

# Civil Engineering SSDA Report

## New Cultural and Civic Space, Coffs Harbour

Prepared for Coffs Harbour City Council / 17 June 2019

182059 CAAA

**Structural  
Civil  
Traffic  
Facade  
Consulting  
Engineers**

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## 1.0 Introduction

Coffs Harbour City Council is proposing to develop a new Cultural and Civic Space at Coffs Harbour. The project is to be approved via a State Significant Development Approval under the reference number SSD 10300.

Taylor Thomson Whitting (TTW) has been engaged by Coffs Harbour City Council (Council) to provide the associated concept Civil Engineering design and documentation related to the proposed works.

### 1.1 Secretary's Environmental Assessment Requirements

This report has been prepared to address relevant civil engineering aspects of the Secretary's Environmental Assessment Requirements (SEARs) for the State Significant Development (reference number SSD 10300) as follows:

#### 19. Water Sources

*The EIS shall include:*

- *An assessment of impacts on surface and ground water sources (both quality and quantity), related infrastructure, adjacent licensed water users, basic landholder rights, watercourses, riparian land, and groundwater dependent ecosystems, and measures proposed to reduce and mitigate these impacts.*
- *An assessment of surface and ground water monitoring activities and methodologies.*

#### 20. Drainage

*The EIS shall include:*

- *Details of drainage associated with the proposal, including stormwater and drainage infrastructure.*
- *Details of measures to minimise operational water quality impacts on surface waters and groundwater.*

#### 22. Infrastructure

*The EIS shall include:*

- *An assessment of existing infrastructure on-site and any possible impacts of the construction and operation of the proposal on this infrastructure, including the road network, footpaths, sewerage infrastructure, stormwater infrastructure and water supply infrastructure.*
- *An assessment of existing capacity and any augmentation requirements of the development for the provision of utilities, including staging of infrastructure and additional licence/approval requirements in consultation with relevant agencies.*

Note that this report does not provide an exhaustive review of the SEARs requirements above and should be read in conjunction with the other consultant's reports.

## 2.0 Existing Conditions

### 2.1 Development Site

The site is located within the Coffs Harbour City local government area as shown in Figure 1. The site covers an area of 3248m<sup>2</sup> and currently contains a number of buildings, two on-grade carparks and a large open landscaped area. The site is largely open, with only the buildings roofed. The site falls from a peak of 4.9 mAHD in the north-west corner to a reduced level (RL) of 4.2 mAHD in the south-east corner at an approximately 1% grade.



Figure 1: Site Location

### 2.2 Reference Documents

- Coffs Harbour City Council's Development Control Plan 2015
- Coffs Harbour City Council's WSUD Guidelines 2018
- AR&R 2016
- Architectural Drawings prepared by BVN Architects dated May 2019
- Site Survey prepared by Blairlanskey Surveys Freeburn Surveying dated January 2018



### 3.0 Proposed Works

The proposed works include (refer to Figure 2):

- Demolition of the existing buildings and on grade parking.
- Construction of a basement carpark and 6 levels above accommodating the cultural and civic centre.

The civil engineering works involved with the proposed development include the provision of stormwater quality measures. Refer to Civil Engineering drawing “C03” for the proposed concept siteworks and stormwater management plan affixed in Appendix A.



Figure 2: Architectural Plans from BVN Architects Rev C dated May 2019.

The Council stormwater system has been documented conceptually. Final detail will include a hydraulic grade line analysis along with complete construction set of drawings to Council standards. Further survey of the topography and existing below ground services is required and will be complete prior to detail design.

## 4.0 Stormwater Quantity

The proposed Cultural and Civic space design has a total catchment of 3,245m<sup>2</sup>. As the site is flood affected, on-site stormwater detention has not been proposed on the site. This has been supported by the Flooding Assessment Report prepared by GHD, and our discussion with Council officers. The proposed minor increase in site flows due to the increase in impervious area has been confirmed through a Flooding Assessment to produce an insignificant afflux and as a result an OSD tank will not be required from a water quantity perspective.

The overall site is designed to discharge via gravity into the existing Council stormwater system located in Gordon Street.

Pipes discharging will include the overflow from the rainwater tank and the roof areas. An emergency overflow pipe will be provided internally to the stormwater treatment chamber to allow overflow in the event of a pipe blockage. This internal pipe network is to be detailed by the hydraulic engineer.

## 5.0 Stormwater Quality

Coffs Harbour City Council's water quality requirements are outlined in their WSUD Guideline. Refer to Table 1 for the pollutant reduction targets as detailed in the guideline.

Stormwater quality measures have been modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC). The stormwater quality treatment train consists of a rainwater tank feeding into a water quality treatment tank containing 8 stormfilter cartridges. The bypass area is assumed to drain to two stormwater inlet pits both of which have an OceanGuard insert. The layout of the MUSIC model and results are shown in Figure 3 and Figure 4 respectively.

The majority of the proposed site is roof covered (2,544 m<sup>2</sup>), excluding paved areas at the frontages along Gordon Street and Riding Lane (701 m<sup>2</sup>). As the basement footprint is roughly equal to the area of the site, there is no pervious area within the site. Stormwater quality measures including rainwater re-use, Ocean Protect's OceanGuard and 8 460 mm PSorb Stormfilter cartridges have been designed to ensure pollutant targets are met.

**Table 1: Stormwater Treatment Targets (Source: Coffs Harbour City Council WSUD Guideline 2018)**

Pollutant	Performance Target Reduction Loads
Gross Pollutants	90% (Size >5mm)
Total Suspended Solids	80%
Total Phosphorus	60%
Total Nitrogen	45%

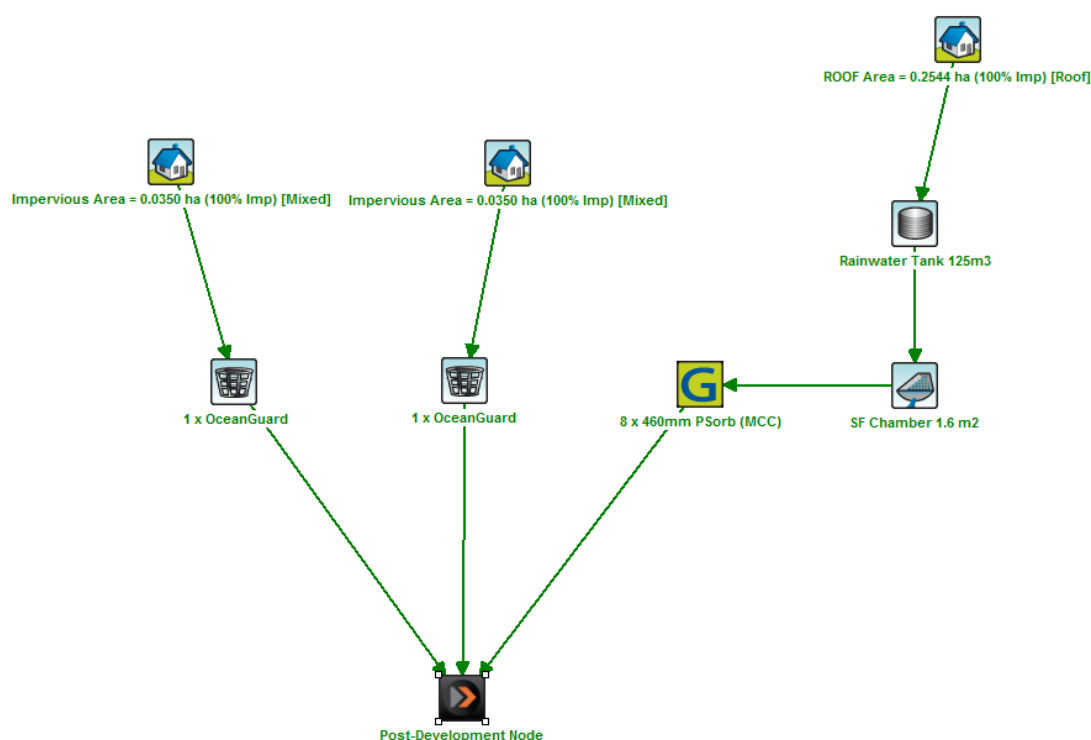


Figure 3: MUSIC Modelling Layout

Treatment Train Effectiveness - Post-Development Node			
	Sources	Residual Load	% Reduction
Flow (ML/yr)	5	3.34	33.3
Total Suspended Solids (kg/yr)	266	48.6	81.7
Total Phosphorus (kg/yr)	0.958	0.355	62.9
Total Nitrogen (kg/yr)	11.5	4.93	57.2
Gross Pollutants (kg/yr)	113	0	100

Figure 4: MUSIC Results

## 5.1 Stormwater Quality During Construction

During the construction stage of the project, an erosion and sediment control plan is to be implemented to prevent sediment laden stormwater from flowing into adjoining properties, bushland, roadways or receiving water bodies. Stormwater controls onsite are to be detailed in an erosion and sediment control plan which is in accordance with relevant regulatory authority guidelines including Council's Development Control Plan and WSUD Guidelines, and Landcom NSW's Managing Urban Stormwater, Soils and Construction ("Blue Book").



## 6.0 Conclusion

Stormwater is collected onsite using a pit and pipe stormwater system. Discharge of stormwater will occur to the nearest Council downstream pit along Gordon Street. Captured stormwater will be treated using water quality measures including rainwater re-use, 2 Enviropods and 8 PSorb Stormfilter cartridges. An erosion and sediment control plan has been prepared for the site detailing the management of stormwater during construction as shown in **Appendix A** of this report.

Prepared by  
**TAYLOR THOMSON WHITTING  
(NSW) PTY LTD**



**KIERAN SMITH**  
Civil Engineer

Approved By  
**TAYLOR THOMSON WHITTING  
(NSW) PTY LTD**



**PAUL YANNOULATOS**  
Technical Director

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## Appendix A

# Concept Civil Engineering Plans



# THE CULTURE AND CIVIC SPACE PROJECT, COFFS HARBOUR

## GENERAL NOTES

- Contractor must verify all dimensions and existing levels on site prior to commencement of works. Any discrepancies to be reported to the Engineer
- Strip all topsoil from the construction area. All stripped topsoil shall be disposed of off-site unless directed otherwise.
- Make smooth connection with all existing works.
- Compact subgrade under buildings and pavements to minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building footprint.
- All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority, the Contractor is to ensure that the drawings used for construction have been approved by all relevant authorities prior to commencement site.
- All work on public property, property which is to become public property, or any work which is to come under the control of the Statutory Authority is to be carried out in accordance with the requirements of the relevant Authority. The Contractor shall obtain these requirements from the Authority. Where the requirements of the Authority are different to the drawings and specifications, the requirements of the Authority shall be applicable.
- For all temporary batters refer to geotechnical recommendations.

## REFERENCE DRAWINGS

- These drawings have been based from, and to be read in conjunction with the following Consultants drawings. Any conflict to the drawings must be notified immediately to the Engineer.

Consultant	Dwg Title	Dwg No	Rev	Date
BVN	Ground Level Floor Plan	AR-B10-00-04	17.05.19	
Blairlansky Surveys	DETAIL SURVEY	9484	N/A	JAN 18

## BOUNDARY AND EASEMENT NOTE

The property boundary and easement locations shown on Taylor Thomson Whitting drawing's have been based from information received from : **No boundary information received.**  
**Refer architect for boundary information and locations**  
Taylor Thomson Whitting makes no guarantees that the boundary or easement information shown is correct.  
Taylor Thomson Whitting will accept no liabilities for boundary inaccuracies. The contractor/builder is advised to check/confirm all boundaries in relation to all proposed work prior to the commencement of construction. Boundary inaccuracies found are to be reported to the superintendent prior to construction starting.

## SURVEY AND SERVICES INFORMATION SURVEY

Origin of levels : PM42792 RL3.51  
Datum of levels : A.H.D. AUSTRALIAN HEIGHT DATUM  
Coordinate system : ISG OR MGA OR LOCAL  
Survey prepared by : BLAIRLANSKEY SURVEYS  
Setout Points : CONTACT THE SURVEYOR

Taylor Thomson Whitting does not guarantee that the survey information shown on these drawings is accurate and will accept no liability for any inaccuracies in the survey information provided to us from any cause whatsoever.

### UNDERGROUND SERVICES - WARNING

The locations of underground services shown on Taylor Thomson Whittings drawings have been plotted from diagrams provided by service authorities. This information has been prepared solely for the authorities own use and may not necessarily be updated or accurate.

The position of services as recorded by the authority at the time of installation may not reflect changes in the physical environment subsequent to installation.

Taylor Thomson Whitting does not guarantee that the services information shown on these drawings shows more than the presence or absence of services, and will accept no liability for inaccuracies in the services information shown from any cause whatsoever.

**The Contractor must confirm the exact location and extent of services prior to construction and notify any conflict with the drawings immediately to the Engineer/Superintendent.**

The contractor is to get approval from the relevant state survey department, to remove/adjust any survey mark. This includes but is not limited to; State Survey Marks (SSM), Permanent Marks (PM), cadastral reference marks or any other survey mark which is to be removed or adjusted in any way.

**Taylor Thomson Whitting plans do not indicate the presence of any survey mark. The contractor is to undertake their own search.**

## SAFETY IN DESIGN

Contractor to refer to Appendix B of the Civil Specification for the Civil Risk and Solutions Register.

### EXISTING SERVICES

Contractor to be aware existing services are located within the site. Location of all services to be verified by the Contractor prior to commencing works. Contractor to confirm with relevant authority regarding measures to be taken to ensure services are protected or procedures are in place to demolish and/or relocate.

### EXISTING STRUCTURES

Contractor to be aware existing structures may exist within the site. To prevent damage to existing structure(s) and/or personnel, site works to be carried out as far as practicable possible from existing structure(s).

### EXISTING TREES

Contractor to be aware existing trees exist within the site which need to be protected. To prevent damage to trees and/or personnel, site works to be carried out as far as practicable possible from existing trees. Advice needs to be sought from Arborist and/or Landscape Architect on measures required to protect trees.

### GROUNDWATER

Contractor to be aware ground water levels are close to existing surface level. Temporary de-watering may be required during construction works.

### EXCAVATIONS

Deep excavations due to stormwater drainage works is required. Contractor to ensure safe working procedures are in place for works. All excavations to be fenced off and batters adequately supported to approval of Geotechnical Engineer.

### GROUND CONDITIONS

Contractor to be aware of the site geotechnical conditions. Refer to geotechnical report by Douglas Partner (CFG190017.P.001.Rev0) for details.

### HAZARDOUS MATERIALS

Existing asbestos products & contaminated material may be present on site. Contractor to ensure all hazardous materials are identified prior to commencing works. Safe working practices as per relevant authority to be adopted and appropriate PPE to be used when handling all hazardous materials. Refer to geotechnical/environmental report by Douglas Partner (CFG190017.P.001.Rev0) for details.

### CONFINED SPACES

Contractor to be aware of potential hazards due to working in confined spaces such as stormwater pits, trenches and/or tanks. Contractor to provide safe working methods and use appropriate PPE when entering confined spaces.

### MANUAL HANDLING

Contractor to be aware manual handling may be required during construction. Contractor to take appropriate measures to ensure manual handling procedures and assessments are in place prior to commencing works.

### WATER POLLUTION

Contractor to ensure appropriate measures are taken to prevent pollutants from construction works contaminating the surrounding environment.

### SITE ACCESS/EGRESS

Contractor to be aware site works occur in close proximity to footpaths and roadways. Contractor to erect appropriate barriers and signage to protect site personnel and public.

### VEHICLE MOVEMENT

Contractor to supply and comply with traffic management plan and provide adequate site traffic control including a certified traffic marshal to supervise vehicle movements where necessary.

## STORMWATER DRAINAGE NOTES

- Stormwater Design Criteria :
  - Average exceedance probability – 1% AEP for roof drainage to first external pit 5% AEP for paved and landscaped areas
  - Rainfall intensities – Time of concentration: 5 minutes 1% AEP = 32 mm 5% AEP = 23.1 mm
  - Rainfall losses – Impervious areas: IL = 1.5 mm , CL = 0 mm/hr Pervious areas: IL = 36 mm , CL = 2.5 mm/hr

- Pipes 300 dia and larger to be reinforced concrete Class "2" approved spigot and socket with rubber ring joints U.N.O.
- Pipes up to 300 dia may be sewer grade uPVC with solvent welded joints, subject to approval by the engineer
- Equivalent strength VCP or FRP pipes may be used subject to approval.
- Precast pits may be used external to the building subject to approval by
- Enlargers, connections and junctions to be manufactured fittings where pipes are less than 300 dia.
- Where subsoil drains pass under floor slabs and vehicular pavements, unslotted uPVC sewer grade pipe is to be used.
- Gates and covers shall conform with AS 3996-2006, and AS 1428.1 for access requirements.
- Pipes are to be installed in accordance with AS 3725. All bedding to be type H2 U.N.O.
- Care is to be taken with invert levels of stormwater lines. Grades shown are not to be reduced without approval.
- All stormwater pipes to be 150 dia at 1.0% min fall U.N.O.
- Subsoil drains to be slotted flexible uPVC U.N.O.
- Adopt invert levels for pipe installation (grades shown are only nominal).

## SIGNS AND LINE MARKING NOTES

- Pavement marking and sign posting on public roads shall be in accordance with the requirements of the relevant Road Authority. The contractor shall obtain these requirements from the Road Authority.
- Pavement marking and sign posting to be in accordance with R.T.A. "Interim Guide to Signs and Markings".
- Contractor is to provide guide posts, spaced in accordance with AS1742.2. They are to be located near all head walls and pipe outlets.
- Raised pavement markers to be in accordance with AS1742.2
- Where existing pavement marking conflicts with proposed, it is to be removed.
- Lane widths do not include width of gutter.
- Line marking plan does not define boundaries.
- Erect temporary sign 'changed traffic conditions ahead' 120m ahead of new work in both directions.
- Establish the location of existing utility services and locate new signs clear of these installations.
- The sloped face of the SF median kerbs which adjoin through lanes, are to be painted white in lieu of an E3 edge line. The reflective pavement markers normally associated with an E3 edge line are to be located on the pavement adjacent to the SF kerb.
- Bicycle pavement markings and sign posting to be in accordance with Austrads Standards.
- The design of major directional sign posting to be prepared and assessed by the R.T.A.

## SURVEY LEGEND

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MH  
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SV  
W  
TL  
TRAP  
S  
ELP  
TL  
TLA  
TLB  
TR  
PMW  
PM 1234  
BM 51.10  
BH 0  
TP No

Surface level  
Contour  
Kerb line  
Batter  
Retaining wall  
Stormwater drainage line  
Telecommunications line  
Gas line  
Water main  
Sewer line  
Electrical line  
Easement  
Fence  
Tree to be removed/be retained  
Boundary  
Sign  
Hydrant  
Manhole  
Gas  
Stop Valve  
Water  
Telecommunications  
Trap  
Gully  
Grate  
Sewer Manhole  
Electricity  
Electric Light Pole  
Traffic Light  
Traffic Light Lid  
Traffic Light Box  
Telephone Box  
Parking Meter  
Permanent Mark  
Bench Mark  
Borehole  
Test Pit

## EXISTING SERVICES LEGEND

S Existing sewer  
W Existing water  
EU Existing underground electrical  
EA Existing aerial electrical  
T Existing telecommunications  
G Existing gas  
SW Existing stormwater



SITE LOCALITY PLAN  
NOT TO SCALE – IMAGE COURTESY OF NSW SPATIAL INFORMATION EXCHANGE

## DRAWING SCHEDULE

Drawing No.	Drawing Title
C01	NOTES AND LEGENDS SHEET
C02	EROSION & SEDIMENT CONTROL PLAN AND DETAILS
C03	SITEWORKS AND STORMWATER MANAGEMENT PLAN
C10	DETAILS SHEET 1
C20	WATER QUALITY TANK DETAILS AND TYPICAL SECTIONS

A1 .....2 1 2 3 4 5 6 7 8 9 10

P1	ISSUE FOR SSDA	NB	JH	19.06.17					
Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date

Architect  
**BVN**  
LEVEL 4, 12 CREEK STREET, BRISBANE  
QLD 4000 AUSTRALIA

Civil Engineer  
**TTW** Taylor Thomson Whitting  
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project  
**THE CULTURE AND CIVIC SPACE PROJECT, COFFS HARBOUR**

Sheet Subject  
**NOTES AND LEGENDS SHEET**

Scale : A1  
- Drawn JH Authorised

Job No 182059 Drawing No C01 Revision P1

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- A. All work shall be generally carried out in accordance with
  - (A) Local authority requirements,
  - (B) EPA – Pollution control manual for urban stormwater,
  - (C) LANDCOM NSW – Managing Urban Stormwater: Soils and Construction ("Blue Book").
2. Erosion and sediment control drawings and notes are provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities.  
The erosion and sediment control plan shall be implemented and adapted to meet the varying situations as work on site progresses.
3. Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
4. When stormwater pits are constructed prevent site runoff entering the pits unless pit fences are erected around pits.
5. Minimise the area of site being disturbed at any one time.
6. Protect all stockpiles of materials from scour and erosion. Do not stockpile loose material in roadways, near drainage pits or in watercourses.
7. All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site conditions.
8. Control water from upstream of the site such that it does not enter the disturbed site.
9. All construction vehicles shall enter and exit the site via the temporary construction entry/exit.
10. All vehicles leaving the site shall be cleaned and inspected before leaving.
11. Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
12. Clean out all erosion and sediment control devices after each storm event.

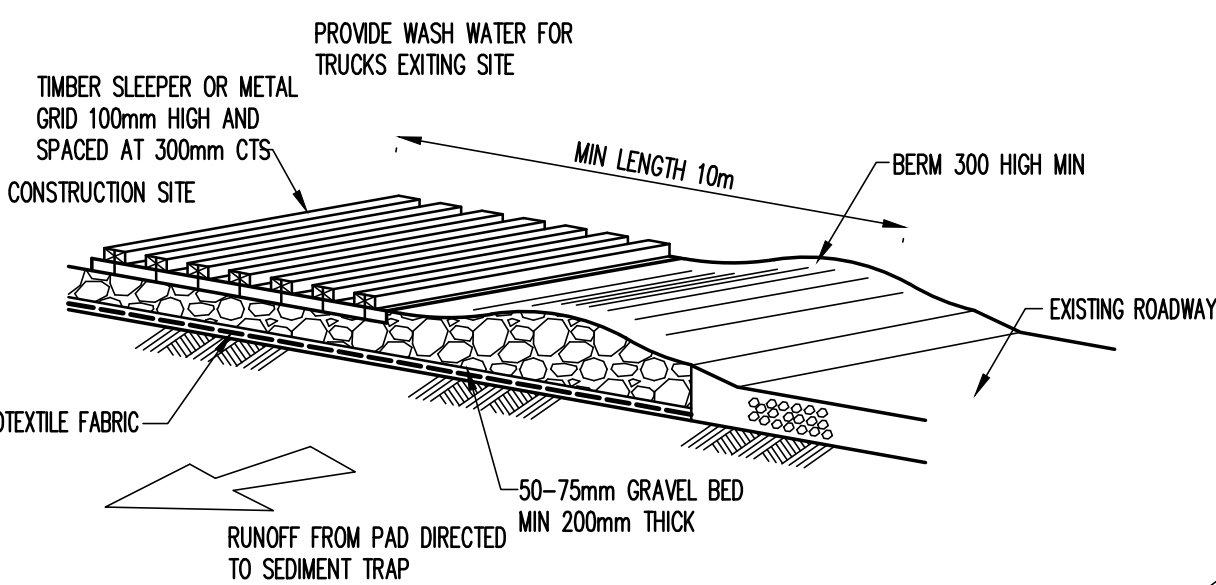
1. Prior to commencement of excavation the following soil management devices must be installed.
1. Construct silt fences below the site and across all potential runoff sites.
2. Construct temporary construction entry/exit and divert runoff to suitable control systems.
3. Construct measures to divert upstream flows into existing stormwater system.
4. Construct sedimentation traps/basin including outlet control and overflow.
5. Construct turf lined swales.
6. Provide sandbag sediment traps upstream of existing pits.
2. Construct geotextile filter pit surround around all proposed pits as they are constructed.
3. On completion of pavement provide sand bag kerb inlet sediment traps around pits.
4. Provide and maintain a strip of turf on both sides of all roads after the construction of kerbs.

Prior to discharge of site stormwater, groundwater and seepage water into council's stormwater system, contractors must undertake water quality tests in conjunction with a suitably qualified environment consultant outlining the following:

- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Councils storm water drainage system. This should include commencing from a suitably qualified environmental consultant confirming the suitability of these remedial measures to manage the water discharged from the site into Councils storm water drainage system. Outlining the proposed, ongoing monitoring, contingency plans and validation program that will be in place to continually monitor the quality of water discharged from this site. This should outline the frequency of water quality testing that will be undertaken by a suitably qualified environmental consultant.

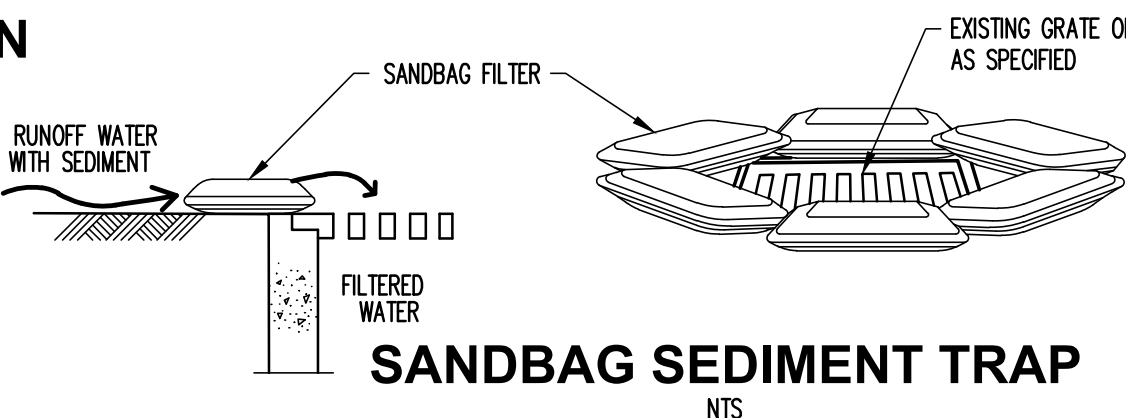
Diagram illustrating various erosion control measures:

- Batler
- Siltation fence
- Stormwater pit with Geotextile filter surround
- Hay bale barriers
- Sandbag sediment trap
- Catch drain
- Overland flow path

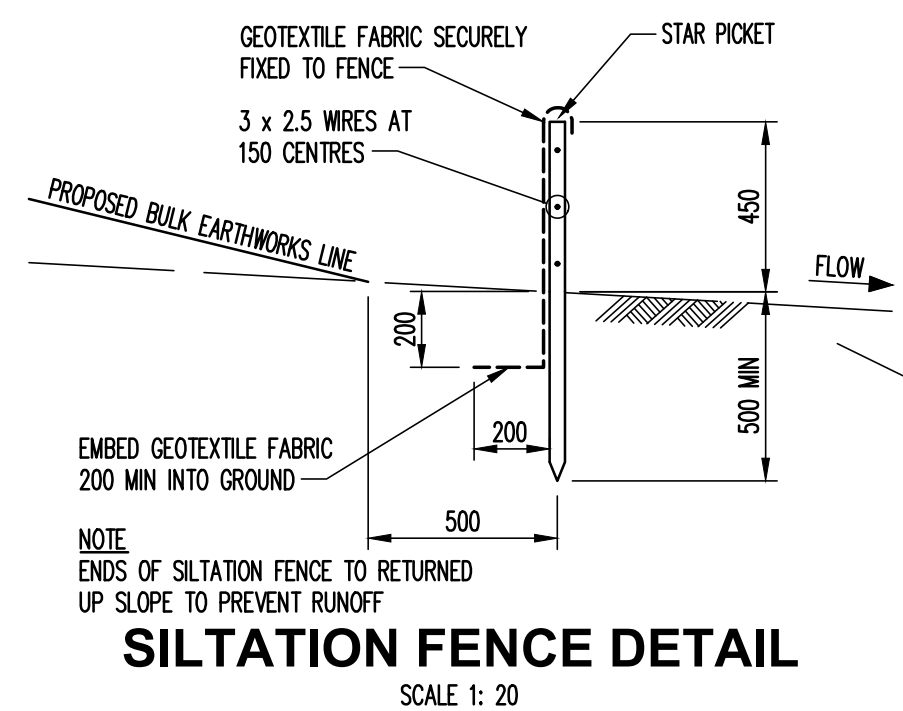


**TYPICAL SECTION THROUGH CATCH DRAIN**

SCALE 1: 20

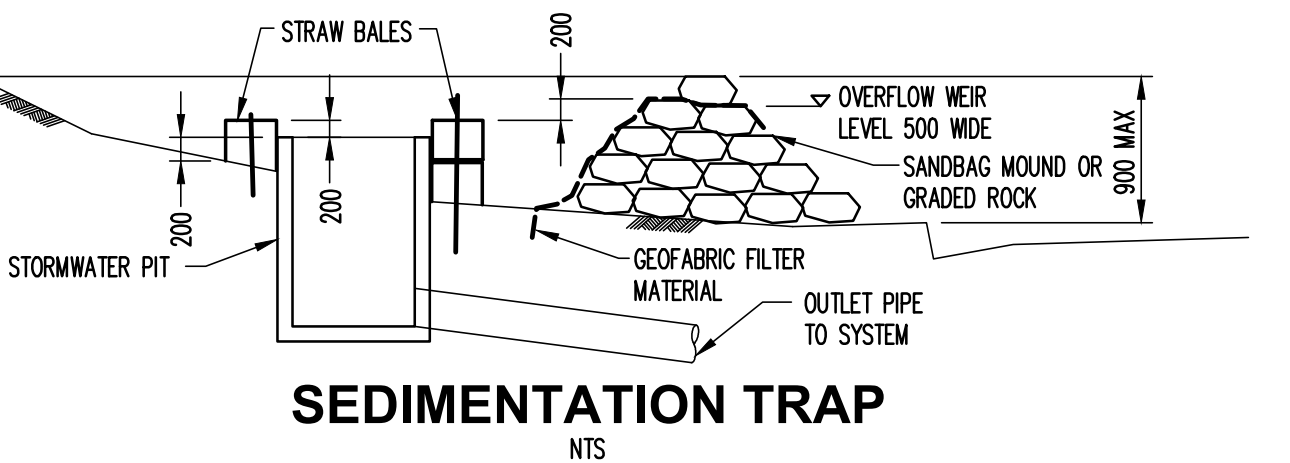


# SANDBAG SEDIMENT TRAP



## SILTATION FENCE DETAIL

SCALE 1: 20



## SEDIMENTATION TRAP

PI ISSUE FOR SSDA					NB LS 19.06.17									
Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date

Civil Engineer

**TTW** **Taylor  
Thomson  
Whitting**

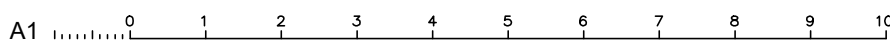
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Sheet Subject

**EROSION & SEDIMENT  
CONTROL PLAN AND DETAILS**

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Job No	Drawing No	Revision
182059	C02	P1
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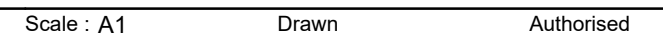




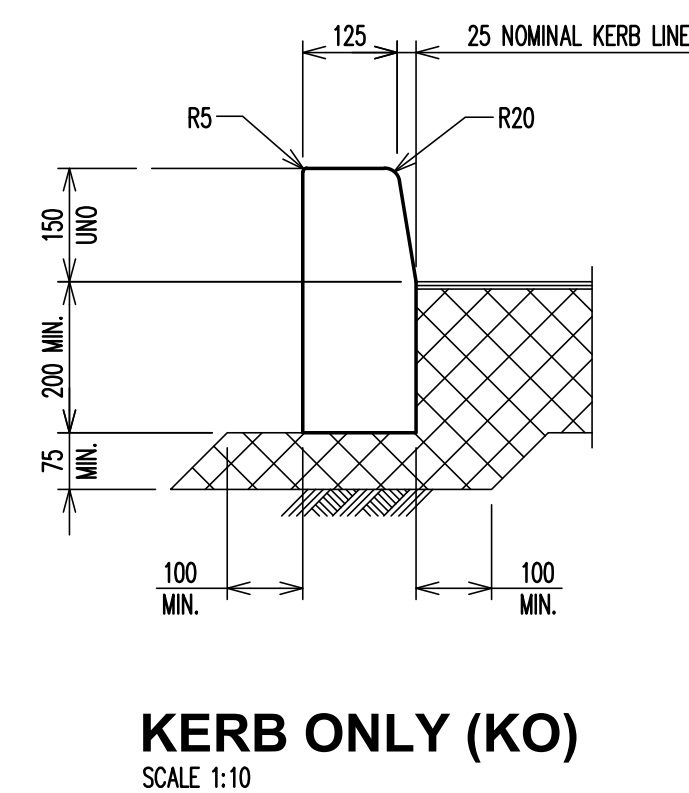
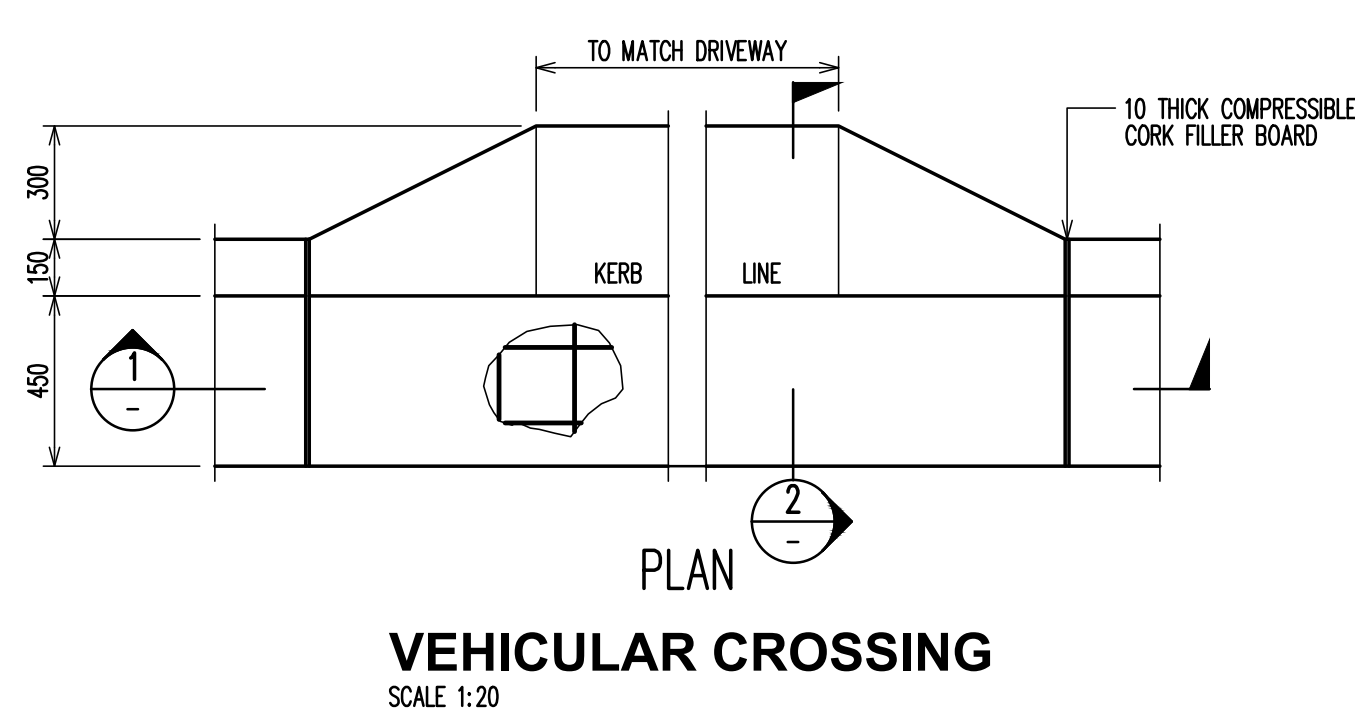
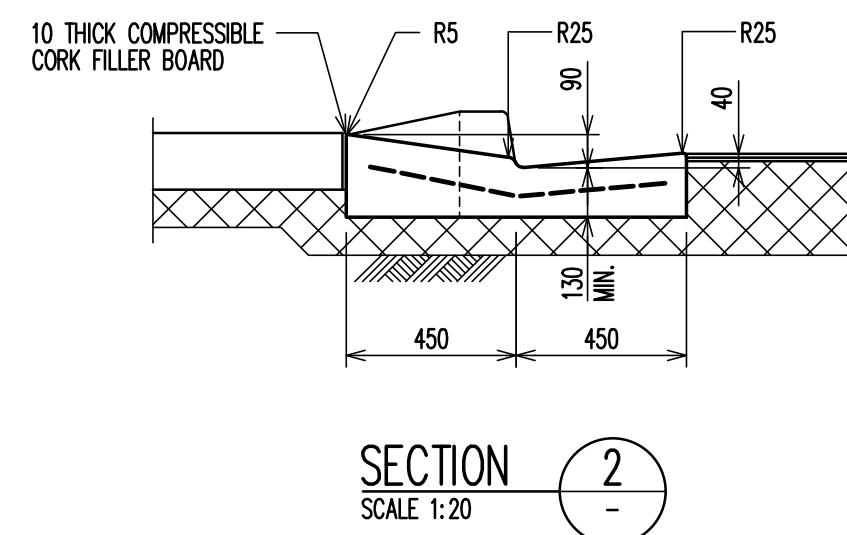
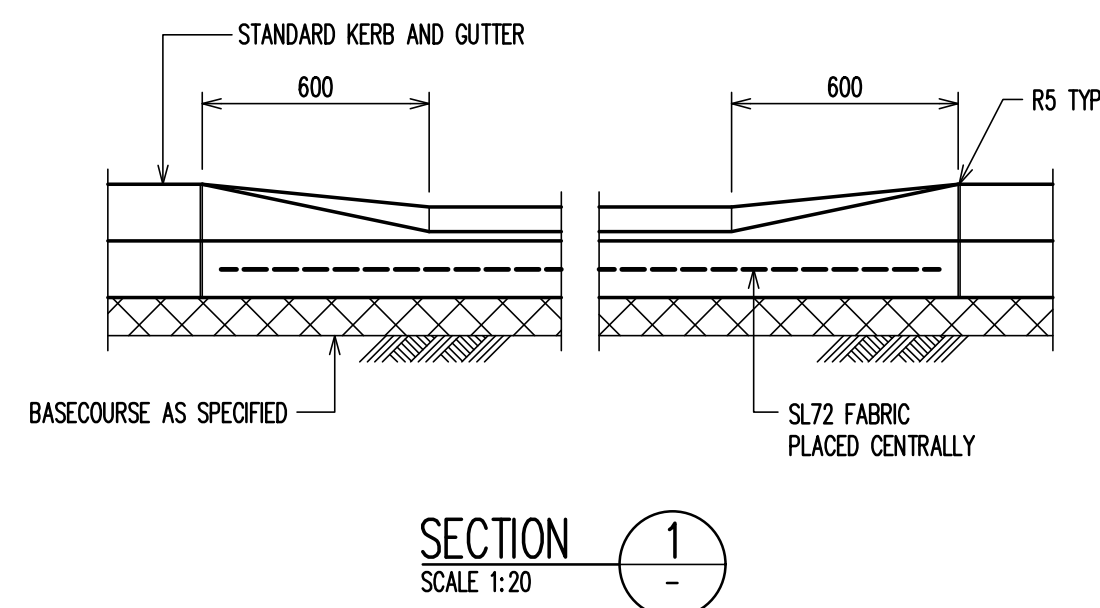
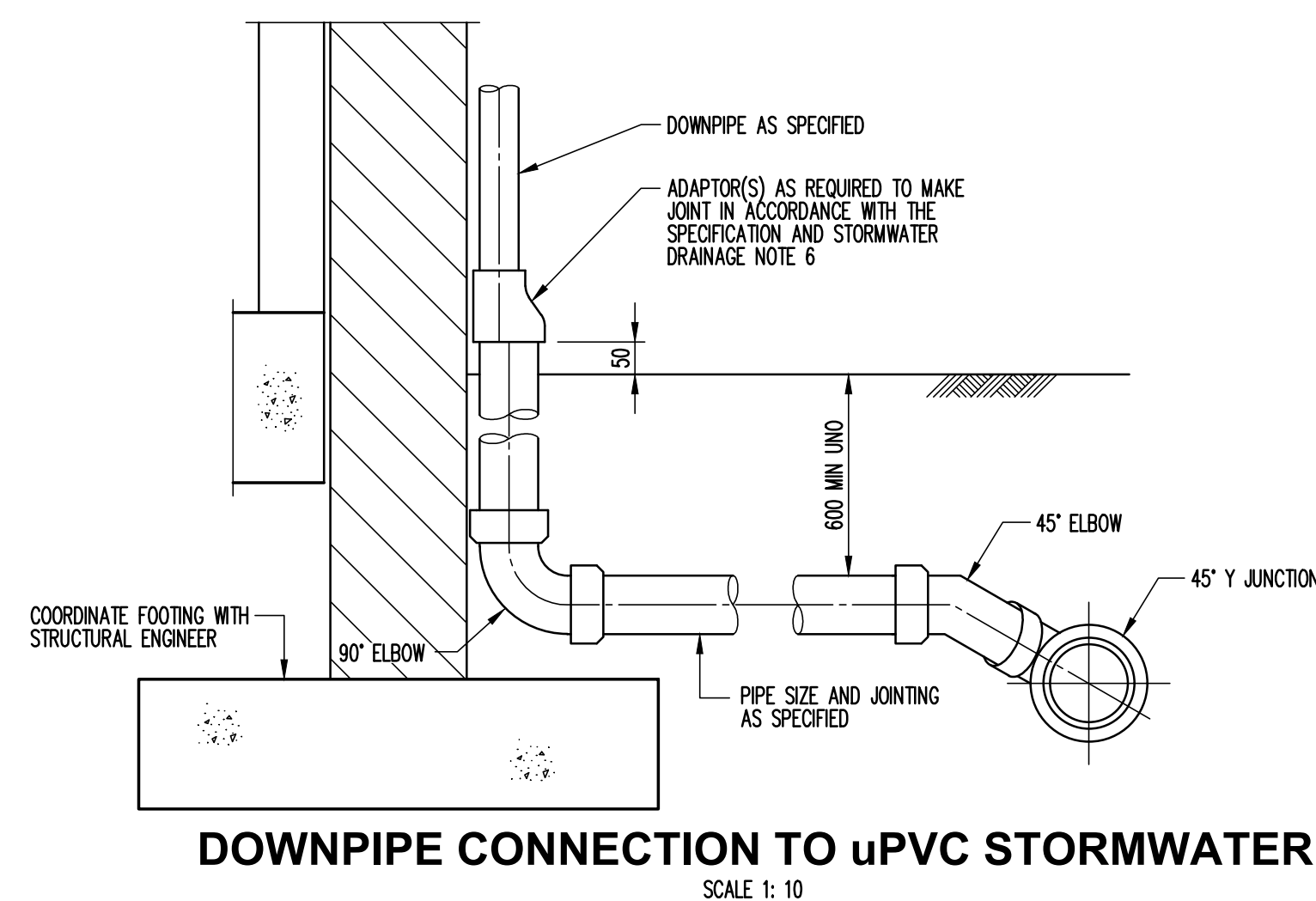
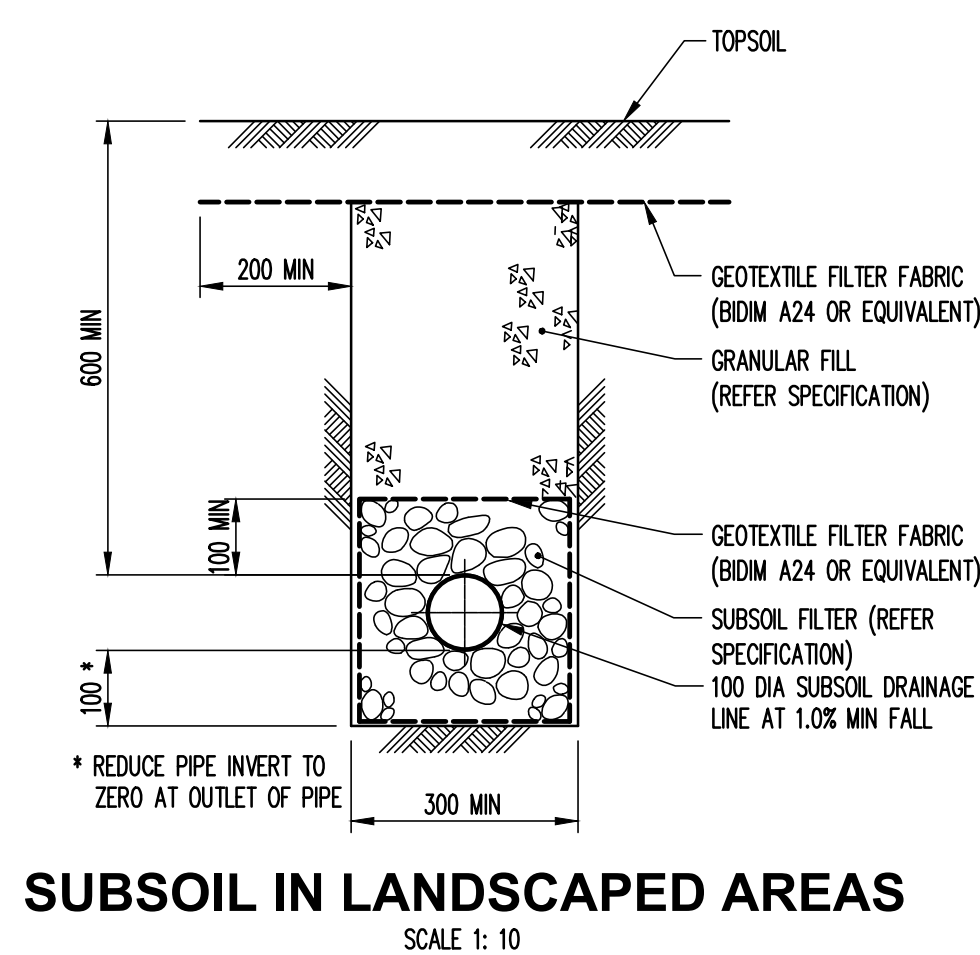
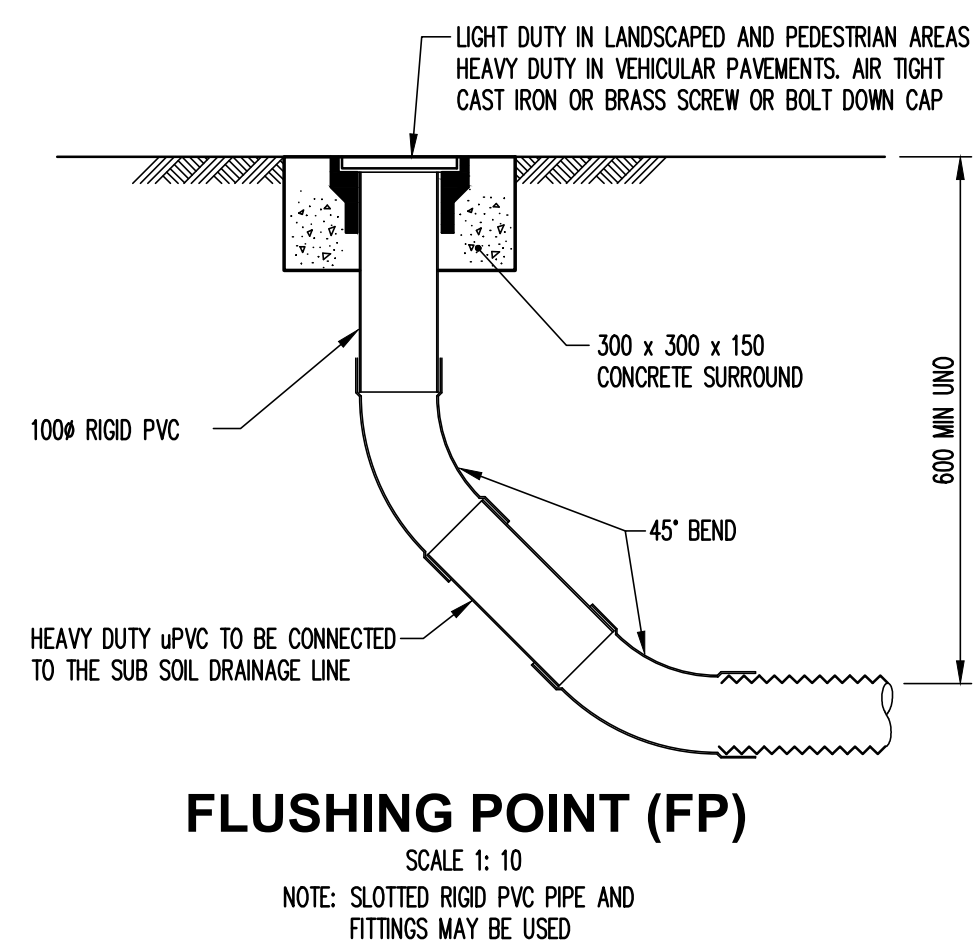
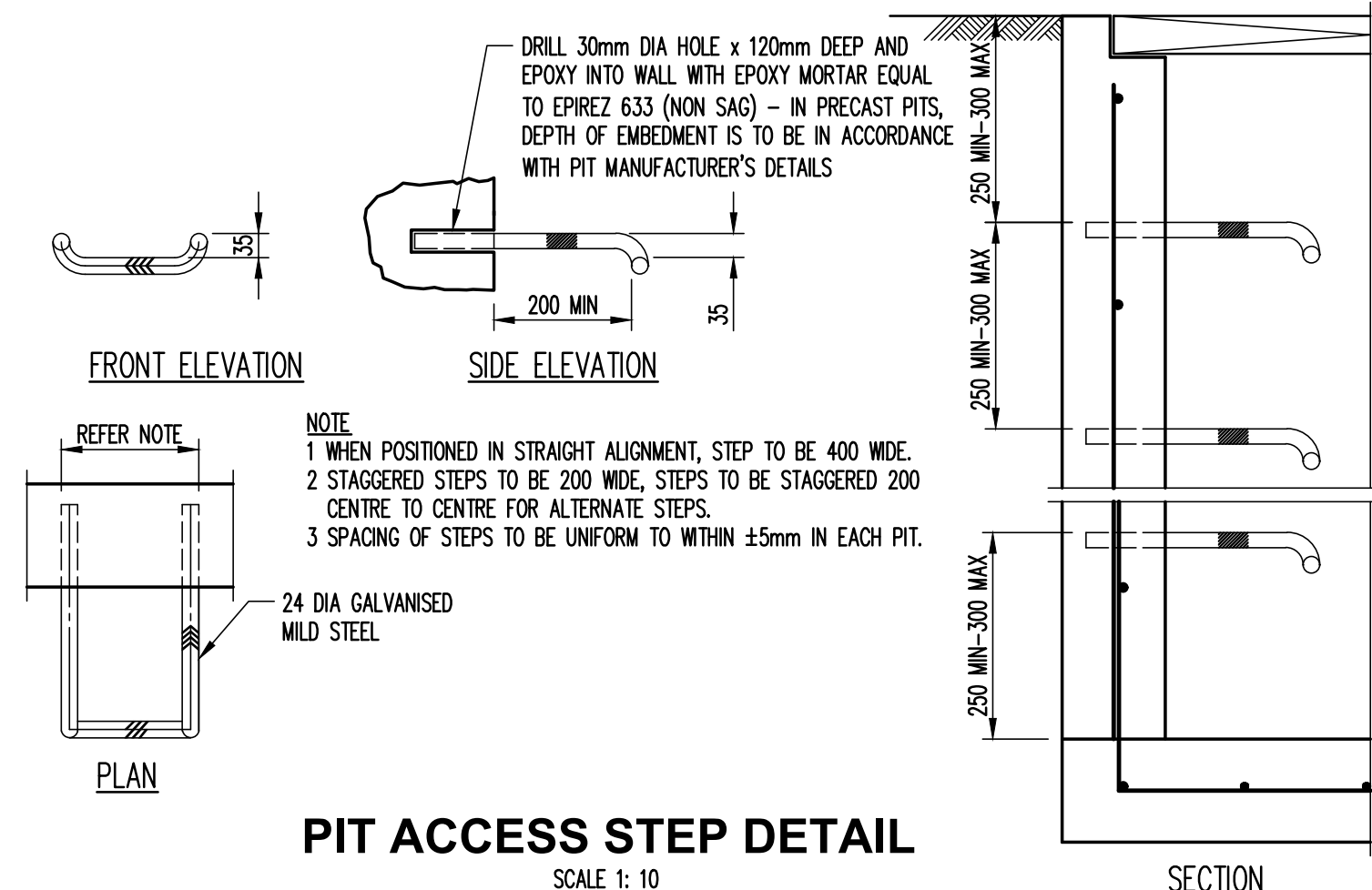
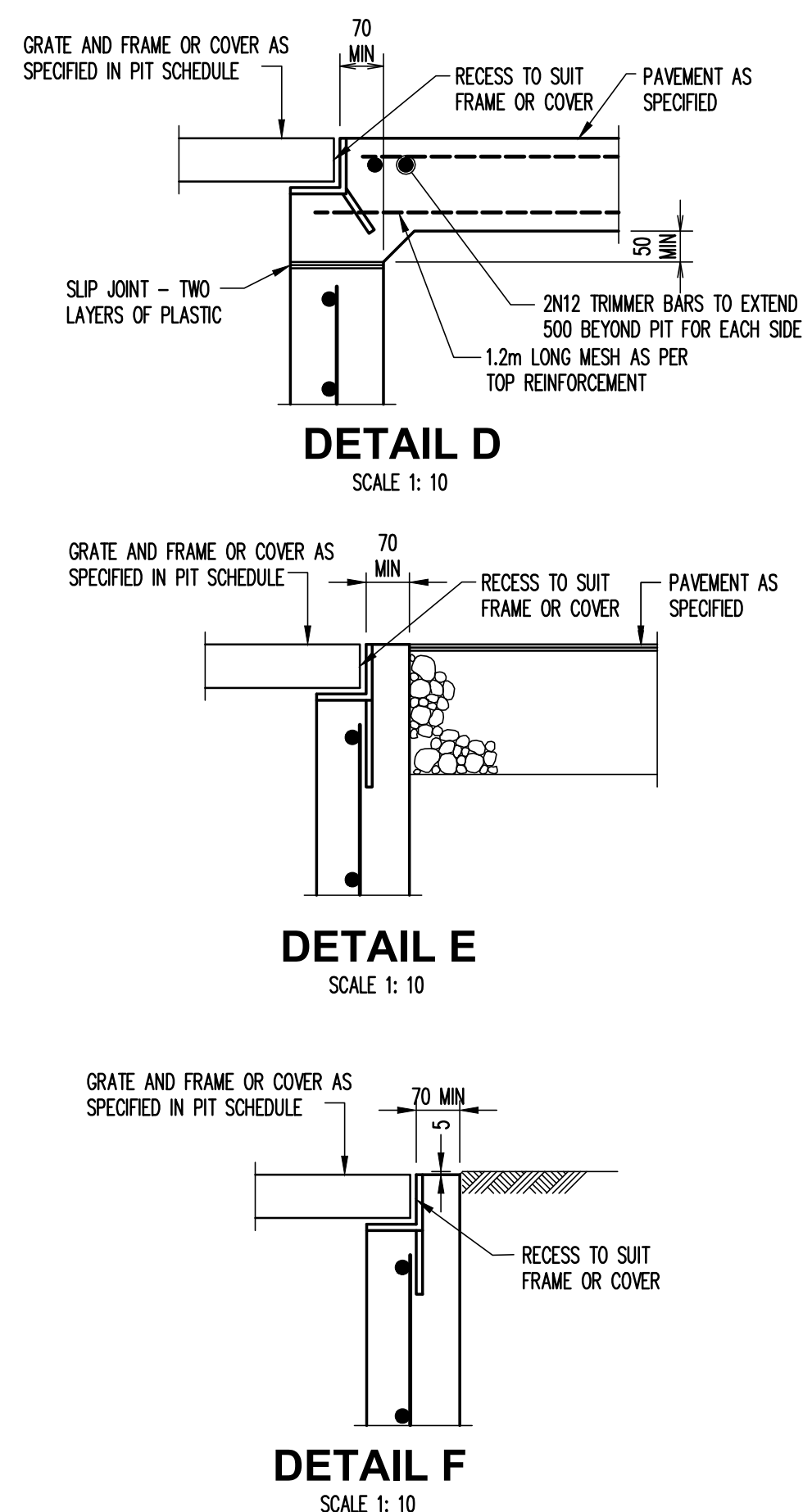
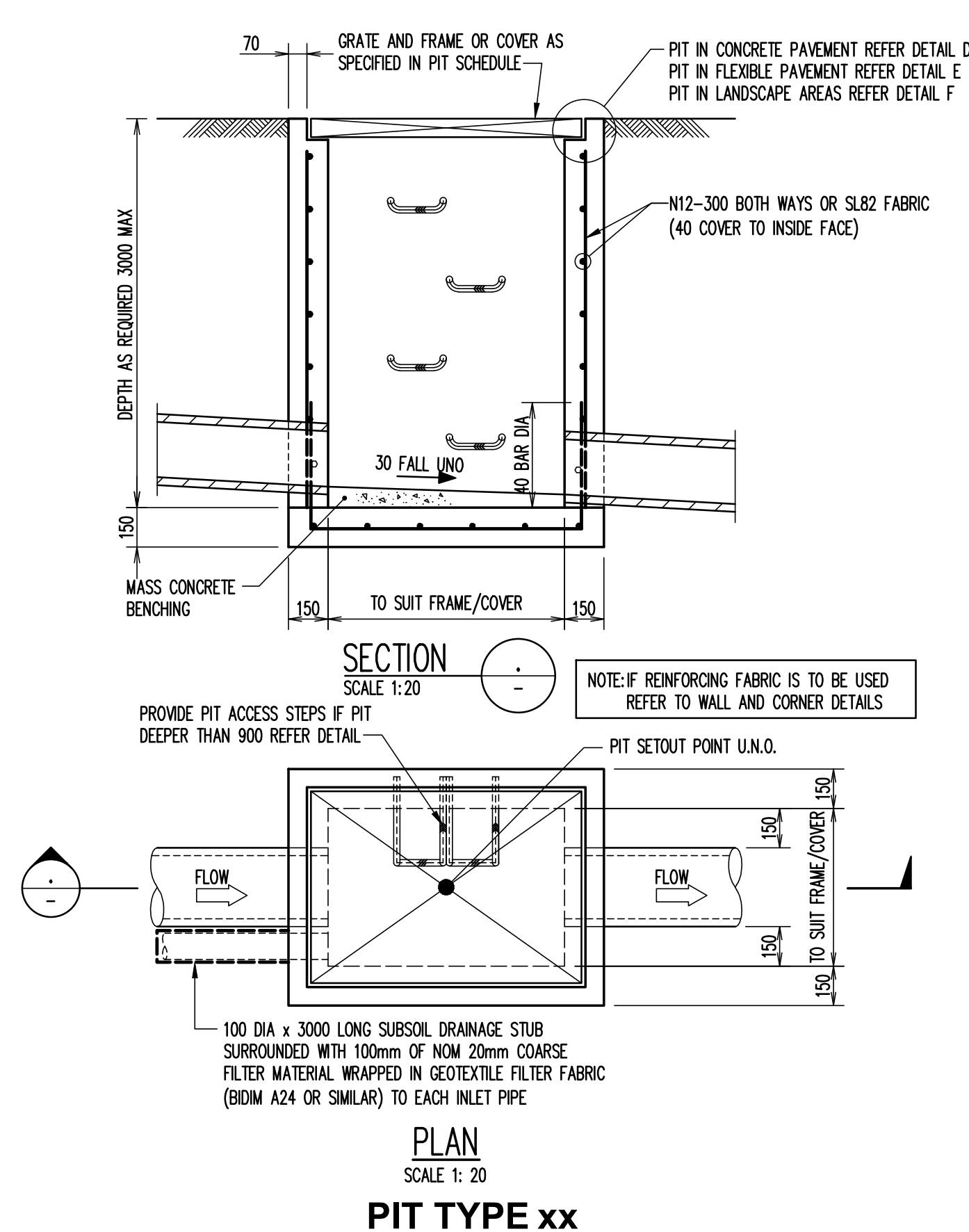
Architect  
**BVN**  
LEVEL 4, 12 CREEK STREET, BRISBANE  
QLD 4000 AUSTRALIA



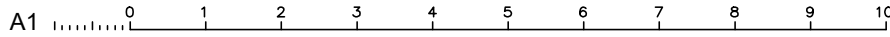
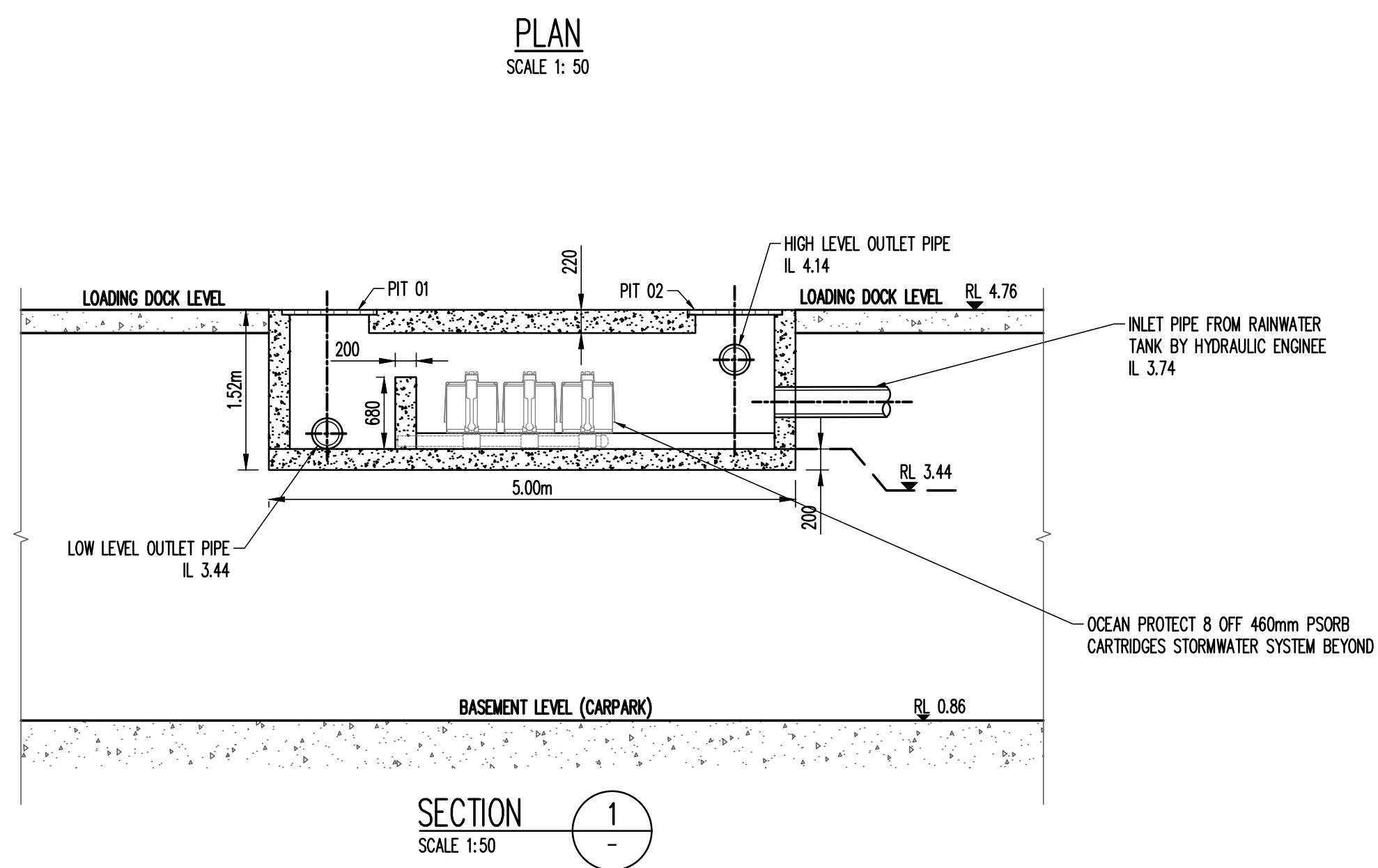
Sheet Subject
SITEWORKS AND STORMWATER MANAGEMENT



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