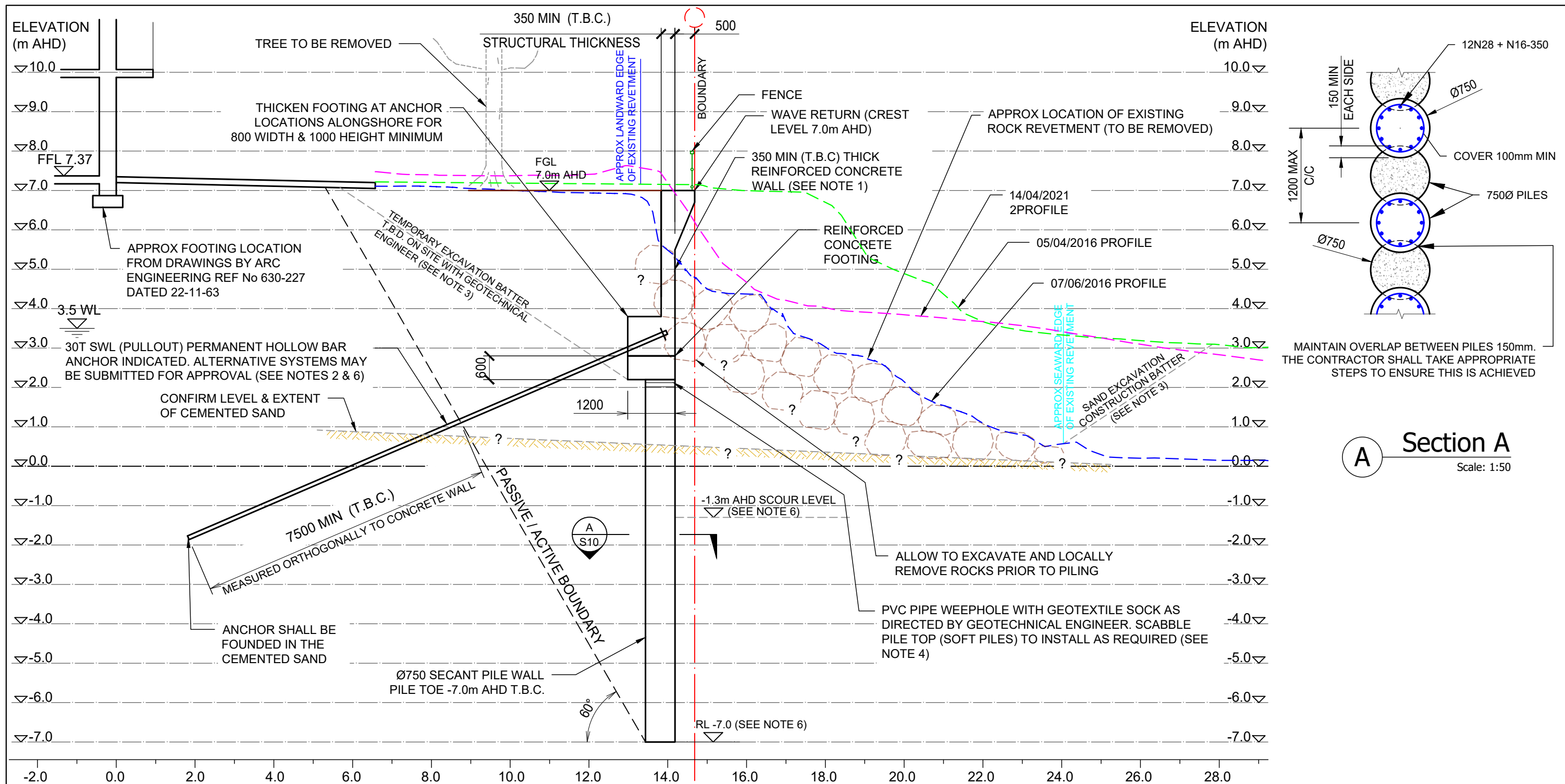
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COASTAL PROTECTION WORKS AT 1190 TO 1196 & 1204 PITTWATER RD NARRABEEN, NSW
EROSION AND SEDIMENT CONTROL PLAN AND WASTE MANAGEMENT PLAN

COASTAL ENGINEERING DESIGN: 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
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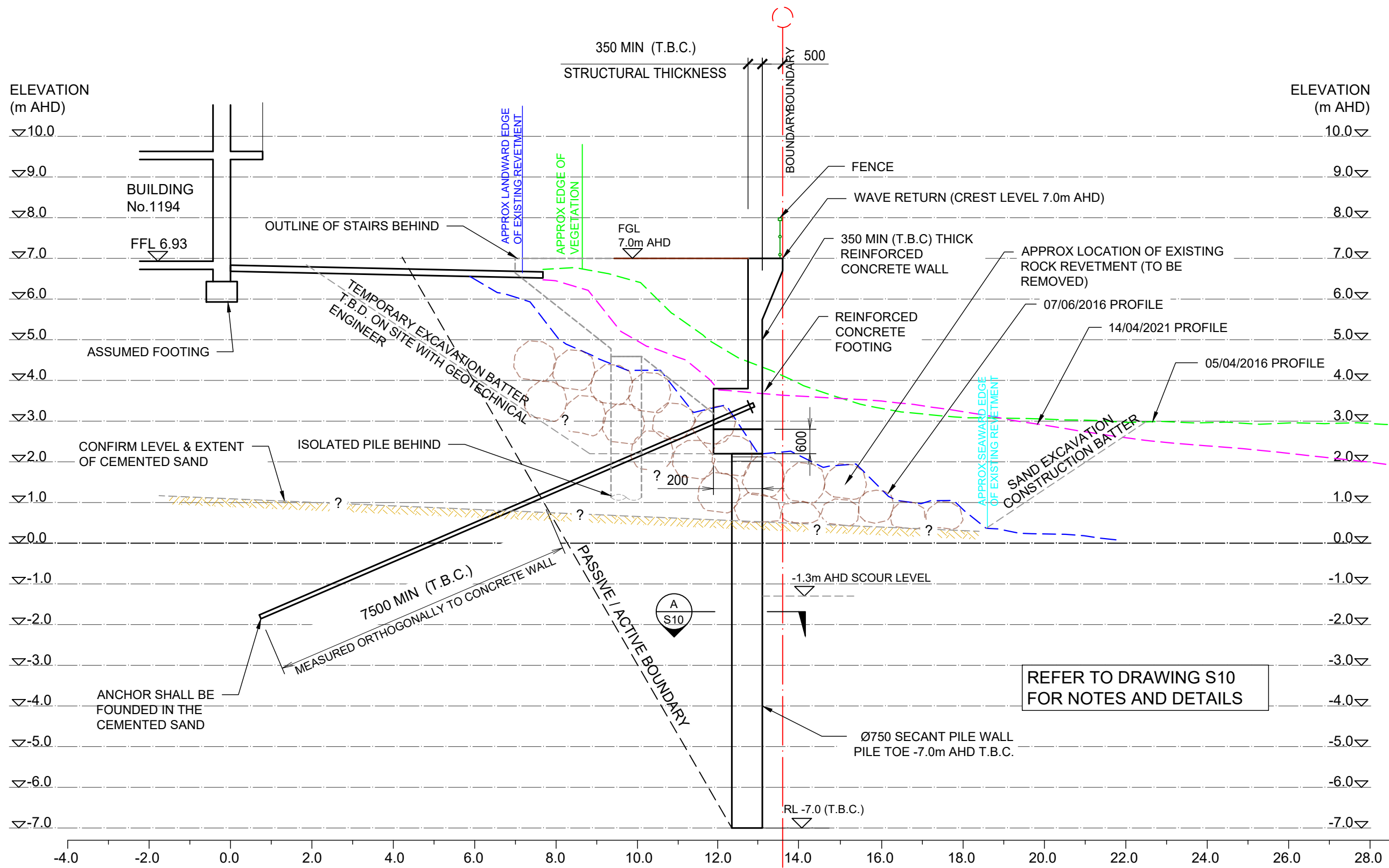
DESIGN	P.H.	DRAWN	P.P.	PROJECT NO.
CHKD.	R.Y.			6355
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A Section A
Scale: 1:50

1. ACHIEVE MINIMUM OF CLASS 3 FINISH ON CONCRETE WALL AS PER AS 3610, WITH CONSISTENT SAND-MATCHING COLOUR AS AGREED PRIOR TO THE WORKS COMMENCING. ALTERNATIVE COLOURS, PATTERNS AND TEXTURES MAY BE CONSIDERED WITH AGREEMENT OF COUNCIL
2. EMBED ANCHOR WITHIN CEMENTED SANDS, DESIGN LIFE MIN 100 YEARS. DETAILED ANCHOR DESIGN & CERTIFICATION BY ANCHORING CONTRACTOR, SUBJECT TO APPROVAL OF STRUCTURAL AND GEOTECHNICAL ENGINEERS. ALTERNATIVE PERMANENT ANCHOR SYSTEMS MAY BE CONSIDERED SUBJECT TO APPROVAL OF STRUCTURAL AND GEOTECHNICAL ENGINEERS.
3. SLOPE OF BATTER TO BE 1V:1.5H OR FLATTER. 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)
4. ENSURE ADEQUATE COVER IS MAINTAINED TO REINFORCEMENT IN PILES AFTER SCABBLING, AS DIRECTED BY STRUCTURAL ENGINEER. PVC PIPE WEEPHOLES COULD ALTERNATIVELY BE TIED TO BASE OF CONCRETE FOOTING (PILE CAPPING BEAM) REINFORCEMENT IF AGREED BY CONTRACTOR AND STRUCTURAL ENGINEER
5. BOULDERS MAY BE RETAINED INSITU LANDWARD OF THE VERTICAL WALL IF AGREED WITH ANCHORING CONTRACTOR AND GEOTECHNICAL ENGINEER. OPTIONS FOR RETENTION WILL BE CONSIDERED ON-SITE BETWEEN THE PRINCIPAL'S GEOTECHNICAL, STRUCTURAL AND COASTAL ENGINEERS AND THE CONTRACTOR, BASED ON FACTORS SUCH AS THE EXTENT OF REQUIRED EXCAVATION AND POTENTIAL FOR UNDERMINING STRUCTURES AND NEED FOR TEMPORARY SHORING, COMPACTION OF BACKFILL THAT CAN BE ACHIEVED WITH BOULDERS IN PLACE, HOW MUCH CONSTRAINT THE BOULDERS IN PLACE WOULD BE TO FUTURE DEVELOPMENT, POTENTIAL IMPACT OF BOULDERS ON ANCHORING, AND POTENTIAL USES OF EXCAVATED BOULDERS
6. SCOUR LEVEL, PILE DEPTH AND ANCHOR CAPACITIES SUBJECT TO REVIEW TO DETERMINE THE REQUIRED MINIMUM FACTOR OF SAFETY OF 1.5 FOR GLOBAL STABILITY AND STRUCTURAL STABILITY (CONSIDERING DISTURBING AND BALANCING FORCES AND MOMENTS) SUBJECT TO GEOTECHNICAL ENGINEER'S MODELLING & CONFIRMATION AS PART OF DETAILED DESIGN

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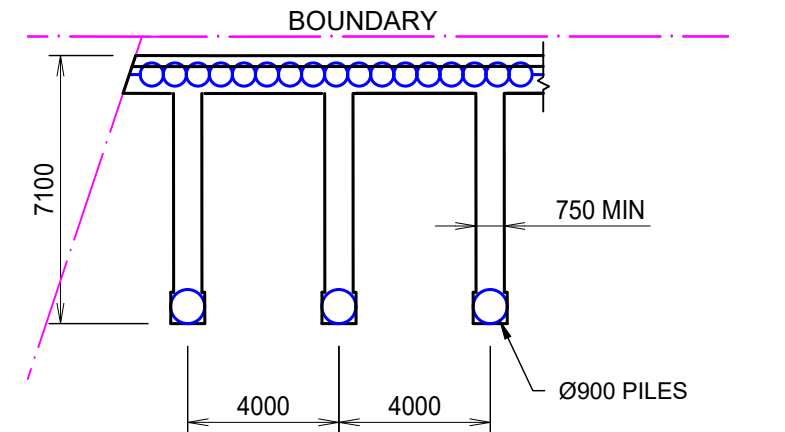
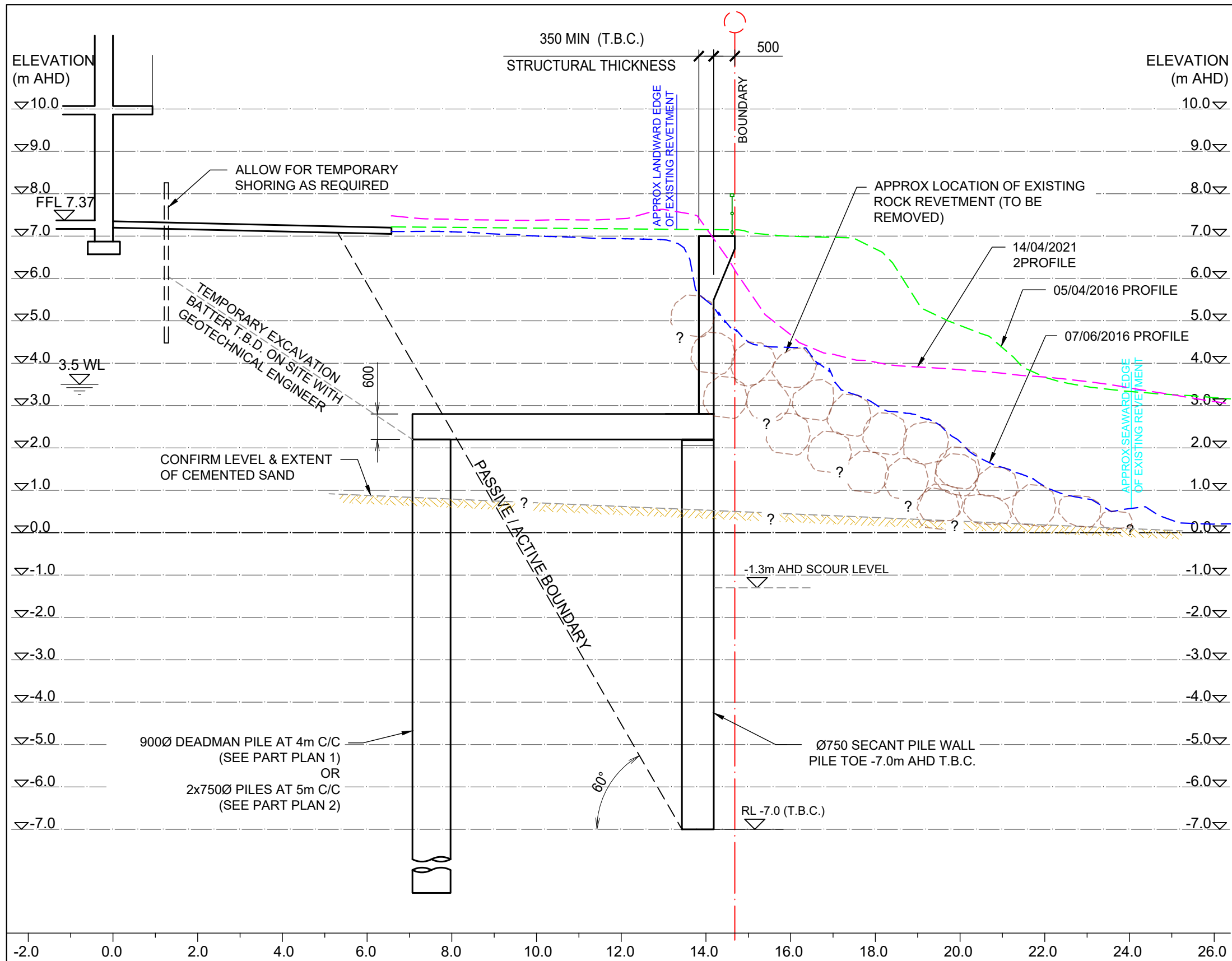
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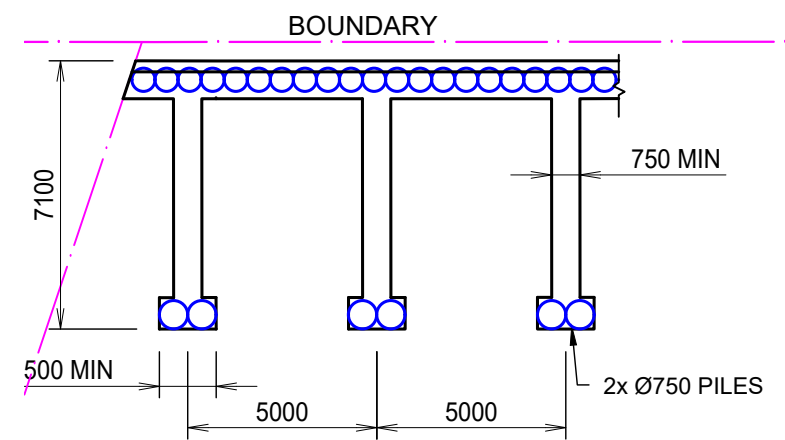
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SCALE	1 : 100	DATE		S11
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PART PLAN 1
SCALE 1:200



PART PLAN 2
SCALE 1:200

1. REFER TO DRAWING S10 FOR DETAILS OF WALL COMPONENTS
2. EXAMPLE SECTION HERE FROM 1204

PP	RY	DESCRIPTION	DATE	REV
PP	RY	REVISED FOR DA	23/07/21	G
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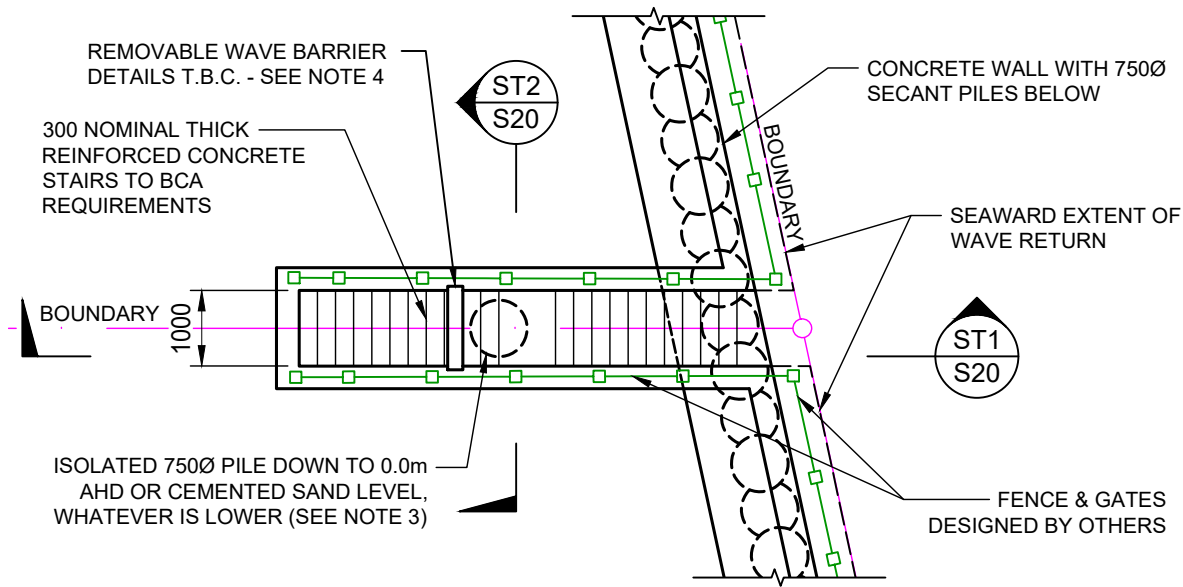
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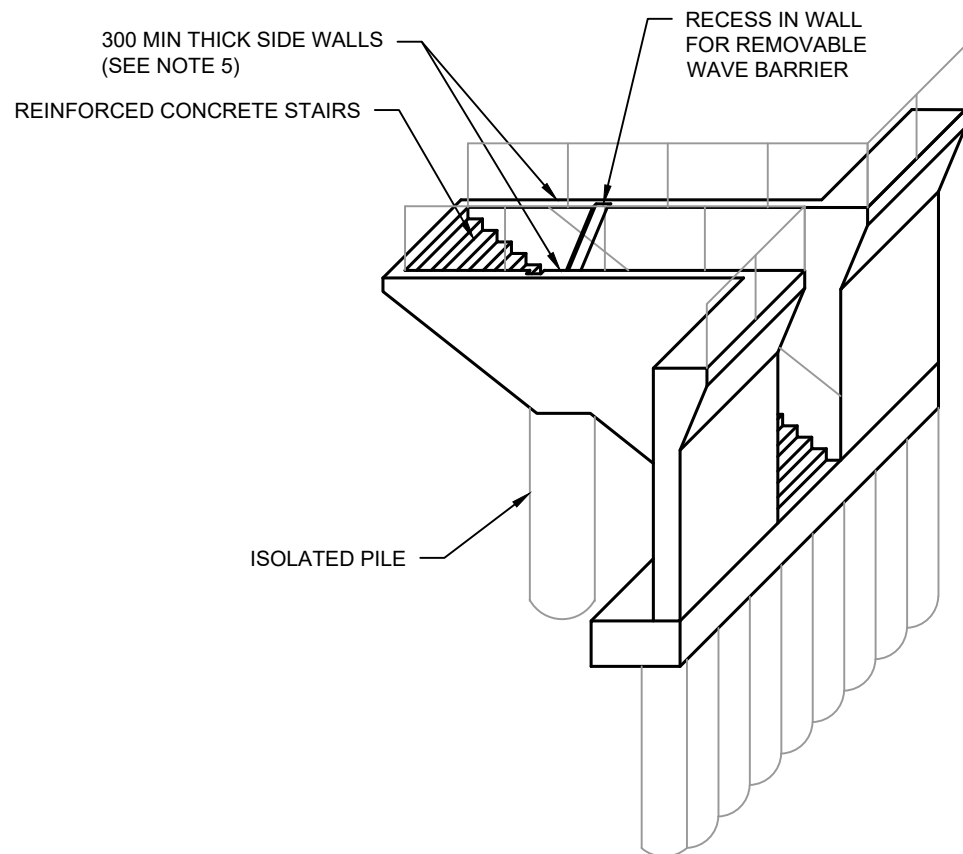
STRUCTURAL ENGINEERING DESIGN:
James Taylor & Associates
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SUITE 301, 115 MILITARY ROAD NEUTRAL BAY NSW 2090
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CHKD.	R.Y.			6355
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SCALE	1 : 100	DATE		S16
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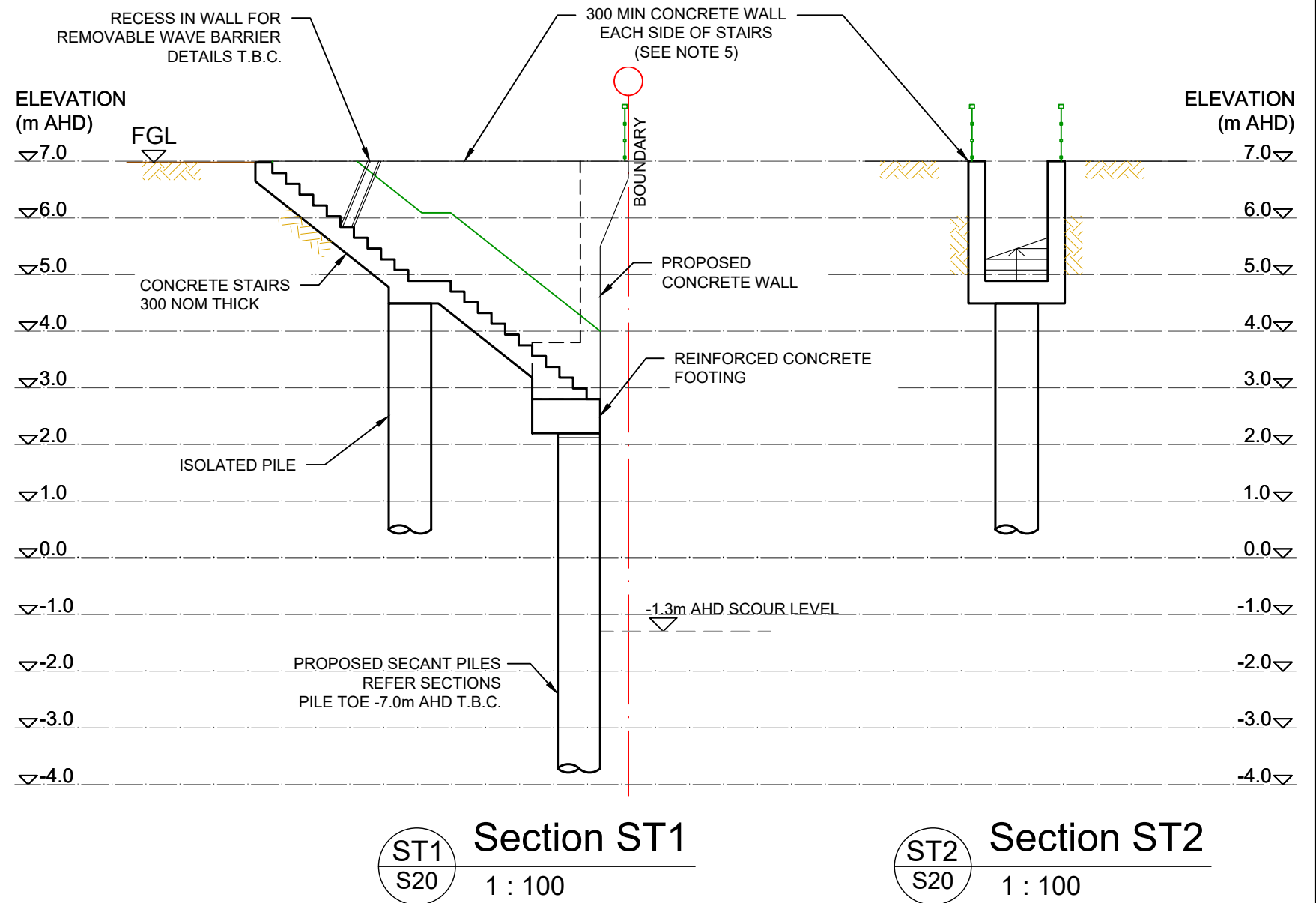


TYPICAL ACCESS STAIRS

SCALE 1:100



TYPICAL 3D VIEW OF STAIRS



1. BALUSTRADES TO STAIRS AND FENCING TO BE INCLUDED AS PER BCA REQUIREMENTS
2. FORM STAIRS TO BE COMPLIANT WITH BCA
3. CEMENTED SAND LEVEL TO BE CONFIRMED BY COASTAL OR GEOTECHNICAL ENGINEER
4. REMOVABLE WAVE BARRIER SHALL BE DESIGNED TO WITHSTAND WAVE FORCES AS NOMINATED BY THE COASTAL ENGINEER
5. FOR MAINTENANCE PURPOSES, MACHINES UP TO 45T ARE PERMITTED TO TRAVERSE OVER STAIR INDENTS AT ANY POINT. ROAD PLATES OR OTHER SAFE ACCESS MEASURES MAY BE REQUIRED, SUBJECT TO THE OPERATOR'S REQUIREMENTS.

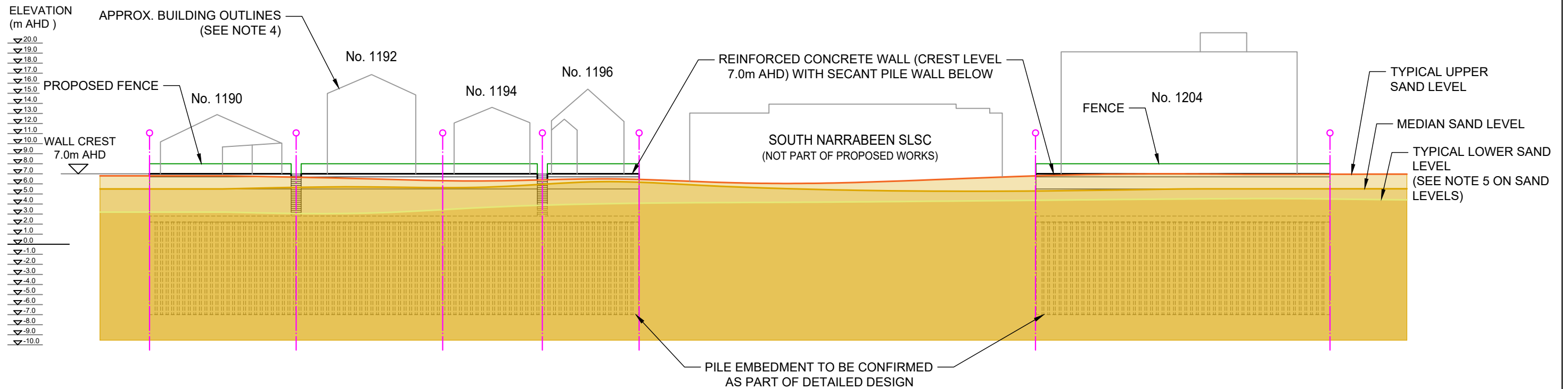
PP	RY	REVISION	DATE	REV
PP	RY	REVISED FOR DA	23/07/21	G
PP	RY	REVISED FOR DA	30/06/21	F
HL	RY	REVISED FOR DA	28/05/21	E
PP	RY	ISSUED FOR DA	24/05/21	D
PP	RY	FOR REVIEW	14/05/21	C
PP	RY	FOR REVIEW	10/05/21	B
PP	RY	WIP ISSUE	03/05/21	A
BY	CHKD	DESCRIPTION	DATE	REV

COASTAL PROTECTION WORKS AT 1190 TO 1196 & 1204 PITTWATER RD NARRABEEN, NSW	ACCESS STAIRS
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COASTAL ENGINEERING DESIGN: 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	STRUCTURAL ENGINEERING DESIGN: James Taylor & Associates Civil & Structural Consulting Engineers SUITE 301, 115 MILITARY ROAD NEUTRAL BAY NSW 2090 TEL: 02 99691999 EMAIL: mail@jamestaylorassociates.com.au
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APPRD. P.H.		DRAWING NO.
SCALE 1:100	DATE	S20

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EASTERN WALL ELEVATION

SCALE 1:400



- ELEVATION IS A PROJECTION ON THE PLANE ORTHOGONAL TO THE PROPERTY SIDE BOUNDARIES
- EXISTING FENCES, ANCILLARY BUILDINGS AND TREES ARE NOT SHOWN
- PORTIONS OF THE SEAWALL BELOW THE SAND LEVEL AT THAT TIME WOULD NOT BE VISIBLE
- BUILDING OUTLINES ARE APPROXIMATE AND DERIVED FROM LIDAR DATA CAPTURED ON 15 JUNE 2020 BY SPATIAL SERVICES, NSW DEPARTMENT OF CUSTOMER SERVICE AND FROM SURVEY DRAWING (REF.1 ON DWG S01)
- SAND LEVELS DERIVED FROM ANALYSIS OF 24 PROFILES CAPTURED FROM 1941 TO 2021 IN THE NSW BEACH PROFILE DATABASE. THE TYPICAL UPPER SAND LEVEL HAS BEEN EXCEEDED FOR ABOUT 10% OF THE TIME IN THE HISTORICAL RECORD. THE TYPICAL LOWER SAND LEVEL HAS BEEN EXCEEDED FOR ABOUT 90% OF THE TIME IN THE HISTORICAL RECORD

PP	RY	REVISED FOR DA	23/07/21	G	COASTAL PROTECTION WORKS AT 1190 TO 1196 & 1204 PITTWATER RD NARRABEEN, NSW	COASTAL ENGINEERING DESIGN: 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	STRUCTURAL ENGINEERING DESIGN: James Taylor & Associates Civil & Structural Consulting Engineers SUITE 301, 115 MILITARY ROAD NEUTRAL BAY NSW 2090 TEL: 02 99691999 EMAIL: mail@jamestaylorassociates.com.au	DESIGN	P.H.	DRAWN	P.P.	PROJECT NO. 6355
PP	RY	REVISED FOR DA	30/06/21	F				CHKD.	R.Y.	DRAWING NO. S30	REV G	
HL	RY	REVISED FOR DA	28/05/21	E				APPRD.	P.H.			
PP	RY	ISSUED FOR DA	24/05/21	D				SCALE	DATE			
PP	RY	FOR REVIEW	14/05/21	C				EASTERN WALL ELEVATION		COPYRIGHT: THIS DESIGN AND PLANS ARE NOT TO BE USED OR REPRODUCED WHOLLY OR IN PART WITHOUT WRITTEN PERMISSION FROM HORTON COASTAL ENGINEERING AND JAMES TAYLOR & ASSOCIATES		
PP	RY	FOR REVIEW	10/05/21	B	A3							
PP	RY	WIP ISSUE	03/05/21	A								
BY	CHKD	DESCRIPTION	DATE	REV								