

NORTHERN BEACHES COUNCIL

# WHALE BEACH NEIGHBOURHOOD CENTRE

231 WHALE BEACH ROAD, WHALE BEACH, NSW 2107

## DEVELOPMENT APPLICATION STORMWATER CONCEPT PLAN



REVISIONS / AMENDMENTS			
Rev	Date	Description	Verified
P1	18.12.19	ISSUED FOR DA	J.S.
P2	13.03.20	ISSUED FOR DA	J.S.

REVISIONS / AMENDMENTS			
Rev	Date	Description	Verified



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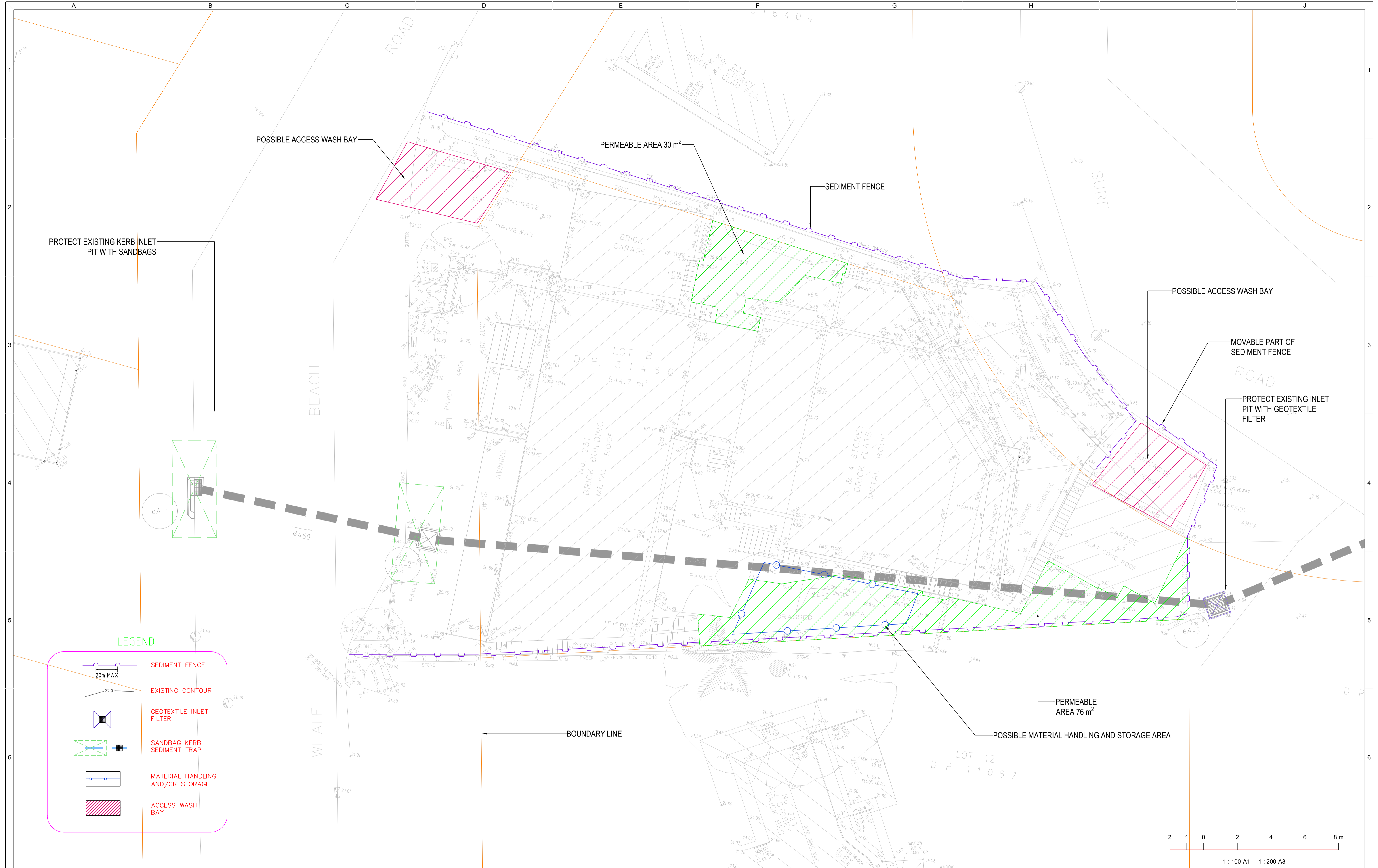


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PROJECT  
**WHALE BEACH NEIGHBOURHOOD DEVELOPMENT APPLICATION**  
231 WHALE BEACH ROAD,  
WHALE BEACH, NSW

TITLE  
**STORMWATER SERVICES COVER SHEET**

DA ISSUE		
NOT FOR CONSTRUCTION		
DRAWN	J.S.	SCALE @ A1
CHECKED	J.S.	<b>NTS</b>
APPROVED	J.S.	
CREATED	12/19	
JOB No.	DRAWING No.	REV
<b>190351</b>	<b>C000</b>	<b>P2</b>



**LEGEND**

- SEDIMENT FENCE
- EXISTING CONTOUR
- GEOTEXTILE INLET FILTER
- SANDBAG KERB SEDIMENT TRAP
- MATERIAL HANDLING AND/OR STORAGE
- ACCESS WASH BAY

REVISIONS / AMENDMENTS				REVISIONS / AMENDMENTS			
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PROJECT  
**WHALE BEACH NEIGHBOURHOOD DEVELOPMENT APPLICATION**  
231 WHALE BEACH ROAD,  
WHALE BEACH, NSW

TITLE  
**STORMWATER SERVICES EXISTING GROUND LEVEL SOIL AND EROSION CONTROL LAYOUT PLAN**

**DA ISSUE**  
NOT FOR CONSTRUCTION

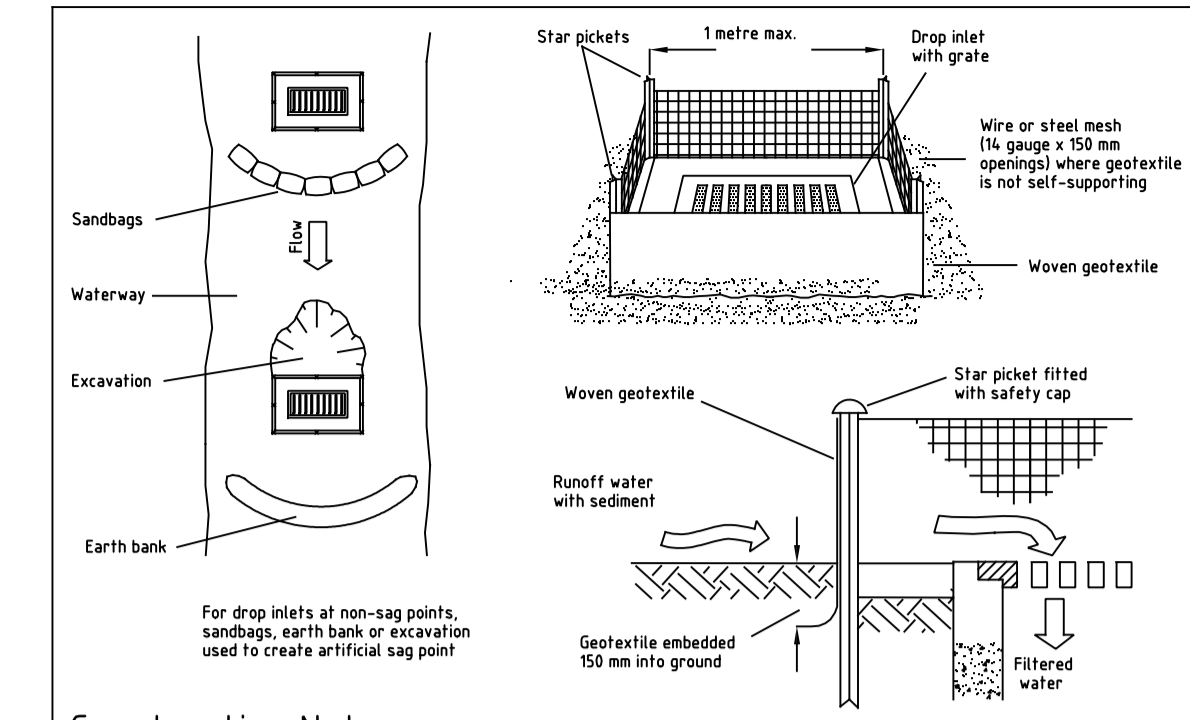
DRAWN J.S. SCALE @ A1  
CHECKED J.S.  
APPROVED J.S. **1:100**  
CREATED 12/19  
JOB No. DRAWING No. REV  
**190351 C101 P2**

# SEDIMENT & EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL IMPLEMENT ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES PRIOR TO THE COMMENCEMENT OF ANY WORKS BEING CARRIED OUT. ALL SOIL AND EROSION MEASURES SHALL BE MAINTAINED AND KEPT IN PLACE FOR THE FULL DURATION OF THE WORKS AND SHALL ONLY BE REMOVED AT FINAL STABILISATION OF THE WORKS. WHERE IT IS NECESSARY TO UNDERTAKE STRIPPING IN ORDER TO CONSTRUCT A SEDIMENT CONTROL DEVICE ONLY SUFFICIENT GROUND SHALL BE STRIPPED TO ALLOW CONSTRUCTION.
2. ALL SOIL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED AS INDICATED ON THESE DRAWINGS. LOCATION AND EXTENT OF SOIL AND WATER MANAGEMENT DEVICES IS DIAGRAMMATIC ONLY AND THE ACTUAL REQUIREMENTS SHALL BE CONFIRMED ON SITE PRIOR TO COMMENCEMENT.
3. CONFORMITY WITH THIS PLAN SHALL IN NO WAY REDUCE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT AGAINST WATER DAMAGE DURING THE COURSE OF THE CONTRACT. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO ENSURE THAT ANY NECESSARY CONTROL IS IN PLACE EVEN THOUGH SUCH CONTROL MAY NOT BE SHOWN ON THE PLAN.
4. THE CONTRACTOR SHALL INFORM ALL SUBCONTRACTORS AND ALL EMPLOYEES OF THEIR RESPONSIBILITIES IN MINIMISING THE POTENTIAL FOR SOIL EROSION AND POLLUTION TO DOWNSTREAM AREAS
5. APART FROM SEDIMENT BASINS, THE CONTRACTOR SHALL REGULARLY MAINTAIN SEDIMENT AND EROSION CONTROL STRUCTURES AND DESILT SUCH STRUCTURES PRIOR TO THE REDUCTION IN CAPACITY OF 30% DUE TO ACCUMULATED SEDIMENT. THE SEDIMENT SHALL BE DISPOSED OF ON SITE IN A MANNER APPROVED BY THE ENGINEER.
6. THE CONTRACTOR SHALL TEMPORARILY REHABILITATE WITHIN TEN (10) DAYS ANY DISTURBED AREAS PROVIDING A MINIMUM 60% COVER. FINAL REHABILITATION IS TO BE PROVIDED WITHIN A FURTHER 60 DAYS WITH A MINIMUM 70% COVER.
8. THE CONTRACTOR SHALL PROVIDE WATERING OF THE VEGETATED BATTERS FOR MAINTENANCE PERIOD. PLANT, MACHINERY AND VEHICLES SHALL NOT BE DRIVEN OVER GRASSSED AREAS UNLESS ON AN APPROVED HAULAGE ROUTE.
9. ALL DRAINAGE WORKS SHALL BE CONSTRUCTED AND STABILISED AS QUICKLY AS POSSIBLE TO MINIMISE RISK OF EROSION.
10. SITE ACCESS SHALL BE RESTRICTED TO THE NOMINATED POINTS. THE CONTRACTOR SHALL PROVIDE STABILISED SITE ACCESS.
11. DUST AND SITE DISTURBANCE MUST BE KEPT TO A MINIMUM. DURING WINDY WEATHER, LARGE, UNPROTECTED AREAS MUST BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO REDUCE WIND EROSION. ERECT BARRIER FENCING TO MINIMISE LAND DISTURBANCE BY PREVENTING VEHICULAR AND PEDESTRIAN ACCESS TO AREAS BEING REHABILITATED AND LANDS THAT DO NOT NEED TO BE DISTURBED BY THIS PROJECT.
12. STOCKPILE TOPSOILS, SUBSOILS AND OTHER MATERIALS SEPARATELY.
13. TOPSOIL SHALL BE STORED IN LOW MOUNDS NO MORE THAN 2 METRES HIGH AND RE-USED WITHIN TWO MONTHS TO MAINTAIN ACTIVE POPULATIONS OF BENEFICIAL SOIL MICROBES AND SEED.
14. PLACE ALL STOCKPILES AT LEAST FIVE METRES FROM AREAS OF LIKELY CONCENTRATED OR HIGH VELOCITY FLOWS, ESPECIALLY EARTH BANKS AND ROADS. IF NECESSARY, EARTH BANKS OR DRAINS WILL BE CONSTRUCTED TO DIVERT LOCALISED RUN-ON.
15. TURN TOPSOIL STOCKPILES OVER TO AERATE THEM AT MONTHLY INTERVALS. ENSURE VEGETATION IS NOT INCORPORATED INTO THE SOIL.
16. AVOID REVERSING THE SOIL PROFILE MATERIALS DURING FILL OPERATIONS - REPLACE DISTURBED SOILS IN THEIR ORIGINAL ORDER.

17. ON COMPLETION OF MAJOR EARTHWORKS AND BEFORE ADDING TOPSOIL LEAVE DISTURBED LANDS WITH A LOOSE SURFACE. ALTERNATELY, DISTURBED AREAS PREVIOUSLY COMPACTED BY CONSTRUCTION WORKS WILL BE RIPPED TO MORE THAN 200-MM ALONG THE CONTOUR BEFORE APPLYING TOPSOIL.
18. PROVIDING MATERIALS ARE AVAILABLE, SPREAD TOPSOIL TO A MINIMUM DEPTH OF 75mm IN REVEGETATION AREAS ON SLOPES OF 4(H):1(V) OR LESS AND TO A DEPTH OF 40 TO 60mm IN REVEGETATION AREAS STEEPER THAN 4:1.
19. LEAVE TOPSOIL IN A SCARIFIED OR ROUGH CONDITION ONCE REPLACED TO HELP MOISTURE INFILTRATION AND REDUCE SOIL EROSION.
20. ENSURE SOIL IS THOROUGHLY SOAKED TO A DEPTH OF 75mm (RAIN OR IRRIGATION) IMMEDIATELY BEFORE PLANTING.
21. HANDLE TOPSOIL ONLY WHEN IT IS MOIST (NOT WET OR DRY) TO AVOID DECLINE OF SOIL STRUCTURE
22. SEDIMENT BASINS SHALL BE MAINTAINED FOR THE ENTIRE DURATION OF THE PROJECT OR UNTIL SUCH TIME AS ALL DISTURBED AREAS ARE HYDROMULCHED.
23. WHERE FLOCCULATION OF BASINS IS REQUIRED UNLESS OTHERWISE SPECIFIED THE RECOMMENDED INITIAL DOSING IS 30KG OF GYPSUM PER 100 CUBIC METRES OF BASIN VOLUME. THE CONTRACTOR MAY VARY THIS RATE SUBJECT TO TESTING OF PREVIOUS WATER SAMPLES AND THE ACHIEVEMENTS OF THE REQUIRED WATER QUALITY STANDARDS.
24. ANY DAMS TO BE DESILTED SHALL BE FLOCCULATED TO SETTLE ANY SUSPENDED SOLIDS CLEAR WATER SHALL THEN BE PUMPED OUT IN A MANNER THAT WILL NOT CAUSE DOWNSTREAM EROSION. THE DAM WALL SHALL THEN BE BREACHED AND ANY SILT REMOVED AND PLACED IN A SUITABLY CONSTRUCTED DRYING BASIN. WHEN DRY, THE SILT SHALL BE REMOVED FROM SITE OR MIXED WITH TOP SOIL FOR FUTURE SPREADING.
25. THE CONTRACTOR SHALL MAINTAIN A LOG BOOK DETAILING:
  - RECORDS OF ALL RAINFALL
  - CONDITION OF SOIL AND WATER MANAGEMENT STRUCTURES
  - ANY APPLICATION OF FLOCCULATING AGENTS TO SEDIMENT BASIN
  - VOLUMES OF ALL WATER DISCHARGED FROM SEDIMENT BASINS
  - ANY ADDITIONAL REMEDIAL WORKS REQUIRED.
26. THE LOG BOOK SHALL BE MAINTAINED ON A WEEKLY BASIS AND BE MADE AVAILABLE TO ANY AUTHORISED PERSON UPON REQUEST. THE ORIGINAL LOG BOOK SHALL BE ISSUED TO THE PROJECT MANAGER AT THE COMPLETION OF WORKS
27. ALL ROAD EMBANKMENTS TO BE STABILISED AS PER LANDSCAPE ARCHITECTS DETAILS.
28. A SELF AUDITING PROGRAM SHOULD BE ESTABLISHED BASED ON A CHECK SHEET DEVELOPED FOR THE SITE. A SITE INSPECTION USING THE CHECK SHEET SHOULD BE MADE BY THE SITE MANAGER AT LEAST WEEKLY, IMMEDIATELY BEFORE SITE CLOSURE AND IMMEDIATELY FOLLOWING RAINFALL EVENTS THAT CAUSE RUNOFF.
29. UNDERTAKE THE SELF AUDIT BY:
  - WALKING AROUND THE SITE SYSTEMATICALLY (E.G. CLOCKWISE)
  - RECORDING THE CONDITION OF EVERY BMP EMPLOYED
  - RECORDING MAINTENANCE REQUIREMENTS (IF ANY) FOR EACH BMP
  - RECORDING THE VOLUMES OF SEDIMENT REMOVED FROM THE SEDIMENT
  - RETENTION SYSTEMS WHERE APPLICABLE
  - RECORDING THE SITE WHERE SEDIMENT IS DISPOSED
  - FORWARDING A SIGNED DUPLICATE OF THE COMPLETED CHECK SHEET TO THE PROJECT MANAGER/DEVELOPER/SITE OPERATOR FOR THEIR INFORMATION

30. IN PARTICULAR, INSPECT:
  - LOCATIONS WHERE VEHICLES ENTER AND LEAVE THE SITE
  - ALL INSTALLED EROSION AND SEDIMENT CONTROL MEASURES, ENSURING THEY ARE OPERATING CORRECTLY
  - AREAS THAT MIGHT SHOW WHETHER SEDIMENT OR OTHER POLLUTANTS ARE LEAVING THE SITE OR HAVE POTENTIAL TO DO SO
  - ALL DISCHARGE POINTS, TO ASSESS WHETHER THE EROSION AND SEDIMENT CONTROL MEASURES ARE EFFECTIVE IN PREVENTING IMPACTS TO THE RECEIVING WATERS
31. A SITE INSPECTION USING THE CHECK SHEET WILL BE MADE BY THE SITE MANAGER AT LEAST WEEKLY, IMMEDIATELY BEFORE SITE CLOSURE, AND IMMEDIATELY FOLLOWING RAINFALL EVENTS GREATER THAN 5mm IN 24 HOURS.

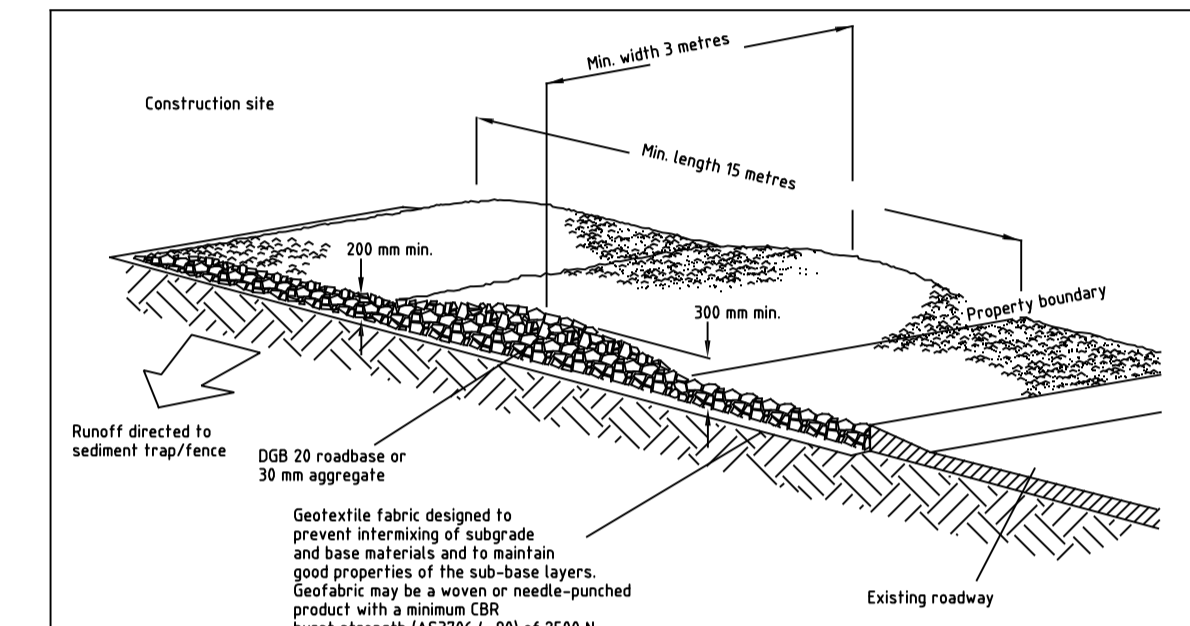


## Construction Notes

1. Fabricate a sediment barrier made from geotextile or straw bales.
2. Follow Standard Drawing 6-7 and Standard Drawing 6-8 for installation procedures for the straw bales or geofabric. Reduce the picket spacing to 1 metre centres.
3. In waterways, artificial sag points can be created with sandbags or earth banks as shown in the drawing.
4. Do not cover the inlet with geotextile unless the design is adequate to allow for all waters to bypass it.

## GEOTEXTILE INLET FILTER

SD 6-12

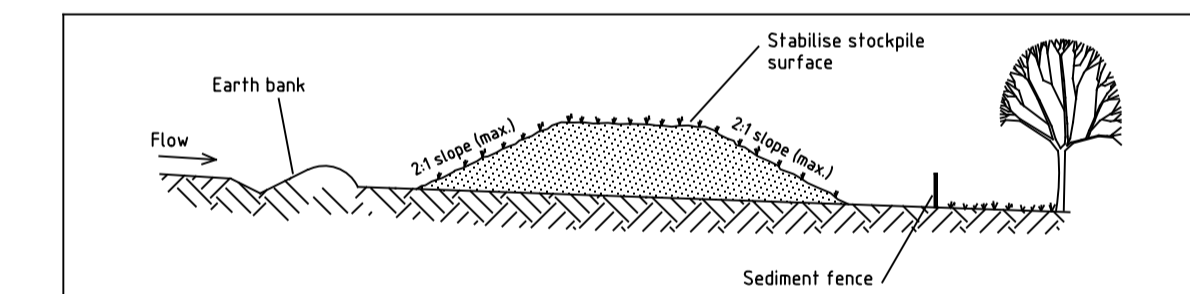


## Construction Notes

1. Strip the topsoil, level the site and compact the subgrade.
2. Cover the area with needle-punched geotextile.
3. Construct a 200 mm thick pad over the geotextile using road base or 30 mm aggregate.
4. Ensure the structure is at least 15 metres long or to building alignment and at least 3 metres wide.
5. Where a sediment fence joins onto the stabilised access, construct a hump in the stabilised access to divert water to the sediment fence

## STABILISED SITE ACCESS

SD 6-14

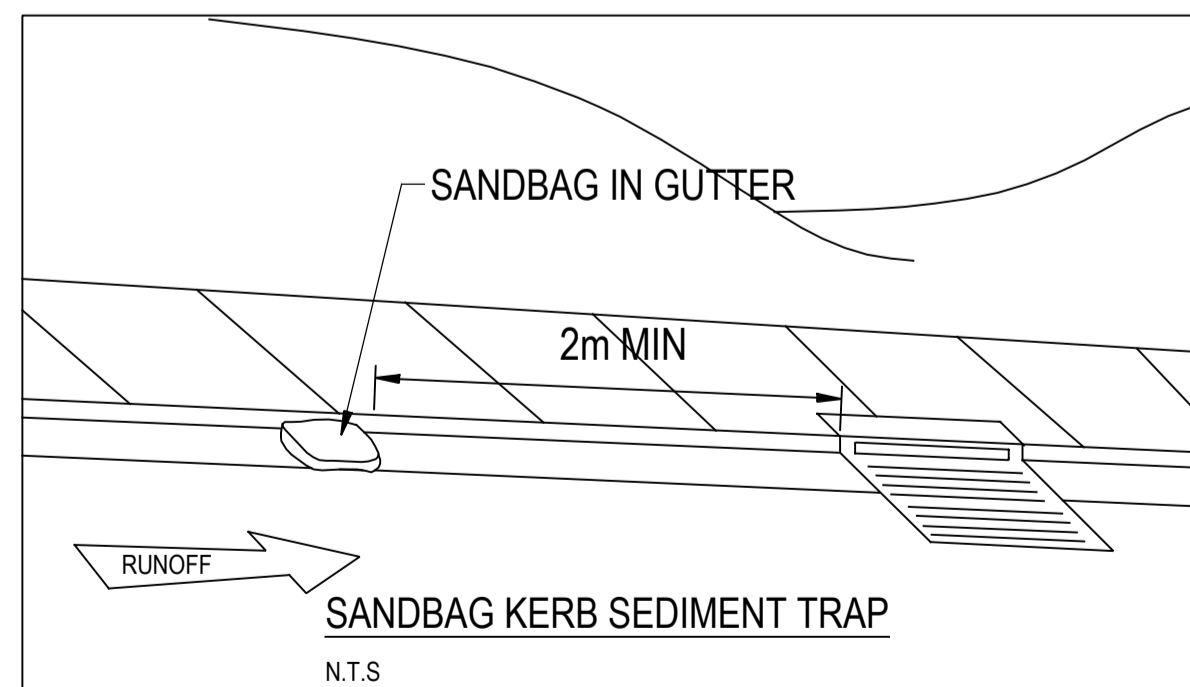


## Construction Notes

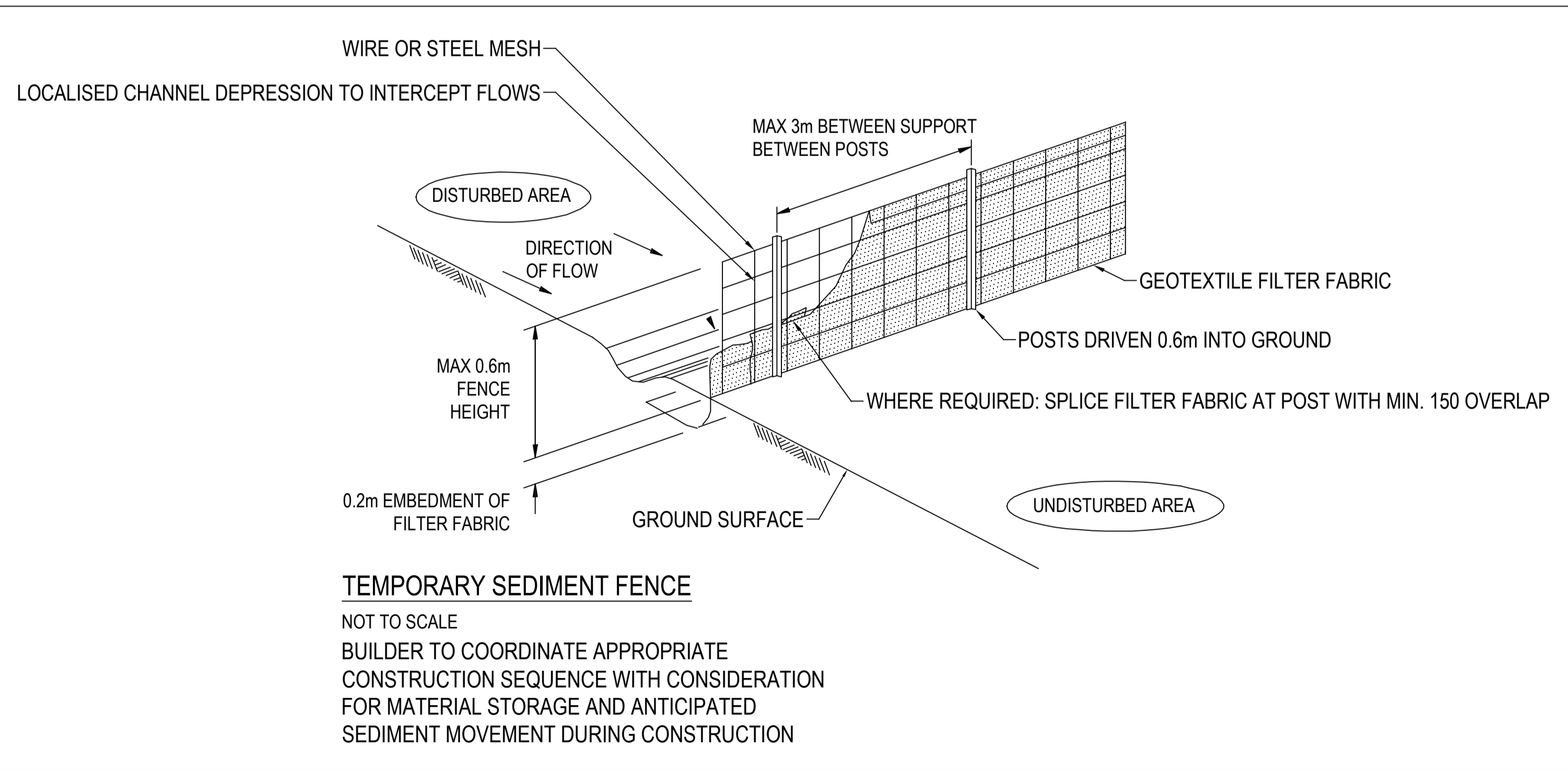
1. Place stockpiles more than 2 (preferably 5) metres from existing vegetation, concentrated water flow, roads and hazard areas.
2. Construct on the contour as low, flat, elongated mounds.
3. Where there is sufficient area, topsoil stockpiles shall be less than 2 metres in height.
4. Where they are to be in place for more than 10 days, stabilise following the approved ESCP or SWMP to reduce the C-factor to less than 0.10.
5. Construct earth banks (Standard Drawing 5-5) on the upslope side to divert water around stockpiles and sediment fences (Standard Drawing 6-8) 1 to 2 metres downslope.

## STOCKPILES

SD 4-1



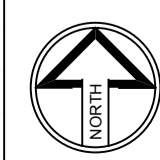
N.T.S.



## TEMPORARY SEDIMENT FENCE

NOT TO SCALE  
 BUILDER TO COORDINATE APPROPRIATE CONSTRUCTION SEQUENCE WITH CONSIDERATION FOR MATERIAL STORAGE AND ANTICIPATED SEDIMENT MOVEMENT DURING CONSTRUCTION

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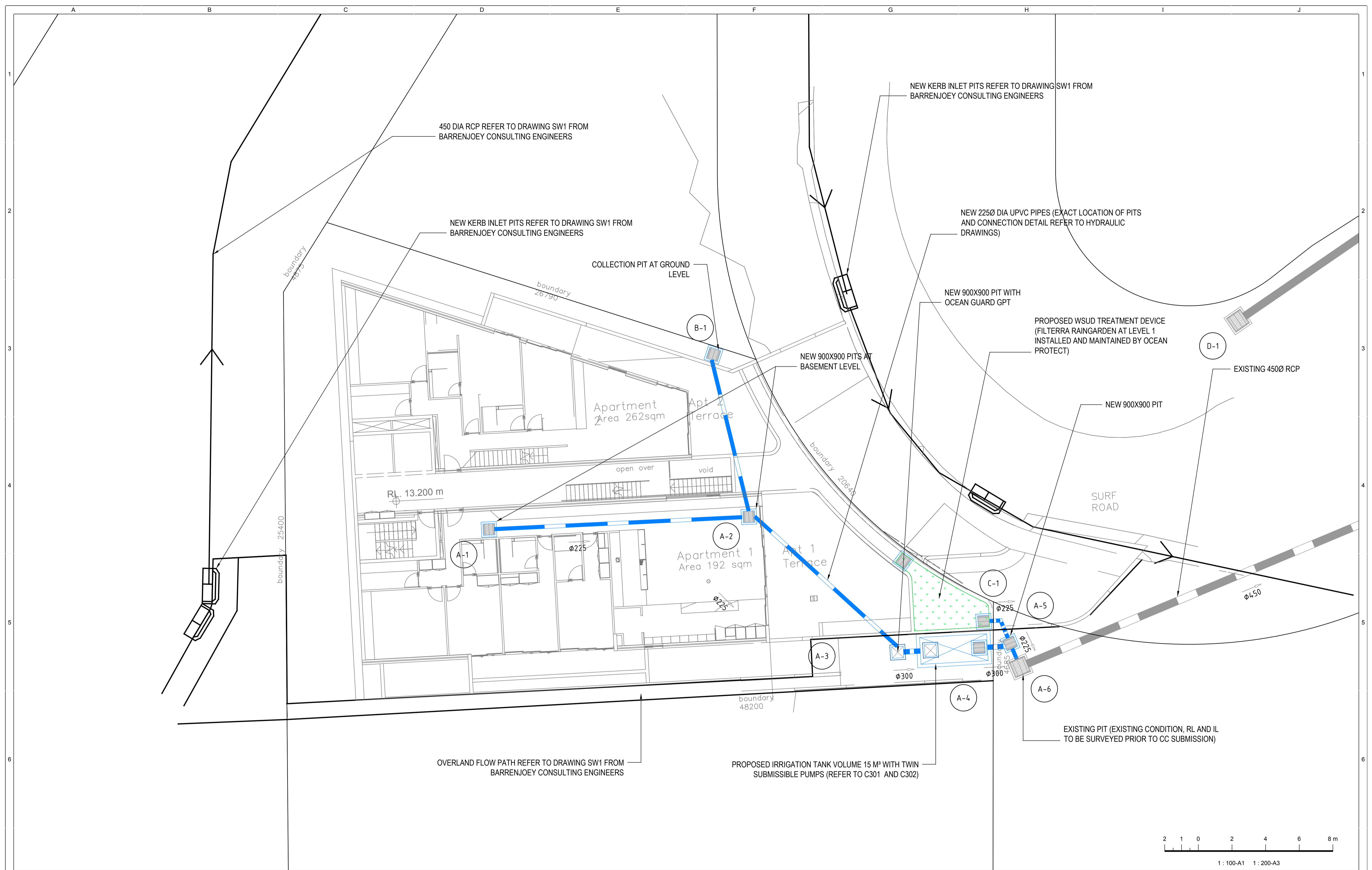
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PROJECT  
**WHALE BEACH  
 NEIGHBOURHOOD  
 DEVELOPMENT APPLICATION**  
 231 WHALE BEACH ROAD,  
 WHALE BEACH, NSW

TITLE  
**STORMWATER SERVICES  
 EXISTING GROUND LEVEL  
 SOIL AND EROSION CONTROL  
 DETAIL AND NOTES**

**DA ISSUE**  
 NOT FOR CONSTRUCTION

DRAWN	J.S.	SCALE @ A1
CHECKED	J.S.	
APPROVED	J.S.	<b>NTS</b>
CREATED	12/19	
JOB No.	DRAWING No.	REV
<b>190351</b>	<b>C102</b>	<b>P2</b>



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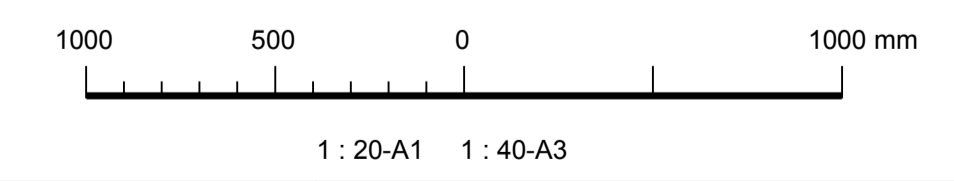
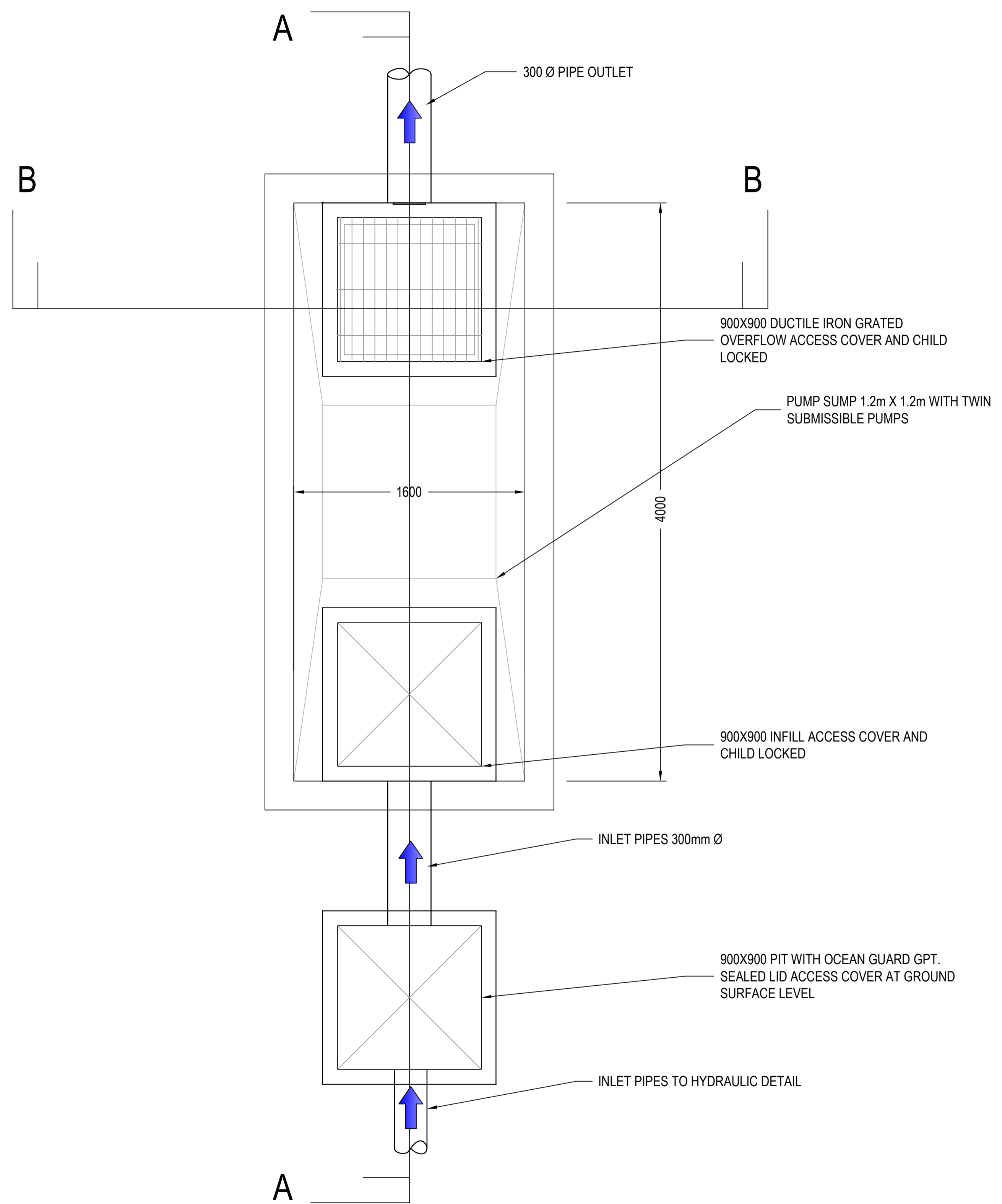
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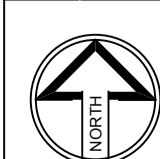
TITLE  
**STORMWATER SERVICES WATER SENSITIVE URBAN DESIGN LAYOUT PLAN**

**DA ISSUE**  
NOT FOR CONSTRUCTION  
DRAWN J.S. SCALE @ A1  
CHECKED J.S.  
APPROVED J.S. **1:100**  
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**190351 C201 P2**



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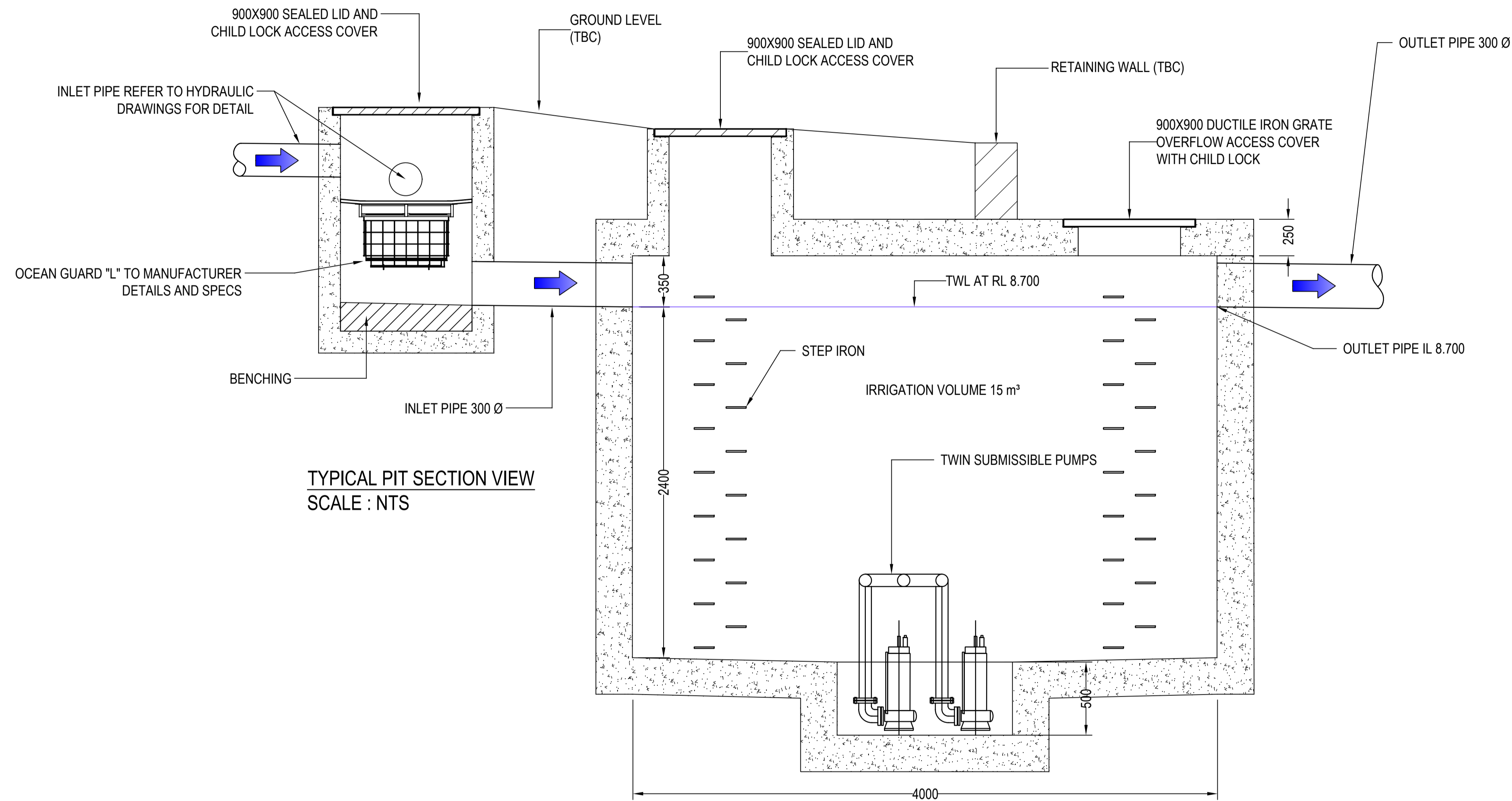
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231 WHALE BEACH ROAD,  
WHALE BEACH, NSW

TITLE  
**STORMWATER SERVICES IRRIGATION TANK PLAN VIEW**

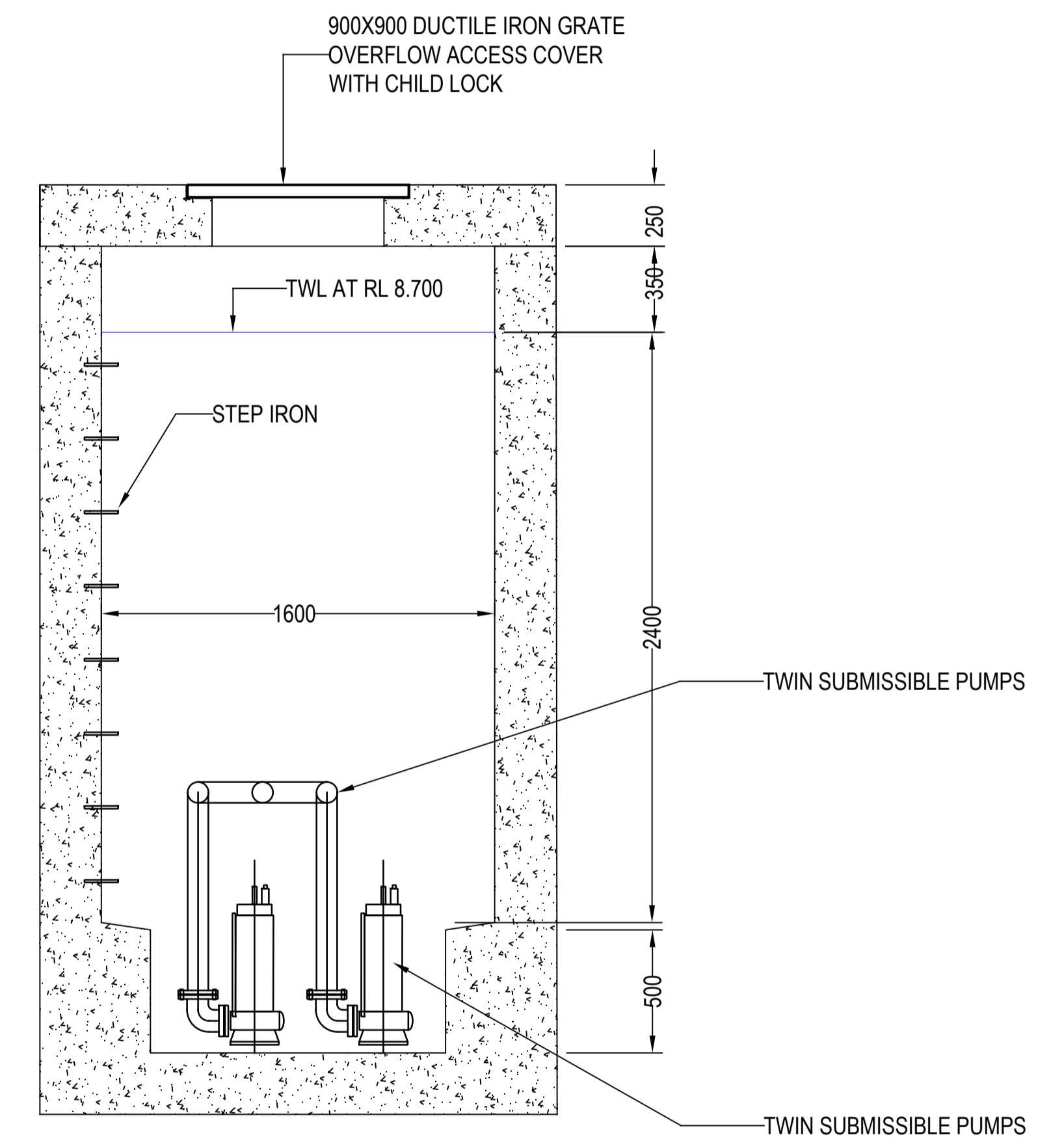
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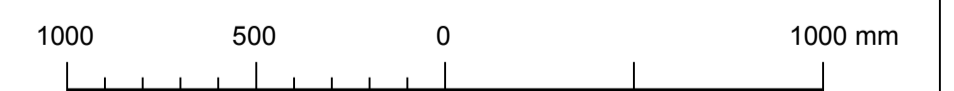


TYPICAL PIT SECTION VIEW  
SCALE : NTS

SECTION A-A



SECTION B-B



1:20-A1 1:40-A3

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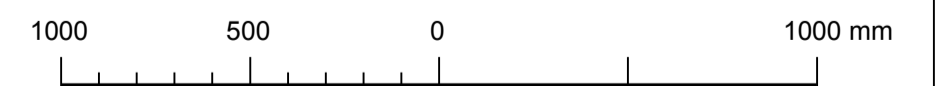
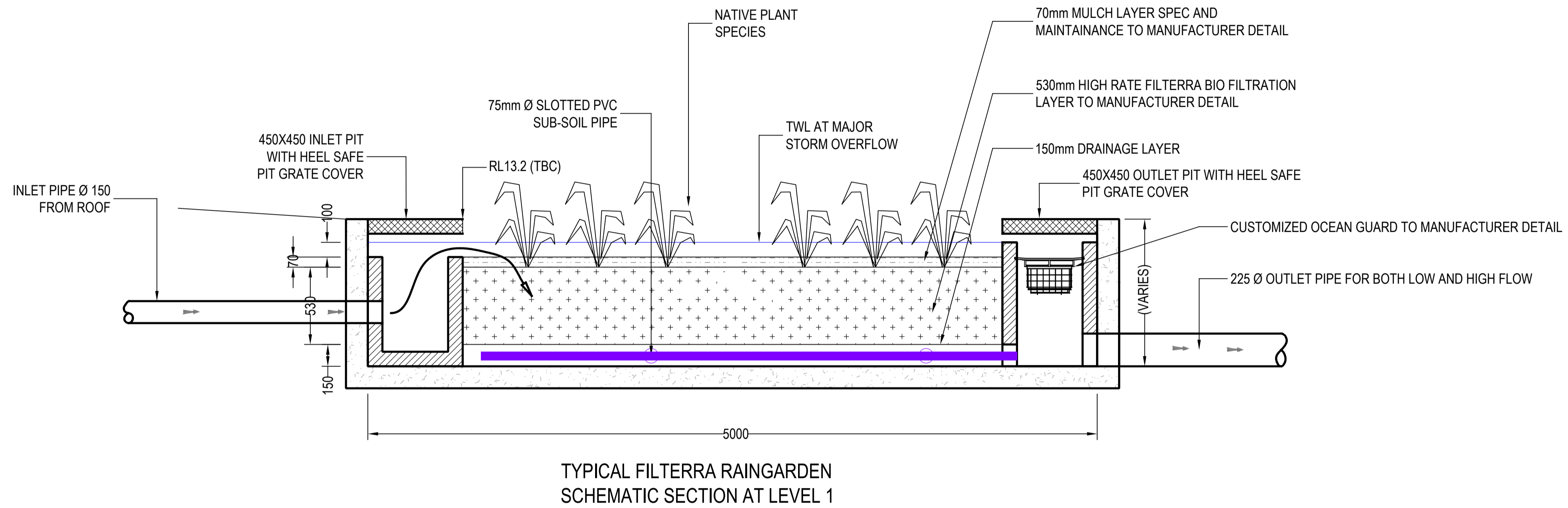
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231 WHALE BEACH ROAD,  
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TITLE  
**STORMWATER SERVICES  
IRRIGATION TANK  
SECTIONAL VIEW**

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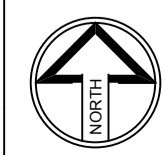
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**190351 C302 P2**



1:20-A1 1:40-A3

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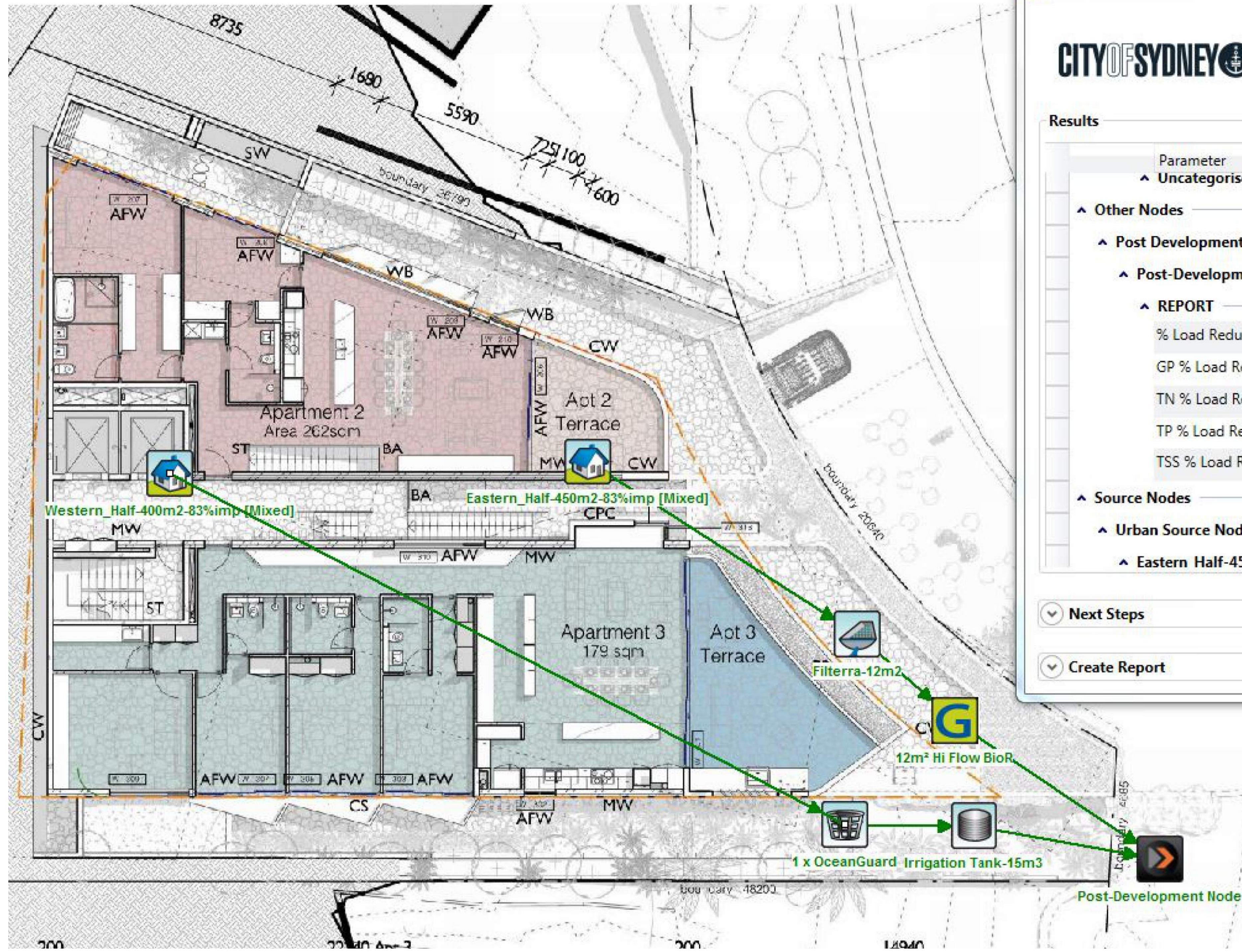
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231 WHALE BEACH ROAD,  
WHALE BEACH, NSW

TITLE  
**STORMWATER SERVICES  
TYPICAL FILTERRA GARDEN  
CROSS SECTION**

**DA ISSUE**  
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CHECKED	J.S.	<b>1:20</b>
APPROVED	J.S.	
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<b>190351</b>	<b>C401</b>	<b>P2</b>



MUSIC-link

CITY OF SYDNEY music link

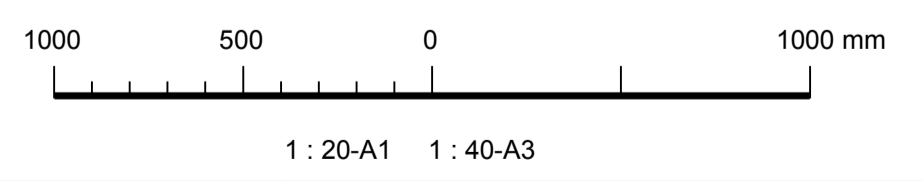
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Parameter	Min	Max	Actual	Result
Uncategorised Parameters				
Other Nodes				
Post Development Nodes				
Post-Development Node				
REPORT				
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GP % Load Reduction	90	None	100	✓
TN % Load Reduction	45	None	50.5	✓
TP % Load Reduction	65	None	66.6	✓
TSS % Load Reduction	85	None	93.5	✓
Source Nodes				
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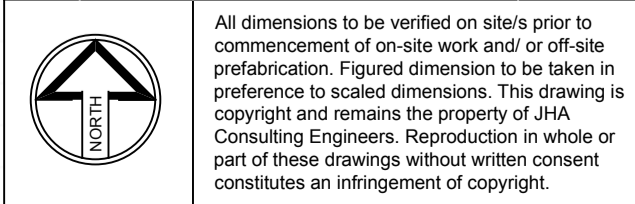
Next Steps

Create Report

- NOTE:
- NORTHERN BEACHES COUNCIL STORMWATER QUALITY TREATMENT TARGETS ARE SIMILAR TO CITY OF SYDNEY COUNCIL TREATMENT TARGETS.
  - IN THIS MUSIC ANALYSIS, WE ARE USING THE LATEST MUSIC LINK DOWNLOADED FROM CITY OF SYDNEY COUNCIL PORTAL.
  - THIS MUSIC MODEL WILL BE PROVIDED DURING CC SUBMISSION STAGE.



REVISIONS / AMENDMENTS				REVISIONS / AMENDMENTS			
Rev	Date	Description	Verified	Rev	Date	Description	Verified
P1	18.12.19	ISSUED FOR DA	J.S.				
P2	13.03.20	ISSUED FOR DA	J.S.				



All dimensions to be verified on site prior to commencement of on-site work and/or off-site prefabrication. Figured dimension to be taken in preference to scaled dimensions. This drawing is copyright and remains the property of JHA Consulting Engineers. Reproduction in whole or part of these drawings without written consent constitutes an infringement of copyright.

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PROJECT  
**WHALE BEACH NEIGHBOURHOOD DEVELOPMENT APPLICATION**  
231 WHALE BEACH ROAD,  
WHALE BEACH, NSW

TITLE  
**STORMWATER SERVICES MUSIC ANALYSIS AND RESULTS**

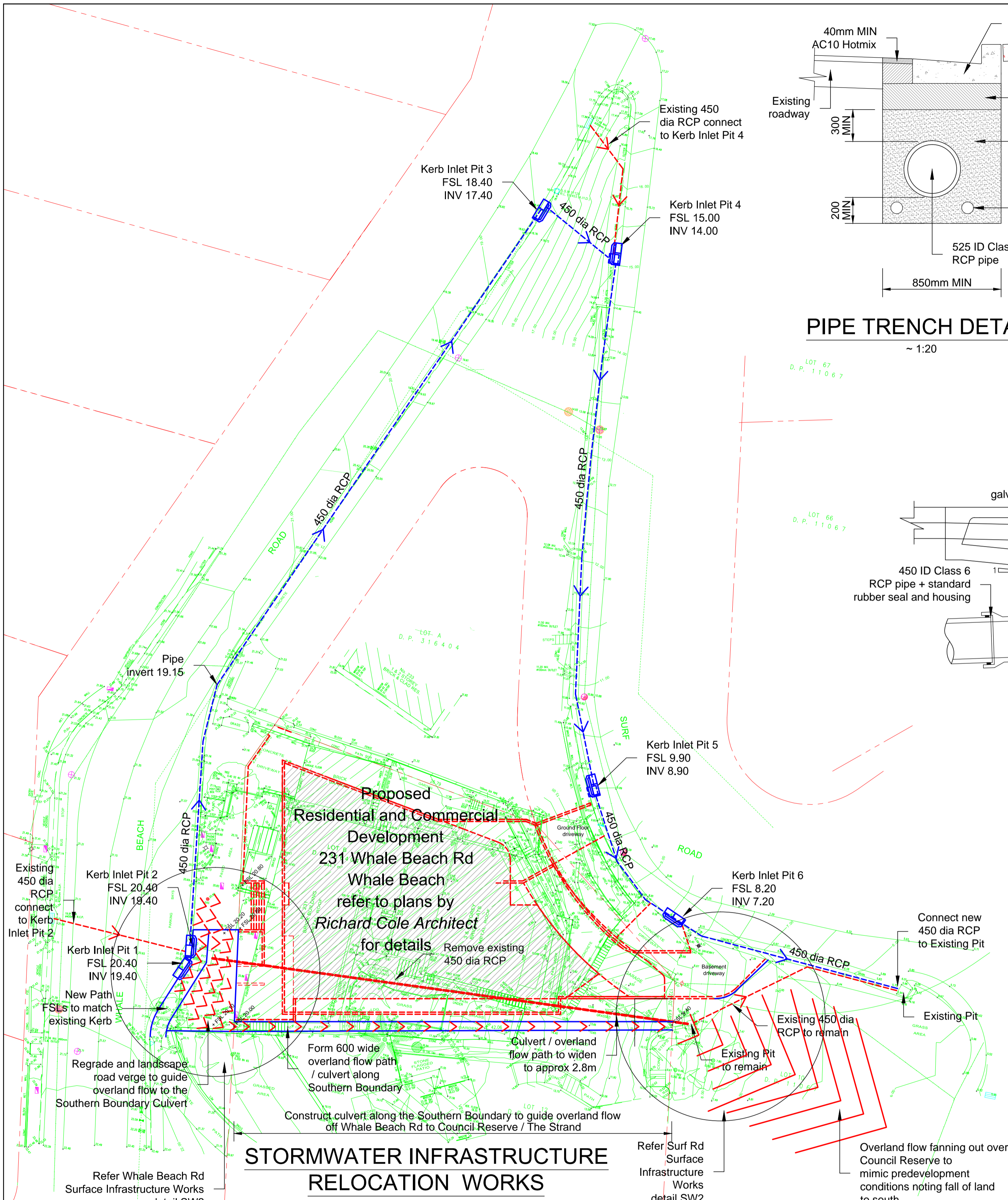
**DA ISSUE**  
NOT FOR CONSTRUCTION

SCALE @ A1

NTS

190351 C501 P2

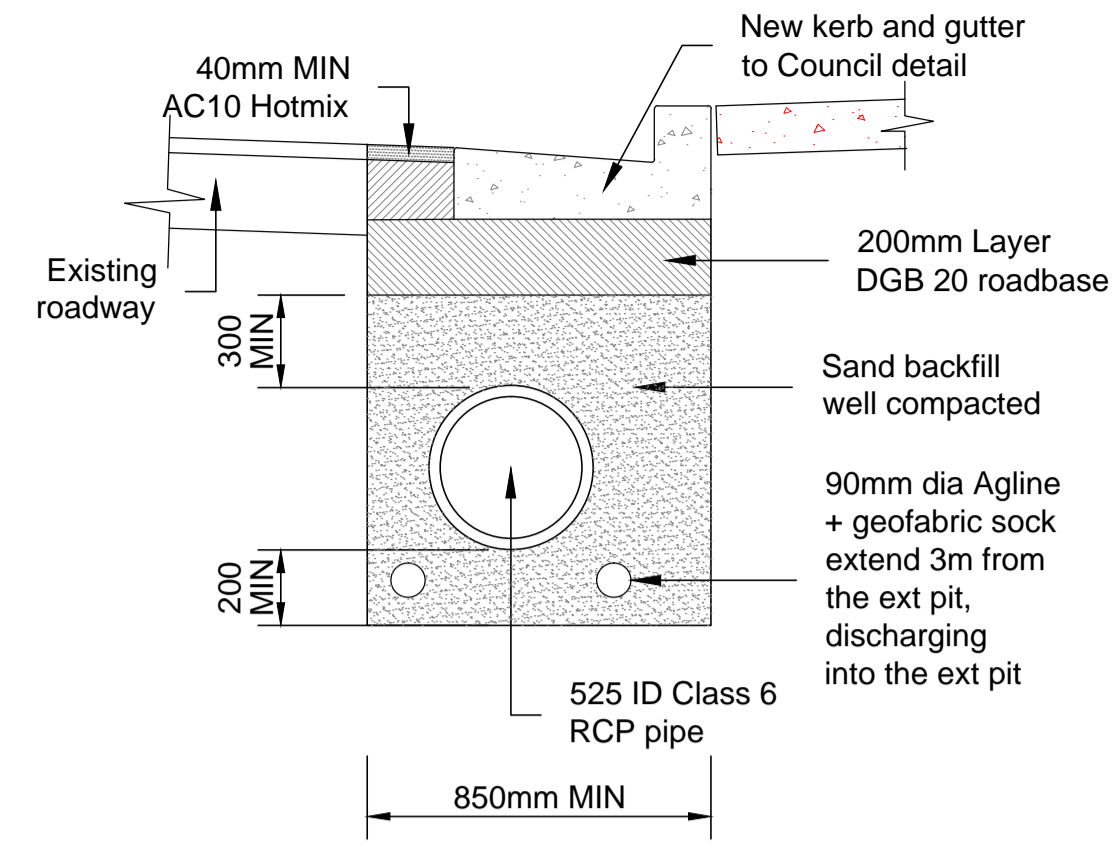




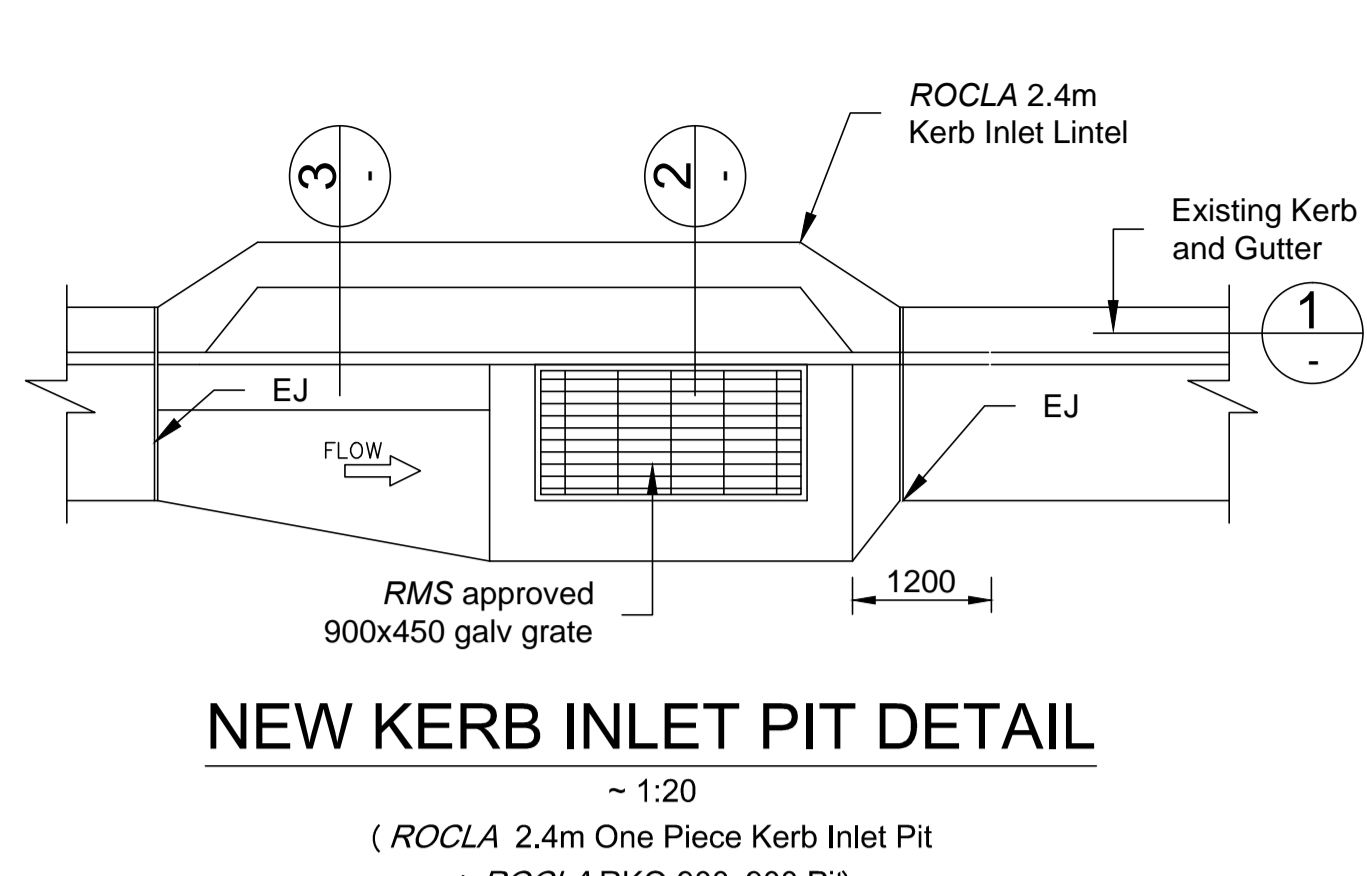
### STORMWATER INFRASTRUCTURE RELOCATION WORKS

PROPOSED WORKS  
 REMOVE THE EXISTING 450 RCP WITHIN No 231, INSTALL NEW KERB INLET PITS AND 450 RCP ALONG WHALE BEACH / SURF RD, INSTALL AN EMERGENCY OVERLAND FLOW PATH ALONG THE SOUTHERN BOUNDARY OF No 231  
 CATCHMENT AREA ~ 6300m<sup>2</sup> (~ 50% IMPERVIOUS)  
 TOTAL DESIGN FLOW RATE 5% AEP EVENT ~ 352 l/s  
 TOTAL DESIGN FLOW RATE 1% AEP EVENT ~ 432 l/s  
 1% AEP OVERLAND FLOW (with 50% pit blockage) ~ 60 l/s

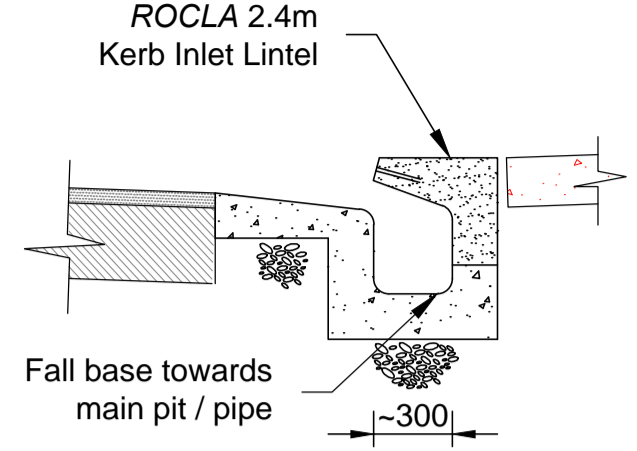
### PIPE TRENCH DETAIL



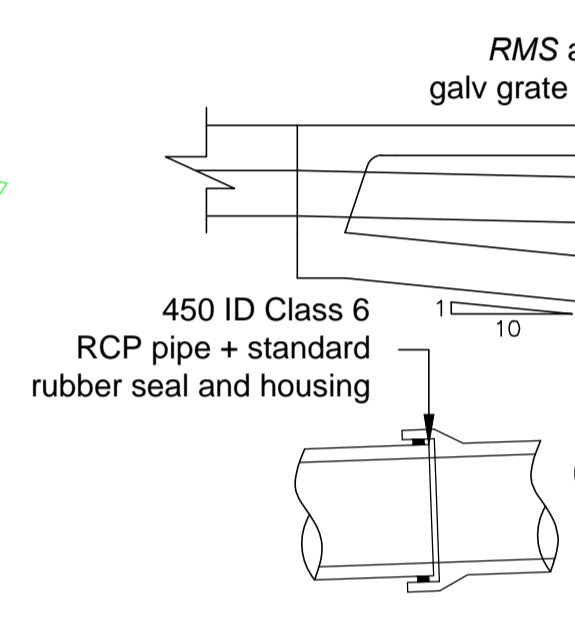
### NEW KERB INLET PIT DETAIL



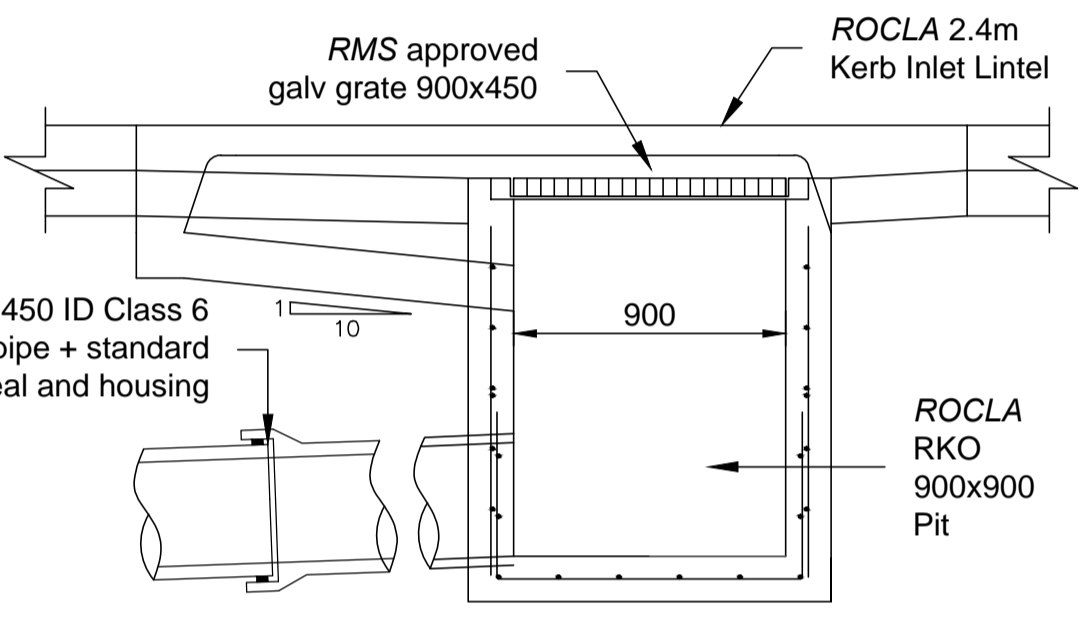
### SECTION 3



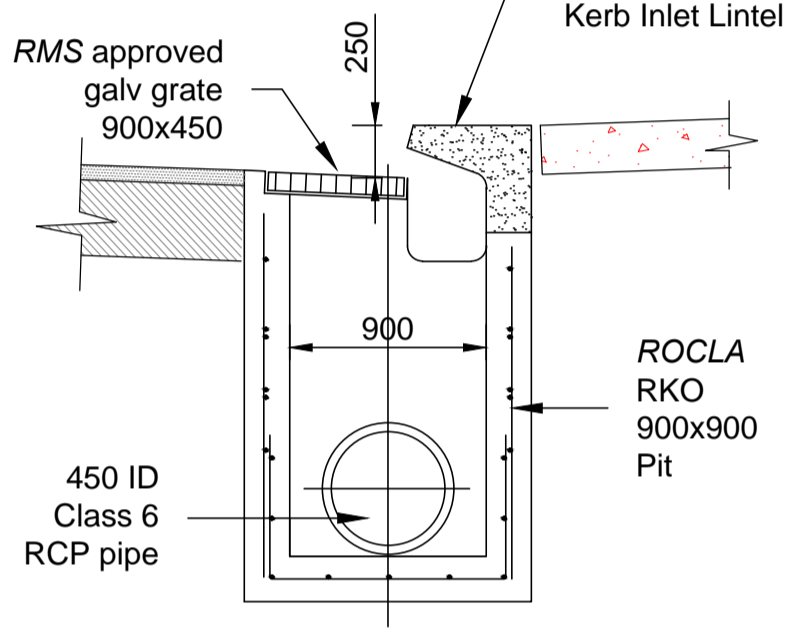
### PIPE TRENCH DETAIL



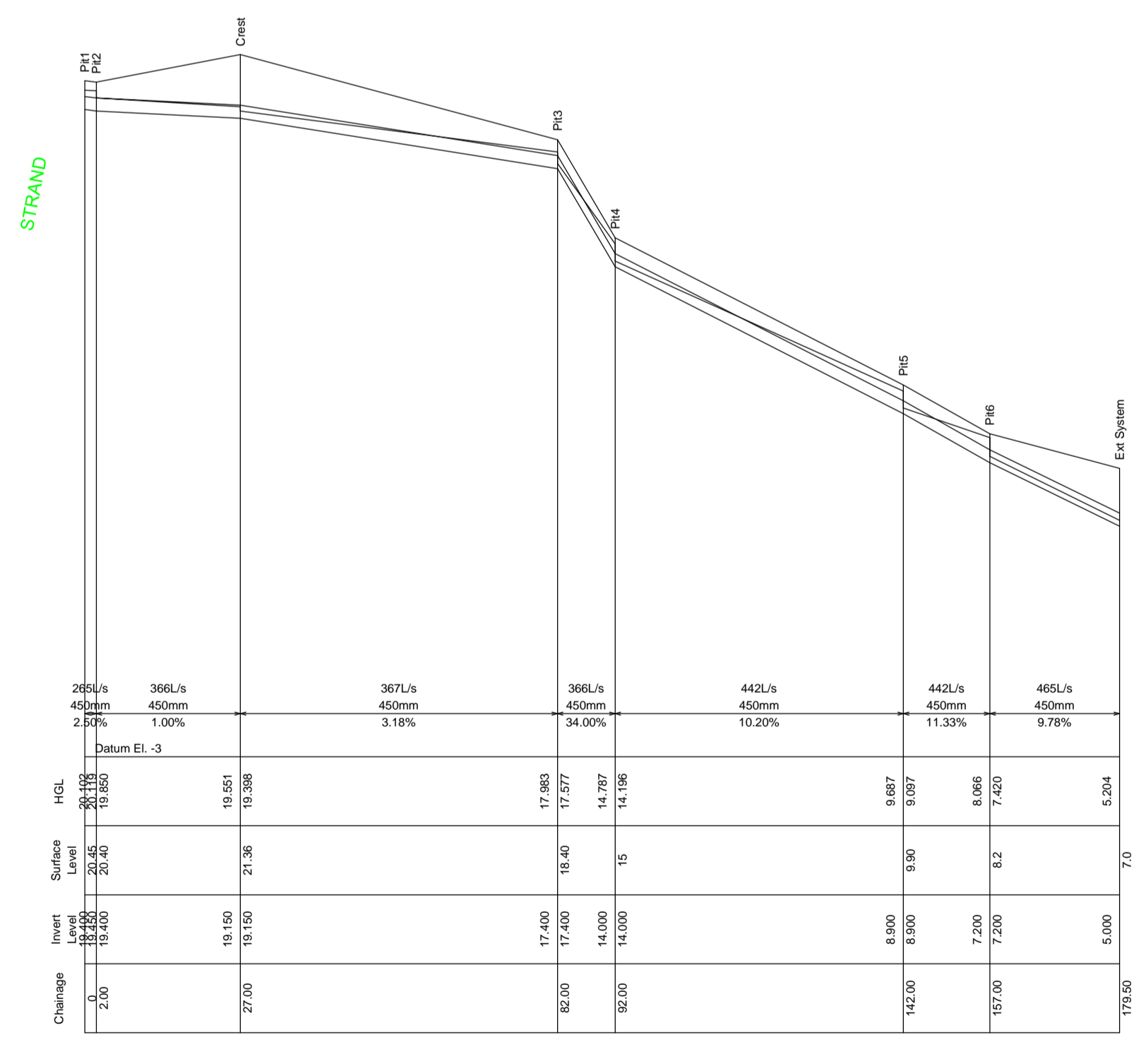
### SECTION 1



### SECTION 2



### NEW 450 dia RCP LONG SECTION



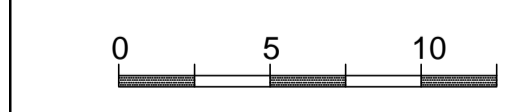
- #### GENERAL NOTES -
- ALL WORKS ARE TO BE CARRIED OUT IN ACCORDANCE WITH RMS STANDARDS AND REQUIREMENTS.
  - ALL WORKS INCLUDING EXCAVATION AND SHORING TO BE CARRIED OUT IN A SAFE MANNER IN ACCORDANCE WITH ALL OH&S REQUIREMENTS.
  - THE BUILDER / CONTRACTOR SHALL LOCATE ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF CONSTRUCTION AND COORDINATE ANY REQUIRED WORKS IN ACCORDANCE WITH THE RELEVANT AUTHORITIES CONSENT.
  - CONCRETE STRENGTH - 32MPa.
  - ALL PEDESTRIAN AND ROAD TRAFFIC SHALL BE CONTROLLED IN ACCORDANCE WITH A TRAFFIC CONTROL PLAN PREPARED BY A QUALIFIED TRAFFIC CONSULTANT, SUBMITTED AND APPROVED BY THE RMS.
  - WORKS TO BE INSPECTED AS REQUIRED BY THE RMS DURING CONSTRUCTION.

DRAINS MODELING RESULTS

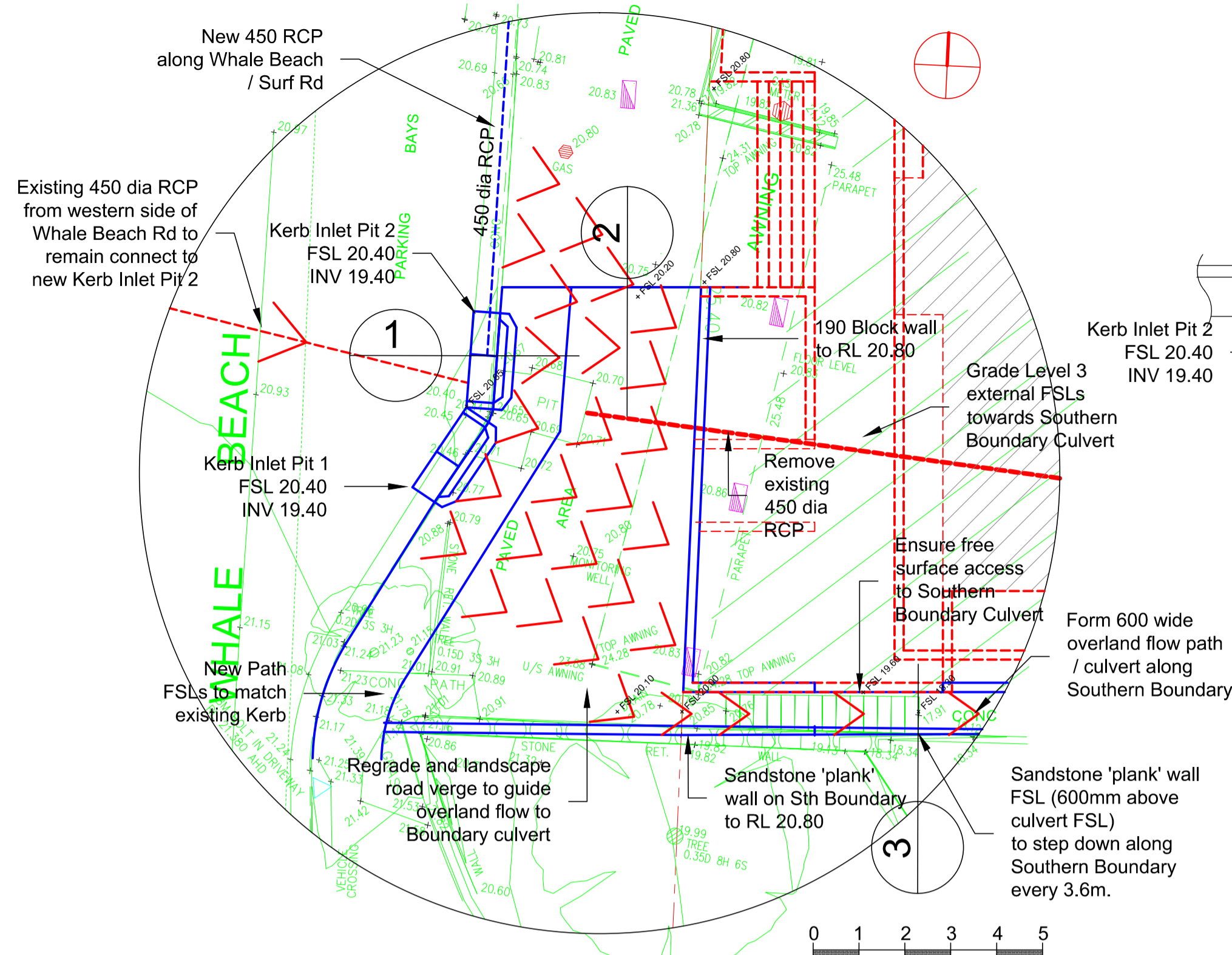
NAME	Max HGL (m)	Max Q (l/s)	Max Flood (m)	Min (m)	Overflow (m)	Constraint
SURF55	20.40	0.000	0.000	0.000	0.000	Inlet Capacity
PIP1	20.37	0.000	0.000	0.000	0.000	Inlet Capacity
PIP2	20.33	0.000	0.000	0.000	0.000	Inlet Capacity
PIP3	19.40	0.000	0.000	0.000	0.000	None
PIP4	17.38	0.000	0.000	0.000	0.000	None
PIP5	14.39	0.000	0.000	0.000	0.000	None
PIP6	8.69	0.000	0.000	0.000	0.000	None
PIP7	8.07	0.000	0.000	0.000	0.000	Inlet Capacity
SURF56	5.32	0.000	0.000	0.000	0.000	None
SURF57	20.36	0.000	0.000	0.000	0.000	Inlet Capacity
SURF58	19.83	0.000	0.000	0.000	0.000	Inlet Capacity
SURF59	8.66	0.000	0.000	0.000	0.000	None
PIP1000	4.84	0.000	0.000	0.000	0.000	None

### DRAINS SYSTEM MODELING RESULTS

1% AEP event flow

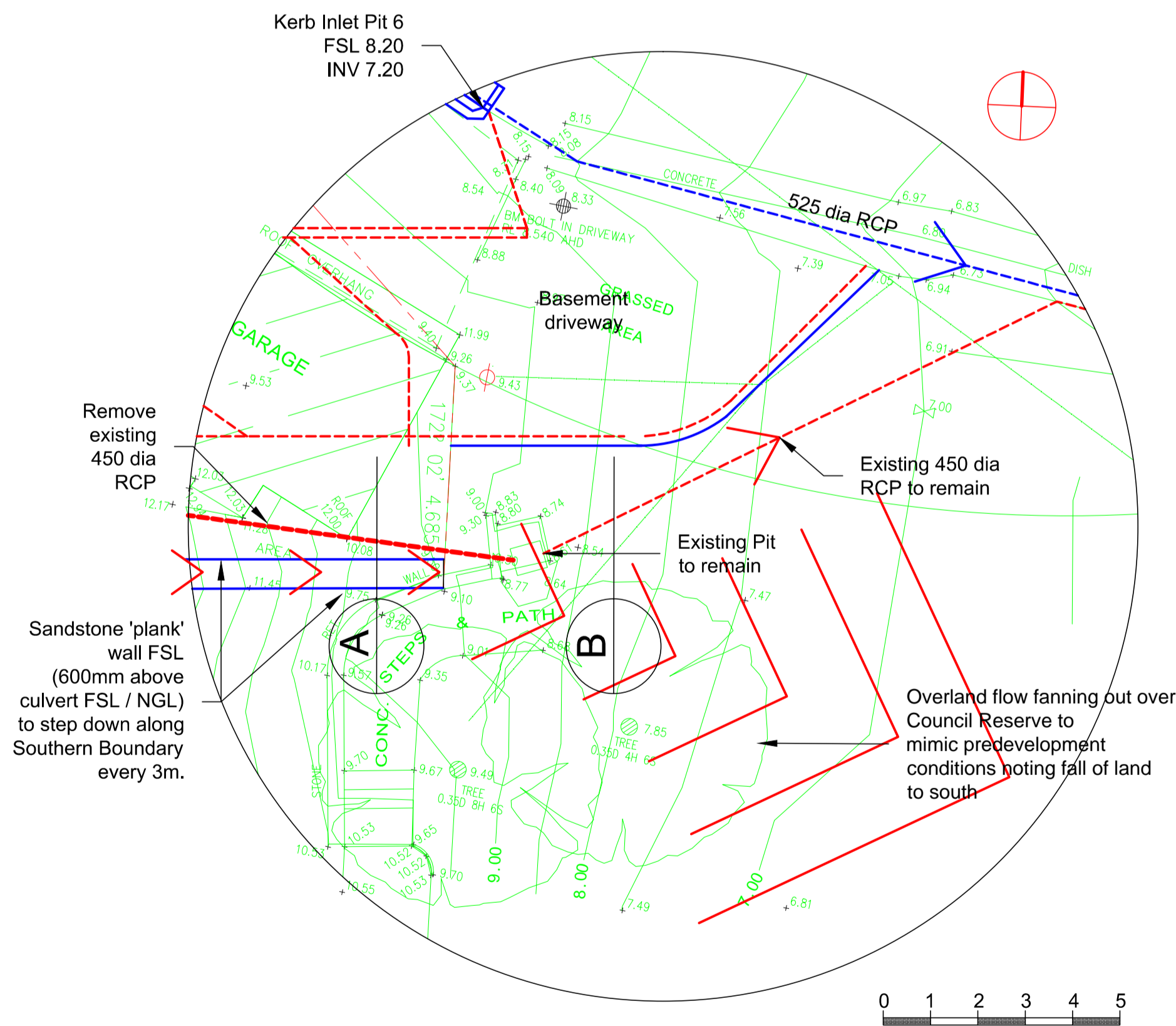


<b>ISSUE:</b> Prelim 18. 02. 2020 Issued for comment DA 03. 03. 2020 Issued for DA submission DA - A 16. 03. 2020 Issued for DA submission, culvert altered DA - B 29. 04. 2020 Issued for DA submission (StH Boundary wall altered)	<b>Barrenjoey Consulting Engineers</b> Pty Ltd Stormwater Structural Civil PO Box 672 Avonlea NSW 2107 M 0418 620 330 E lucas@bce@bigpond.com ABN: 13124694917 ACN: 124694917	<b>PROJECT:</b> WHALE BEACH NEIGHBOURHOOD CENTRE 231 WHALE BEACH RD WHALE BEACH for ~ L. CASSAR	<b>DRAWING :</b> WHALE BEACH RD STORMWATER INFRASTRUCTURE WORKS	<b>Job No :</b> <b>190210</b>	<b>Drawing No</b> <b>SW1 DA - B</b>
	<b>Document Certification</b> Barrenjoey Consulting Engineers Pty Ltd per Lucas Molloy MIA CPENG NER Director				



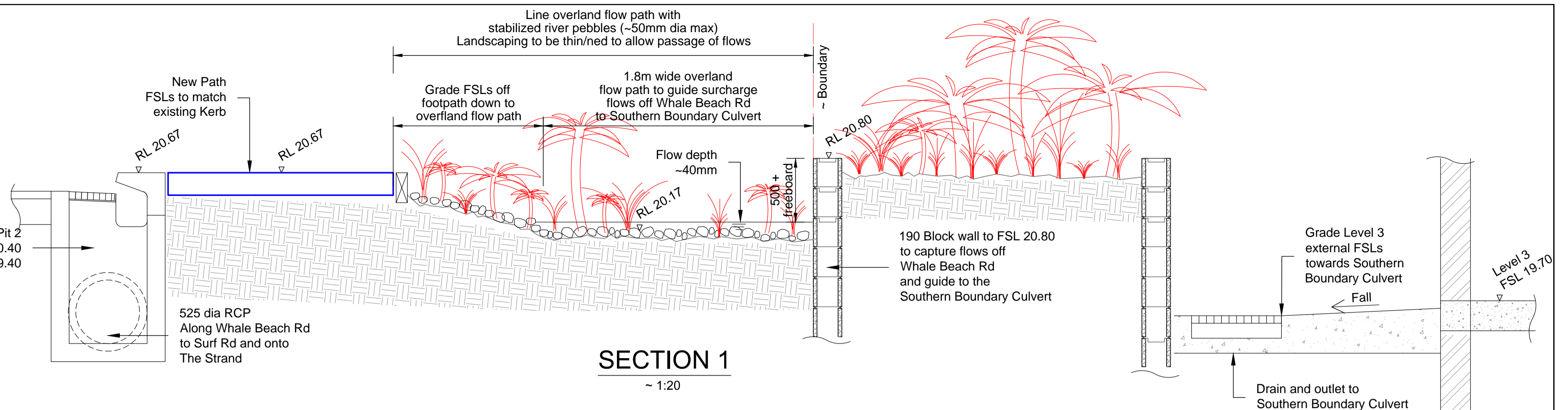
**WHALE BEACH ROAD SURFACE INFRASTRUCTURE WORKS**  
~ 1:100

1% AEP EVENT SURFACE FLOW ~ 50 l/s (refer DRAINS model for details)

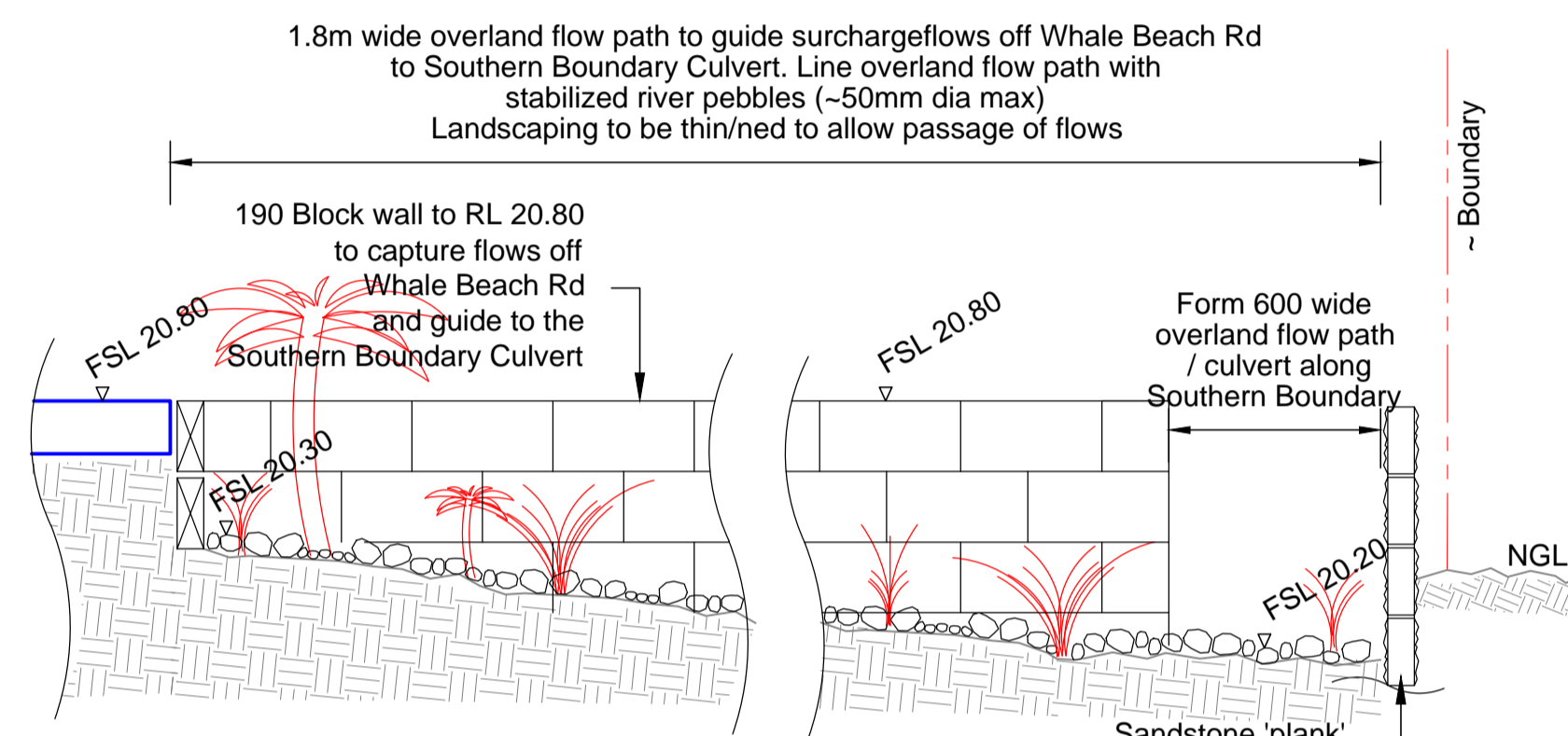


**SURF ROAD SURFACE INFRASTRUCTURE WORKS**  
~ 1:100

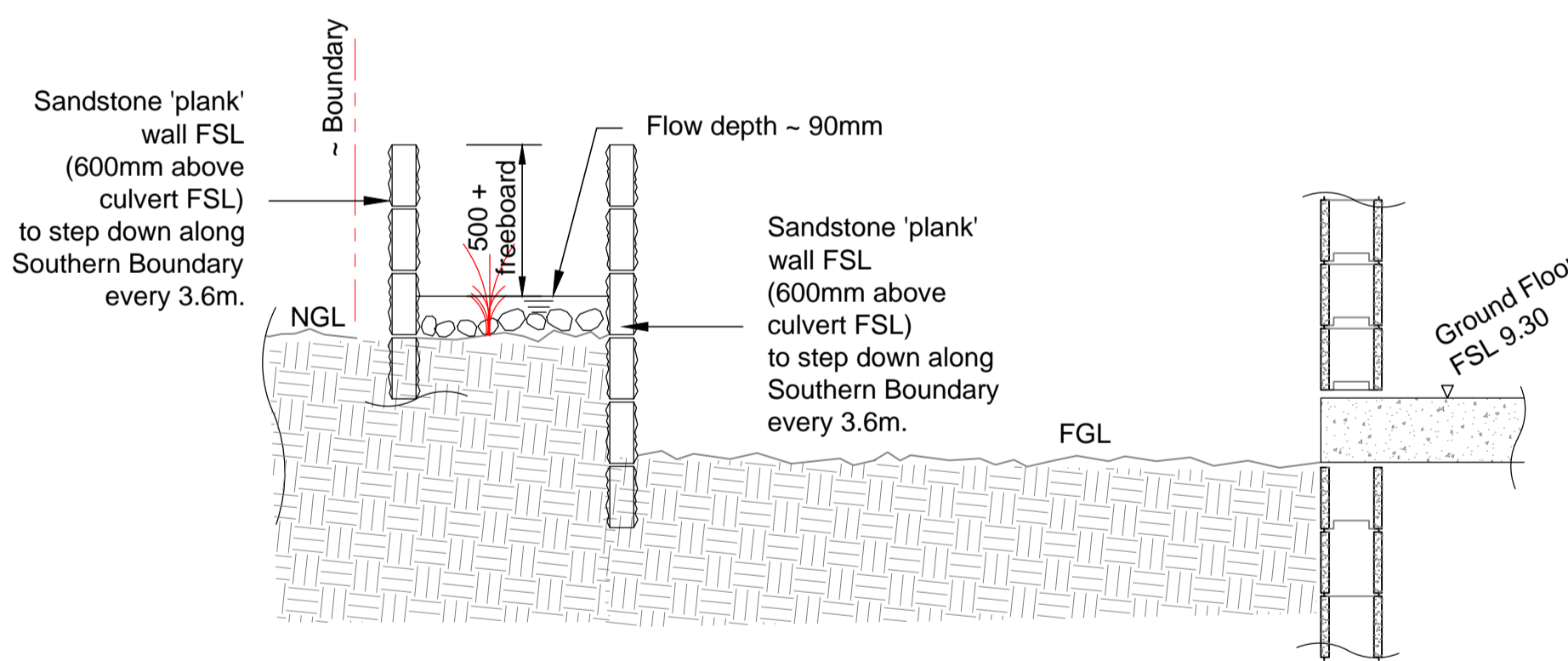
1% AEP EVENT SURFACE FLOW ~ 60 l/s (refer DRAINS model for details)



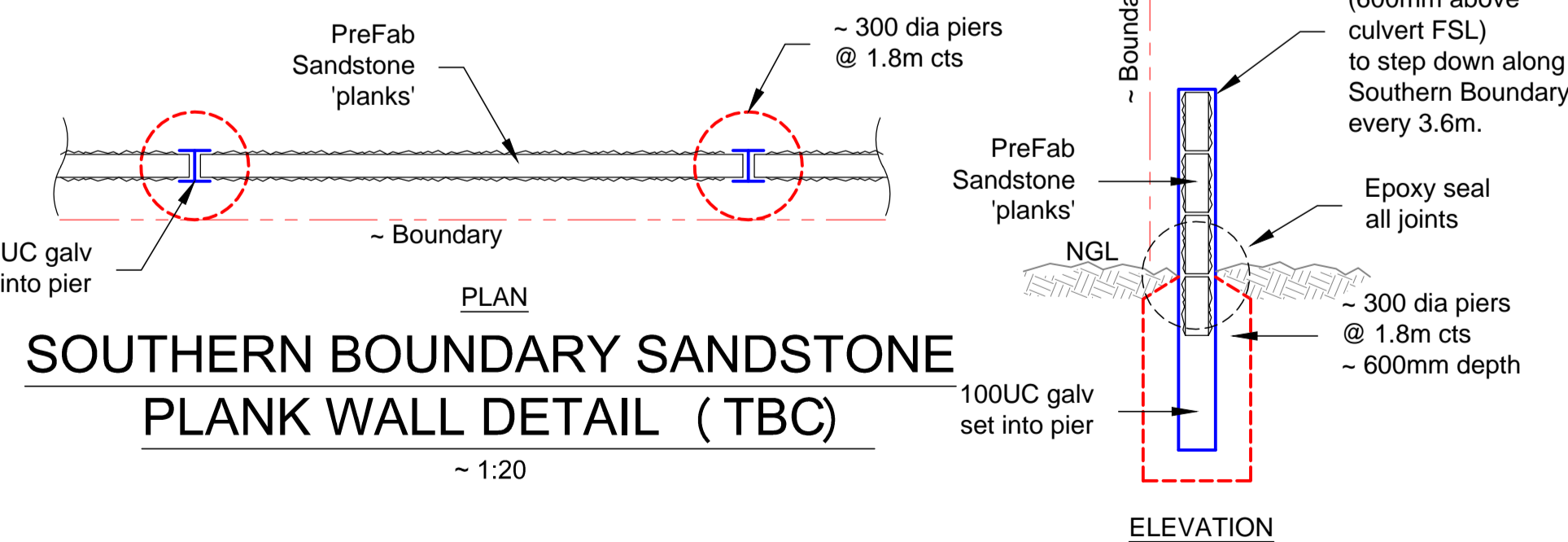
**SECTION 1**  
~ 1:20



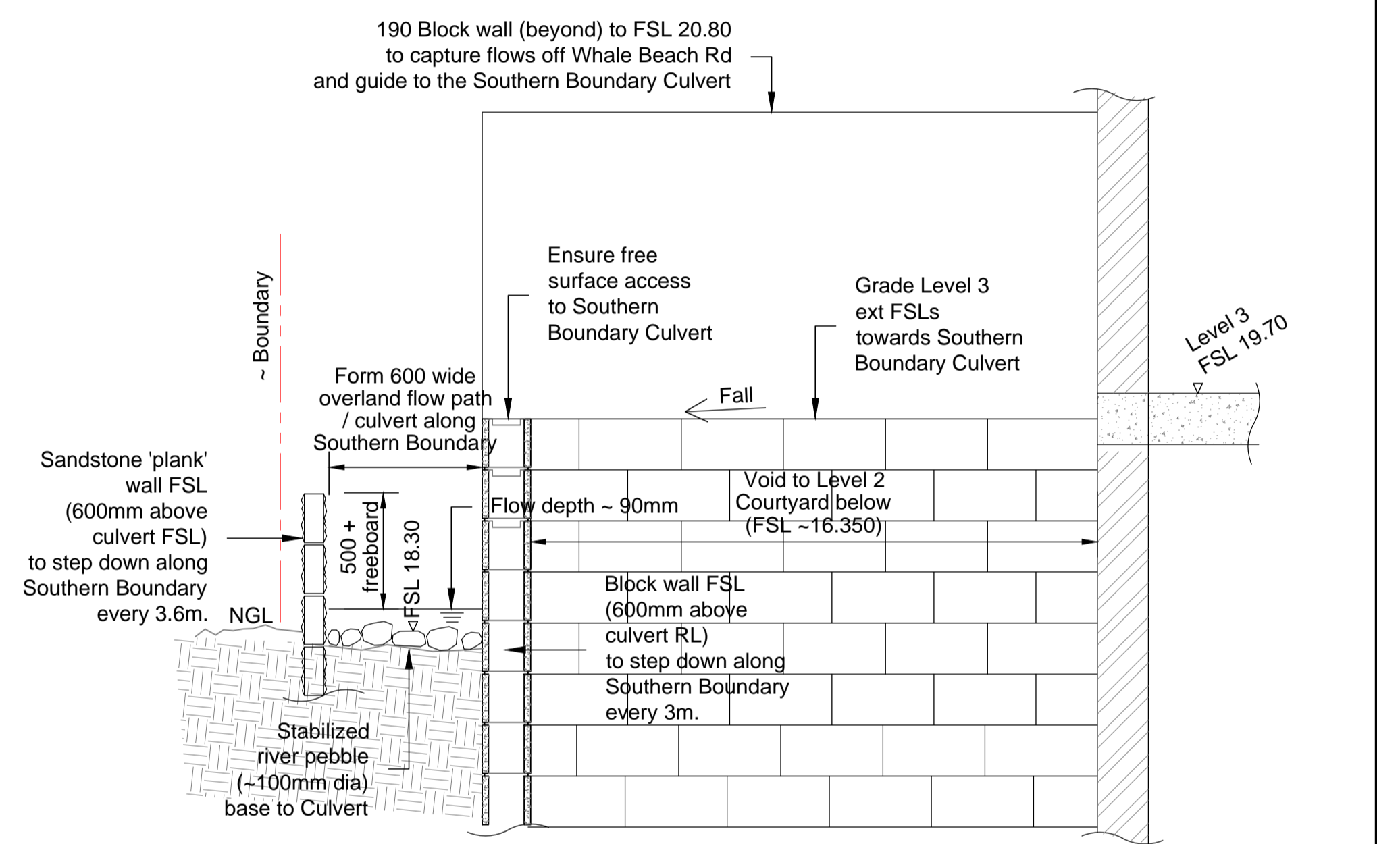
**SECTION 2**  
~ 1:20



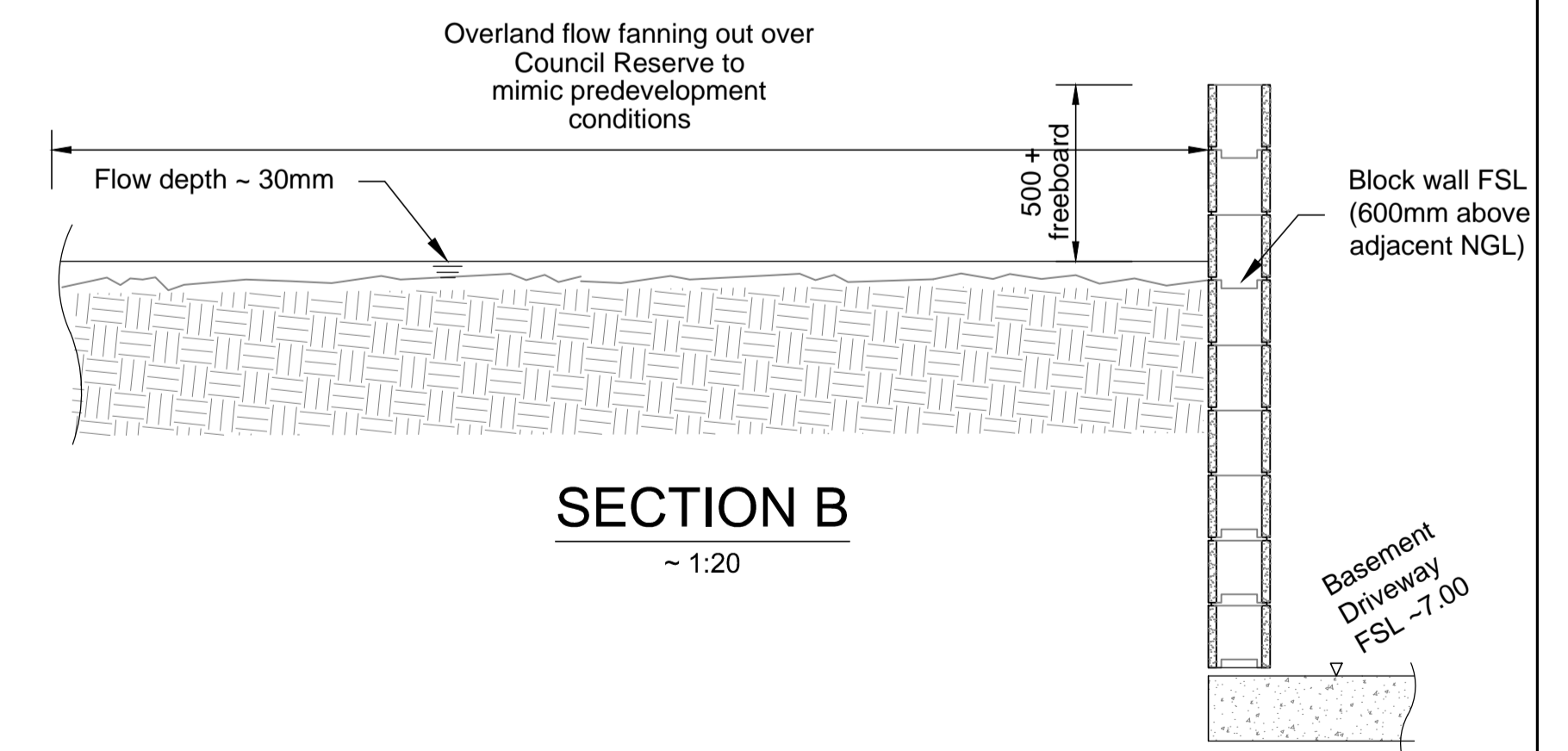
**SECTION A**  
~ 1:20



**SOUTHERN BOUNDARY SANDSTONE PLANK WALL DETAIL (TBC)**  
~ 1:20



**SECTION 3**  
~ 1:20



**SECTION B**  
~ 1:20

ISSUE:	DATE:	DESCRIPTION:
Prelim	18. 02. 2020	Issued for comment
DA	03. 03. 2020	Issued for DA submission
DA	16. 03. 2020	Issued for DA submission (culvert extent altered)
DA-B	29. 04. 2020	Issued for DA submission (Sth Boundary wall altered)

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PROJECT: WHALE BEACH NEIGHBOURHOOD CENTRE 231 WHALE BEACH RD WHALE BEACH for ~ L. CASSAR

DRAWING: WHALE BEACH RD STORMWATER INFRASTRUCTURE WORKS DETAILING

Job No: 190210  
Drawing No: SW2 DA - B  
Document Certification  
Barrenjoey Consulting Engineers Pty Ltd per Lucas Molloy MEA CPENGR Director