

THE FOREST HIGH SCHOOL

CIVIL ENGINEERING SSDA REPORT



THE FOREST HIGH SCHOOL

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ISSUE AUTHORISATION

PROJECT: The Forest High School

Project No: 6310

Rev	Date	Purpose of Issue / Nature of Revision	Prepared by	Reviewed by	Issue Authorised by
01	09/02/22	Issue for SSDA	NKK	NKK	PAL
02	25/02/22	Re-issue for SSDA	NKK	NKK	PAL
03	23/08/22	Re-issue for SSDA	MZV	PAL	PAL
04	28/09/22	Re-issue for SSDA	MZV	PAL	PAL

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Executive Summary

enstruct have been engaged by School Infrastructure NSW to provide civil engineering consultancy and design to achieve development (SEARs) approval for The Forest High School. This report relates to the civil engineering elements of the works in relation to Items 13. *Stormwater and Wastewater* and 14. *Flood Risk* of the SSD-26876801 SEARs Matrix for the high school.

The key items include:

- Onsite Stormwater Detention (OSD)
- Water Sensitive Urban Design (WSUD)
- Flooding
- Stormwater Overland Flow
- Erosion and Sediment control

The report will address the following elements of the SEARs SSD-26876801 document for the development of the Forest High School:

13.	Stormwater and Wastewater
13.1	Provide an Integrated Water Management Plan for the development that: <ul style="list-style-type: none"> - is prepared in consultation with the local council and any other relevant drainage or water authority. - details the proposed drainage design for the site including any on-site treatment, reuse and detention facilities, water quality measures, and the nominated discharge points (Section 4 of this report). - demonstrates compliance with the local council or other drainage or water authority requirements and avoids adverse impacts on any downstream properties (Section 4 Stormwater Design of this report).
13.2	Where drainage infrastructure works are required that would be handed over to the local council, or other drainage or water authority, provide full hydraulic details and detailed plans and specification of proposed works that have been prepared in consultation with, and comply with the relevant standards of, the local council or other drainage or water authority (Section 4.2 of this report).
14.	Flood Risk
14.1	Identify any flood risk on-site having regard to adopted flood studies, the potential effects of climate change, and any relevant provisions of the NSW Floodplain Development Manual (Section 5.0 of this report).
14.2	Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions and operational procedures to mitigate flood risk where required (Section 5.1 of this report).

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1 Introduction

Schools Infrastructure NSW (SINSW) is seeking to relocate the existing school campus of Forest High School (located at 135 Frenchs Forest Road, Frenchs Forest) with the development of a new school campus located to the southeast of the existing site (Figure 1) at 187 Allambie Road, Allambie Heights. This will provide a Stream 9 high school campus to facilitate a capacity of 1460 students. The school development is aimed at meeting the Educational Facilities Standards and Guidelines (EFSG) and strengthen the curriculum offering of the high school, whilst enhancing the relationships that the school has with community groups and adjacent schools.

The existing site currently has one disused two storey building in the north eastern portion of the site, greenfield land to the west and north, and a hardstand carpark area to the south. A crib-lock and concrete retaining wall up to approximately 6m in height follows the southern boundary of the site adjacent to the CPA site

1.1 The School Site

The new Forest High School is located at the intersection of Allambie Road and Aquatic Drive in Allambie Heights (Figure 2), within the Northern Beaches Council (NBC) Local Government Area. The overall site has an area of approximately 4.50ha. The site comprises of Lot 11 DP1194177 and Lot 13 DP 1112906, and the proposed Lots 11 and 12. The site is bounded by Aquatic Drive and Allambie Road to the north, Allambie Road to the east, the Cerebral Palsy Alliance (CPA) and Arranounbai School to the south, and vacant bushland to the west.

The site generally grades from the north east corner of the site at the bend of Allambie Road, down to a low point at the south west corner of Lot 11 and the CPA site. There is an approximate difference in land height between these two points of RL 156.00m AHD on the north eastern boundary and RL 147.71m AHD at the south western corner. The vacant greenfield land that will make up the proposed Lots 11 and 12 similarly grades from RL 152.50m AHD at the boundary with Aquatic Drive, to RL 142.50m AHD at the southwestern site corner adjacent to Arranounbai School.



Figure 1: Site Comparison (Source: architectus)



Figure 2: Site Location (Source: architectus)

2 Existing Site

The existing site currently has one disused two storey building in the north eastern portion of the site, greenfield land to the west and north, and a hardstand carpark area to the south. A crib-lock and concrete retaining wall up to approximately 6m in height follows the southern boundary of the site adjacent to the CPA site, which is to be maintained.

A bridge crosses the southern boundary of the site from the adjacent CPA site which functions as the emergency exit for their Building A.

An ephemeral creek traverses the north western portion of the site (Figure 3). Two embankments of approximately 3m in height run parallel to Aquatic Drive in the western greenfield portion of the site.

A survey has been completed across the site including the location of services. The location quality of the service ranges from Level B (electronically traced) to Level D (Dial Before You Dig), however as the design progresses, should there be any possibility of the services clashing, then Level A (Pot holing of service) will be recommended.

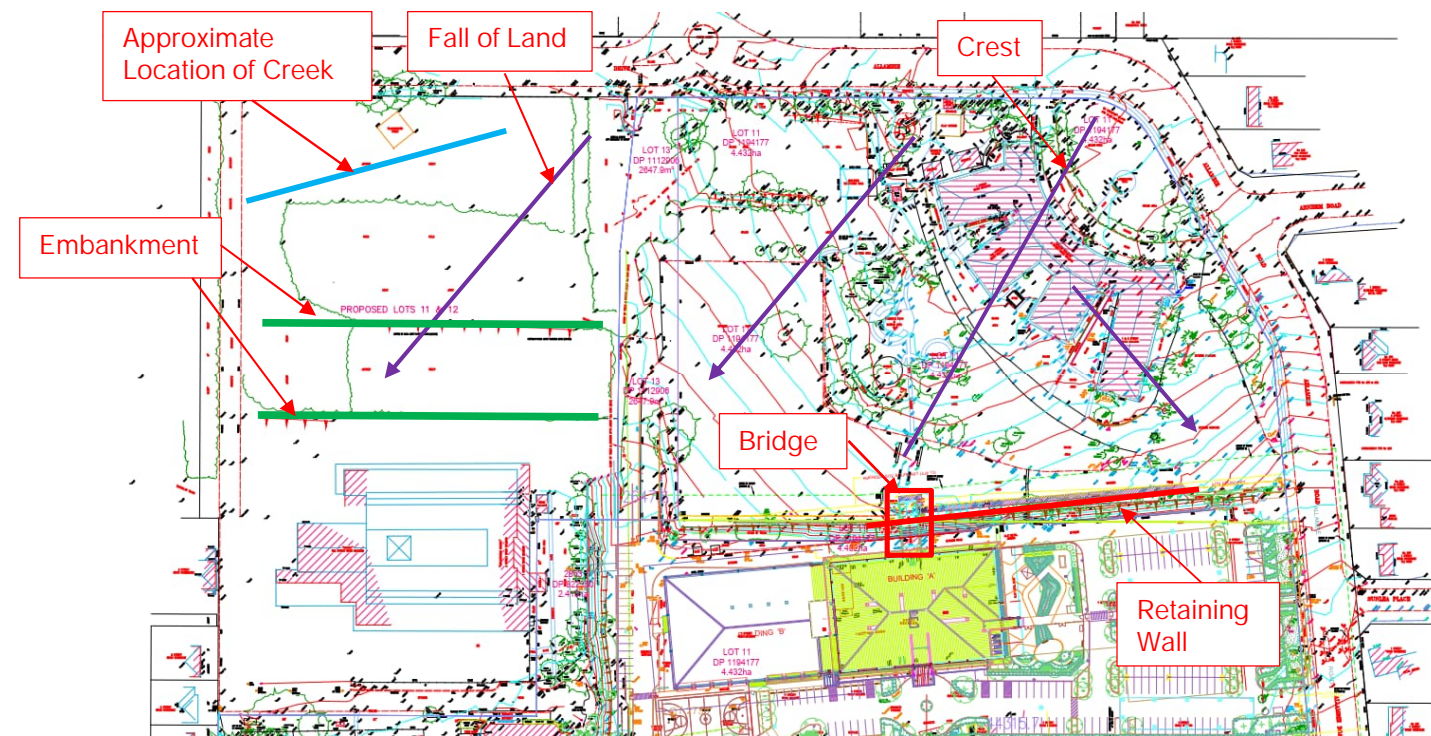


Figure 3: Site Survey

2.1 Existing Stormwater

The site has several stormwater lines draining various parts of the site. The existing carpark in the south-eastern side of the site is drained with a number of pits and pipes to a 500mm box culvert traversing the CPA car park and then connecting into Allambie Road. The western side of Lot 11 including the car park area, drains to the south western corner of the site and into the CPA site. The Council pipe drainage system from Allambie Road / Aquatic Drive intersection drains through a 600mm diameter pipe at the northern boundary of the site and discharges into an existing ephemeral creek traversing the site in the north western corner. The creek in the greenfield lot flows from northeast to west (Figure 4) and is captured into a 450mm diameter pipe prior to the Arranounbai School driveway (Figure 5). There is also another smaller 150 mm diameter pipe collecting water from the lower level of the greenfield lot and connecting it into the Arranounbai School driveway drainage system (Figure 6).

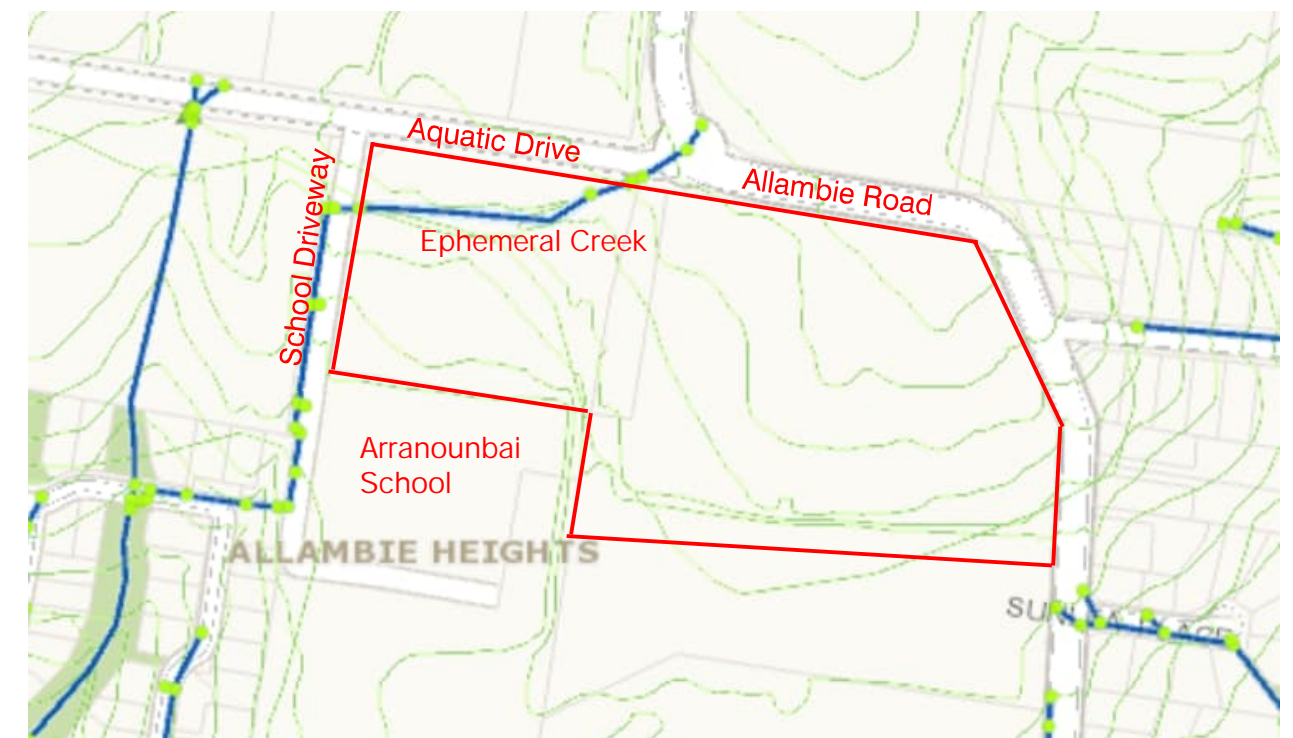


Figure 4: Stormwater system (Source: NBC Stormwater Map)



Figure 5: Headwall from ephemeral creek crossing Arranounbai School driveway



Figure 6: Overland flow from lower embankment into 150mm diameter pit discharging into Arranounbai School driveway

3 Proposed Development

The proposed development is to include a kiss and drop zone at the Allambie Road, bus zones along Aquatic Drive and Allambie Road with school parking under the playing field. There are five basketball courts and one playing field which is located to the western portion of the site. There are eight buildings located in the eastern portion of the site which include a gymnasium, cola, theatre, administration office building, a library and specialised learning precinct to the east of the site along Allambie Road (Figure 7).

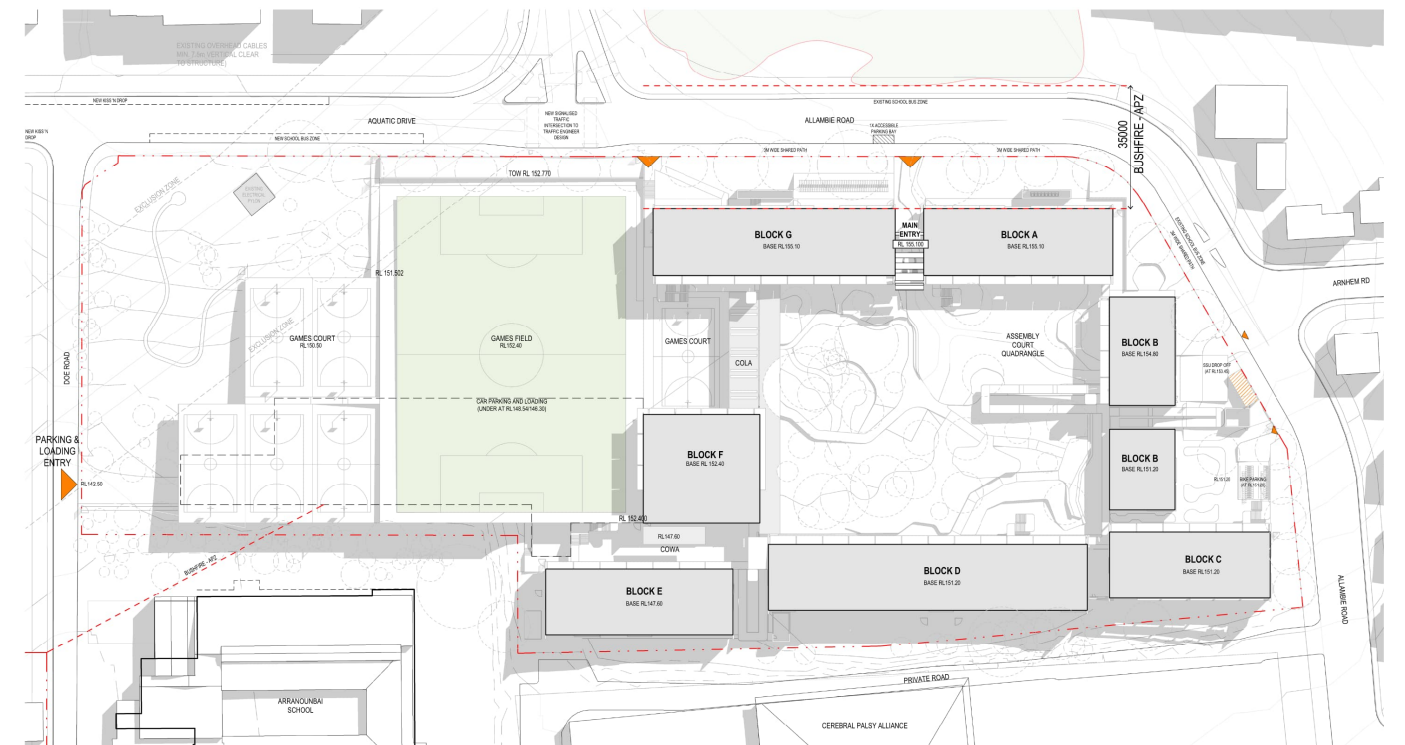


Figure 7: Proposed Site Plan (Source: architectus)

4 Integrated Water Management Plan

The stormwater design has been conducted in accordance with Australian Standards, Northern Beaches Council Water Management for Developments Policy, Northern Beaches Council Onsite Stormwater Detention Technical Specification, Australian Rainfall and Runoff (2019), and School Infrastructure NSW's EFSG Section DG95 Stormwater in reference to Item 13.1 of the SSD-26876801 SEARs Matrix.

In general, drainage has been designed to ensure that site facilities are available for student use in all weather conditions up to a 1% AEP storm event. All new roof stormwater will be collected in roof gutters and downpipes and conveyed to the in-ground pipe system. Surface stormwater has been designed to be collected in pits. The in-ground stormwater has been connected to water quality controls and one of the three Onsite Stormwater detention (OSD) tank.

Pipes and pits have been designed to satisfy the minimum provisions of AS 3500.3. They will convey, at least, the 5% Annual Exceedance Probability (AEP) flows. Where pipe capacity is exceeded i.e. greater than 5% AEP, stormwater will be conveyed as overland flow. Overland flow paths will convey at the minimum 1% AEP stormwater flows with a Depth x Velocity product less than 0.4m²/s.

Prior to stormwater pipeline design, enstruct confirmed soil classification from the geotechnical report. Pipeline design has provided minimum cover relevant to the ground material.

Minimum Pipe sizes are in accordance with EFSG Section 95.08.01 Pipework requirements as follows:

- DN 100 for subsoil drainage
- DN 225 downstream of any grated pit
- DN 225 downstream of any side entry pit

Class B pits have been chosen in accordance with AS 3996.

4.1 Onsite Stormwater Detention (OSD)

The Forest High School site is located in Region 2 of the Northern Beaches Council stormwater map (Figure 8). This requires OSD to be provided in all cases (Figure 9) where the total existing and proposed impervious area exceeds 40% of the total site area. The OSD is required to manage the runoff from the post development site to below the amount of runoff from the total site prior to the development, for the 20% AEP, 10% AEP, 5% AEP and a 1% AEP storm events (NBC Water Management for Developments Policy). The pre-development permissible site discharge (PSD) has been calculated from “state of nature” conditions, with 0% impervious area. As the total site area will comprise of the existing Lots 11 and 13, and newly proposed Lots 11 and 12, as well as land grading to various directions, three (3) OSD structures have been designed.

The OSD tanks are located at the lowest point of their catchment area to ensure all surface flows will be directed to them, even in the event of a pipe system failure. OSD has been located away from any natural watercourses and Overland Flow Paths (OLFP) from catchments external to the site and will not be inundated by a natural watercourse or externally sourced OLFP in any events up to and including the 1% AEP storm event.

As the OSD tanks are to be located underground, they have been designed in consideration of easy access for inspections and maintenance. The systems have been designed to be constructed from prefabricated reinforced concrete units to operate to the requirements of Council. This also allows the tanks to be readily cleaned and perform hydraulically as required.

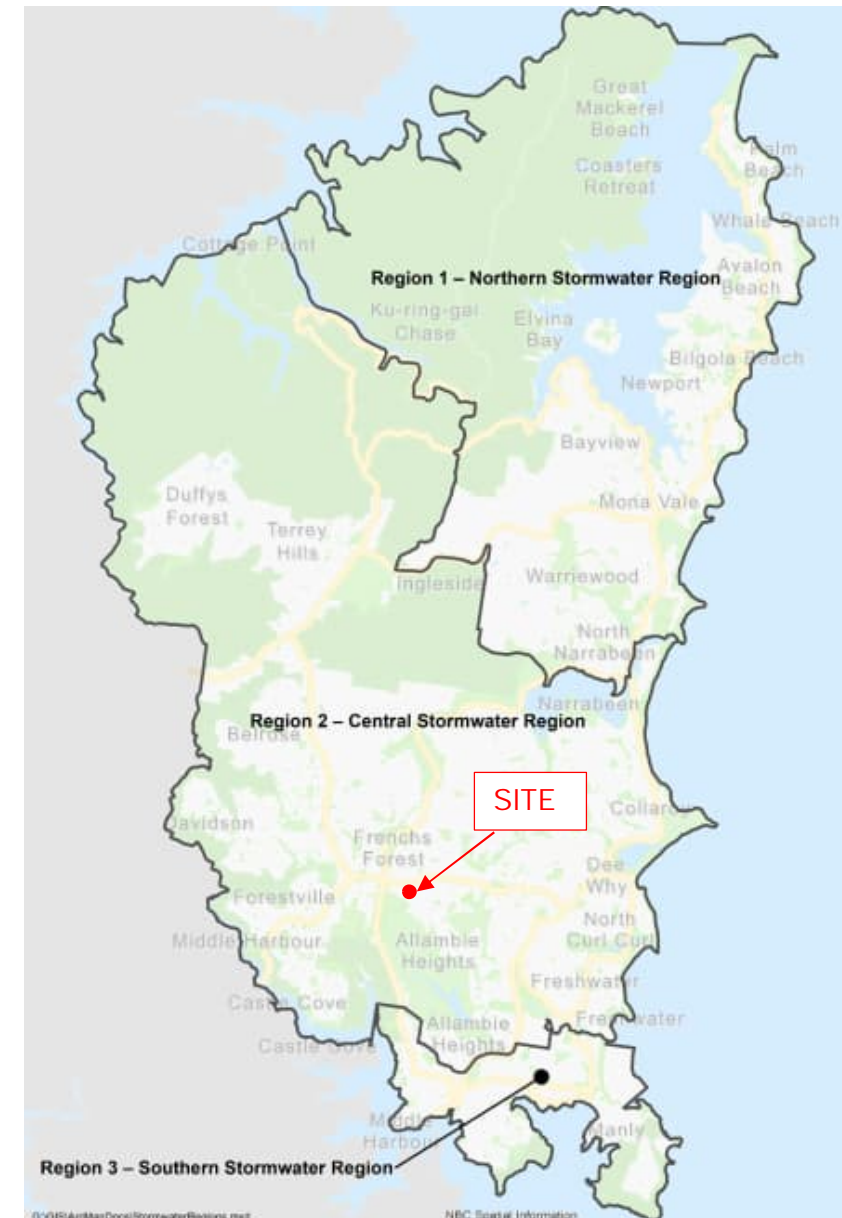


Figure 8: Stormwater Region Map (Source: NBC Water Management for Developments Policy)

Part 4.2 Northern Beaches Stormwater Region 2
Part 4.2.1 Description of Work
Residential flat building, commercial, industrial, multiple occupancy development and subdivisions resulting in the creation of three lots or more, will require OSD in all case. Please provide a design in accordance with the section 9.3.2 of Council’s Water Management for Development Policy. Any single residential building development, please proceed to part 4.2.2 of this checklist.

Figure 9: OSD Requirement (Source: NBC Water Management for Developments Policy)

Three (3) underground OSD tanks have been provided on the site to successfully manage the velocity and volume of water discharging from the site. Figure 10 indicates their proposed location and their corresponding catchment areas as a result of the land grades. The

designated point of discharge into the existing Council stormwater system in adjacent streets is also shown. A detailed OSD plan can be referred in Appendix C.

Any reduction in the number of OSD tanks will require detailed analysis of the downstream stormwater network to understand the impacts of the additional stormwater being included in the system.

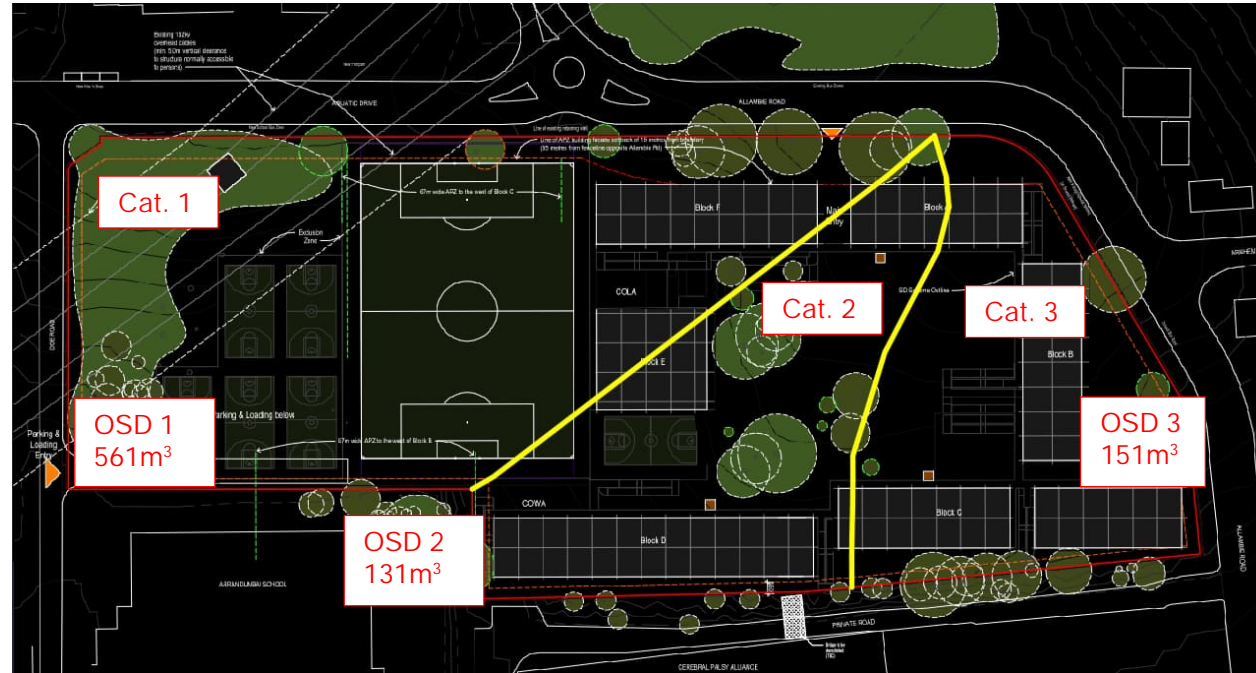


Figure 10: OSD size and location for each catchment

4.2 DRAINS Modelling

A DRAINS model has been developed to confirm the ability of the three (3) proposed underground OSD tanks to manage stormwater flows from the site to below predevelopment site flow rates. OSD sizing calculations indicate the following parameters for each OSD tank.

	VOLUME (m ³)	OUTLET PIPE DIAMETER (mm)
OSD 1	561	375
OSD 2	131	375
OSD 3	151	375

Appendix A indicates the restricted flows from the site through the use of the abovementioned OSD tanks.

4.3 Overland Flow Paths

If the piped in-ground stormwater system fails due to blockage or other obstruction, stormwater flows will be required to be conveyed as overland flow. The overland flow paths have been designed to direct the water away from buildings and towards the sites downstream boundary.

Overland flow paths have been sized to accommodate the 1% AEP storm flows and not exceed safe Depth x Velocity product of 0.4m²/s for pedestrians and vehicles.

4.4 Stormwater Quality

The NBC Water Management for Developments Policy sets out the requirements for treatment of the stormwater prior to discharge into the Council system. The site is not located within a NBC High Quality Catchment (Figure 12). As the total site area is comprised of various Lots, there are separate requirements for each. The proposed Lot 11 and 12 satisfies the NBC category of “undeveloped land” which will require pollutant targets at shown in Figure 13. The existing Lot 11 is required to follow Figure 14 pollutant requirements. The stormwater is discharging to Manly Creek to the south of the site which connects to the Manly Dam, requiring stringent stormwater treatment.

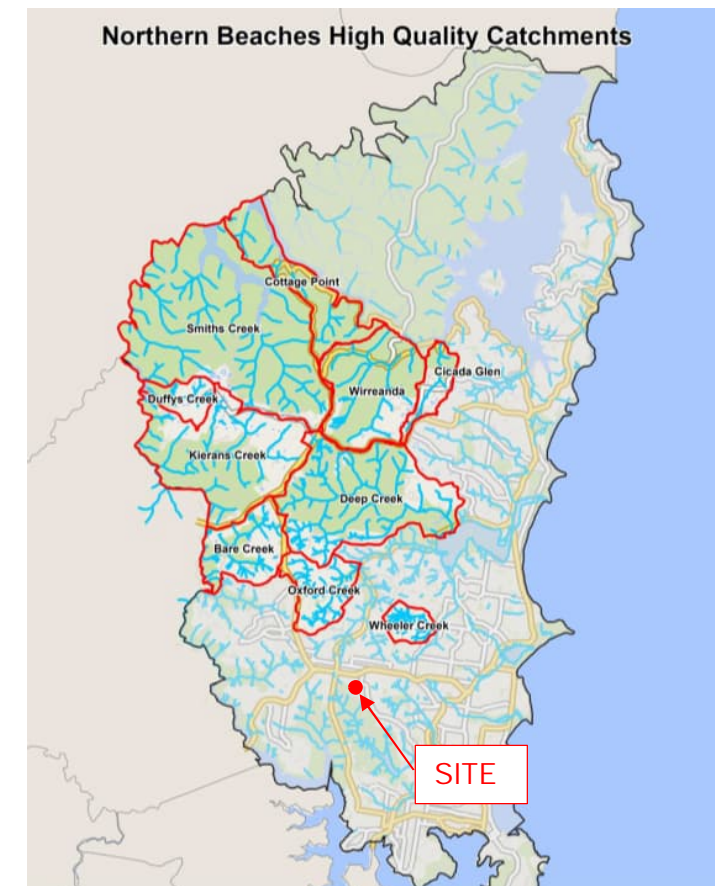


Figure 12: Northern beaches High Quality Catchments Map (Source: NBC Water Management for Developments Policy)

Criteria	Objectives
Stormwater Quality	Stormwater quality (temperature, salinity, chemical makeup and sediment loads) discharging from the development shall not impact the receiving waters. Reference shall be made to local data if available, including the Warringah Creek Management Study and the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC), or other widely accepted guidelines. Stormwater and other drainage shall not be discharged into saltmarsh.
Sediment	Disturbance to stream and wetland sediments is to be minimised by regulated discharge of stormwater and dissipation of flows at discharge locations. Runoff from the development must be retained at natural discharge rates and sediments controlled at the source.
Hydrology	Stormwater and groundwater flow is to mimic natural conditions and ensure a dispersed pattern of flow, avoiding centralised or concentrated discharge points into the wetland or waterway. Natural flow regimes must be retained. The reduction or increase in flows, alteration in seasonality of flows, changes to the frequency, duration, magnitude, timing, predictability and variability of flow events, altering surface and subsurface water levels and changing the rate of rise or fall of water levels must be avoided.

Figure 13: Undeveloped land stormwater quality requirements (Source: NBC Water Management for Developments Policy)

Pollutant	Performance Requirements
Total Phosphorous	65% reduction in the post development mean annual load ¹
Total Nitrogen	45% reduction in the post development mean annual load ¹
Total Suspended Solids	85% reduction in the post development mean annual load ¹
Gross Pollutants	90% reduction in the post development mean annual load ¹ (for pollutants greater than 5mm in diameter)
pH	6.5 - 8.5
Hydrology	The post-development peak discharge must not exceed the pre-development peak discharge for flows up to the 50% AEP

Figure 14: General Stormwater quality requirements (Source: NBC Water Management for Developments Policy)

The removal rates have also been designed to meet the requirements of:

- The EPA's manual on Managing Urban Stormwater (Treatment Techniques)
- Stormwater Treatment Devices User Guide (NSW Supply) – Government Contract No.019, July 1999, Department of Public Works and Services
- The relevant Australian Standards for pollution control devices.

To always ensure the safety of the school population, physical (in lieu of natural removal) pollutant removal devices have been incorporated into the stormwater design to remove gross pollutants, suspended solids, and reduce nutrient runoff including nitrogen and phosphorous.

The mechanical pollution control devices will require on-going maintenance. Pollutant removal devices will require at least a yearly inspection and maintenance.

A series of pollution control devices have been provided to remove contamination from stormwater runoff to the required level, prior to discharge. The devices will include litter screens in pits, a detention tank trash screen, and an end of line treatment device to remove nitrogen, phosphorus, and suspended solids prior to discharge to the Council stormwater system. This system is preferred as it will be able to achieve pollutant reductions required, is easily maintained, and does not require large open areas or pose a risk to safety for the school population. The EFSG also notes that stormwater is to be treated to remove foreign matter and ensure minimal impact.

4.5 MUSIC Model

A MUSIC model has been developed to demonstrate the suitability of the proposed WSUD measures on the site. Appendix B indicates the WSUD designs for each catchment of the site.

Catchment 1 will utilise 19 Ocean Protect OceanGuards in stormwater pits, and 40-690mm Ocean Protect Stormfilter Cartridges in the OSD tank. Catchment 2 will treat stormwater to Council requirements using 15 OceanGuards in stormwater pits, 10-690mm Stormfilter cartridges, and a 30kL Rainwater tank for further treatment. Finally, 17 OceanGuard pit inserts, and 40-690mm Stormfilter cartridges will be used to treat stormwater in Catchment 3.

4.6 Erosion and Sediment Control

During construction and while the site is disturbed, erosion prevention and sediment control measures are required. The erosion and sediment control plan has been designed to maintain the required performance standard defined by the project ecologist to guarantee the protection of the site downstream environment with specific attention to the Manly Creek downstream.

Erosion prevention generally involves managing stormwater by diverting overland flow around construction areas as well as collecting stormwater within the construction zone and directing to sediment control devices. Devices incorporated into the site erosion and sediment control design are silt removal fences, hay bales, catch drains, and water flow dissipation and discharge control devices such as sandbags, pollution mattresses, geotextile pit filters, and basins.

Erosion prevention and sediment removal strategies need to be inspected regularly during construction works, cleaned and maintained after storm events, and modified to suit construction work progress, decanting and demolition.

The erosion and sediment controls are designed in accordance with Managing Urban Stormwater: Soils and construction - Volume 1 and are to be maintained until the site is fully stabilised to prevent pollution of the receiving environment. The erosion and sediment control plan can be referred in Appendix C.

5 Flooding

In reference to *Item 14. Flood Risk Assessment* of the SSD-26876801 SEARs Matrix, and Northern Beaches Council advice being:

“Council has a flood study which indicates that there is some flood affectation on the site. The report indicates that the private road through Lot 11 and the entrance to the underground car park are affected by the 1% AEP flood event. Basement carparks need to be protected up to the Flood Planning Level (FPL) determined by the 1% AEP flood height, which generally means having the crest of entrances at or above the FPL. The main entrance is at the south-west corner, with overland flow coming from the north / north-east. Flood engineer shall do a flood investigation to ensure that the carpark is protected up to the FPL, and that building floor levels are at or above the PMF level as a school is Vulnerable Development.” the civil engineering design has been undertaken following review of existing flood studies, consideration of climate change impacts on the site, and the relevant provisions of the NSW Floodplain Development Manual.

The existing site currently has one disused two storey building in the north eastern portion of the site, greenfield land to the west and north, and a hardstand carpark area to the south. A crib-lock and concrete retaining wall up to approximately 6m in height follows the southern boundary of the site.

An ephemeral creek traverses the north western portion of the site (Figure 3). Two embankments of approximately 3m in height run parallel to Aquatic Drive in the western greenfield portion of the site. There is a trunk drainage line on the western side of the roadway in Lot11 which the site is connected to.

In regard to the whole Manly Lagoon Catchment, the site is located towards the top of the catchment and grades from the north-eastern corner to the south-western corner. There is a level difference across the site from RL156.00 to RL141.00.

The NBC Water Management for Developments Policy does not identify the site as being flood prone due to the inland location of the campus (Figure 15). The school site is not within a Low, Medium or High Flood Risk Planning Precinct (Figure 16). The Medium Flood Risk Planning area represents the extent of the 1% AEP flood and so the site is not within the 1% AEP flood zone. Minor flooding spots of 1% and 20% AEP flood extents can be seen in NBC Manly Lagoon Floodplain Risk Management Study and Plan (Figure 17), but this is most likely a result of the LiDAR survey in the computerised model with the treed environment and does not indicate major flooding impacts as the flooding spots are not connected to the mainstream flooding. The site also sits in an elevated position above the Manly Creek to the south of the site which flows to the Manly Reservoir and therefore would not be affected by flood levels in this waterway.

Any new development is required to provide suitable freeboard to habitable floor levels. The NBC Water Management for Developments Policy requires that habitable floor levels are to be 500mm above the 1% AEP storm event flood level. Since a school is a vulnerable development, the building floor levels are to be set at or above the PMF flood level.

A flood planning certificate was requested from NBC which identifies flood levels across the site, however, Council has since advised that their current flood model for the Manly Lagoon Catchment is for mainstream flood analysis and is unable to provide overland flow flooding at the top of the catchment. NBC will provide enstruct with their TUFLOW model to assess the overland flow as part of the next phase of works. Refer to correspondence in Appendix D.

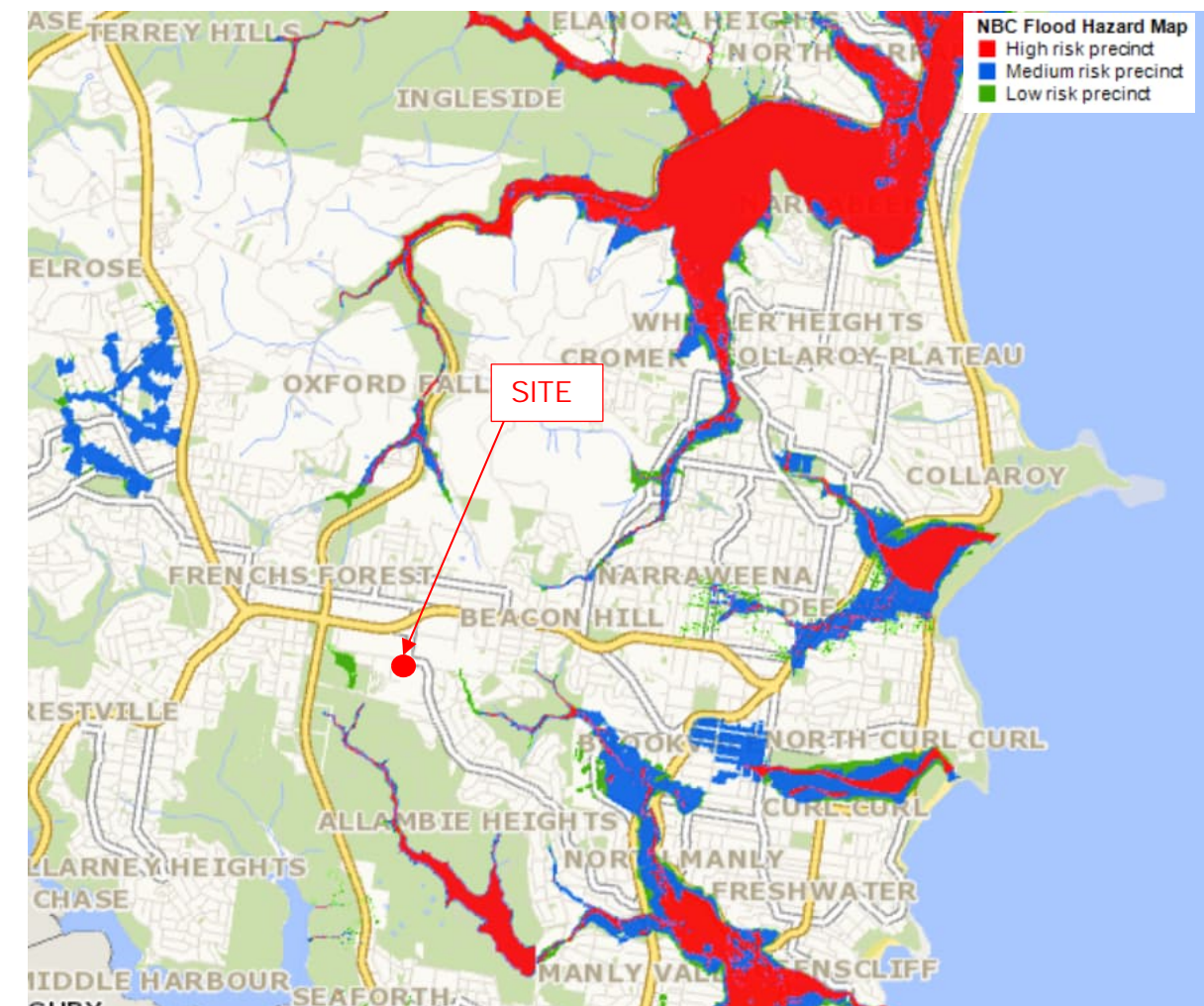


Figure 15: NBC Flood Hazard Map (Source: NBC Water Management for Developments Policy)

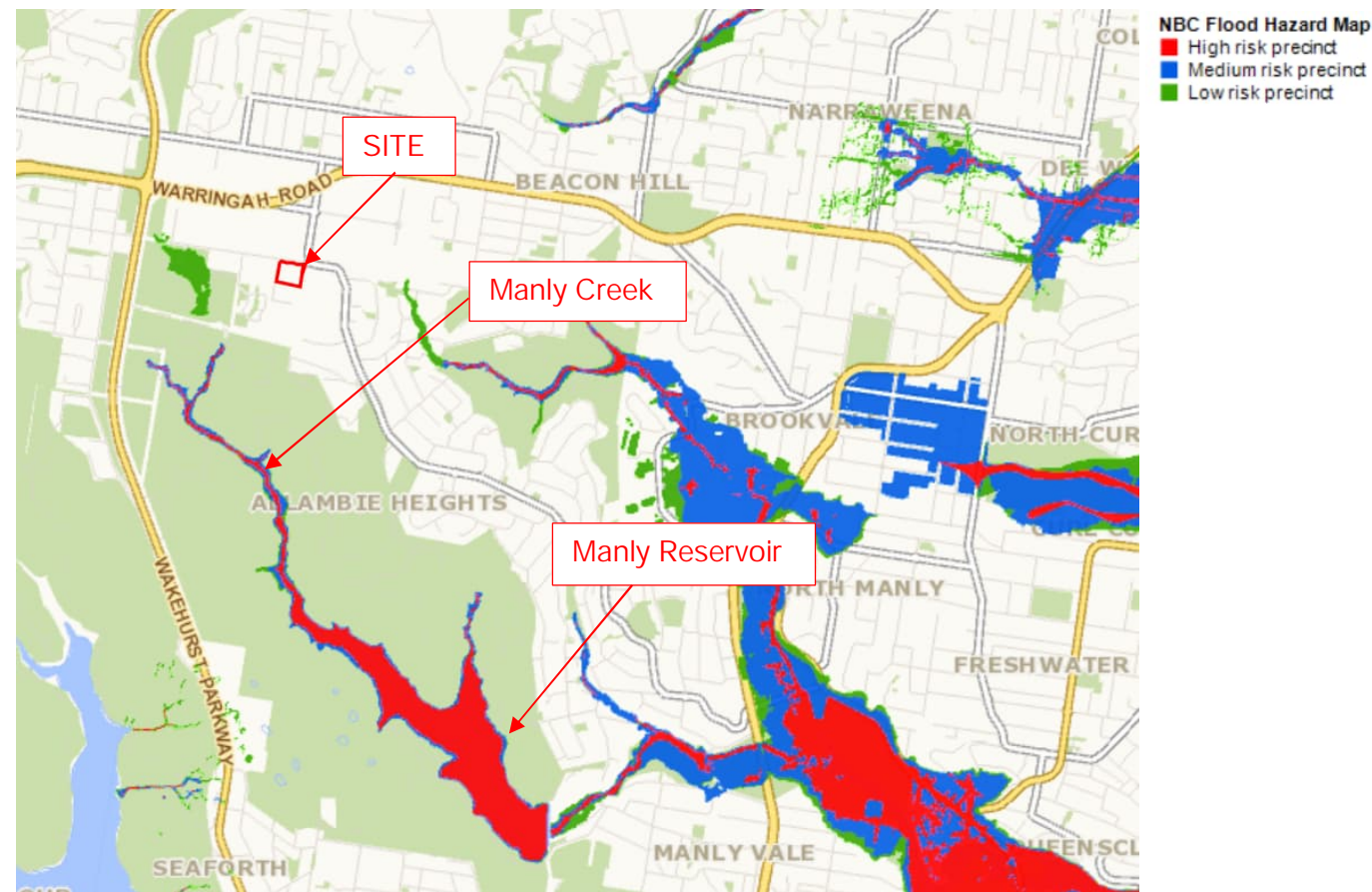


Figure 16: NBC Flood Hazard Map (Source: NBC Water Management for Developments Policy)

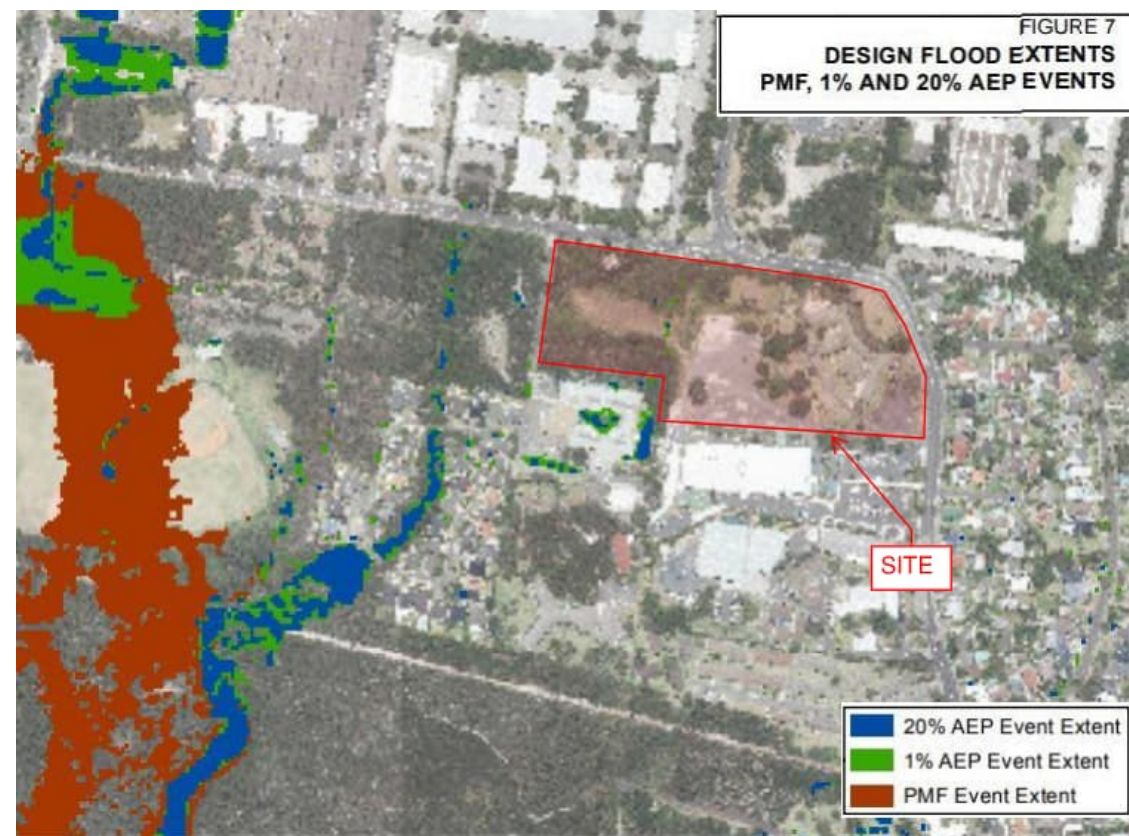


Figure 17: Extract from NBC Manly Lagoon Floodplain Risk Management Study and Plan

5.1 Flooding Impacts

To address Item 14.2 of the SEARs Matrix, the impact of the development on the flood risk on and off the site has been assessed. Since the development is not within a flood risk precinct, it is not anticipated that the development will have a major impact on existing flood extents. Local overland flow paths will be impacted in locations where new buildings are proposed on existing cleared land. This may have minor impact on the flow of stormwater in larger storm events but has been considered in civil design as per Section 4.3 of this report as the overland flow paths have been safely designed accommodate the 1% AEP storm flows and direct the water away from buildings and towards the sites downstream boundary.

From the NBC flood hazard map it is not anticipated that the school site will be impacted by climate change in regards to flooding as it is located a significant distance from the flood extents, shown in Figure 15. In addition, residential houses and streets surrounding school campus will be affected first, giving advanced flooding notification. Also noting that due to the surrounding topography, the school site will not become a flood island. Verbal correspondence with Northern Beaches Council indicates that the site is at the top of the catchment.

In response to Council's advice regarding the flood affectation of Lot 11 and the entrance to the new under cover car park, the flooding report shows some minor isolated flooding, but the flooding is not connected to the main overland flow path, as shown in Figure 17. The proposed driveway entrance road to the car park at Lot 11 is at RL142.5, with the entrance to the undercover carpark being at RL146.3 which is 5.0m above the existing ground. Therefore, the undercover car park or covered carpark is above the FPL and will not be impacted by any flooding.

6 Conclusion

As part of the Integrated Water Management Plan for the site, three (3) OSD tanks have been designed to manage the stormwater flows from the site due to the various land grades. OSD 1 is 561m³ in volume with a 375mm diameter outlet pipe. OSD 2 is 131m³ in volume with a 375mm diameter outlet pipe, and OSD 3 is to be 151m³ in volume with a 375mm diameter outlet pipe.

To achieve Council and regulatory water quality targets, Catchment 1 utilises 19 Ocean Protect OceanGuards in stormwater pits, and 40 690mm Ocean Protect Stormfilter Cartridges in the OSD tank. Catchment 2 treats stormwater to Council requirements through the use of 15 OceanGuards in stormwater pits, a 30kL rainwater tank collecting roof and sports court runoff, and 10 690mm Stormfilter cartridges. 17 OceanGuard pit inserts, and 40 Stormfilter cartridges will be used to treat stormwater in Catchment 3.

Erosion and sediment control measures are to be in place during construction to prevent contamination of the downstream stormwater system and tracking of grit and sediment onto the roadway.

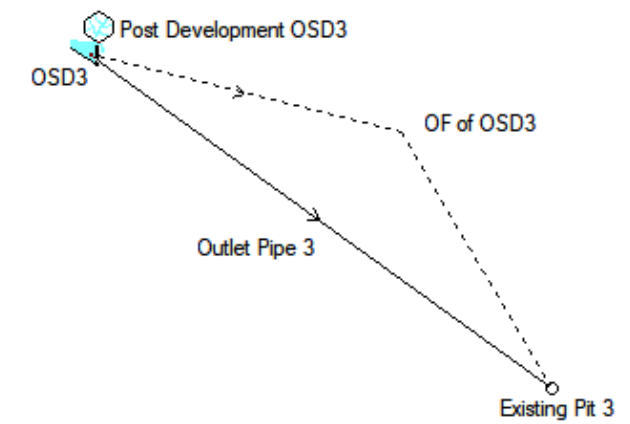
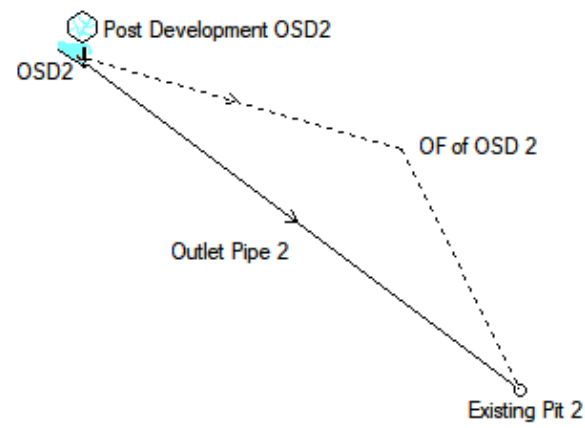
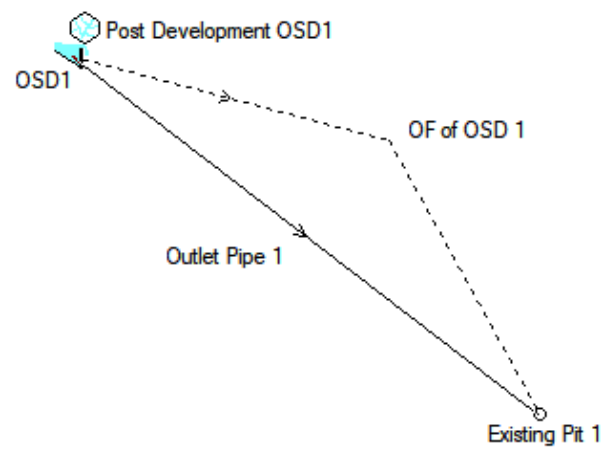
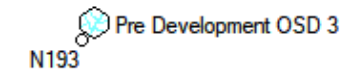
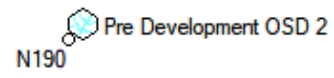
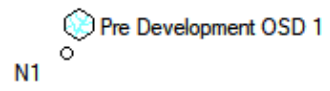
The NBC Water Management for Developments Policy does not identify the site as being flood prone due to the inland location of the campus.

As the school site including the undercover car park, is not impacted by the flooding in the 1% AEP storm event, it is anticipated that rainfall intensity and frequency caused by climate change will not cause the site to be impacted more significantly. The school is in an elevated position above the nearby Manly Creek and is located at the top of the catchment as per verbal NBC correspondence.

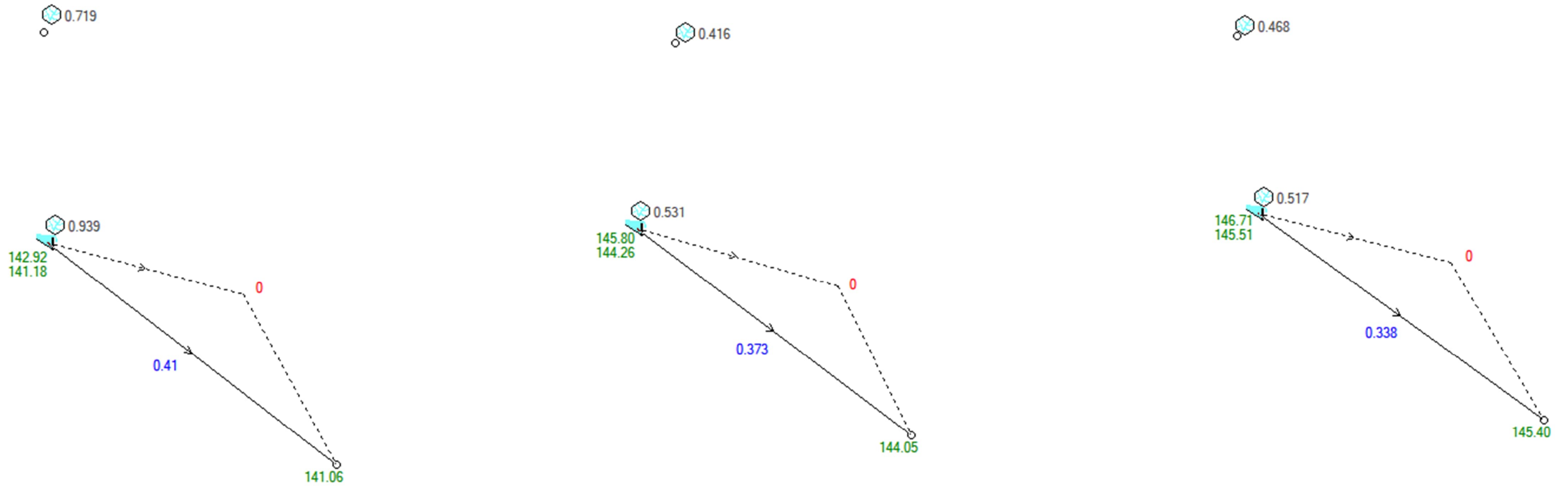
In order to confirm the impact of overland flooding both within the site and on downstream properties, NBC will provide enstruct with their TUFLOW model to assess the overland flow as part of the next phase of works.

APPENDIX A

DRAINS MODEL



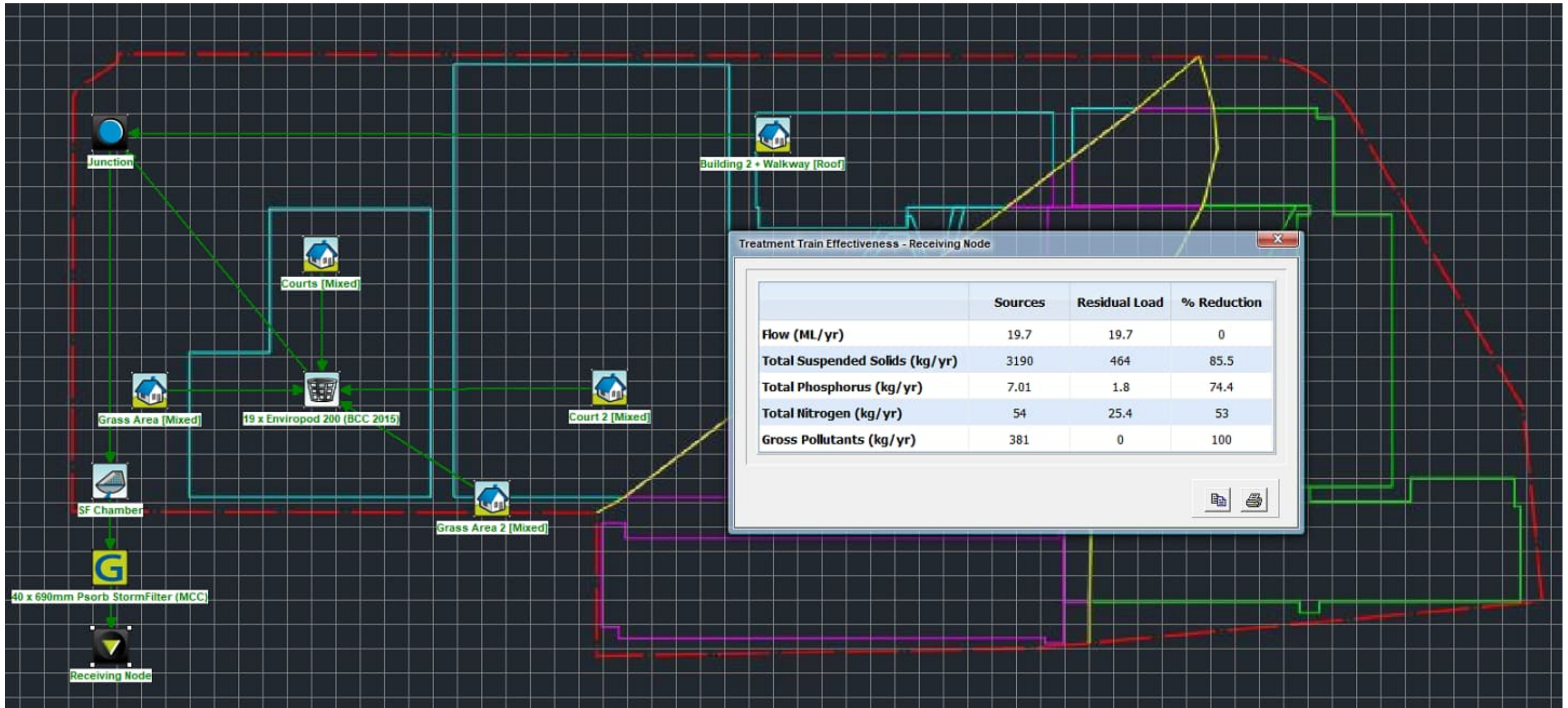
Preliminary DRAINS Model Layout



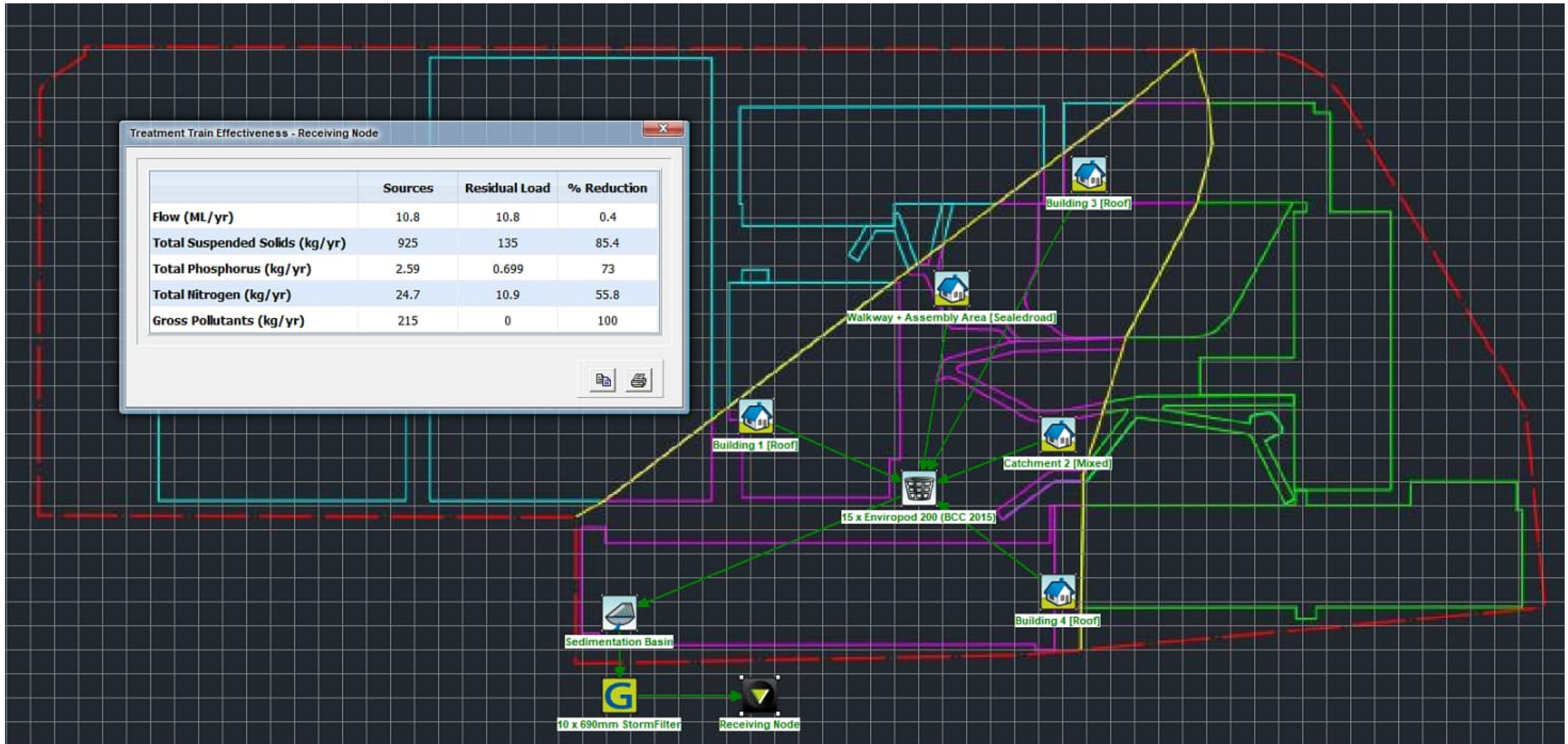
1% AEP storm event flows

APPENDIX B

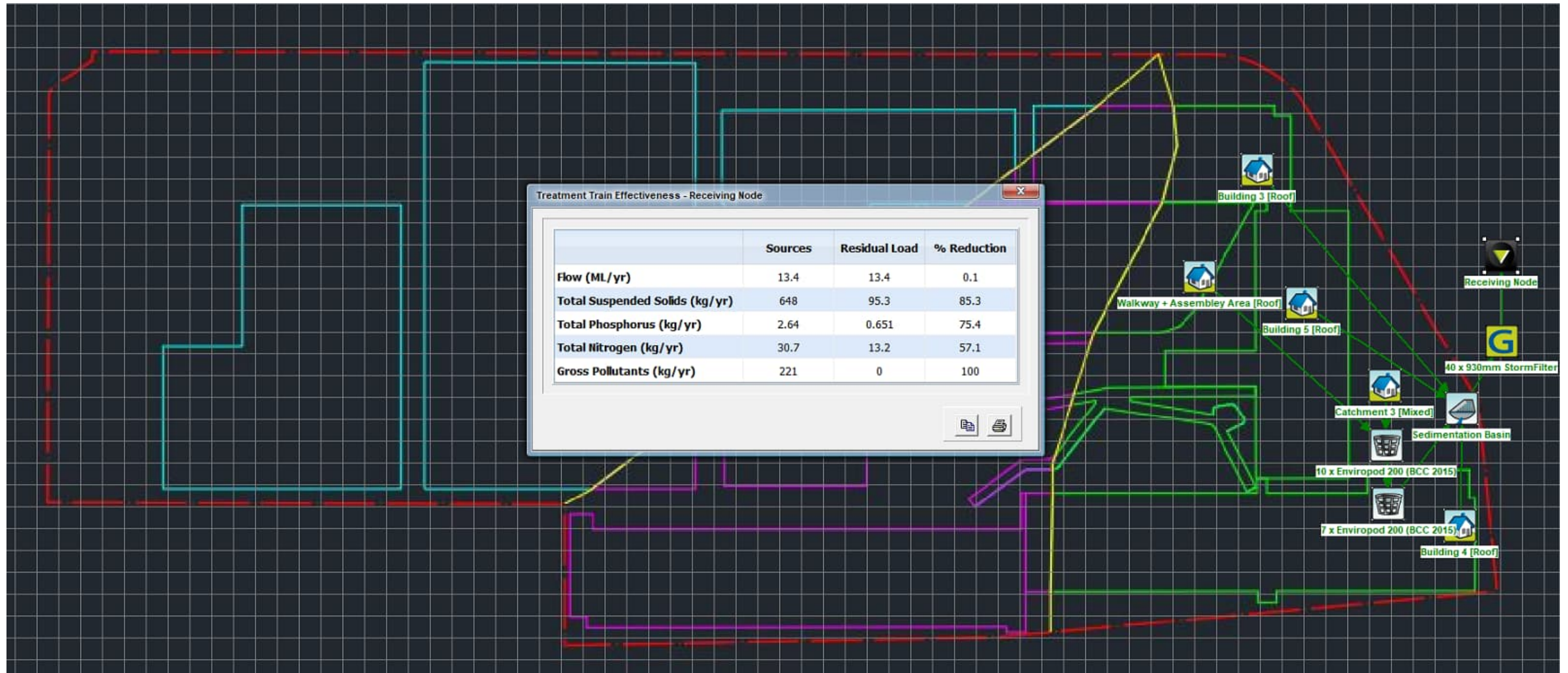
MUSIC MODEL



WSUD Measures - Catchment Area 1



WSUD Measures - Catchment Area 2



WSUD Measures - Catchment Area 3

APPENDIX C

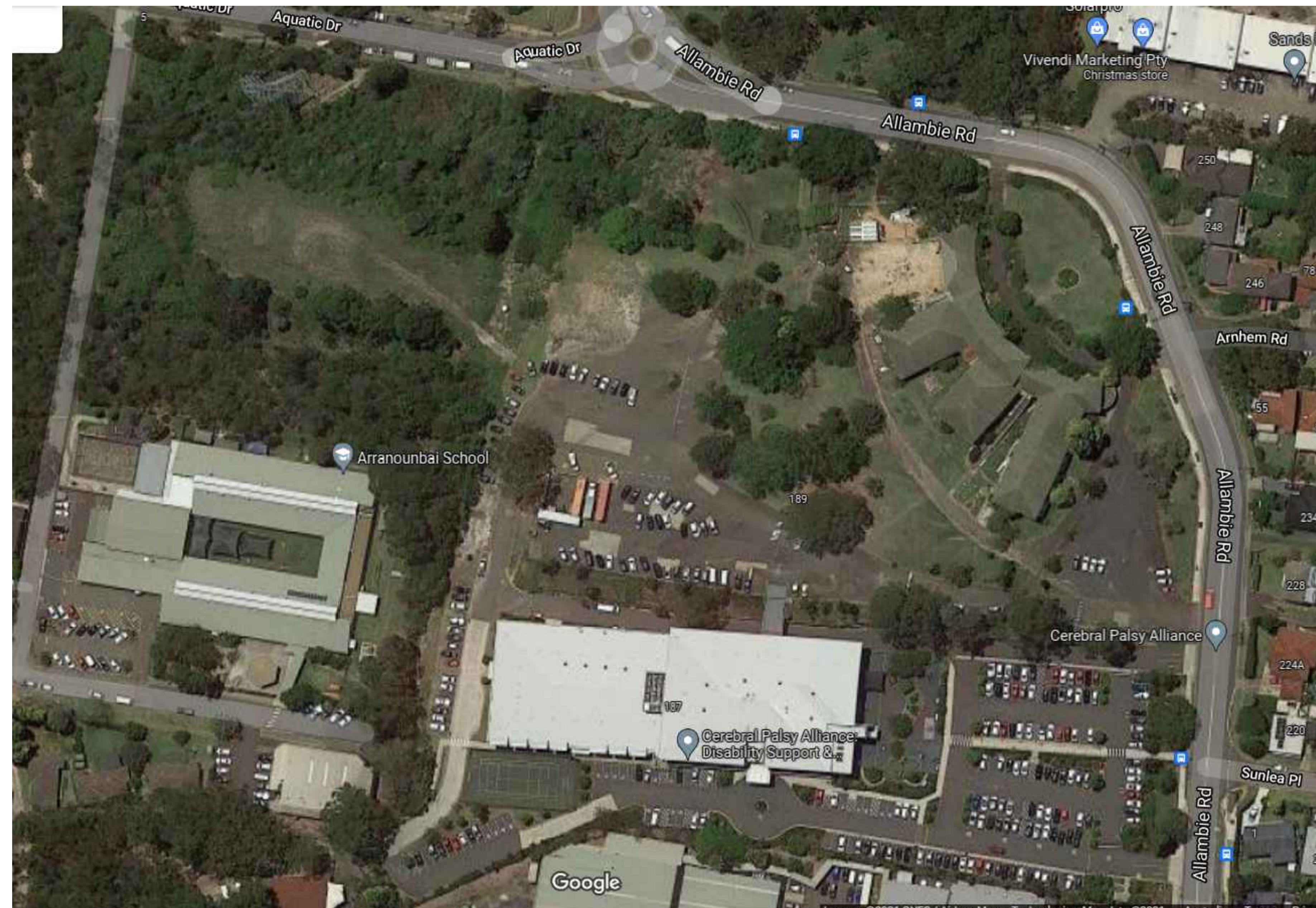
CIVIL DRAWINGS

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CIVIL ENGINEERING WORKS DRAWING LIST:

CV-0000	COVER SHEET
CV-0001	NOTES SHEET
CV-0200	BULK EARTHWORKS
CV-0205	EROSION AND SEDIMENT CONTROL PLAN
CV-0206	EROSION AND SEDIMENT CONTROL DETAILS
CV-0220	CIVIL SITEWORKS AND STORMWATER KEY PLAN
CV-0221	CIVIL SITEWORKS AND STORMWATER PLAN - SHEET 1
CV-0222	CIVIL SITEWORKS AND STORMWATER PLAN - SHEET 2
CV-0223	CIVIL SITEWORKS AND STORMWATER PLAN - SHEET 3
CV-0224	CIVIL SITEWORKS AND STORMWATER PLAN - SHEET 4
CV-0225	CIVIL SITEWORKS AND STORMWATER PLAN LOWER GROUND
CV-0250	RETAINING WALL PLAN
CV-0400	DETAILS SHEET 1
CV-0401	DETAILS SHEET 2
CV-0402	DETAILS SHEET 3
CV-0405	PAVEMENT DETAIL
CV-0410	ONSITE DETENTION TANK SECTION SHEET 1
CV-0411	ONSITE DETENTION TANK SECTION SHEET 2
CV-0412	ONSITE DETENTION TANK SECTION SHEET 3
CV-0600	CONTAMINATION PLAN



rev	date	description	dwn	ch'k
E	15/09/22	REISSUE FOR 100% SD	BEJ	PAL
D	12/08/22	REISSUE FOR 100% SD	MZV	PAL
C	24/11/21	ISSUE FOR 100% SD	PAD	PAL
B	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL
A	29/10/21	ISSUE FOR 70% SD	BEJ	PAL

rev	date	description	dwn	ch'k



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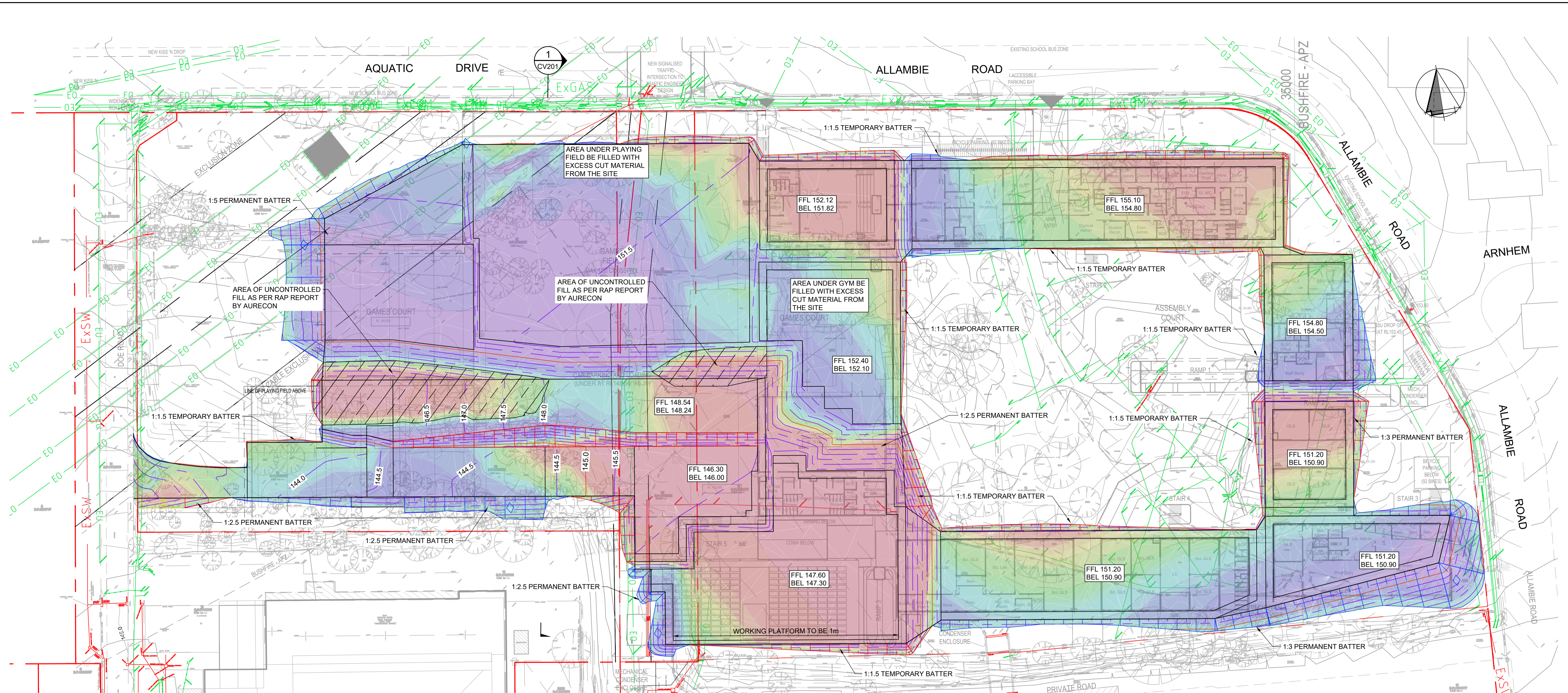


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drawing title	COVER SHEET
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status			
FOR INFORMATION ONLY			
scale at A1	drawn by	checked	date
NTS	PAD	PAL	OCT-21
project no.	drawing no.	rev.	
6310	CV-0000	E	



Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Bulk Cut & Fill Volume	1.000	1.000	25602.934sq.m	14441.572 Cu. M.	13922.325 Cu. M.	519.247 Cu. M.<Cut>

BULK EARTHWORKS METHODOLOGY

- STAGE 1**
- PROVIDE THE BULK EXCAVATION FOR BUILDINGS TO THE BULK EARTHWORKS LEVELS AS SHOWN ON THE PLAN WHICH COMPRISES OF FINISHED FLOOR LEVEL MINUS (SLAB THICKNESS + BASE COURSE).
 - PROVIDE BULK EXCAVATION FOR UNDERGROUND CARPARK, LOADING DOCK AND ACCESS ROAD WHICH COMPRISES OF FINISHED SURFACE LEVELS MINUS PAVEMENT (0.4m).
 - STOCKPILE THE VOLUME OF EXCESS UNCONTROLLED CUT MATERIAL WITHIN THE SITE.
- STAGE 2**
- UNCONTROL CUT MATERIAL EXCAVATED FROM STAGE 1 TO UNDERGO APPROPRIATE SEIVING AND REMOVAL OF WASTE MATERIAL TO BE REUSED ON SITE. THIS IS BASED ON THE GEOTECH REPORT SECTION 6.2.7 MATERIAL REUSE AND DISPOSAL, PREPARED BY TETRA TECH COFFEY, REFERENCE NUMBER 754-SYDGE284698-AB, DATED 31 MAY 2021.
 - AFTER UNDERGOING TREATMENT, UNCONTROL CUT MATERIAL TO BE REUSED AS CONTROL FILL UNDER THE SPORTS FIELD AND GYM.
 - LEFTOVER WASTE (ASBESTOS) AFTER CLEANING TO BE DISPOSED UNDER THE SPORTS FIELD.
 - GEOGRID TO BE USED IN PROPOSED ACCESS ROAD CARPARK AND LOADING DOCK.

- NOTES:**
- * BULK EARTHWORKS LEVEL = FINISH SURFACE - (SLAB THICKNESS + BASE COURSE)
 - BULK VOLUMES DOES NOT INCLUDE STRIPPING OF TOPSOIL.
 - REFER ARCHITECTS DRAWINGS FOR BUILDING SETOUT
 - BULK EARTHWORK DRAWINGS ARE FOR BULK EXCAVATION ONLY. THEY ARE NOT TO BE USED FOR DETAILED EXCAVATION SUCH AS: LIFT SHAFTS, FOOTINGS, PITS, BACKFILL, TRENCHING AND LANDSCAPING.
 - BULK EARTHWORK SETOUT REFERS TO BULK EXCAVATION ONLY. THEY ARE NOT TO BE USED FOR BUILDING, KERB OR ANY OTHER SETOUT.

LEGEND

- 8.4 ---
 - 9.0 ---
 - BE 22.00
 - ExW
 - EO
 - EU
 - ExSW
 - ExGAS
 - ExCOM
- SITE BOUNDARY**
- EASEMENTS**
- BULK EARTHWORKS MINOR CONTOUR**
- BULK EARTHWORKS MAJOR CONTOUR**
- BUILDING OUTLINE**
- BULK EARTHWORKS PAD OUTLINE**
- BATTER**
- BULK EARTHWORKS PLATFORM LEVEL**
- EXISTING WATER LINE**
- EXISTING ELECTRICITY OVERHEAD LINE**
- EXISTING ELECTRICITY UNDERGROUND LINE**
- EXISTING STORMWATER LINE**
- EXISTING GAS LINE**
- EXISTING COMMS LINE**
- CARPARK AND LOADING DOCK AREA 4250 m²**

Surface Analysis: Elevation Ranges

Number	Color	Minimum Elevation (m)	Maximum Elevation (m)	2D Area (m ²)
1		-4.194	-1.700	3154.1
2		-1.700	-1.000	2919.0
3		-1.000	-0.800	1296.6
4		-0.800	-0.700	655.1
5		-0.700	-0.600	680.6
6		-0.600	-0.400	1180.4
7		-0.400	-0.100	1911.4
8		-0.100	0.000	709.4
9		0.000	0.100	772.6
10		0.100	0.200	800.0
11		0.200	0.400	1787.9
12		0.400	0.500	828.7
13		0.500	0.900	2743.8
14		0.900	1.300	1886.0
15		1.300	1.700	1244.3
16		1.700	3.600	2903.8

rev	date	description	dm	ch/k
F	12/08/22	REISSUE FOR 100% SD	BEJ	PAL
E	04/08/22	UPDATED FOR NEW DESIGN	BEJ	PAL
D	11/07/22	VOLUME OF UNCONTROLLED FILLED ADDED	GBM	PAL
C	08/07/22	ISSUE FOR COSTING	GBM	PAL
B	01/06/22	ISSUE FOR CONCEPT DESIGN	PAD	PAL
A	13/05/22	BULK EARTHWORKS GEOGRID OPTION	PAD	PAL

rev	date	description	dm	ch/k
I	15/09/22	REISSUE FOR 100% SD	BEJ	PAL
H	09/09/22	REISSUE FOR 100% SD	BEJ	PAL
G	02/09/22	REISSUE FOR 100% SD	BEJ	PAL

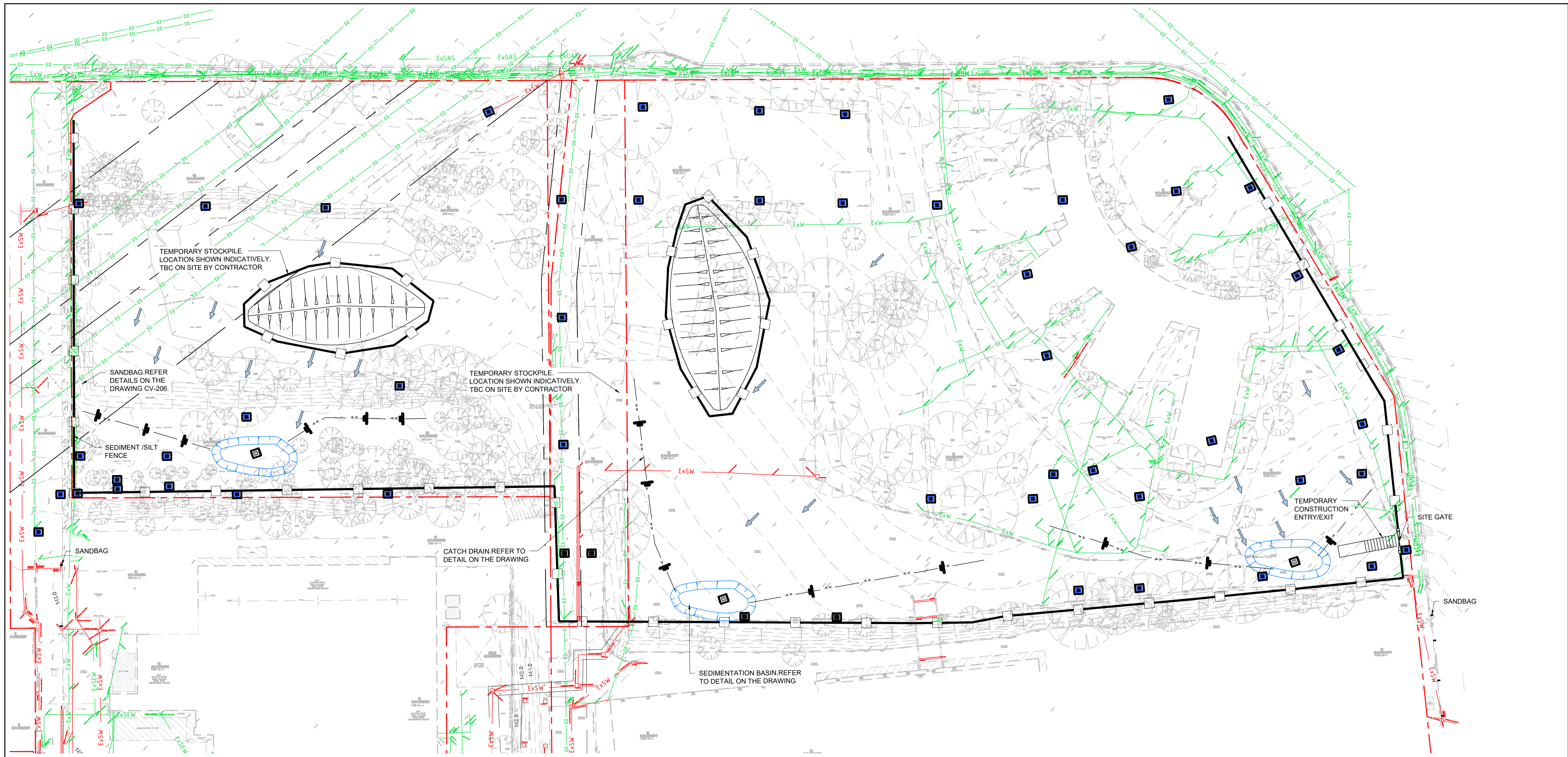


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drawing title
BULK EARTHWORKS OPTION 2

status FOR INFORMATION ONLY			
scale at A1 1:500	drawn by GBM	checked PAL	date MAR-21
project no. 6310	drawing no. CV-0200	rev. I	



EROSION AND SEDIMENT CONTROL LEGEND

- - - SITE BOUNDARY
- Siltation fence
- Stormwater pit with Geotextile filter surround
- Sandbag sediment trap
- Existing Overland flow path
- Batter

rev	date	description	dm	ch/k
F	01/06/22	ISSUE FOR CONCEPT DESIGN	PAD	PAL
E	29/04/22	EQUITABLE ACCESS MASTERPLAN	PAD	PAL
D	24/11/21	ISSUE FOR 100% SD	PAD	PAL
C	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL
B	29/10/21	ISSUE FOR 70% SD	PAD	PAL
A	14/04/21	FOR INFORMATION	CBH	PAL

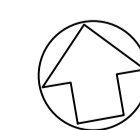
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G	12/08/22	REISSUE FOR 100% SD	MZV	PAL



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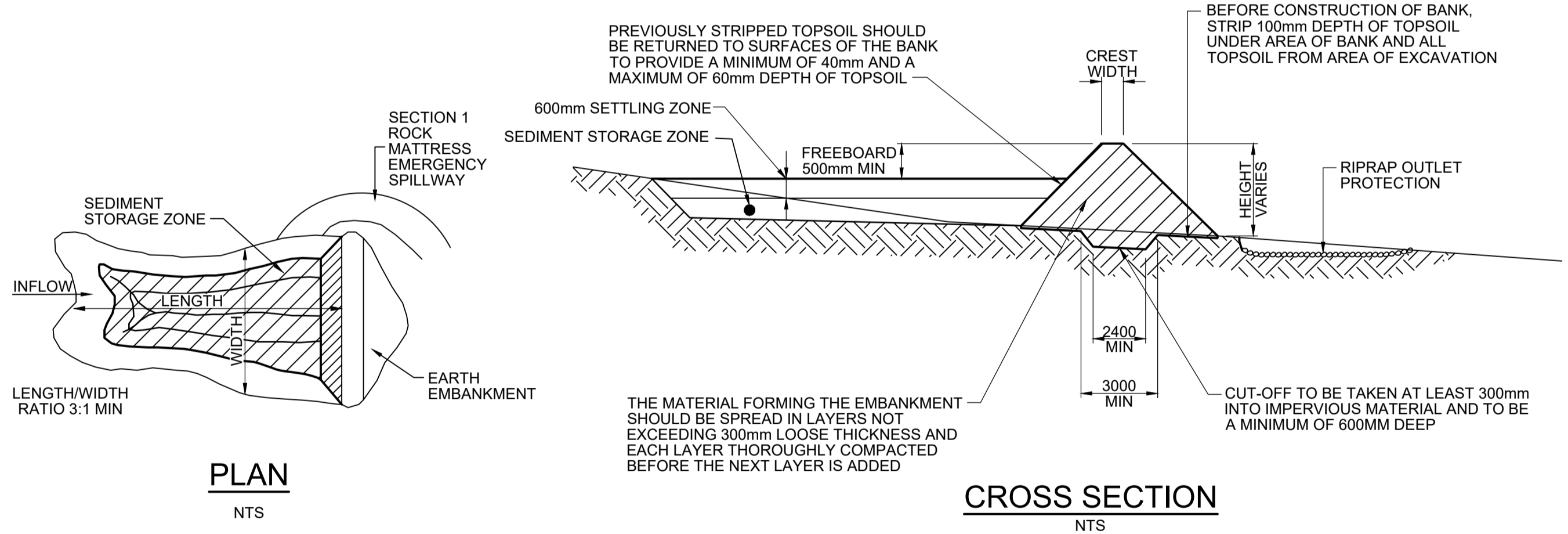
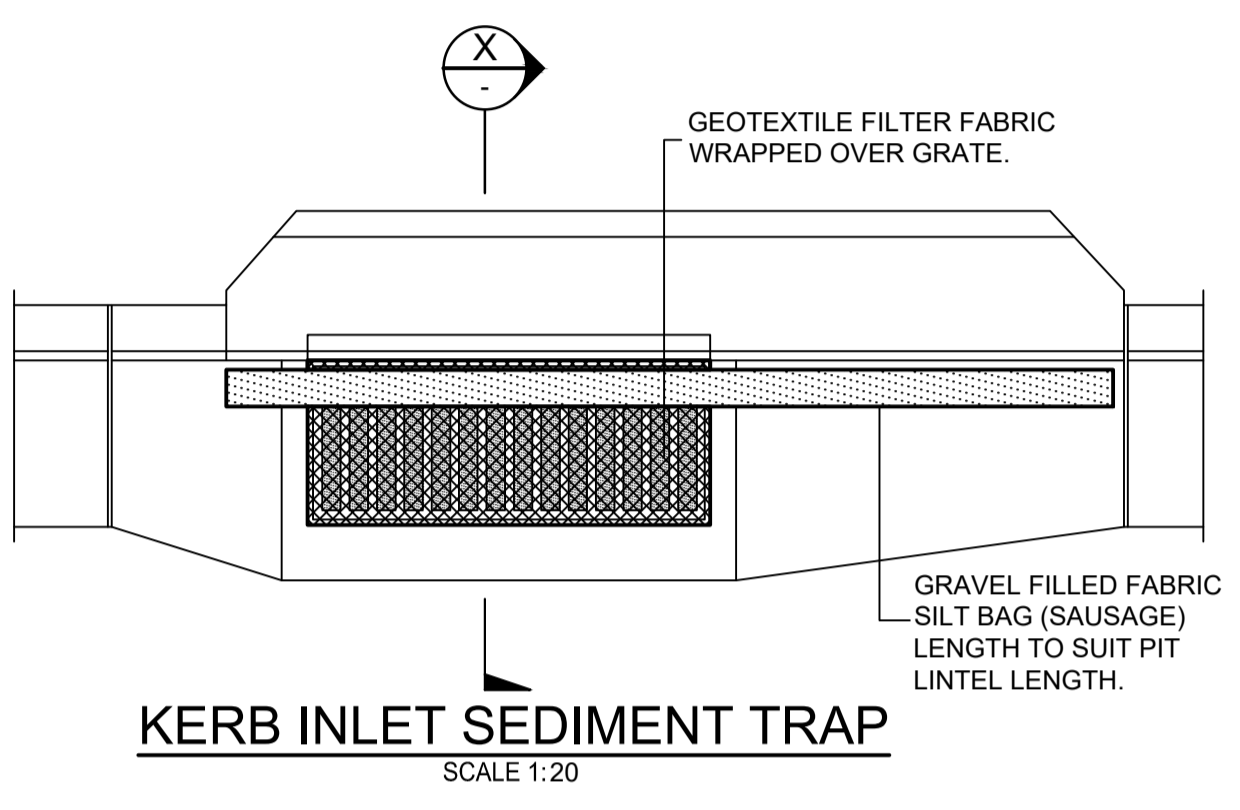
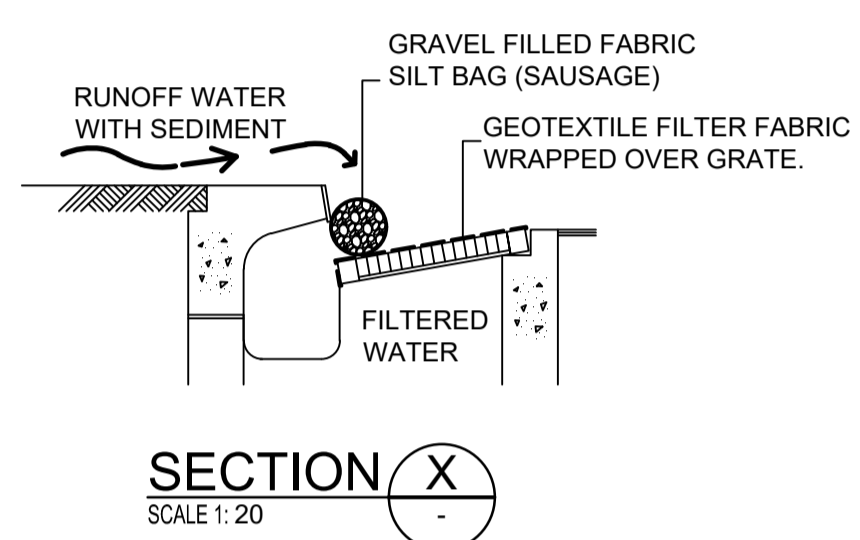
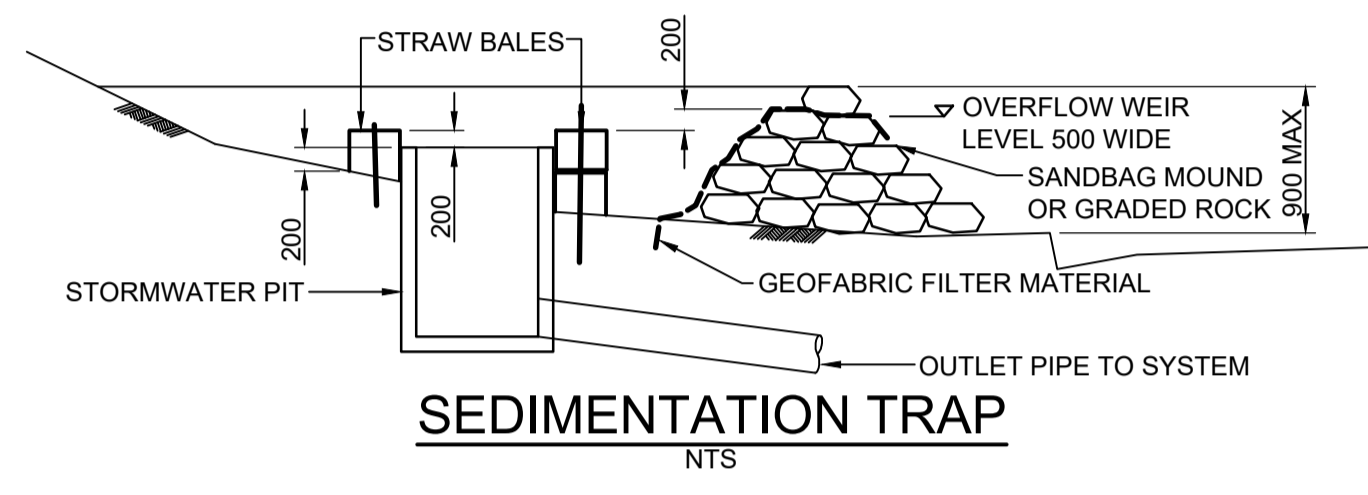
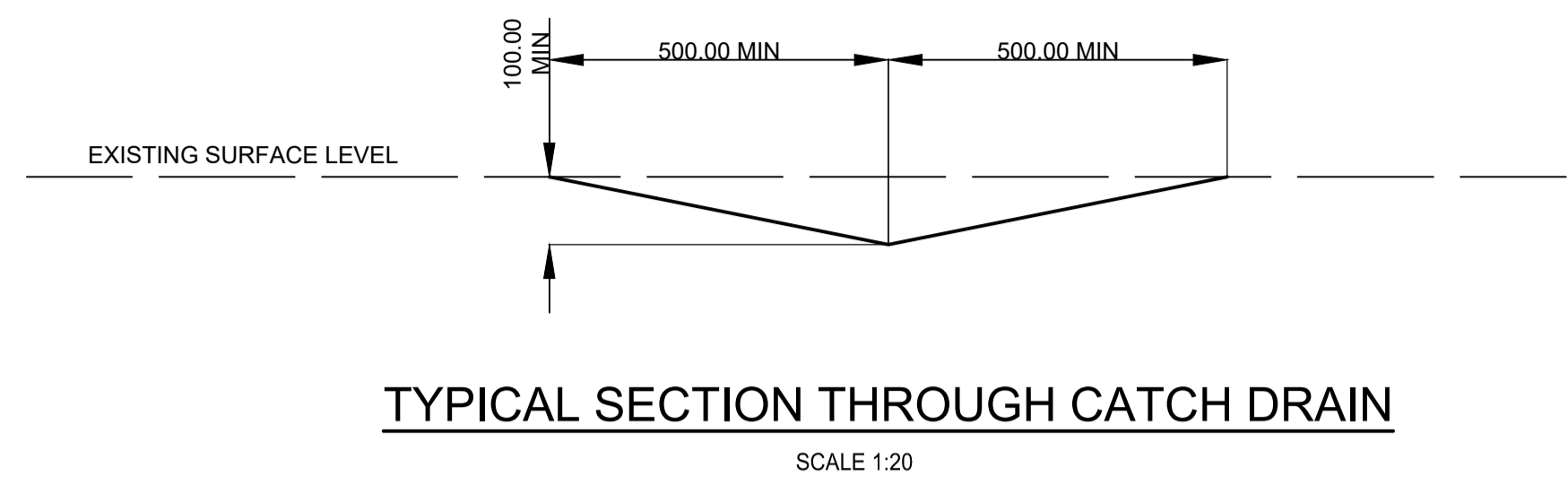
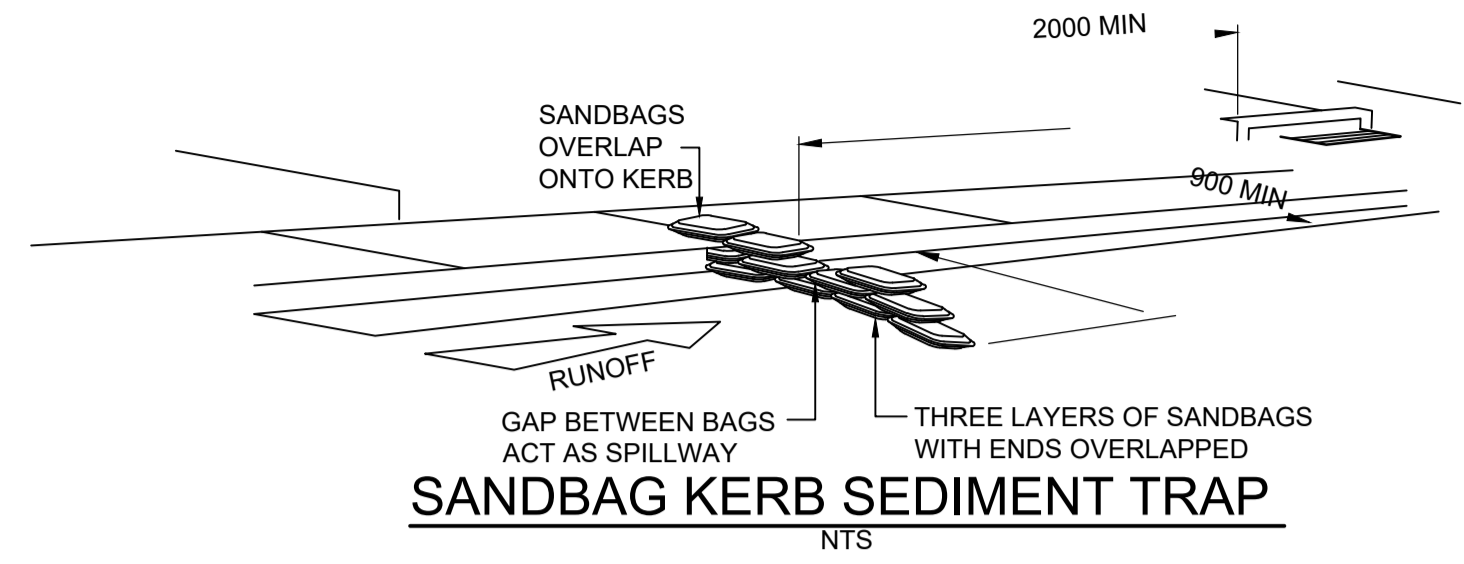
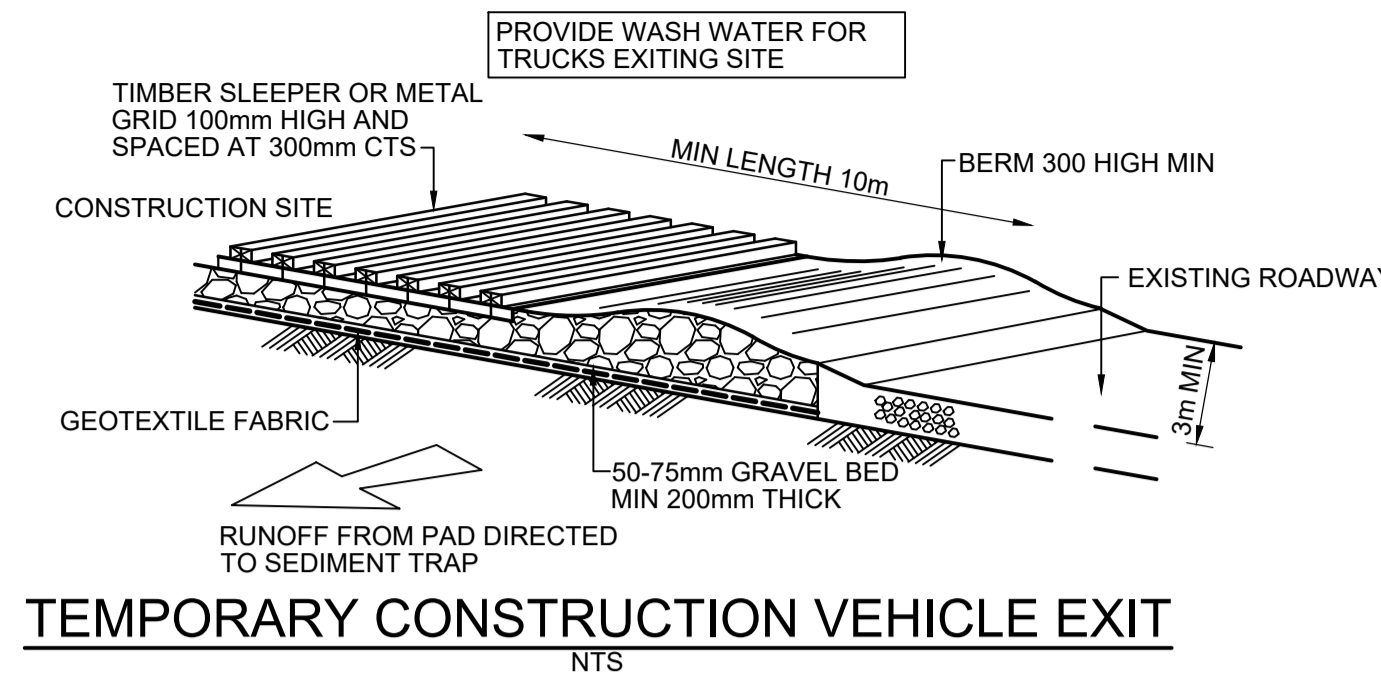


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project	THE FOREST HIGH SCHOOL
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drawing title	EROSION AND SEDIMENT CONTROL PLAN
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status	FOR INFORMATION ONLY		
scale at A1	drawn by	checked	date
1:500	PAD	PAL	APR-21
project no.	drawing no.	rev.	
6310	CV-0205	H	



SEDIMENT BASIN (TYPICAL) CROSS SECTION - TYPE D AND F SOILS

rev	date	description	dm	ch/k
F	01/06/22	ISSUE FOR CONCEPT DESIGN	PAD	PAL
E	29/04/22	EQUITABLE ACCESS MASTERPLAN	PAD	PAL
D	24/11/21	ISSUE FOR 100% SD	PAD	PAL
C	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL
B	29/10/21	ISSUE FOR 70% SD	PAD	PAL
A	14/04/21	FOR INFORMATION	CBH	PAL

rev	date	description	dm	ch/k
H	15/09/22	REISSUE FOR 100% SD	MZV	PAL
G	12/08/22	REISSUE FOR 100% SD	MZV	PAL

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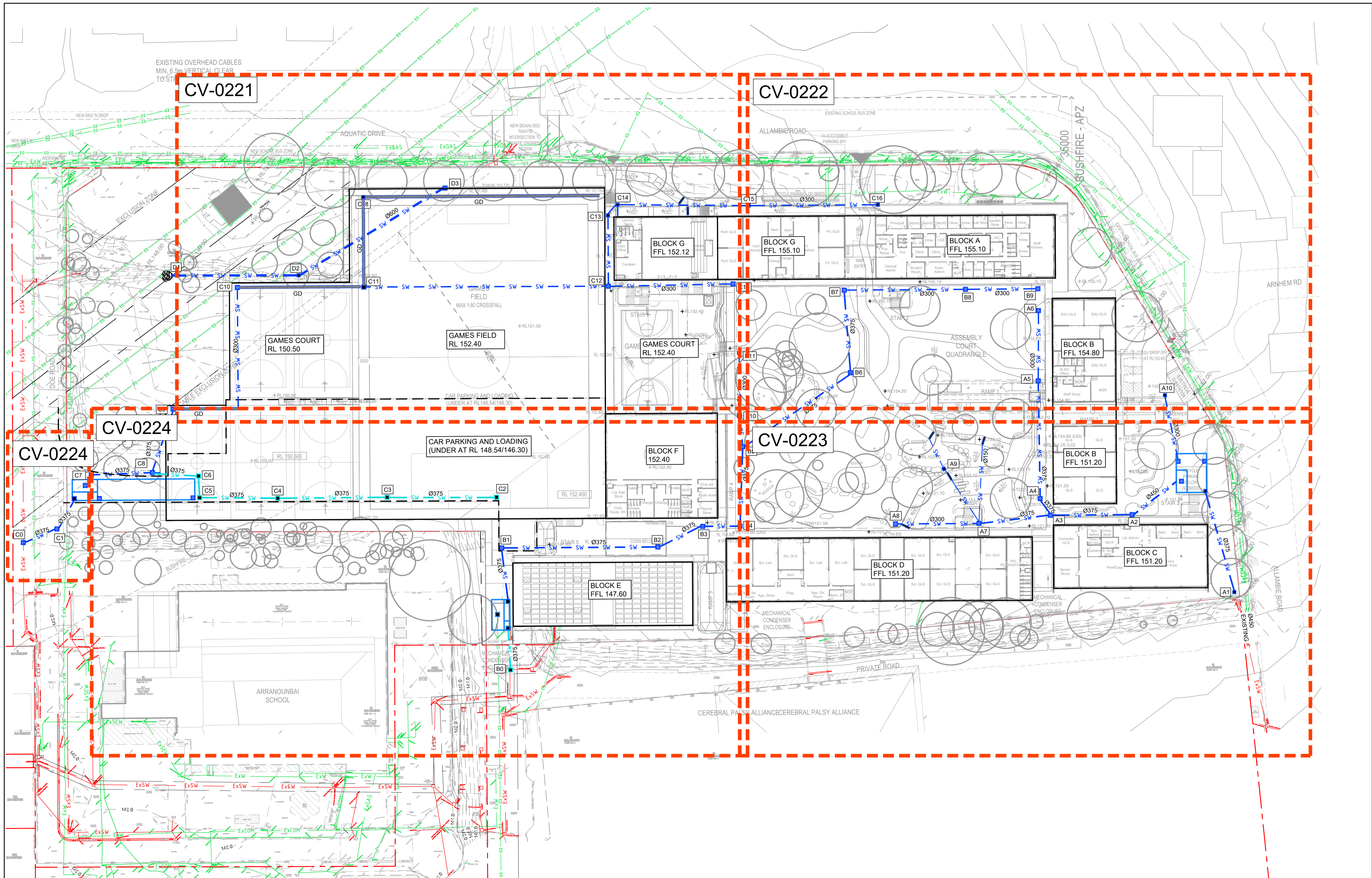
drawing title

EROSION AND SEDIMENT CONTROL DETAILS

status

FOR INFORMATION ONLY

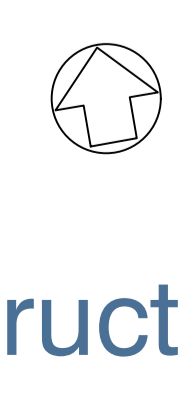
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project no. 6310	drawing no. CV-0206	rev. H	



rev	date	description	dm	ch/k
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E	29/10/21	70% SCHEMATIC DESIGN	PAD	PAL
D	01/10/21	40% SCHEMATIC DESIGN	PAD	PAL
c	29/04/21	FOR INFORMATION	NKK	PAL
B	14/04/21	FOR INFORMATION	PAD	PAL
A	19/03/21	FOR INFORMATION	PAD	PAL

rev	date	description	dm	ch/k
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K	12/08/22	REISSUE FOR 100% SD	BEJ	PAL
J	01/06/22	ISSUE FOR CONCEPT DESIGN	PAD	PAL
I	29/04/22	EQUITABLE ACCESS MASTERPLAN	PAD	PAL
H	03/12/21	EMERGENCY EXIT ROAD ADDED	PAD	PAL
G	24/11/21	ISSUE FOR 100% SCHEMATIC DESIGN	PAD	PAL

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drawing title
CIVIL SITEWORKS AND STORMWATER KEY PLAN

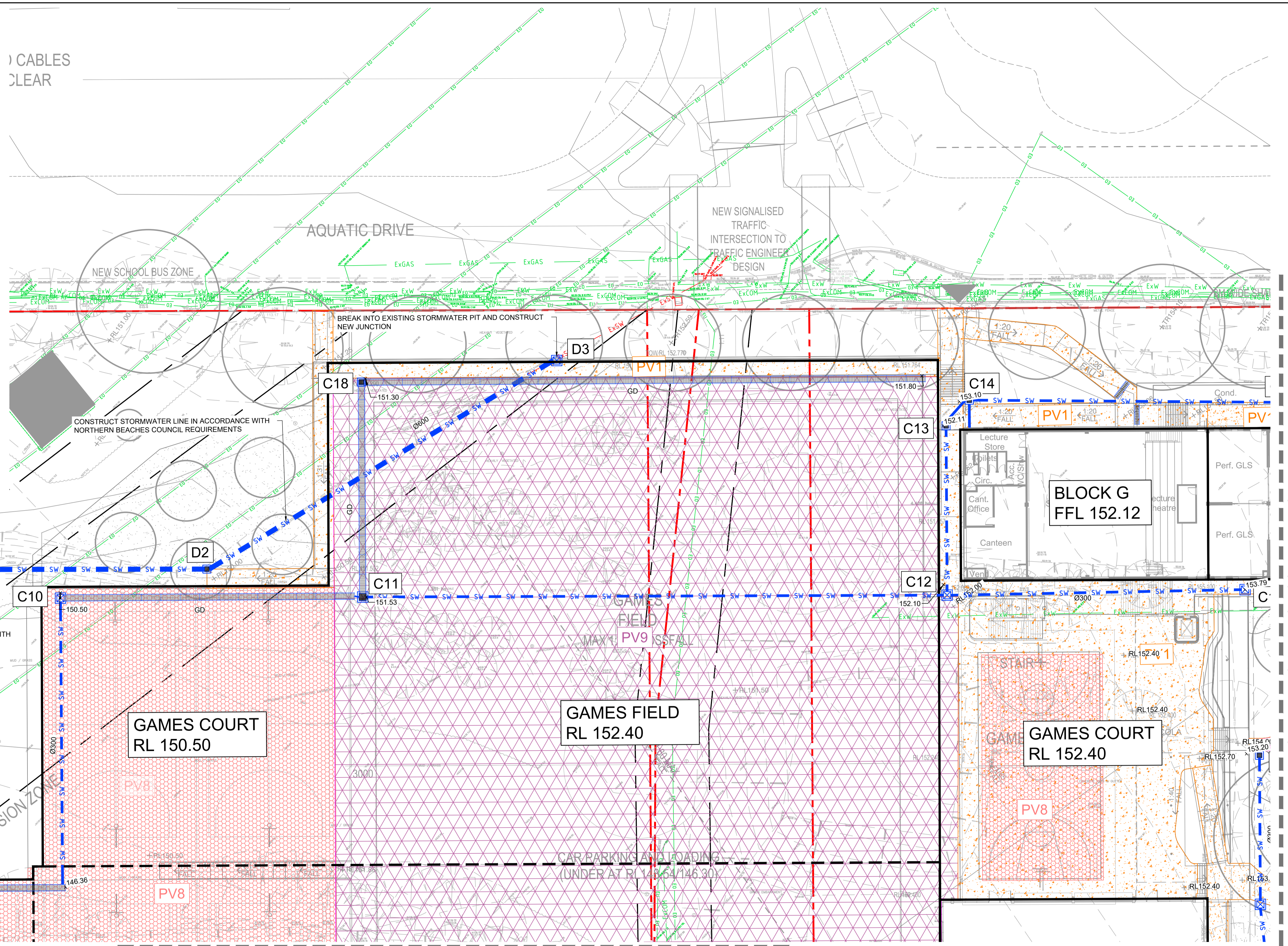
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FOR INFORMATION ONLY			
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project no. 6310	drawing no. CV-0220	rev. L	

LEGEND

- SITE BOUNDARY
- EASEMENTS
- STORMWATER PIT AND PIPE
- STORMWATER PIT AND PIPE (UNDERGROUND CARPARK)
- RW
- ExSW
- GD
- IO
- DP
- SW
- SWALE
- 155.1
- 155.0
- EXW
- EO
- EU
- ExSW
- ExGAS
- ExCOM

- STORMWATER PIT AND PIPE
- RETAINING WALL REFER TO DRAWING 250 FOR HEIGHT AND TYPE OF RETAINING WALL
- EXISTING STORMWATER LINE
- GRATED DRAIN
- INSPECTION OPENING AND SUSBOIL DRAIN
- DOWNPIPE WITH ROOFWATER LINE
- DESIGN CONTOUR MAJOR
- DESIGN CONTOUR MINOR
- EXISTING WATER LINE
- EXISTING ELECTRICITY OVERHEAD LINE
- EXISTING ELECTRICITY UNDERGROUND LINE
- EXISTING STORMWATER LINE
- EXISTING GAS LINE
- EXISTING COMMS LINE

- GENERAL NOTE:**
1. THE ON-SITE DETENTION TANK SIZING HAS BEEN BASED ON COUNCIL'S POLICY OF PREDEVELOPMENT CONDITION BEING GREENFIELD.
 2. REFER TO DRAWING CV-0405 FOR PAVEMENT DETAIL



REFER TO DRAWING 0224 FOR CONTINUATION

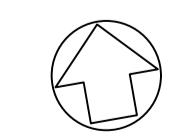
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D	12/08/22	REISSUE FOR 100% SD	BEJ	PAL
C	03/12/21	EMERGENCY ACCESS ROAD ADDED	PAD	PAL
B	24/11/21	ISSUE FOR 100% SD	PAD	PAL
A	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL

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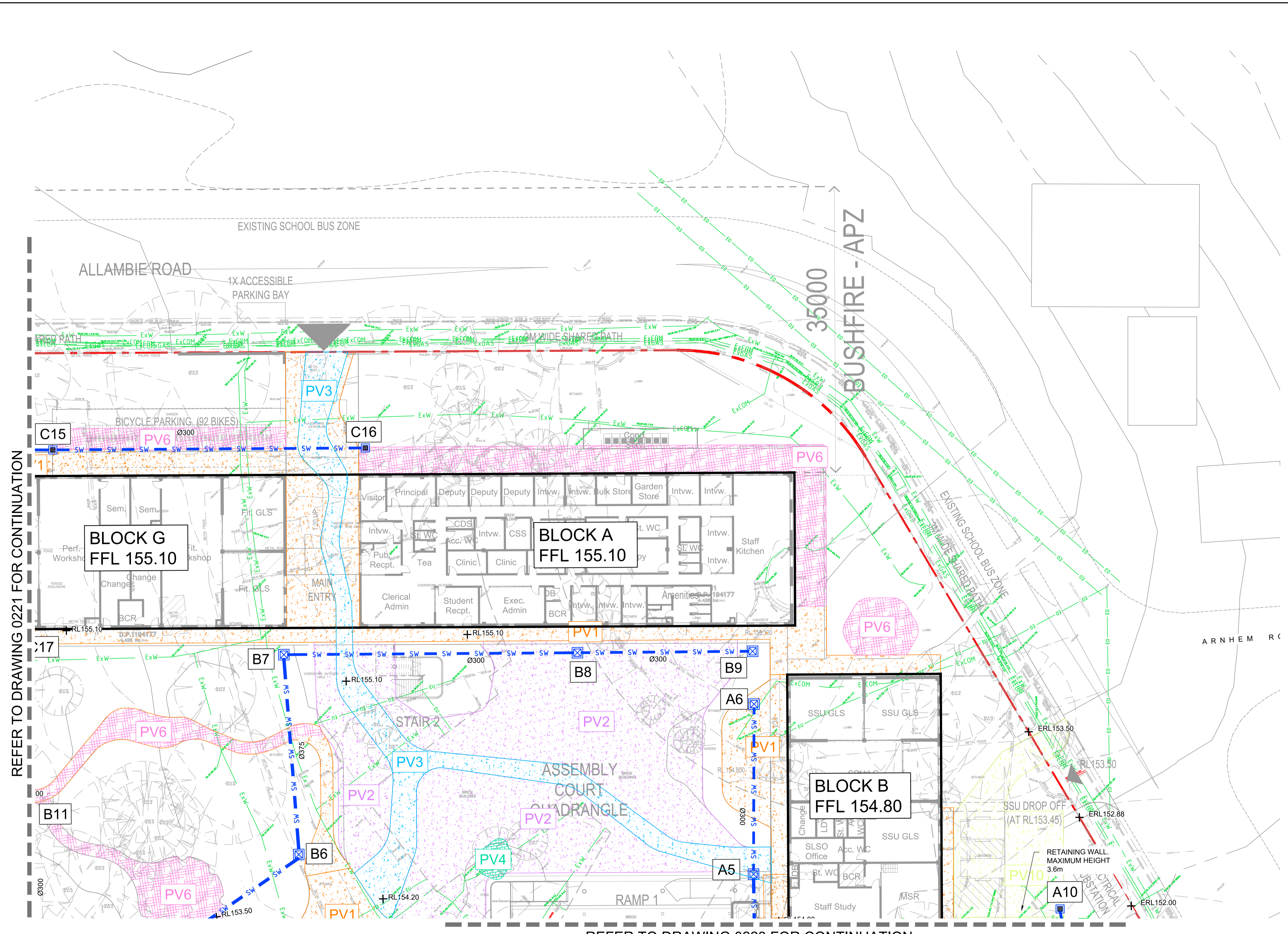
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CIVIL SITEWORKS AND STORMWATER PLAN - SHEET 1

status			
FOR INFORMATION ONLY			
scale at A1 1:250	drawn by PAD	checked PAL	date NOV-21
project no. 6310	drawing no. CV-0221	rev. E	



LEGEND

- SITE BOUNDARY
- EASEMENTS
- STORMWATER PIT AND PIPE
- STORMWATER PIT AND PIPE (UNDERGROUND CARPARK)
- RW
- RETAINING WALL. REFER TO DRAWING 250 FOR HEIGHT AND TYPE OF RETAINING WALL
- EXISTING STORMWATER LINE
- GRATED DRAIN
- IO
- INSPECTION OPENING AND SUSBOIL DRAIN
- DP
- DOWNPIPE WITH ROOFWATER LINE
- SWALE
- DESIGN CONTOUR MAJOR
- DESIGN CONTOUR MINOR
- EXISTING WATER LINE
- EXISTING ELECTRICITY OVERHEAD LINE
- EXISTING ELECTRICITY UNDERGROUND LINE
- EXISTING STORMWATER LINE
- EXISTING GAS LINE
- EXISTING COMMS LINE

REFER TO DRAWING 0221 FOR CONTINUATION

REFER TO DRAWING 0223 FOR CONTINUATION

- GENERAL NOTE:
- THE ON-SITE DETENTION TANK SIZING HAS BEEN BASED ON COUNCIL'S POLICY OF PREDEVELOPMENT CONDITION BEING GREENFIELD.
 - REFER TO DRAWING CV-0405 FOR PAVEMENT DETAIL

rev	date	description	dm	ch/k
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D	02/09/22	REISSUE FOR 100% SD	BEJ	PAL
C	12/08/22	REISSUE FOR 100% SD	BEJ	PAL
B	24/11/21	ISSUE FOR 100% SD	PAD	PAL
A	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL

rev	date	description	dm	ch/k



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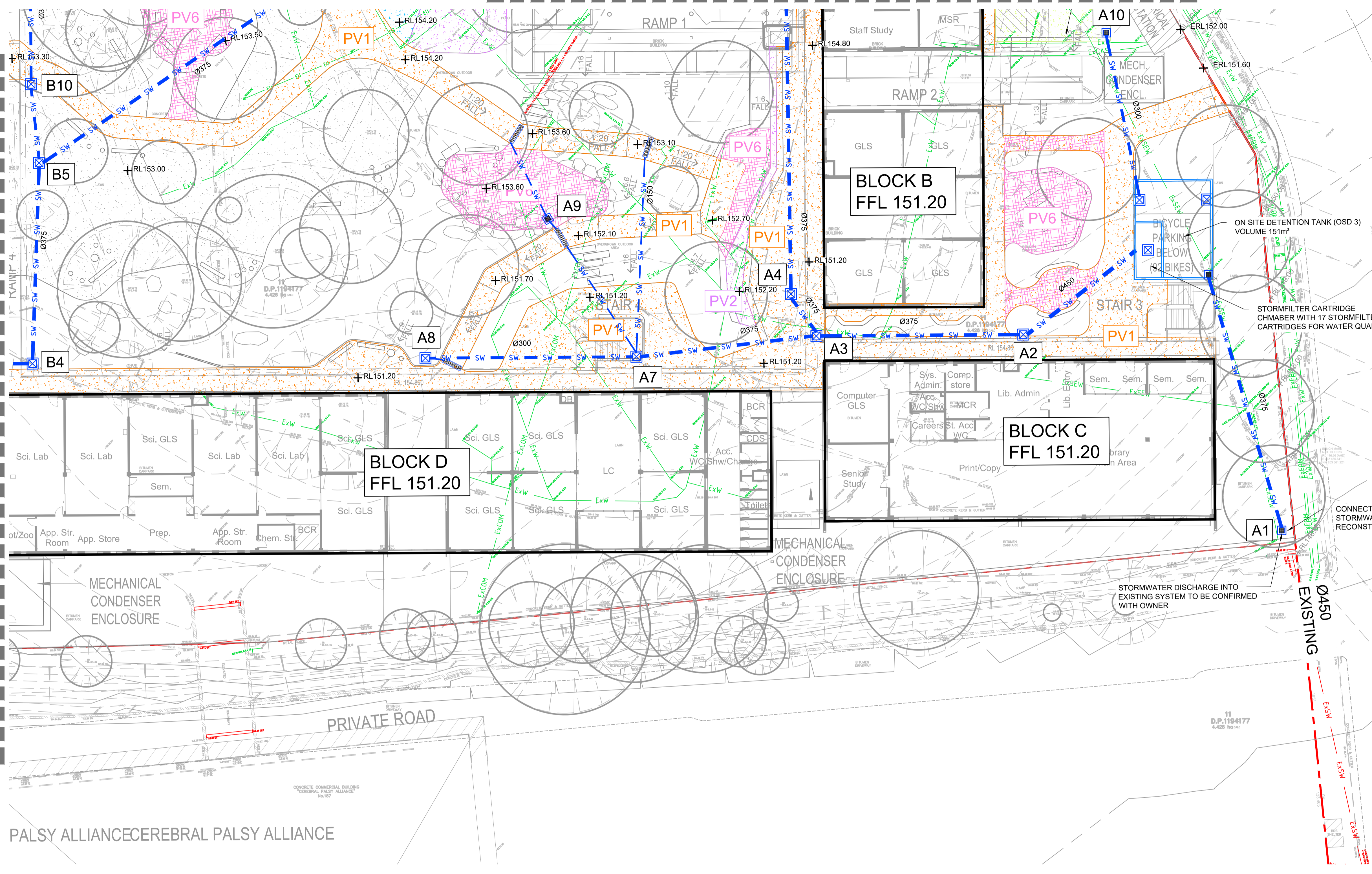
project
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drawing title
CIVIL SITeworks AND STORMWATER PLAN - SHEET 2

status			
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scale at A1 1:250	drawn by PAD	checked PAL	date NOV-21
project no. 6310	drawing no. CV-0222	rev. E	

REFER TO DRAWING 0222 FOR CONTINUATION

REFER TO DRAWING 0221 FOR CONTINUATION



LEGEND

- SITE BOUNDARY
- EASEMENTS
- STORMWATER PIT AND PIPE
- STORMWATER PIT AND PIPE (UNDERGROUND CARPARK)
- RETAINING WALL. REFER TO DRAWING 250 FOR HEIGHT AND TYPE OF RETAINING WALL
- EXISTING STORMWATER LINE
- GRATED DRAIN
- INSPECTION OPENING AND SUSBOIL DRAIN
- DOWNPIPE WITH ROOFWATER LINE
- SWALE
- DESIGN CONTOUR MAJOR
- DESIGN CONTOUR MINOR
- EXISTING WATER LINE
- EXISTING ELECTRICITY OVERHEAD LINE
- EXISTING ELECTRICITY UNDERGROUND LINE
- EXISTING STORMWATER LINE
- EXISTING GAS LINE
- EXISTING COMMS LINE

GENERAL NOTE:

1. THE ON-SITE DETENTION TANK SIZING HAS BEEN BASED ON COUNCIL'S POLICY OF PREDEVELOPMENT CONDITION BEING GREENFIELD.
2. REFER TO DRAWING CV-0405 FOR PAVEMENT DETAIL

rev	date	description	dm	ch/k
E	15/09/22	REISSUE FOR 100% SD	BEJ	PAL
D	12/08/22	REISSUE FOR 100% SD	BEJ	PAL
C	03/12/21	EMERGENCY ACCESS ROAD ADDED	PAD	PAL
B	24/11/21	ISSUE FOR 100% SD	PAD	PAL
A	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL

rev	date	description	dm	ch/k

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CIVIL SITEWORKS AND STORMWATER PLAN - SHEET 3

status

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scale at A1: 1:250

drawn by: PAD

checked: PAL

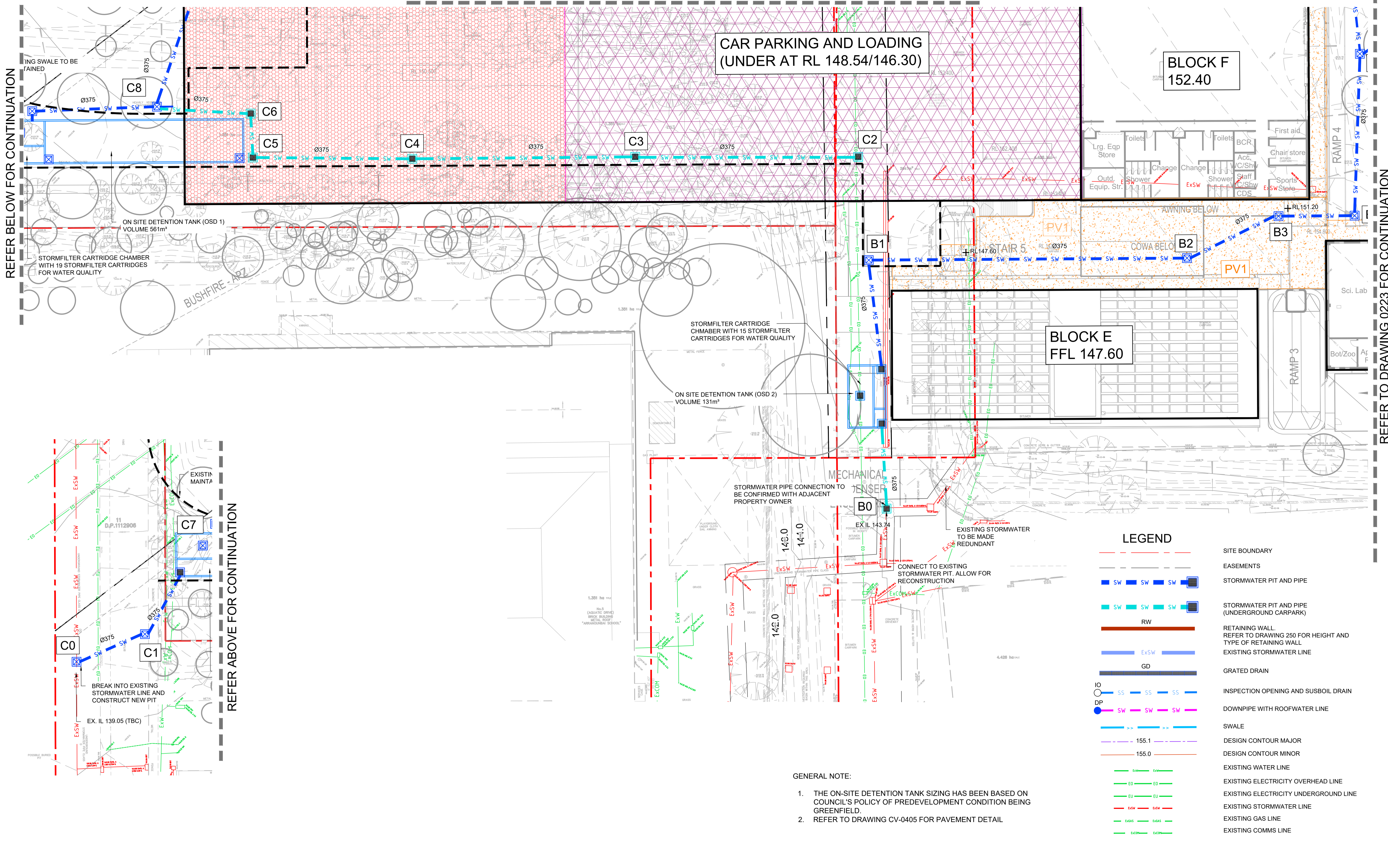
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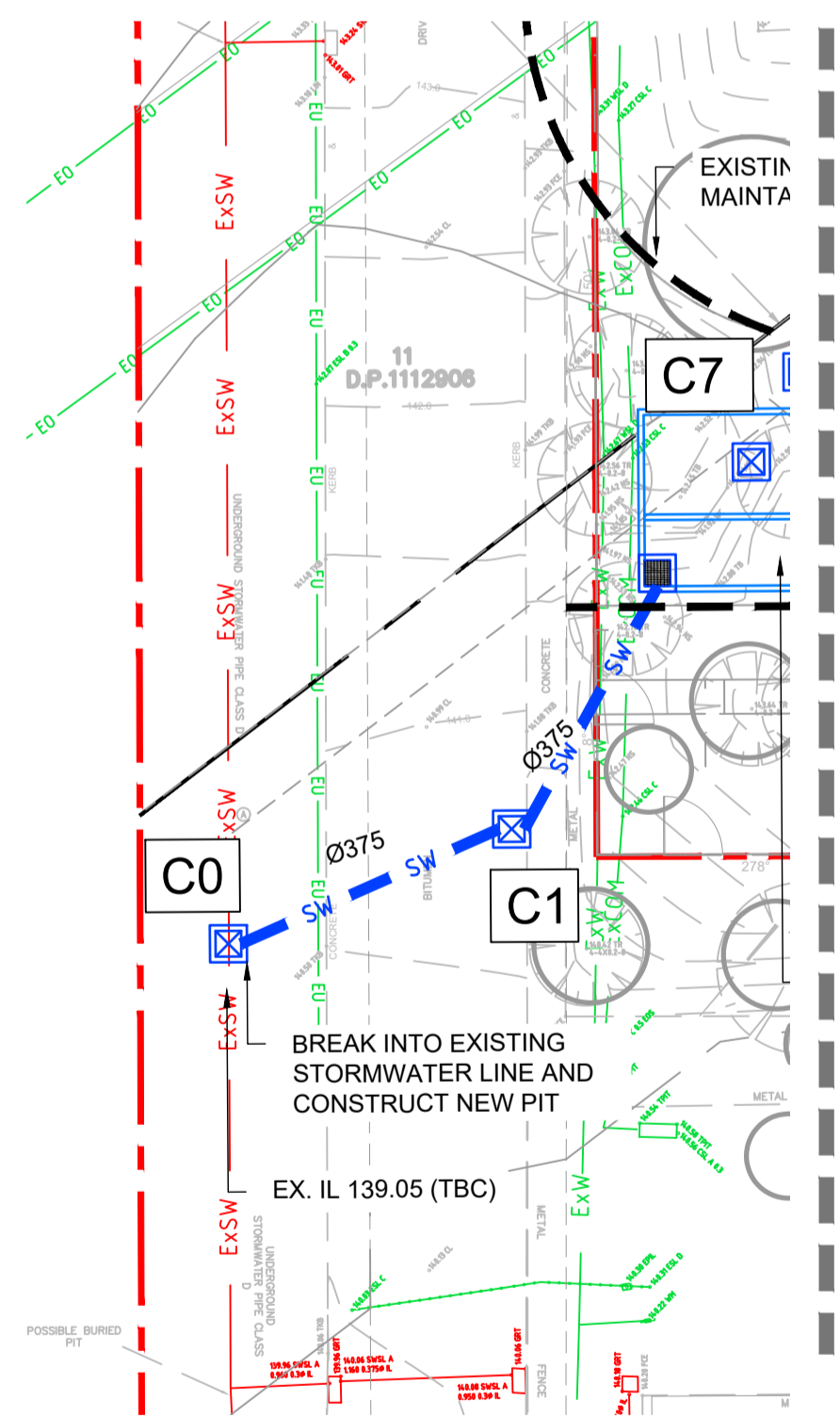
rev.: E

REFER TO DRAWING 0221 FOR CONTINUATION



REFER BELOW FOR CONTINUATION

REFER TO DRAWING 0223 FOR CONTINUATION



REFER ABOVE FOR CONTINUATION

LEGEND

- SITE BOUNDARY
- EASEMENTS
- STORMWATER PIT AND PIPE
- STORMWATER PIT AND PIPE (UNDERGROUND CARPARK)
- RW
- RETAINING WALL. REFER TO DRAWING 250 FOR HEIGHT AND TYPE OF RETAINING WALL
- EXISTING STORMWATER LINE
- GRATED DRAIN
- IO --- INSPECTION OPENING AND SUSBOIL DRAIN
- DP --- DOWNPIPE WITH ROOFWATER LINE
- SWALE
- 155.1 DESIGN CONTOUR MAJOR
- 155.0 DESIGN CONTOUR MINOR
- EXISTING WATER LINE
- EXISTING ELECTRICITY OVERHEAD LINE
- EXISTING ELECTRICITY UNDERGROUND LINE
- EXISTING STORMWATER LINE
- EXISTING GAS LINE
- EXISTING COMMS LINE

- GENERAL NOTE:
1. THE ON-SITE DETENTION TANK SIZING HAS BEEN BASED ON COUNCIL'S POLICY OF PREDEVELOPMENT CONDITION BEING GREENFIELD.
 2. REFER TO DRAWING CV-0405 FOR PAVEMENT DETAIL

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C	03/12/21	EMERGENCY ACCESS ROAD ADDED	PAD	PAL
B	24/11/21	ISSUE FOR 100% SD	PAD	PAL
A	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL

rev	date	description	dm	ch/k

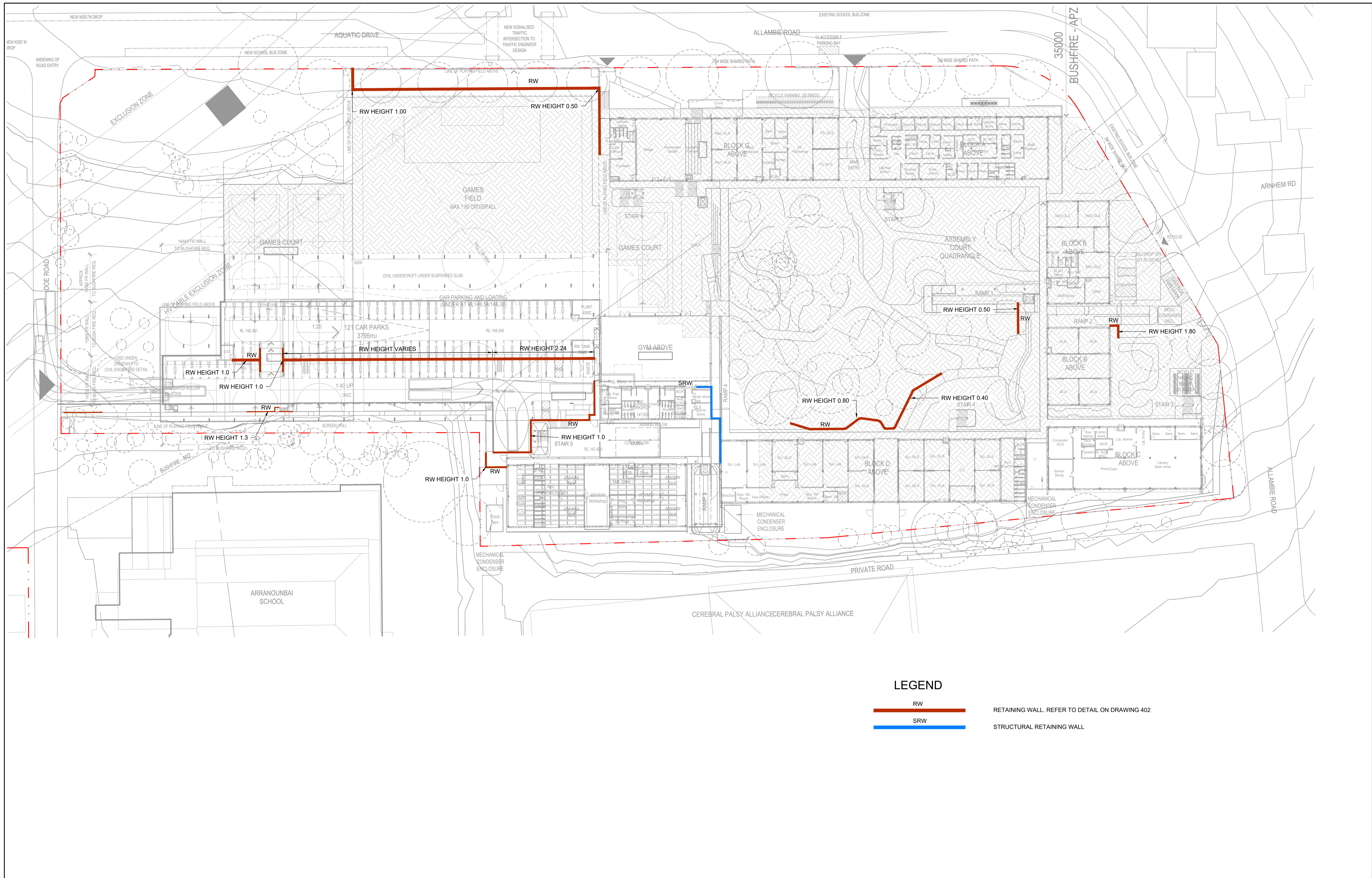


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CIVIL SITWORKS AND STORMWATER PLAN - SHEET 4

status FOR INFORMATION ONLY			
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project no. 6310	drawing no. CV-0224	rev. E	



rev	date	description	dm	ch/k
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E	24/11/21	ISSUE FOR 100% SD	PAD	PAL
D	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL
C	10/11/21	WORK IN PROGRESS	PAD	PAL
B	3/11/21	ISSUE FOR 70% SD	PAD	PAL
A	29/10/21	ISSUE FOR 70% SD	PAD	PAL

rev	date	description	dm	ch/k
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H	02/09/22	REISSUE FOR 100% SD	BEJ	PAL
G	12/08/22	REISSUE FOR 100% SD	MZV	PAL



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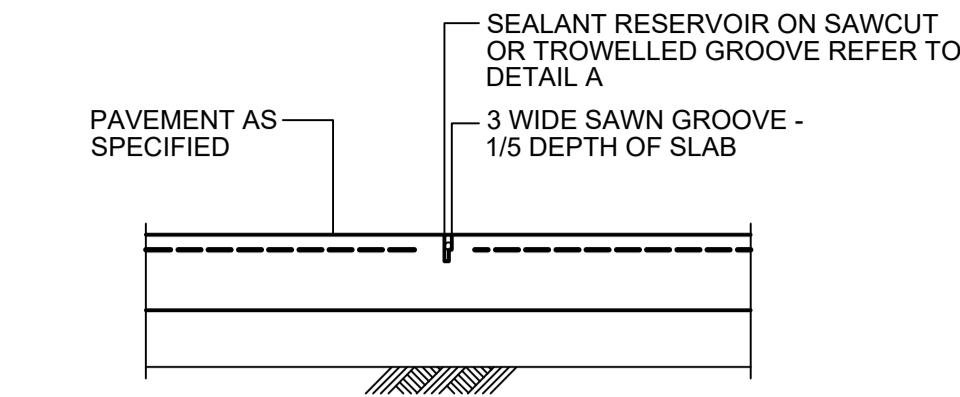
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project	THE FOREST HIGH SCHOOL
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drawing title	RETAINING WALL PLAN
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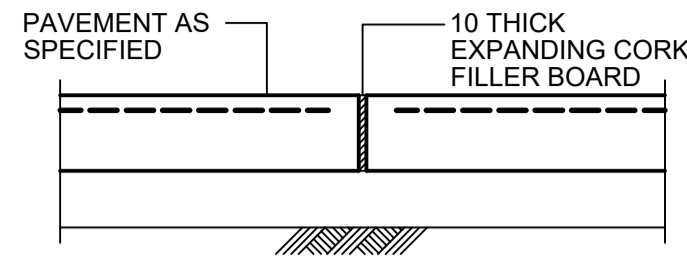
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project no.	drawing no.	rev.		
6310	CV-0250	I		



WEAKENED PLANE JOINT (WPJ)

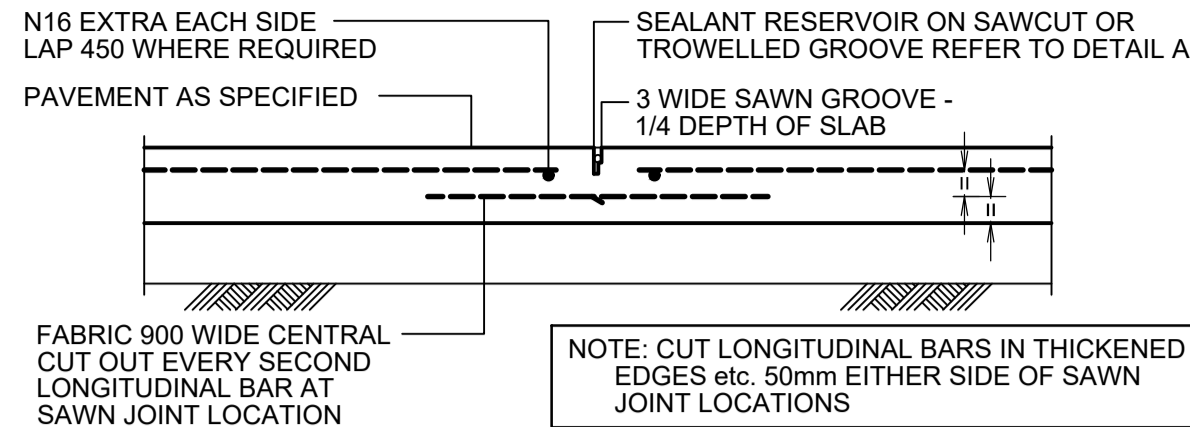
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NOTE: REFER TO JOINTING NOTES, POINT 5 FOR TIMING OF SAW CUTS.



EXPANSION JOINT (EJ)

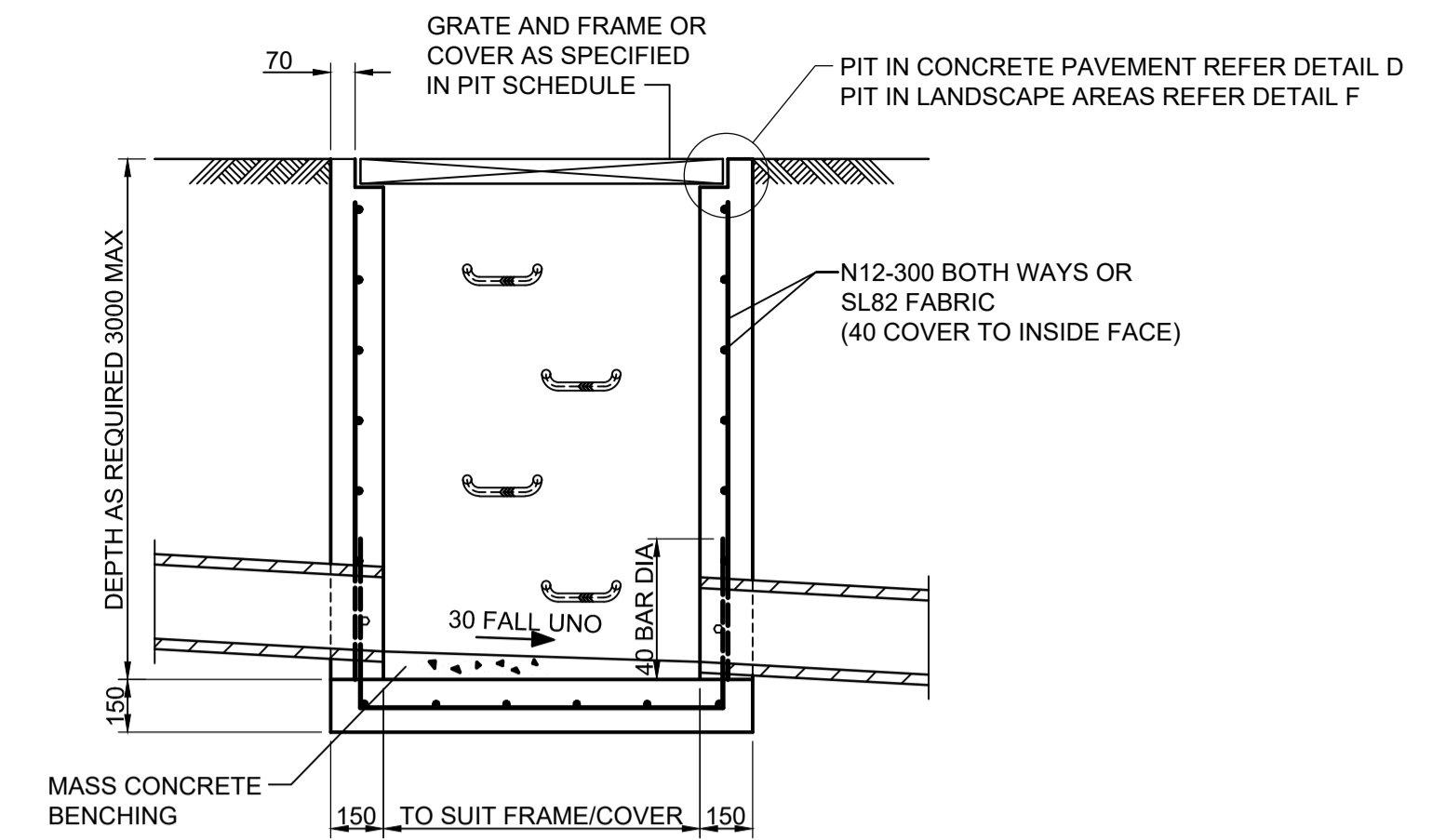
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SAWN CONTROL JOINT (SJ)

SCALE 1:20

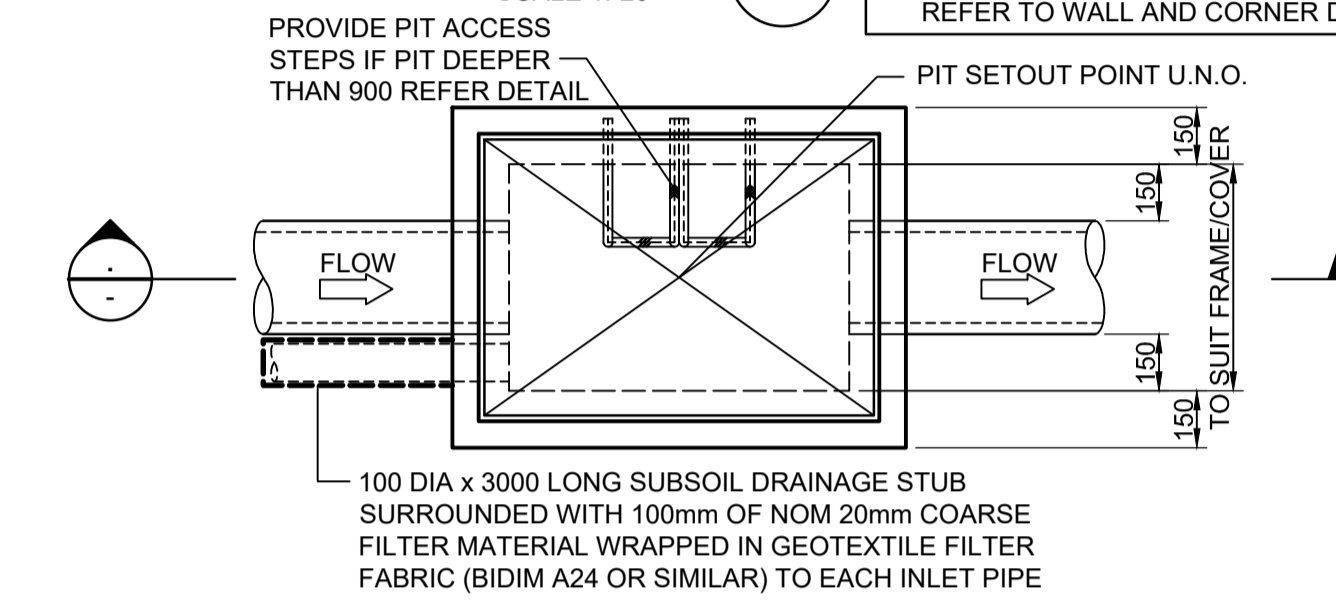
NOTE: REFER TO JOINTING NOTES, POINT 5 FOR TIMING OF SAW CUTS.



SECTION

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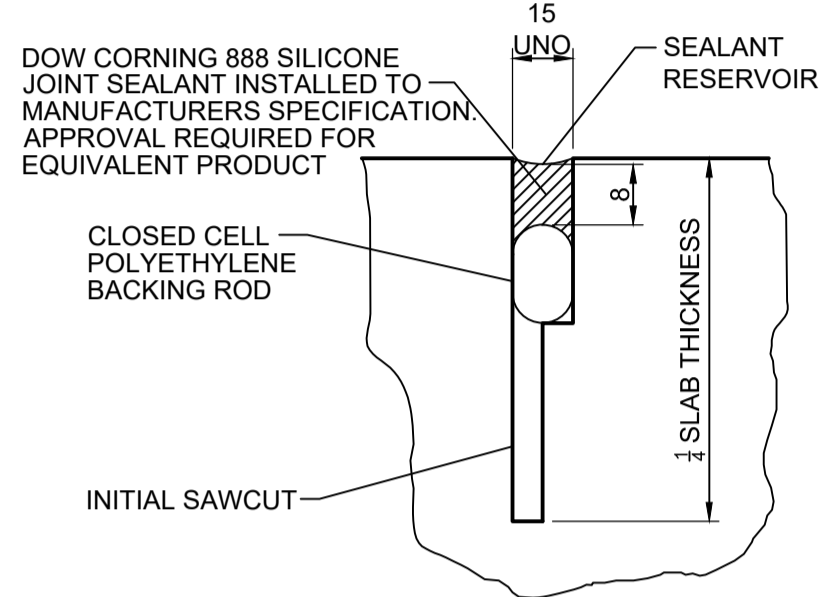
NOTE: IF REINFORCING FABRIC IS TO BE USED REFER TO WALL AND CORNER DETAILS



PLAN

SCALE 1:20

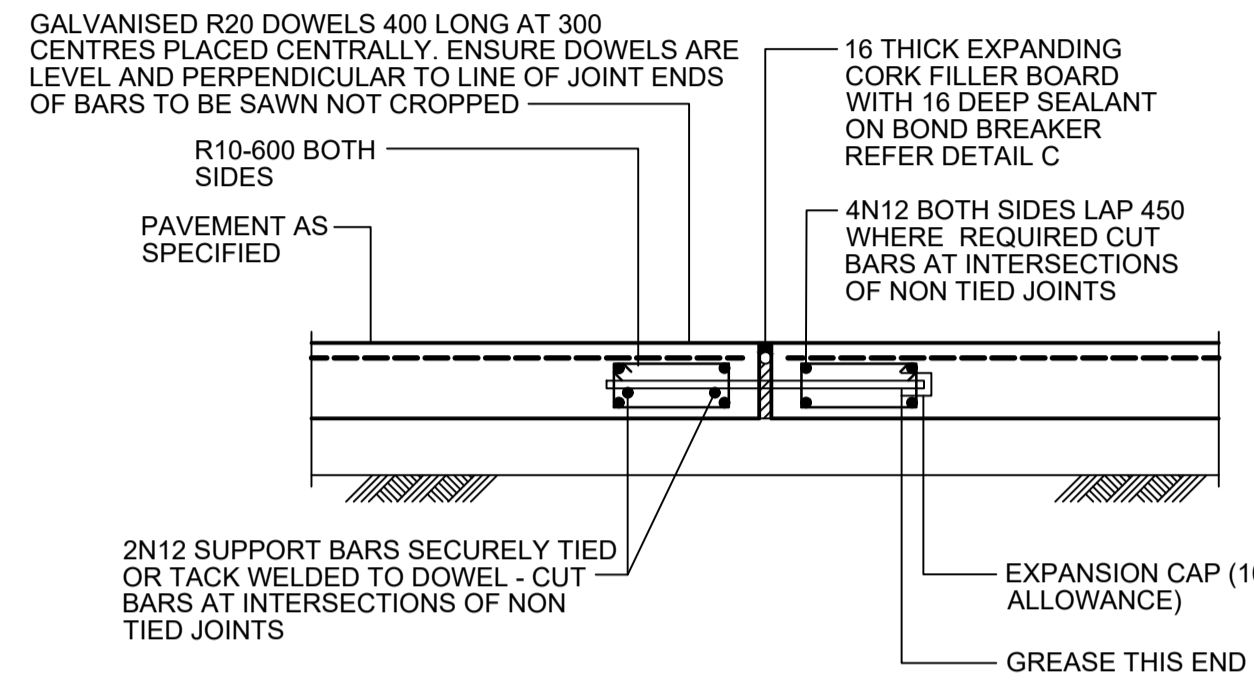
PIT TYPE B



DETAIL A

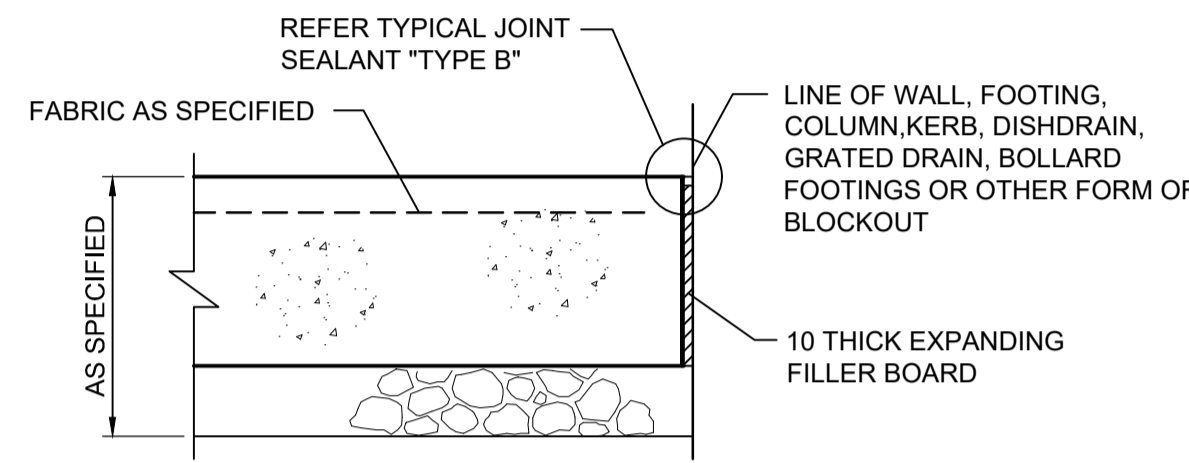
NTS

NOTE: REFER TO JOINTING NOTES, POINT 5 FOR TIMING OF SAW CUTS.



DOWELLED EXPANSION JOINT (DEJ)

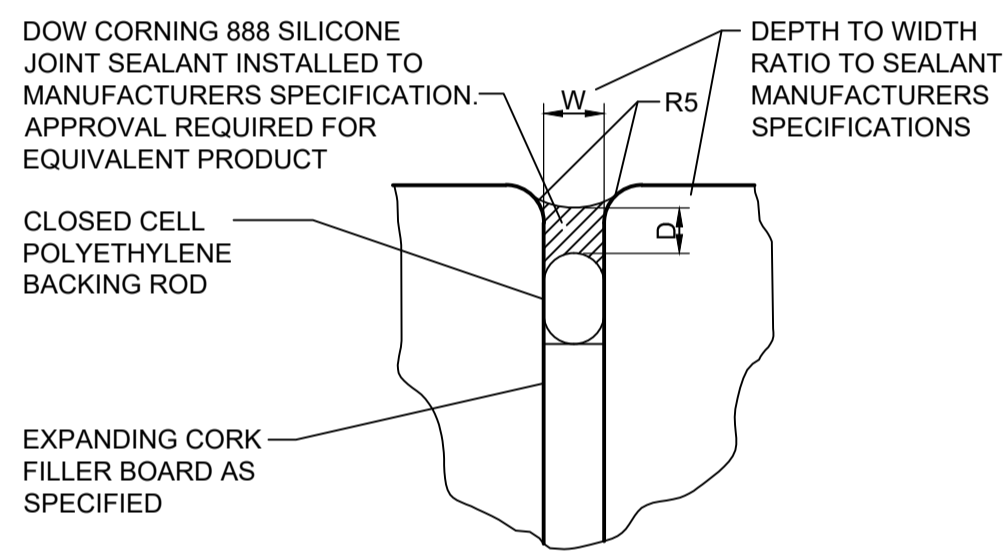
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TYPICAL ISOLATION JOINT DETAIL (IJ)

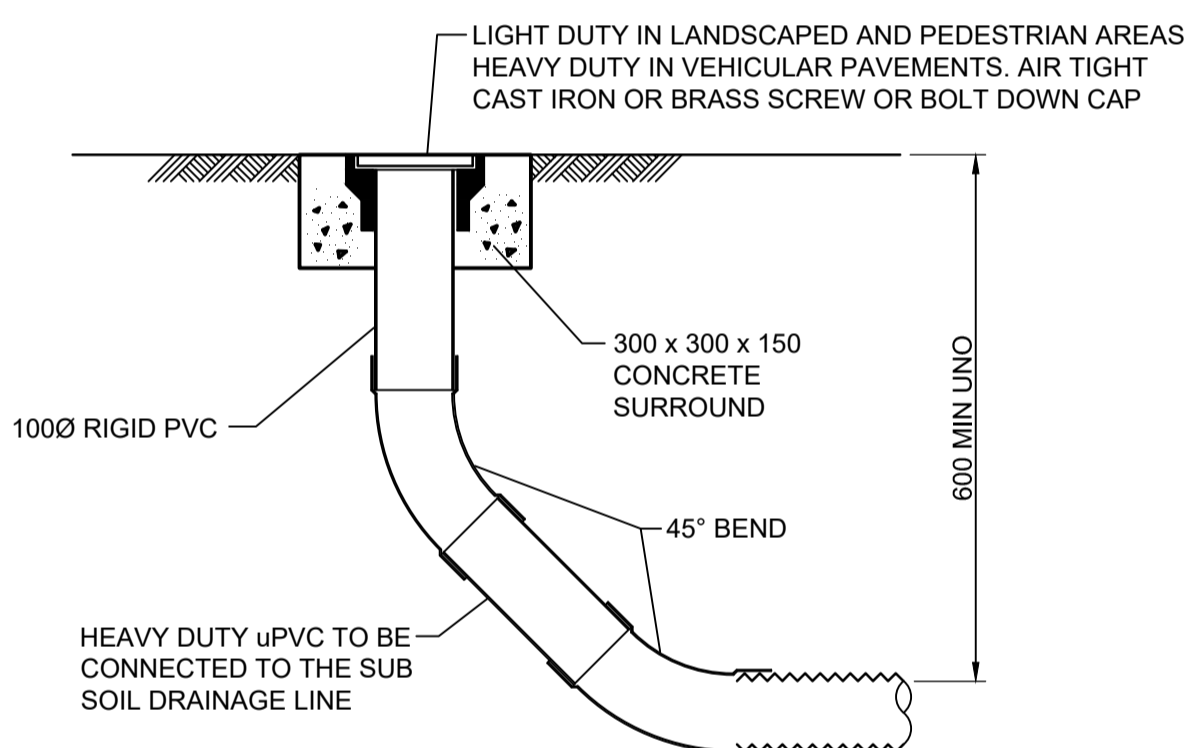
SCALE 1:10

SHOWN AS 'IJ' ON PLAN AND TO ALSO BE CONSTRUCTED IN LOCATIONS WHERE CONCRETE PAVEMENTS ABUT FORMS OF BLOCKOUT AS SPECIFIED BY THIS ISOLATION JOINT DETAIL UNLESS NOTIFIED OTHERWISE.



DETAIL C

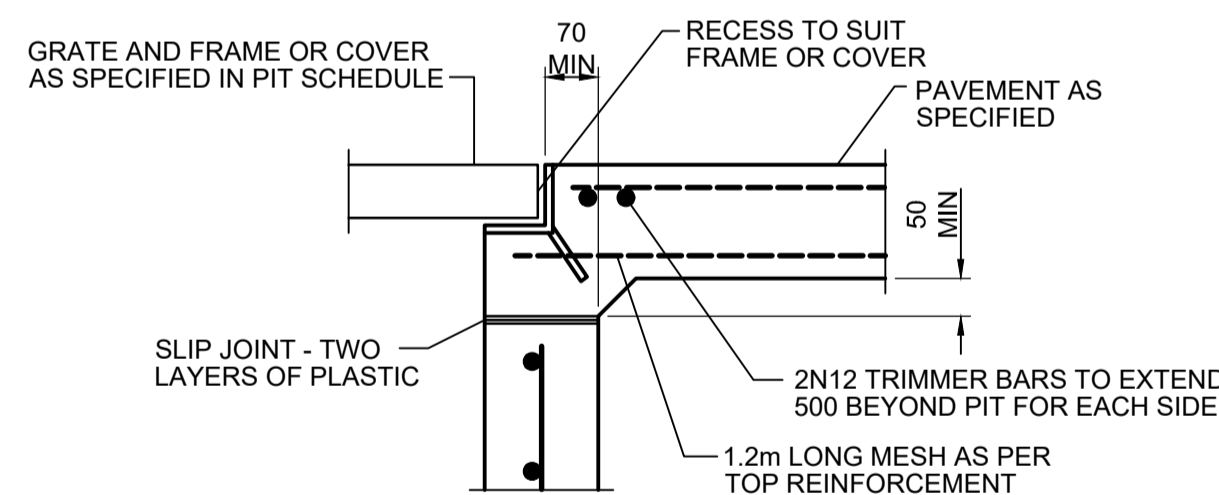
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FLUSHING POINT (FP)

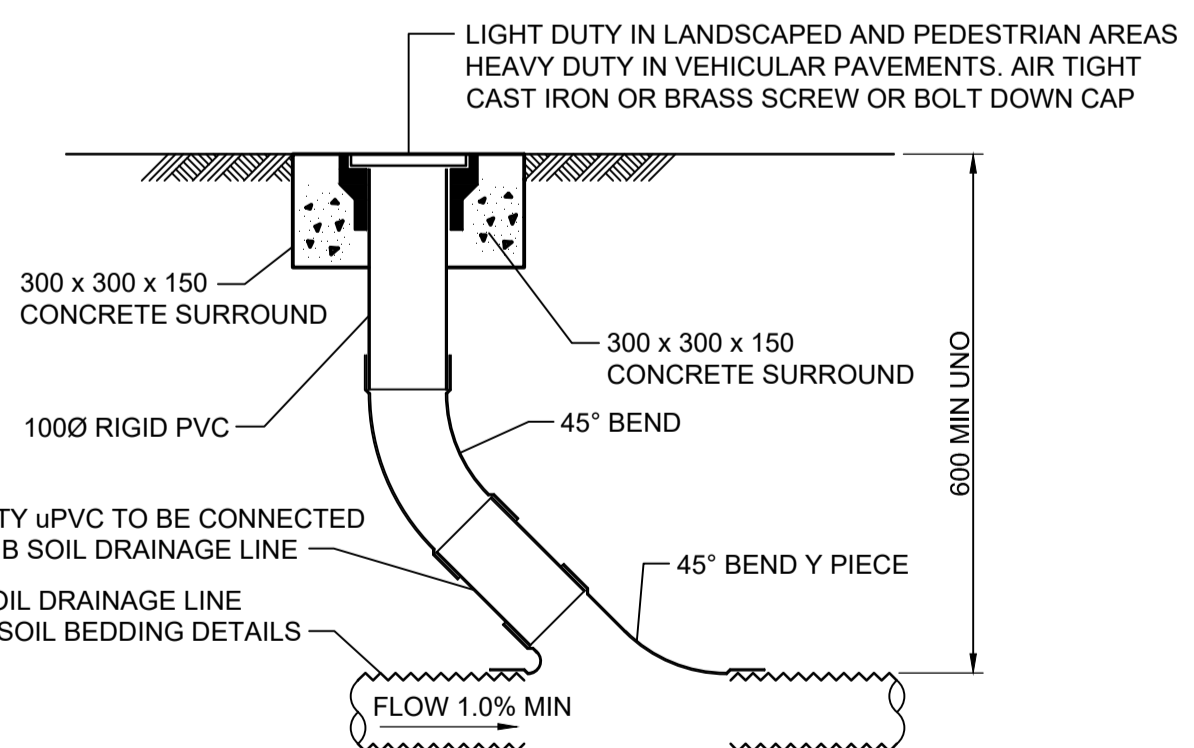
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NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



DETAIL D

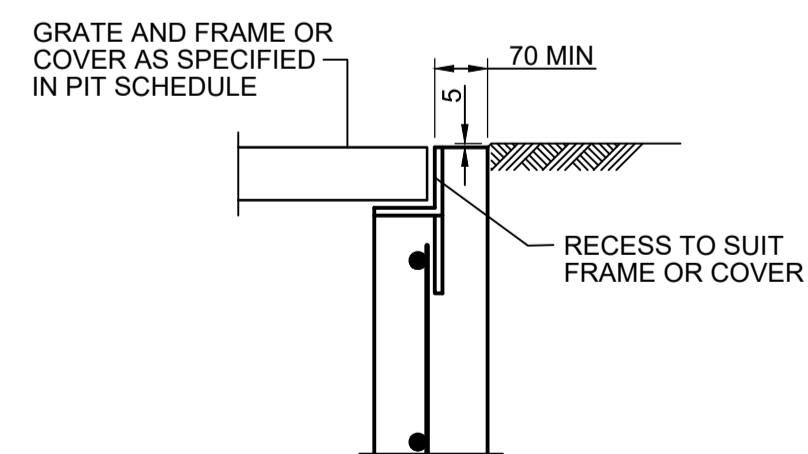
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INTERMEDIATE RISER (IR)

SCALE 1:10

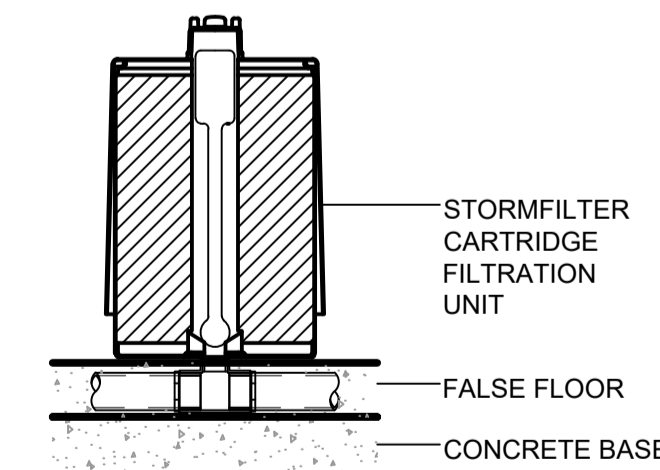
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED



DETAIL F

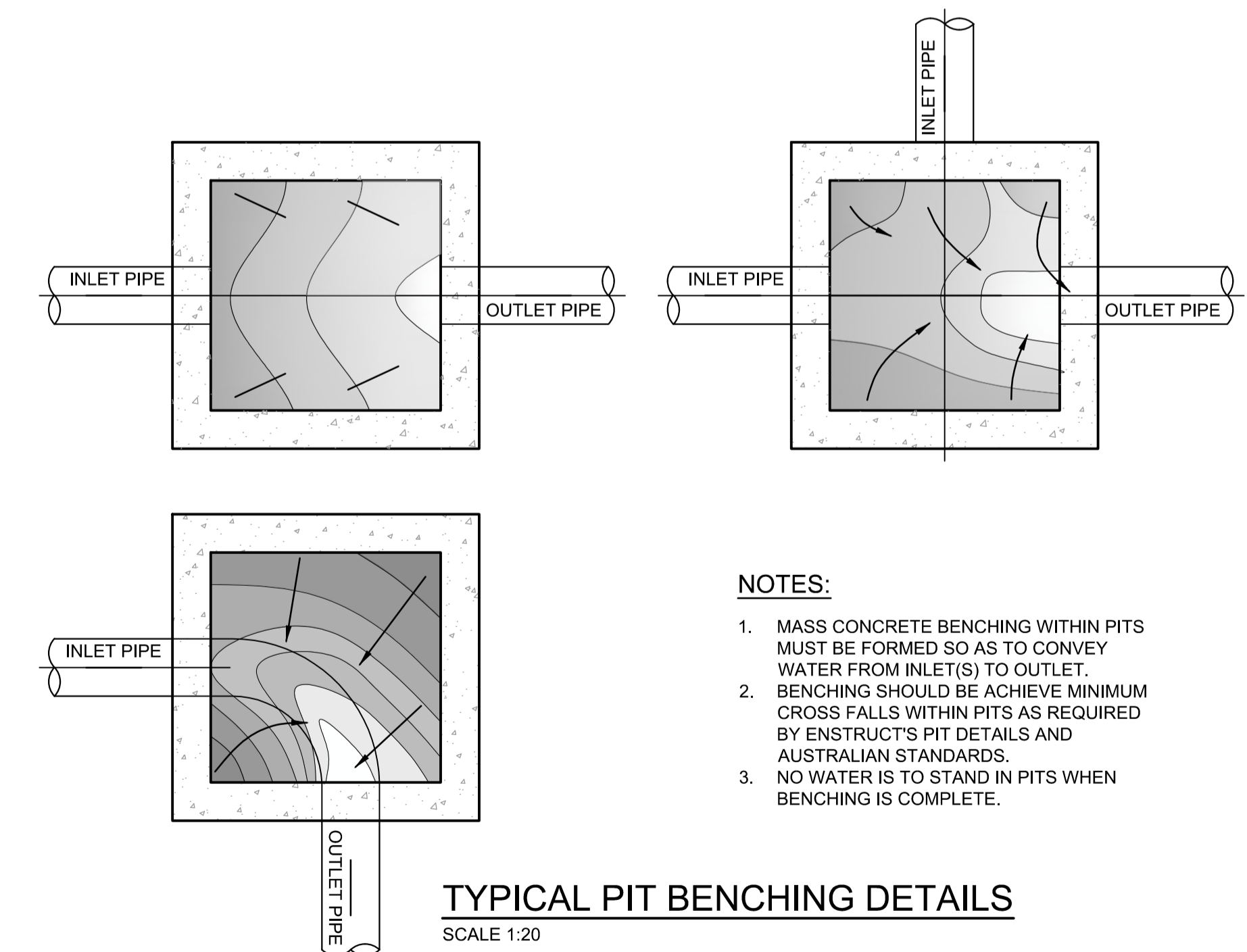
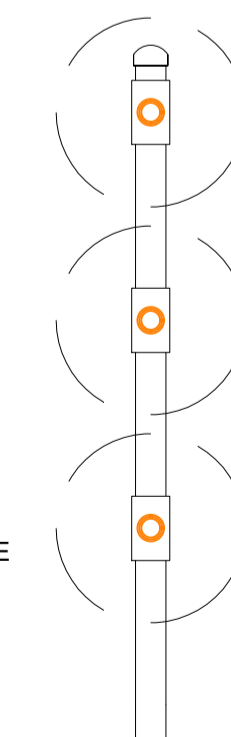
SCALE 1:10

STORM FILTER CARTRIDGE



STORMFILTER CARTRIDGE DETAIL

SCALE 1:50



TYPICAL PIT BENCHING DETAILS

SCALE 1:20

NOTES:

1. MASS CONCRETE BENCHING WITHIN PITS MUST BE FORMED SO AS TO CONVEY WATER FROM INLET(S) TO OUTLET.
2. BENCHING SHOULD BE ACHIEVE MINIMUM CROSS FALLS WITHIN PITS AS REQUIRED BY ENSTRUCT'S PIT DETAILS AND AUSTRALIAN STANDARDS.
3. NO WATER IS TO STAND IN PITS WHEN BENCHING IS COMPLETE.

rev	date	description	dm	ch/k
E	15/09/22	REISSUE FOR 100% SD	BEJ	PAL
D	12/08/22	REISSUE FOR 100% SD	MZV	PAL
C	24/11/21	ISSUE FOR 100% SD	PAD	PAL
B	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL
A	29/10/21	ISSUE FOR 70% SD	PAD	PAL

rev	date	description	dm	ch/k



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drawing title
DETAILS SHEET 1

status
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scale at A1
1:500

drawn by
PAD

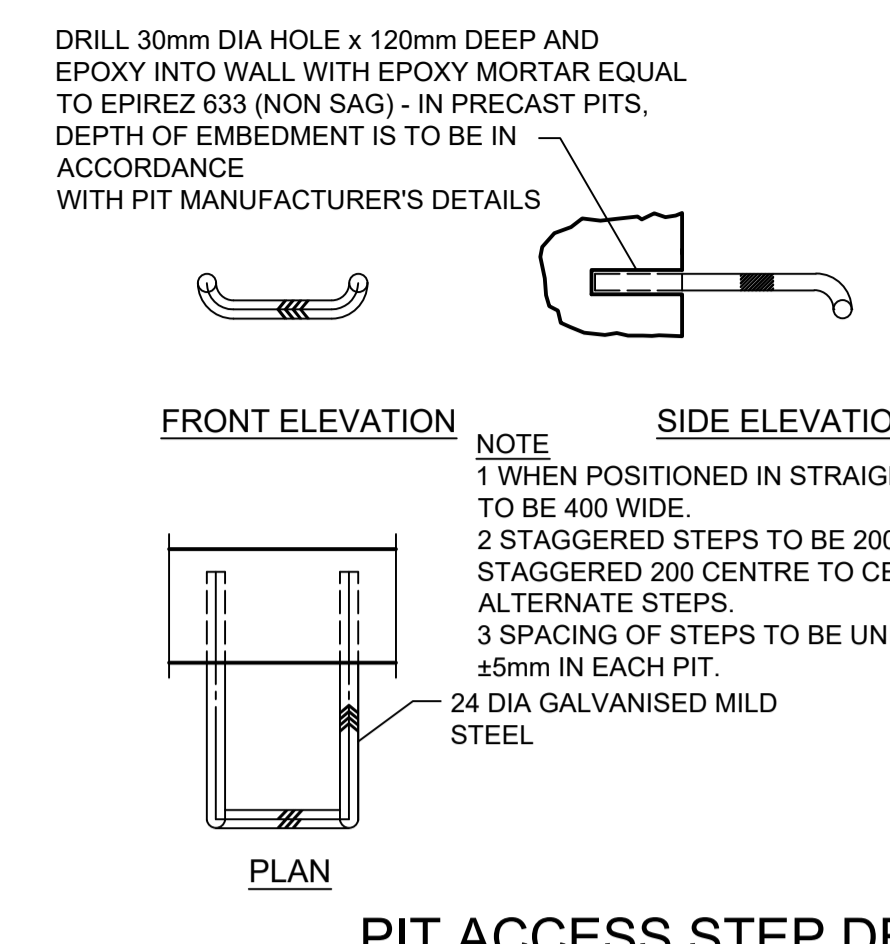
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date
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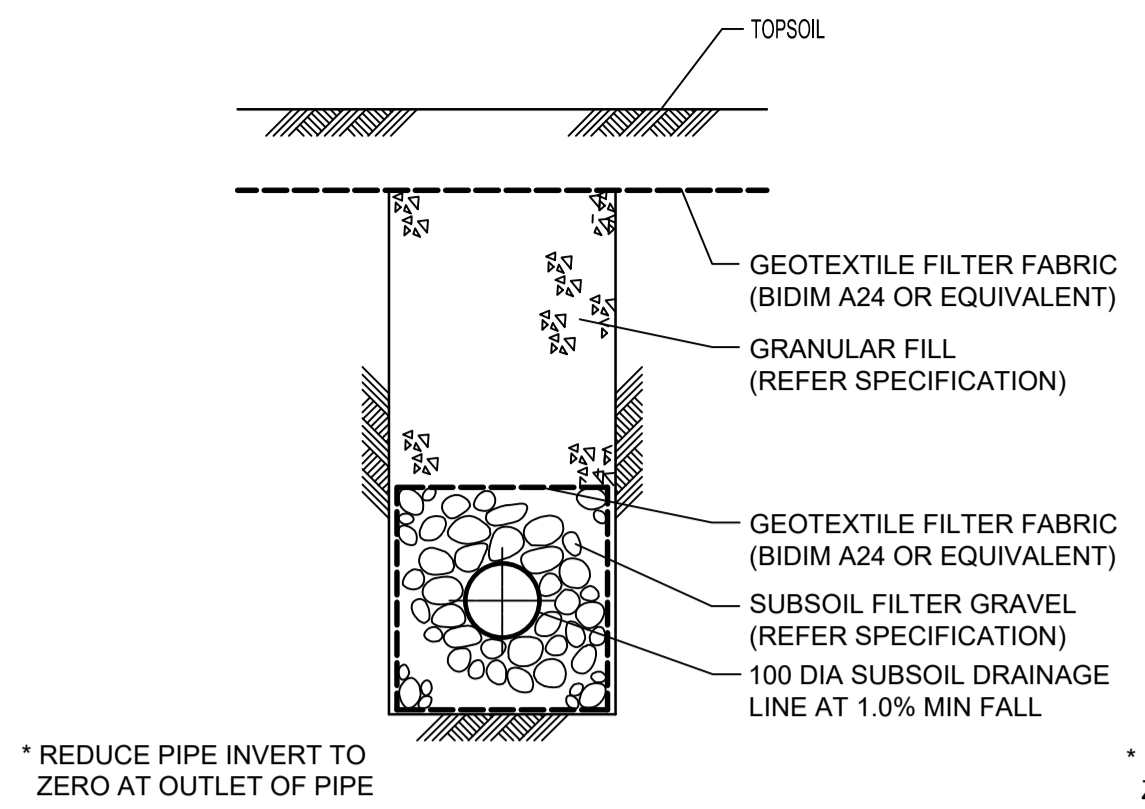
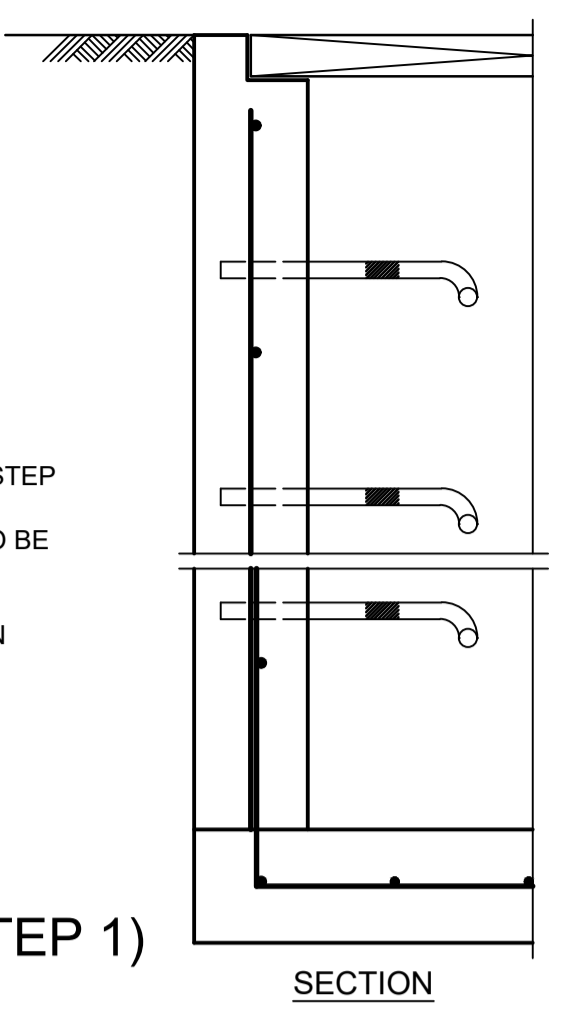
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drawing no.
CV-0400

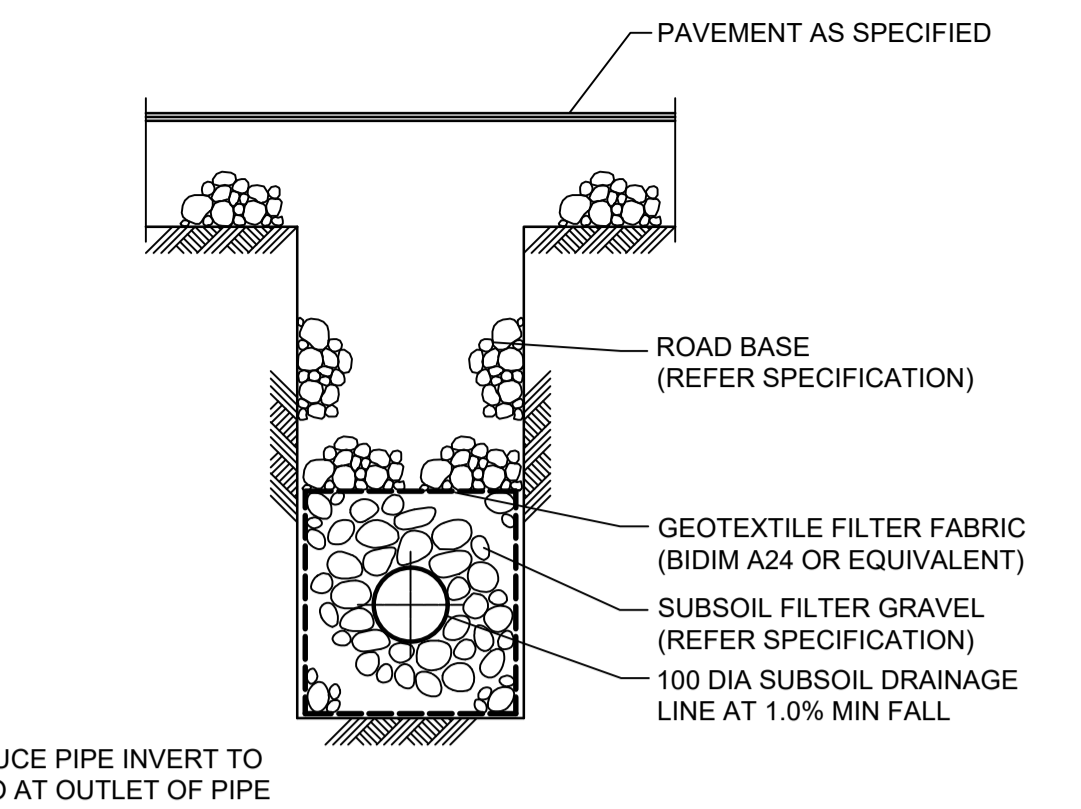
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E



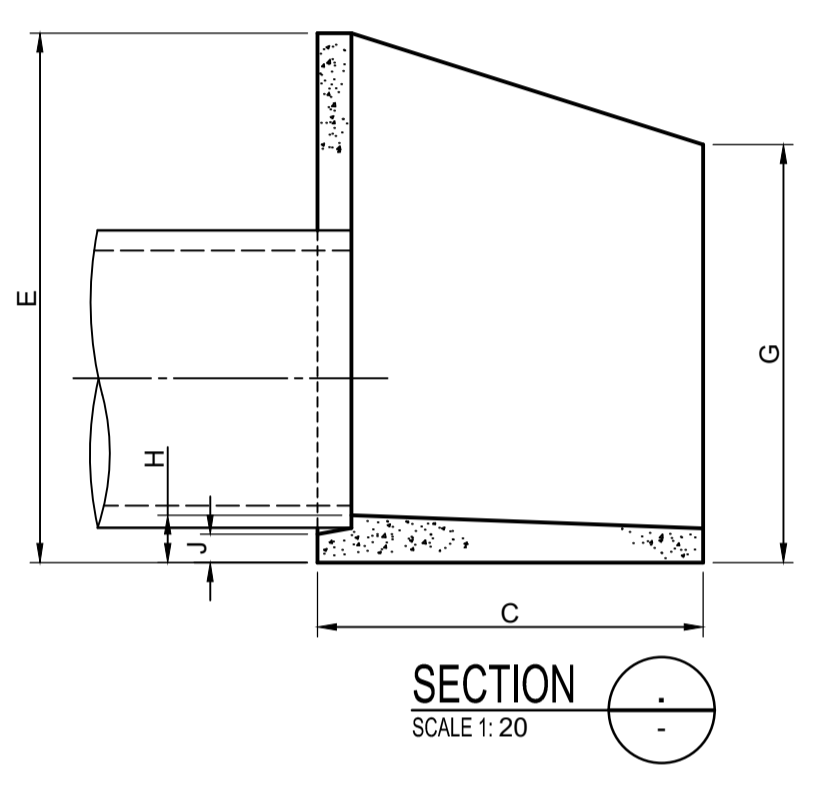
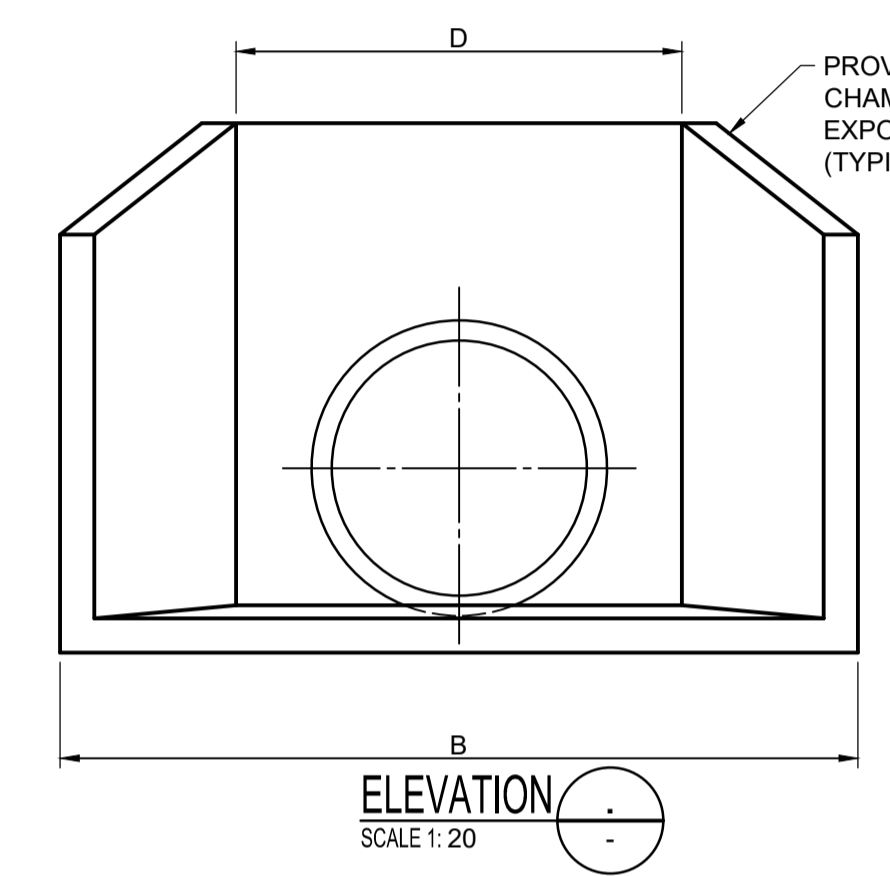
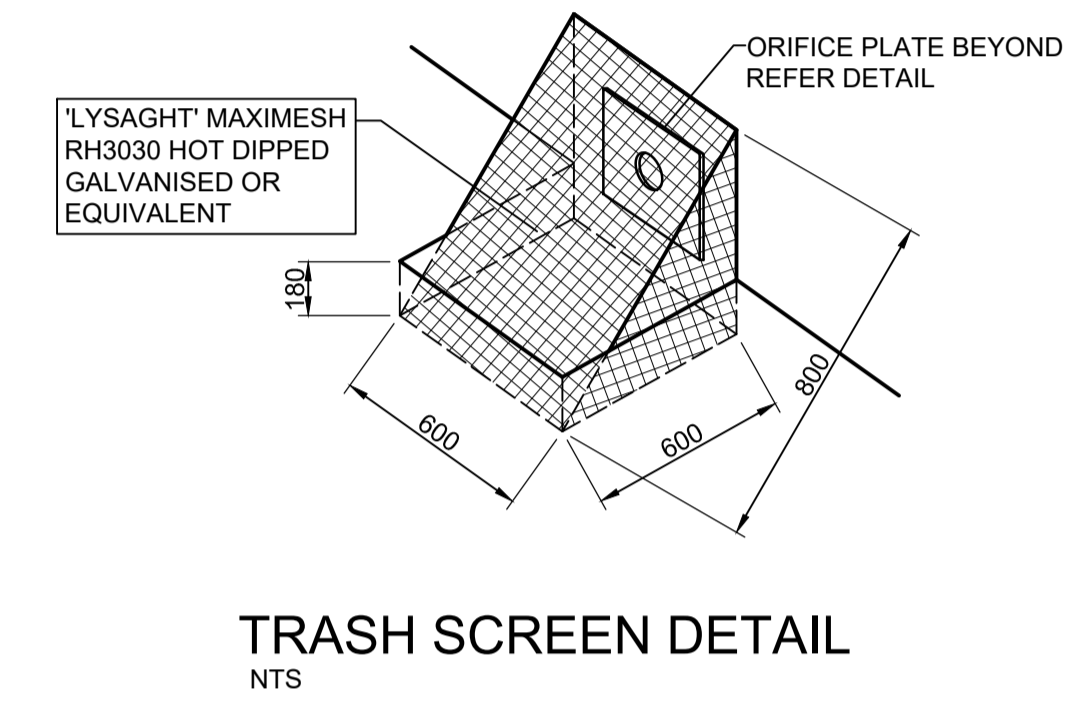
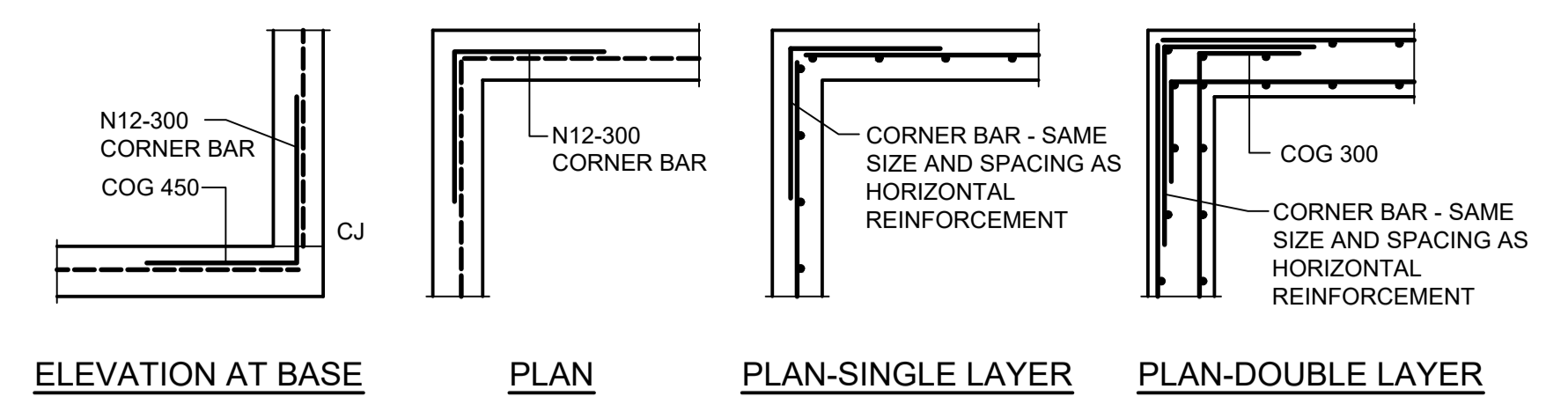
PIT ACCESS STEP DETAIL (STEP 1)
SCALE 1:10
TO BE PROVIDED FOR PITS DEEPER THAN 900mm



SUBSOIL IN LANDSCAPED AREAS
SCALE 1:10

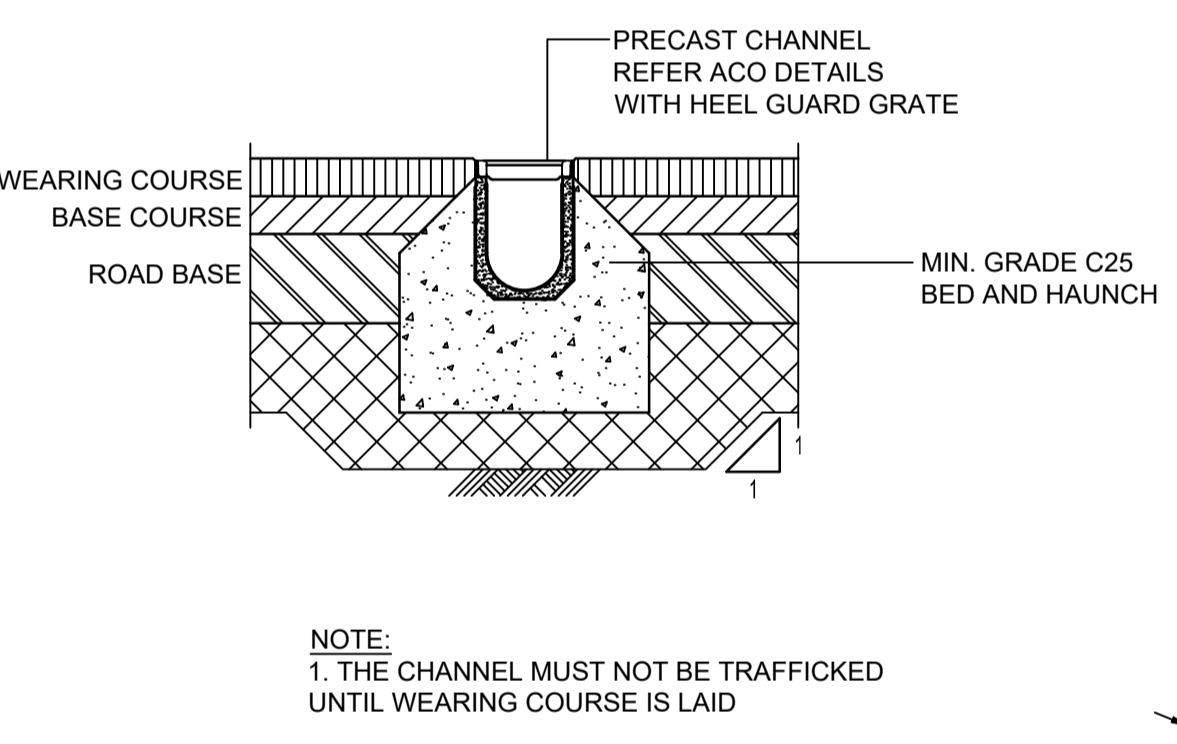
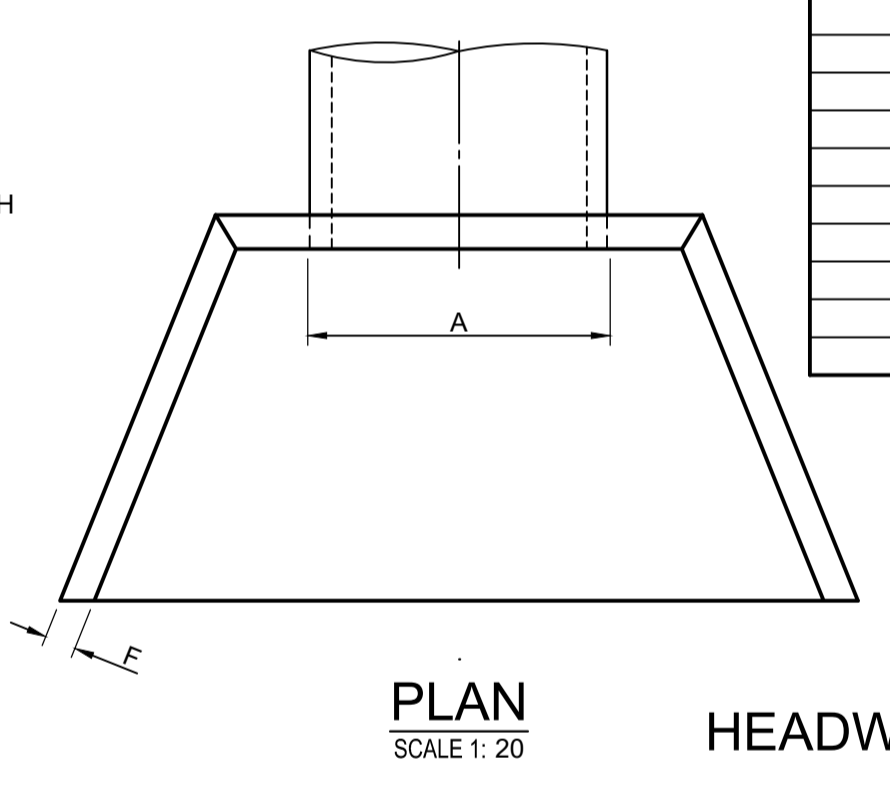


SUBSOIL IN PAVED AREAS
SCALE 1:10

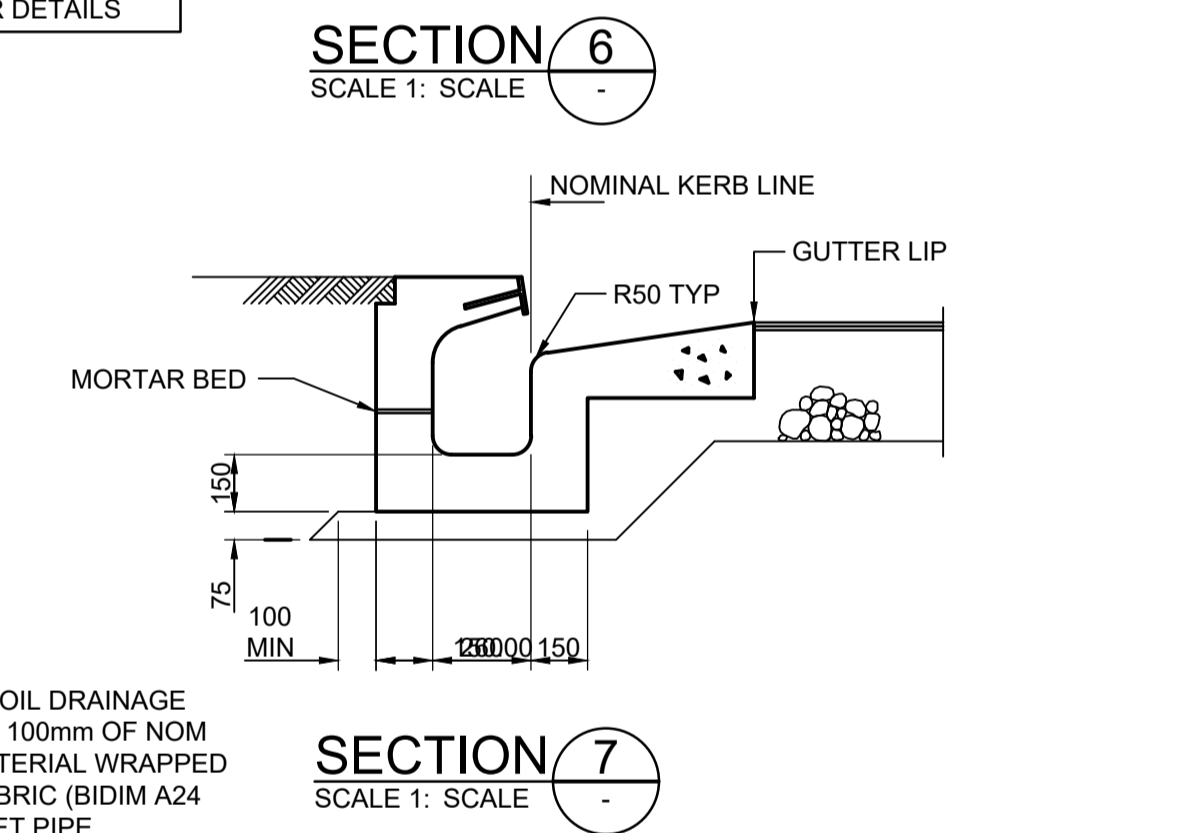
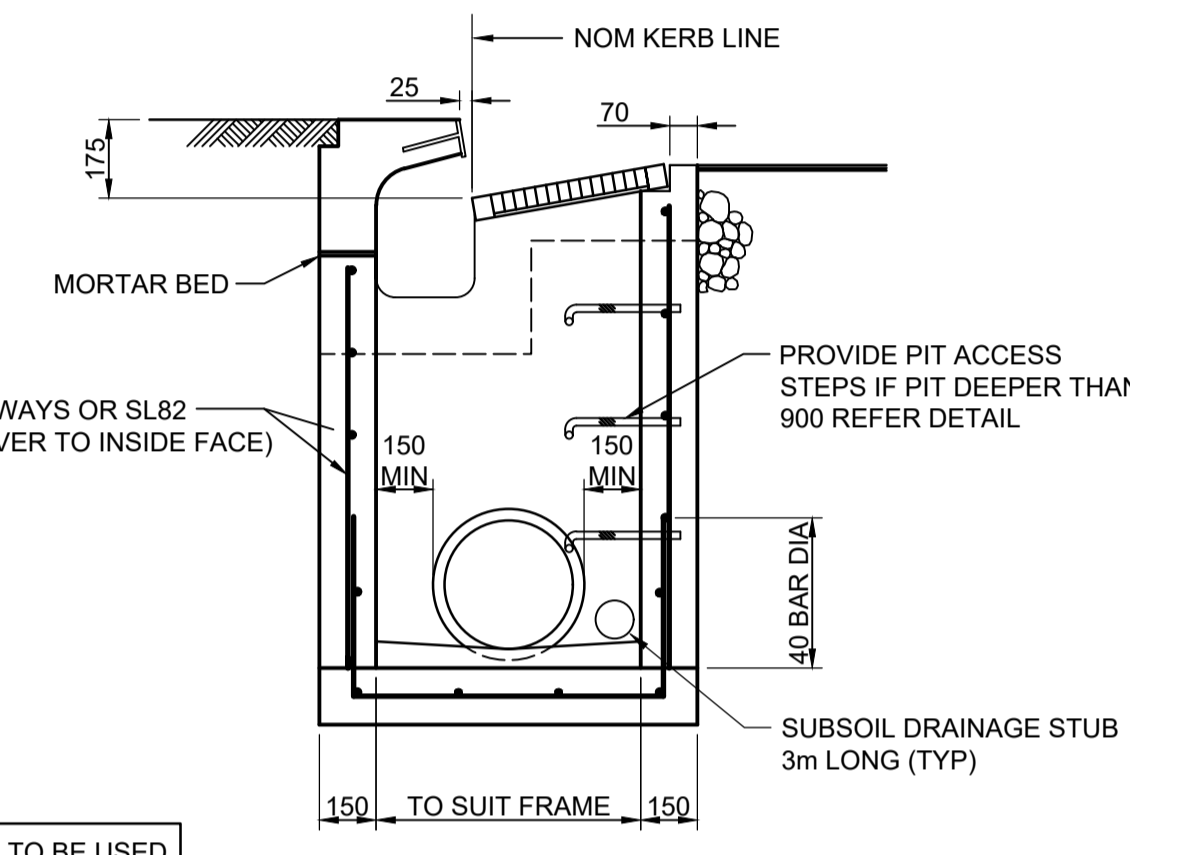
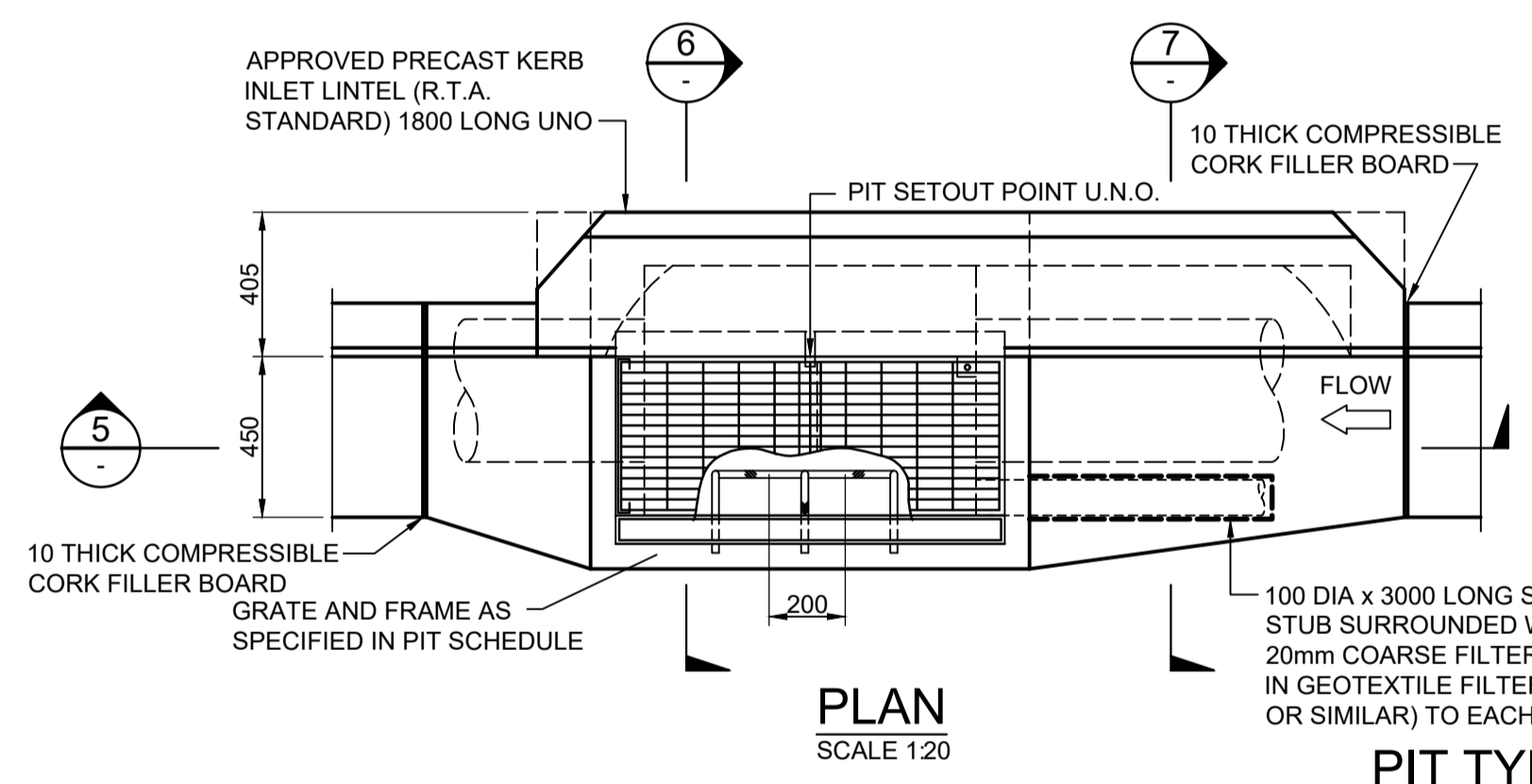
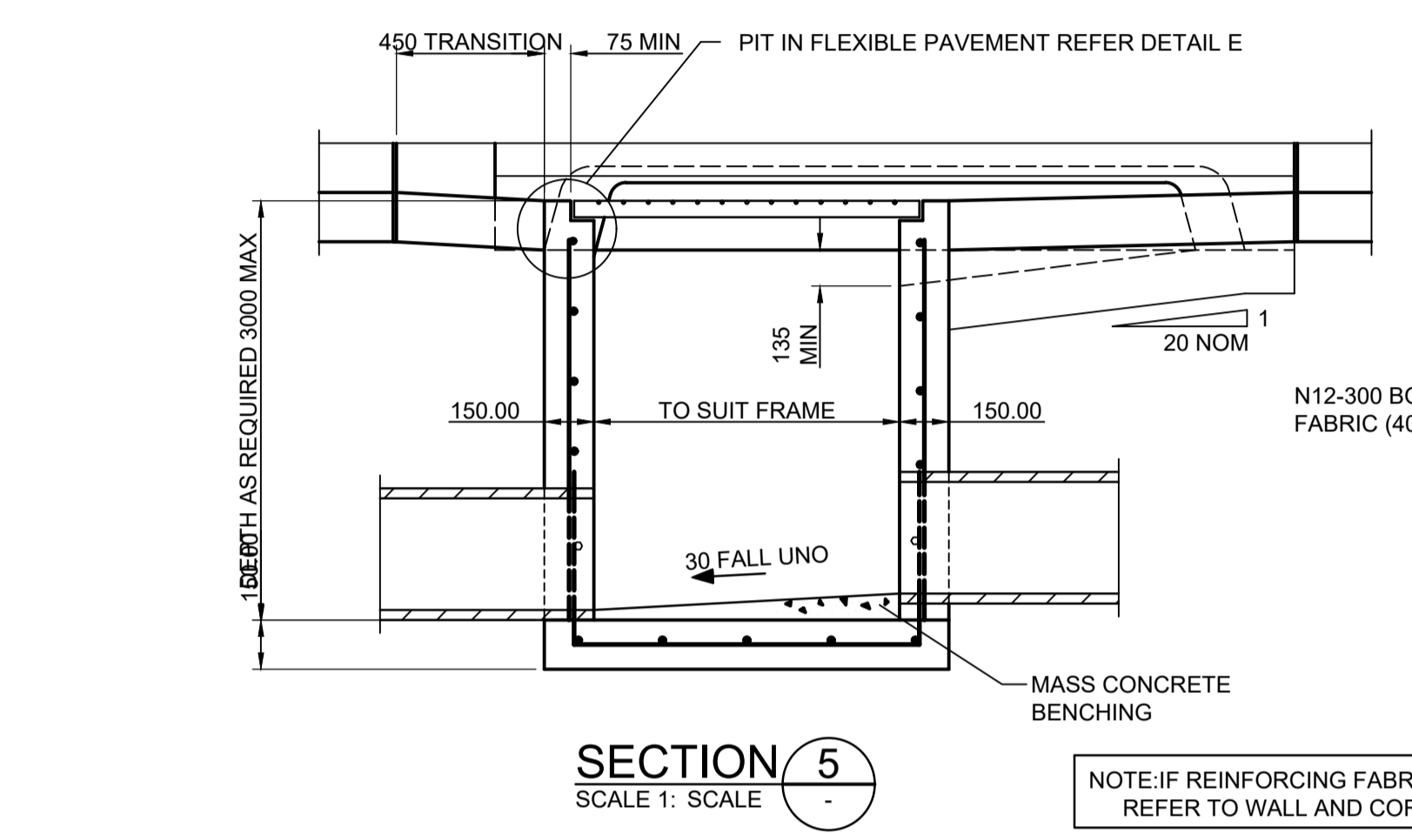


NOM PIPE SIZE	A	B	C	D	E	F	G	H	J
225	295	1100	565	630	775	76	560	35	50
300	378	1100	565	630	775	76	560	35	50
375	461	1100	565	635	775	78	560	35	50
450	543	1100	565	635	775	78	560	30	50
525	626	1700	690	795	1035	90	775	45	65
600	709	1700	690	795	1035	90	775	45	60
675	800	1020	1010	1180	1400	90	1105	50	75
750	870	2020	1010	1180	1400	90	1105	55	70
825	975	2000	1010	1200	1400	90	1100	45	85
900	1060	2000	1010	1200	1400	90	1100	35	95

NOTE
COMPRESSIVE STRENGTH (F_c) FOR CAST IN-SITU CONCRETE TO BE A MINIMUM OF 25MPa AT 28 DAYS.



GRATED DRAIN TYPE D (GDD)
SCALE 1:10



rev	date	description	dm	ch/k
E	15/09/22	REISSUE FOR 100% SD	BEJ	PAL
D	12/08/22	REISSUE FOR 100% SD	MZV	PAL
C	24/11/21	ISSUE FOR 100% SD	PAD	PAL
B	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL
A	29/10/21	ISSUE FOR 70% SD	PAD	PAL

rev	date	description	dm	ch/k



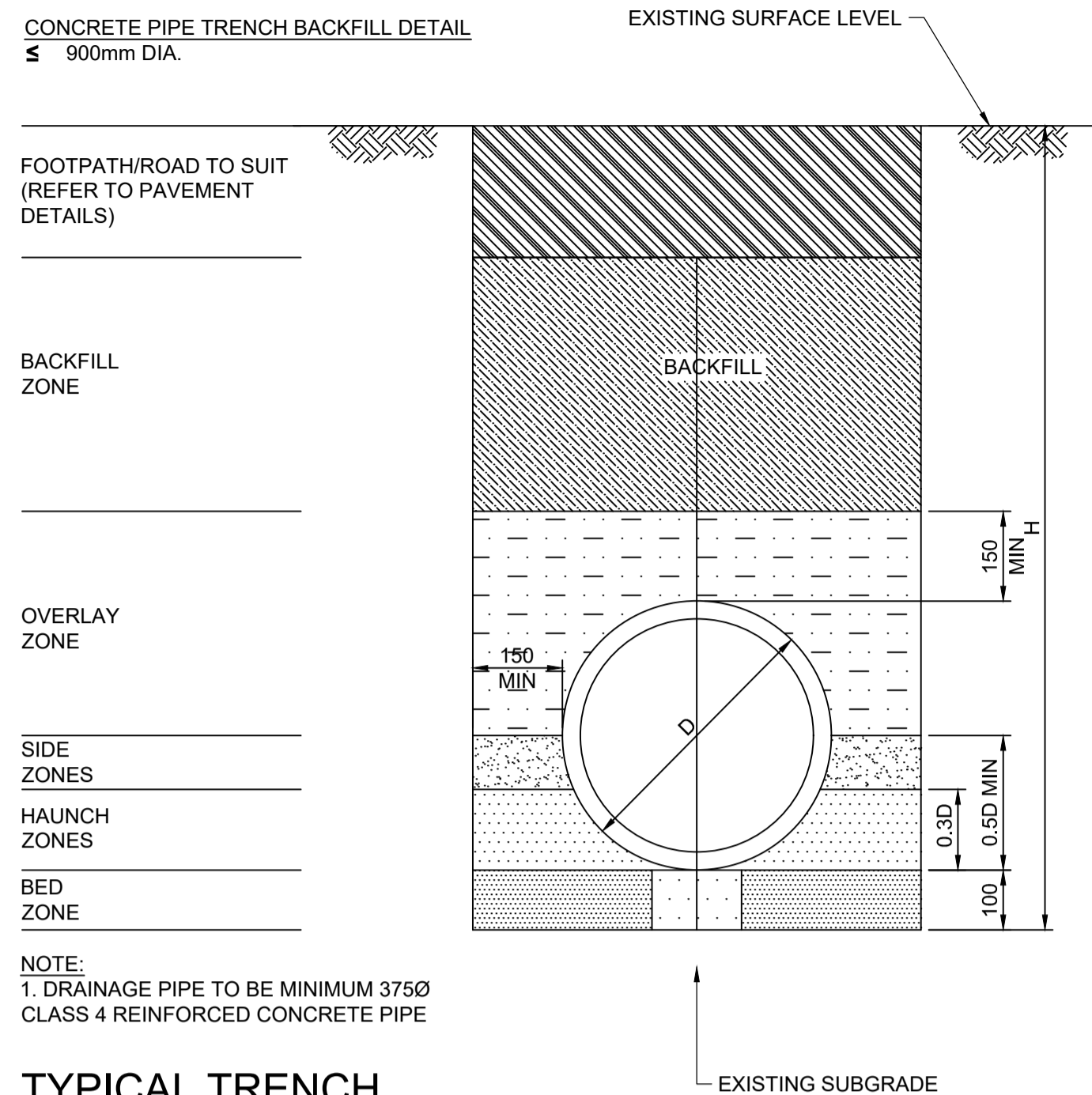
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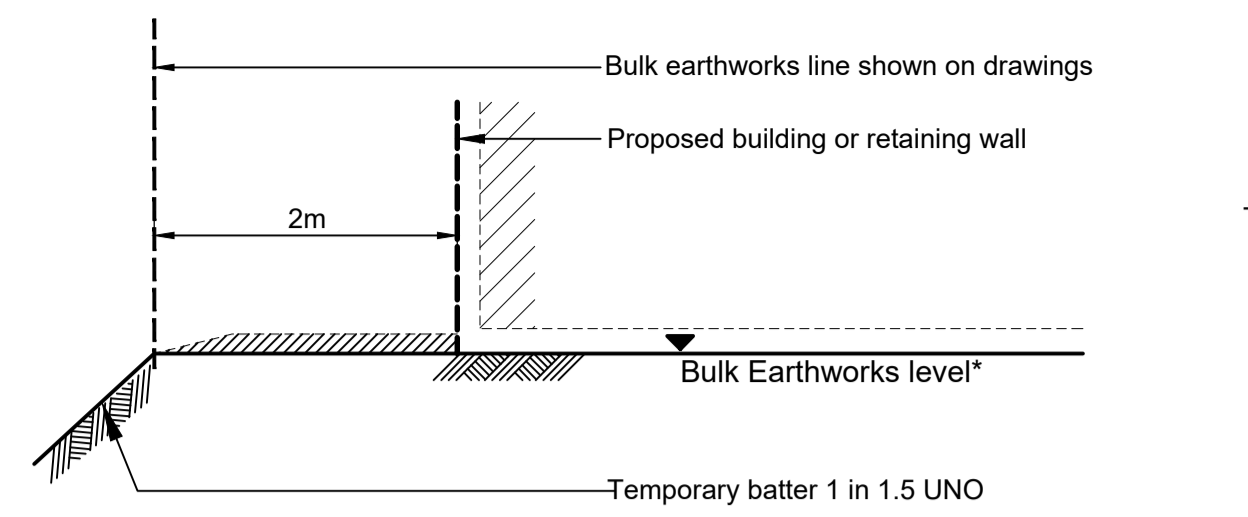
project
THE FOREST HIGH SCHOOL

drawing title
DETAILS SHEET 2

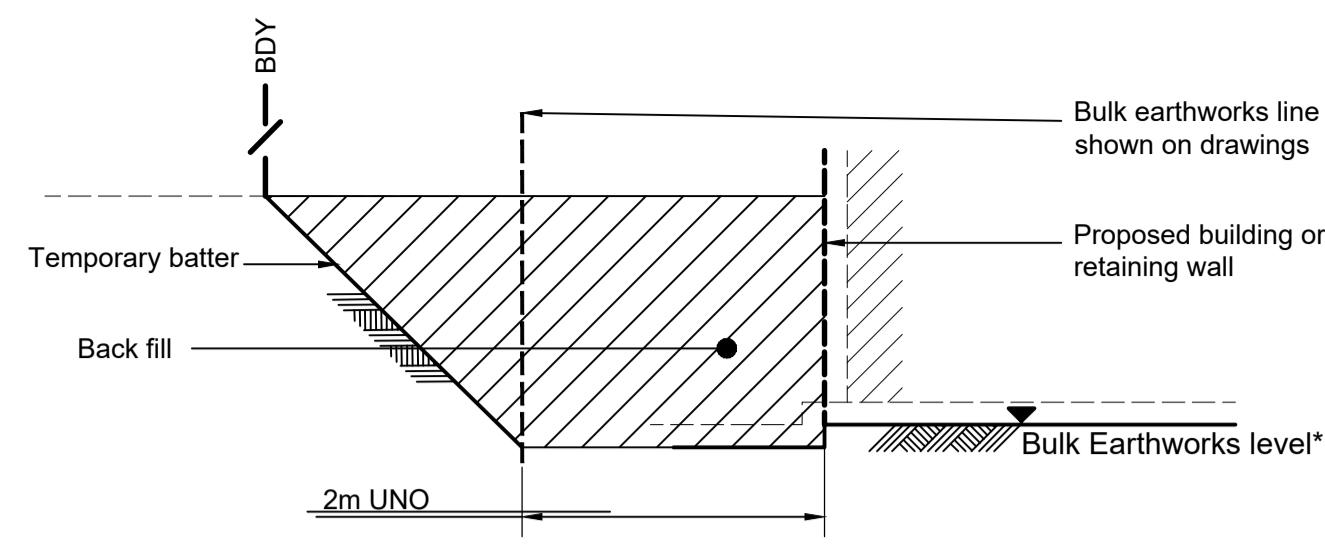
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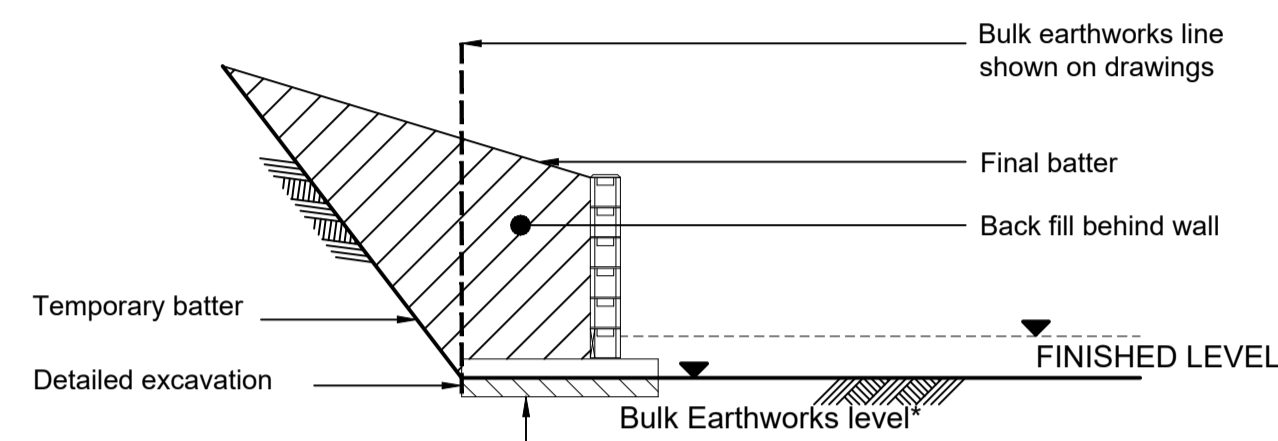
TYPICAL TRENCH BACKFILL DETAIL
SCALE 1:10



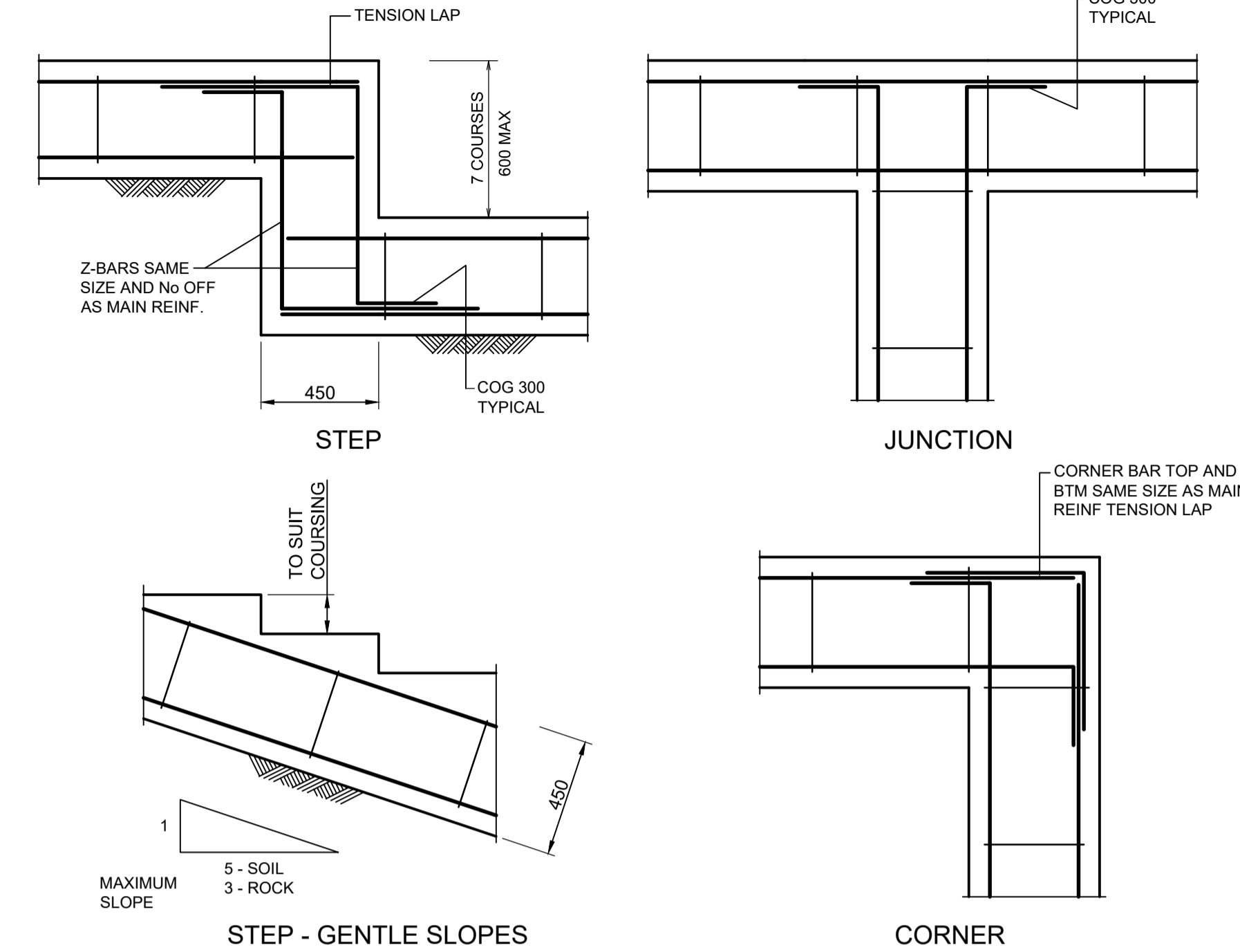
BATTER TYPE D



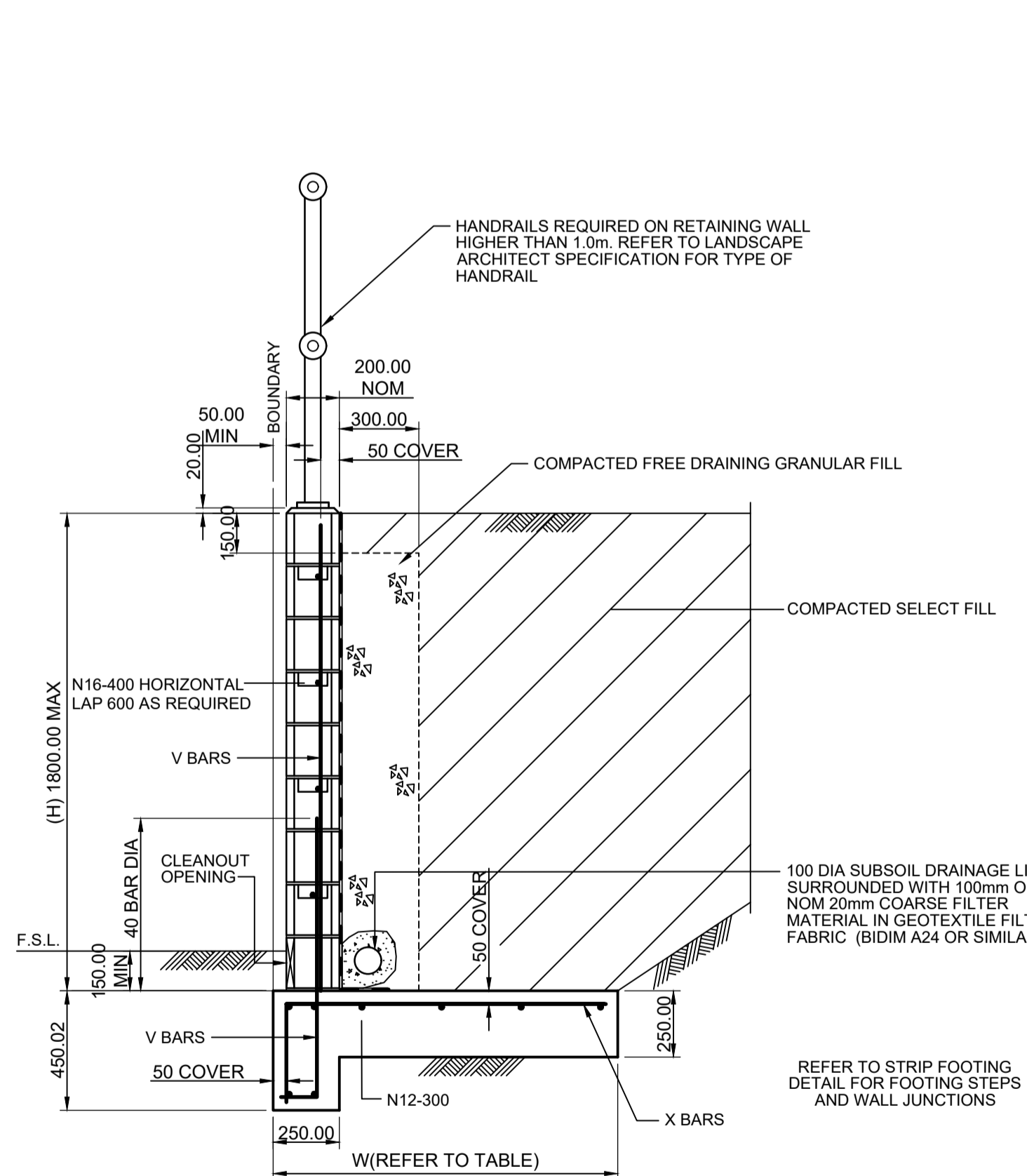
BATTER TYPE A



BATTER TYPE F

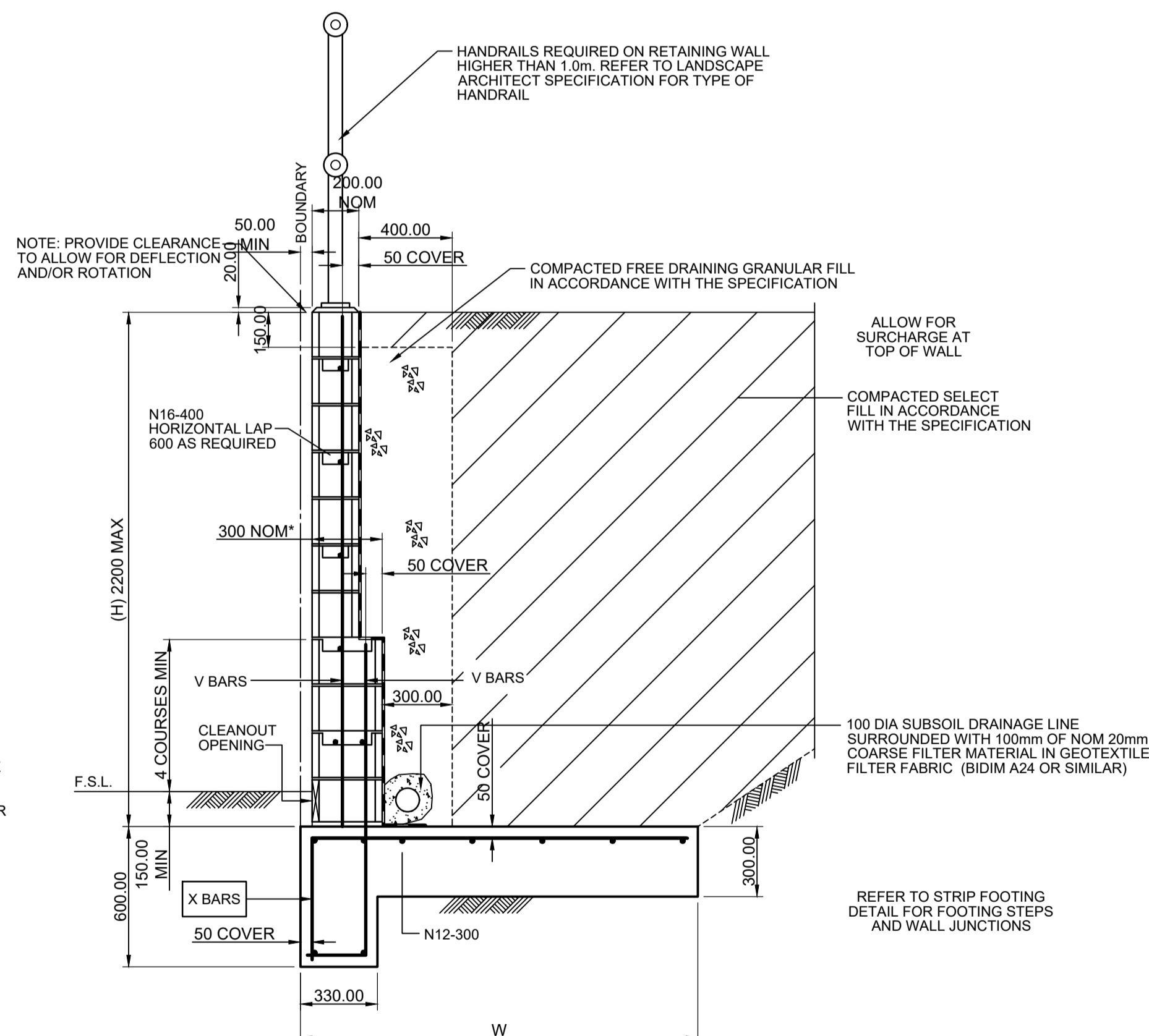


STRIP FOOTING DETAILS



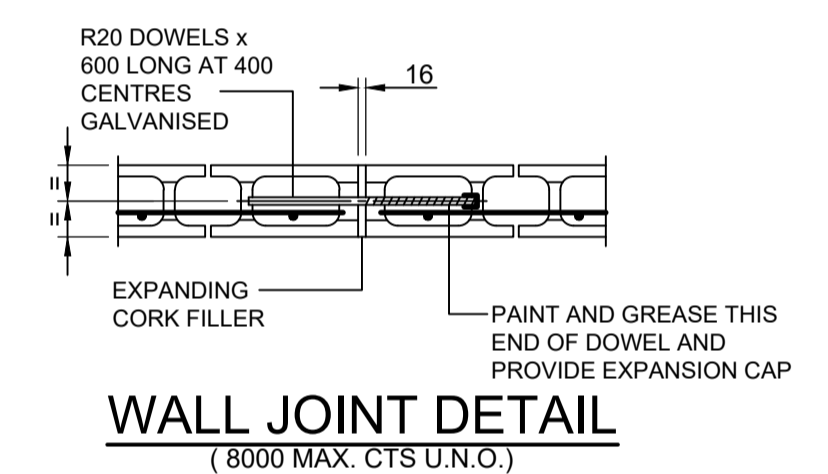
RETAINING WALL (RW1 HEIGHT UPTO 1.8m)
SCALE 1:20

Height (H)	Width (W)	V Bars	X Bars
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1400	1450	N16-400	N16-400
1800	1750	N20-200	N16-400

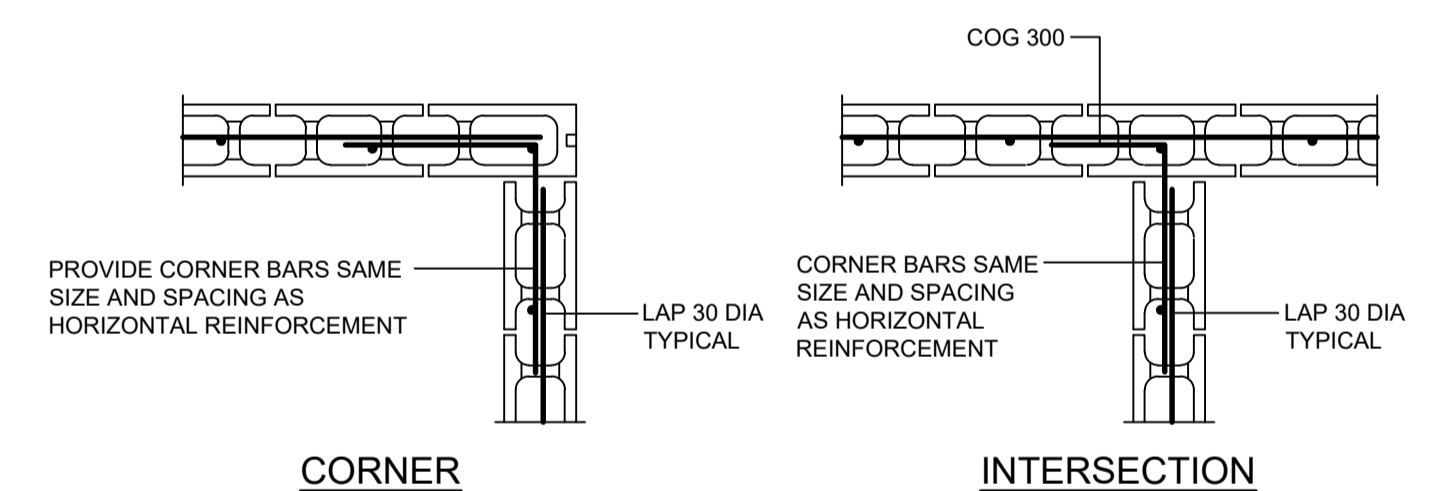


RETAINING WALL (RW1 HEIGHT UPTO 2.2m)
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1400	1450	N16-400	N16-400
1800	1750	N24-400	N20-400
2200	2050	N20-400	N20-400



WALL JOINT DETAIL
(8000 MAX. CTS U.N.O.)



BLOCK WORK WALL JOINTS
SCALE 1:20

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D	12/08/22	REISSUE FOR 100% SD	MZV	PAL
C	24/11/21	ISSUE FOR 100% SD	PAD	PAL
B	29/10/21	ISSUE FOR DRAFT 100% SD	PAD	PAL
A	29/10/21	ISSUE FOR 70% SD	PAD	PAL

rev	date	description	drm	ch/k



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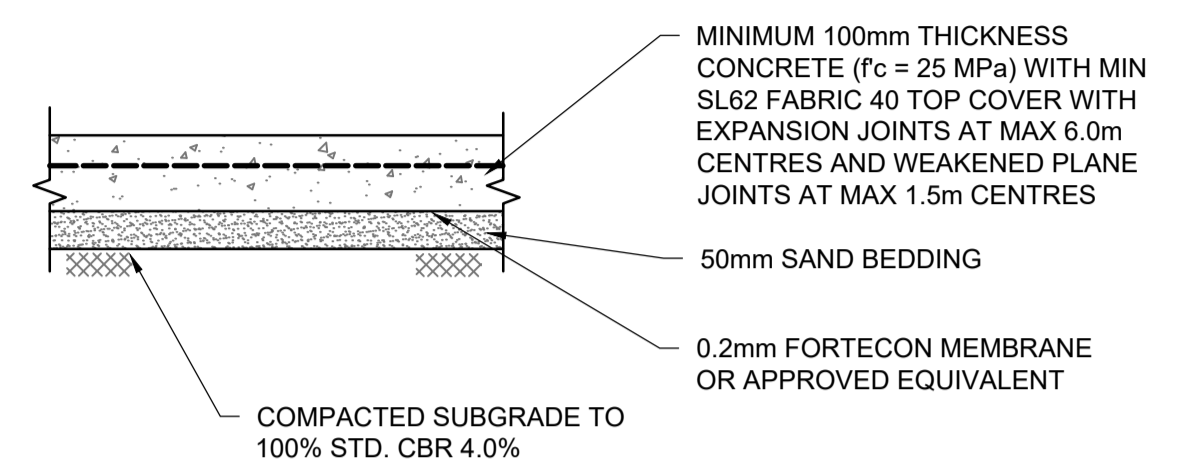
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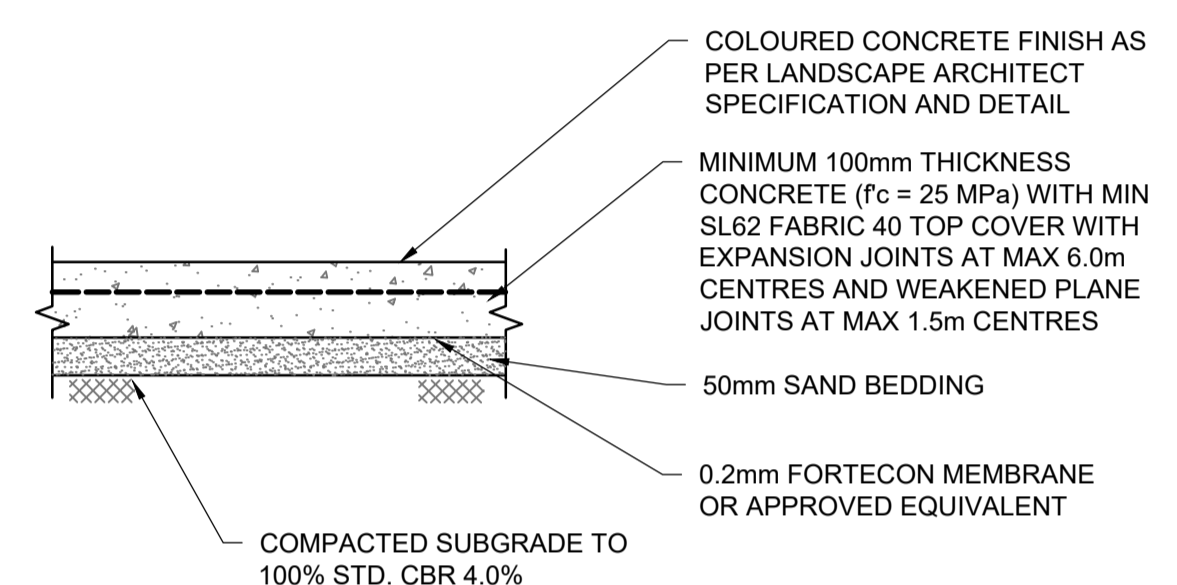
project	THE FOREST HIGH SCHOOL
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drawing title	DETAILS SHEET 3
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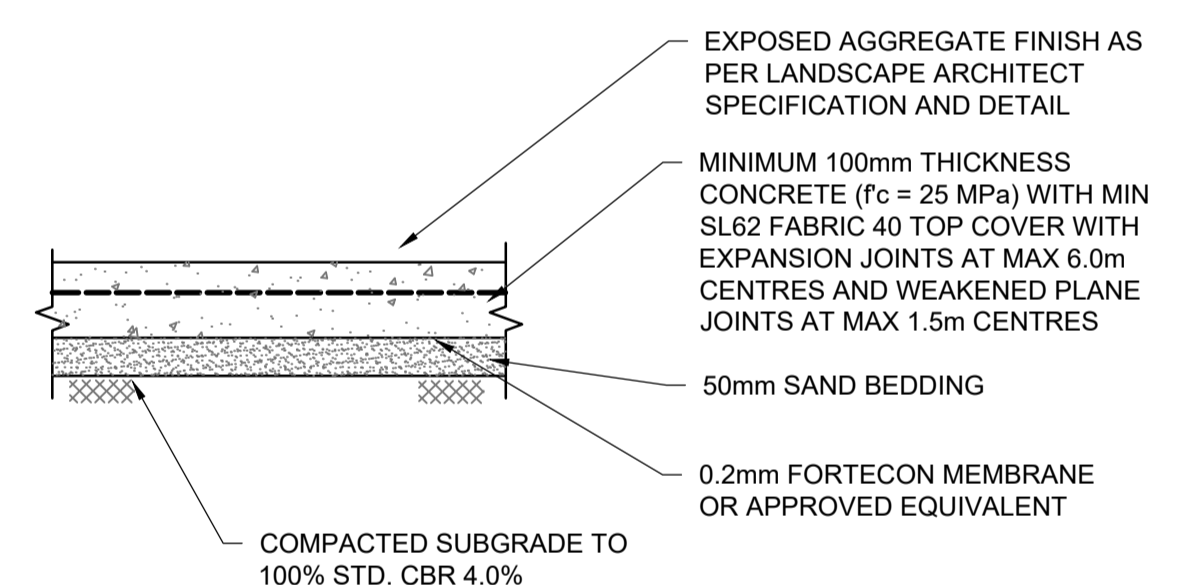
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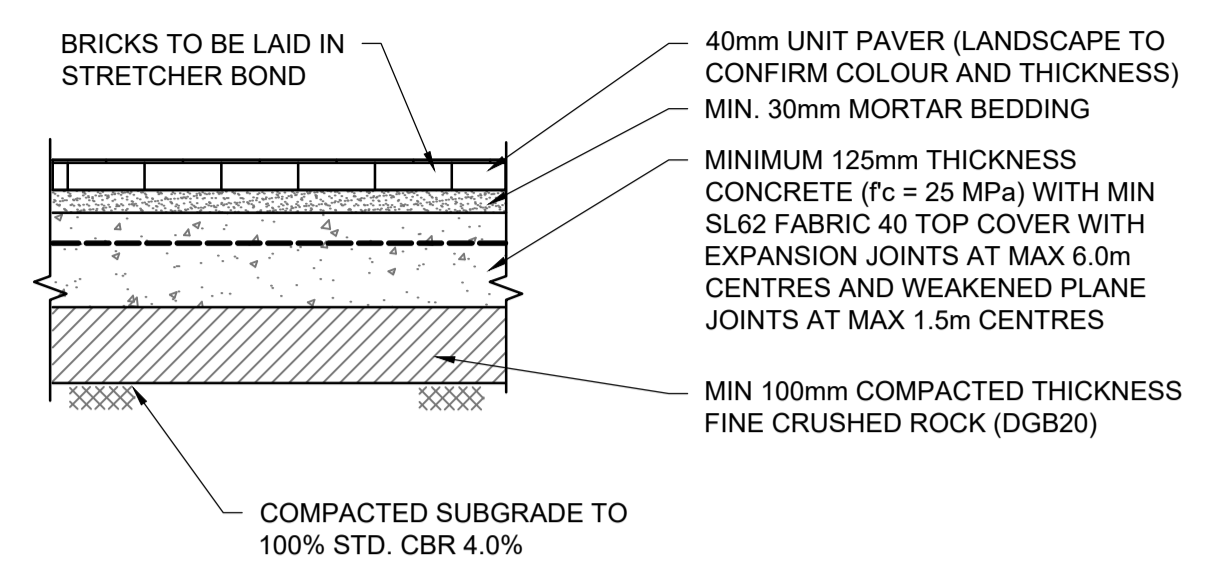
PV1
 PAVEMENT P1
 INSITU CONCRETE PAVING
 SCALE:1:10



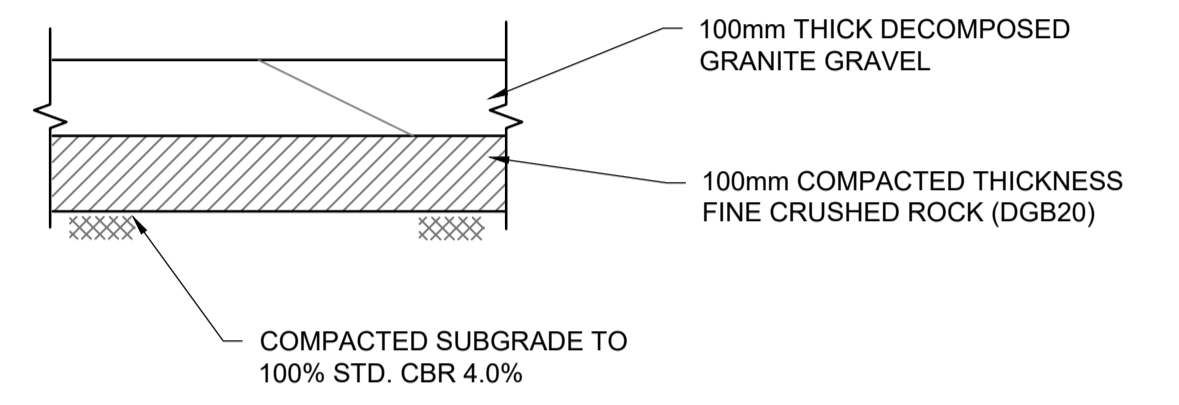
PV2
 PAVEMENT P2
 INSITU COLOURED CONCRETE PAVING
 SCALE:1:10



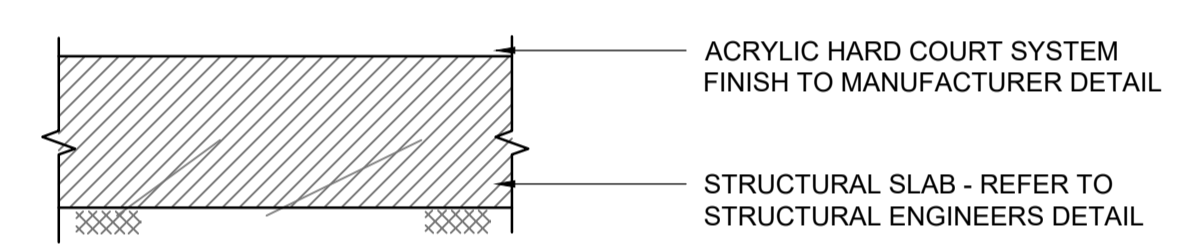
PV3
 PAVEMENT P3
 INSITU CONCRETE BANDING WITH EXPOSED AGGREGATE
 SCALE:1:10



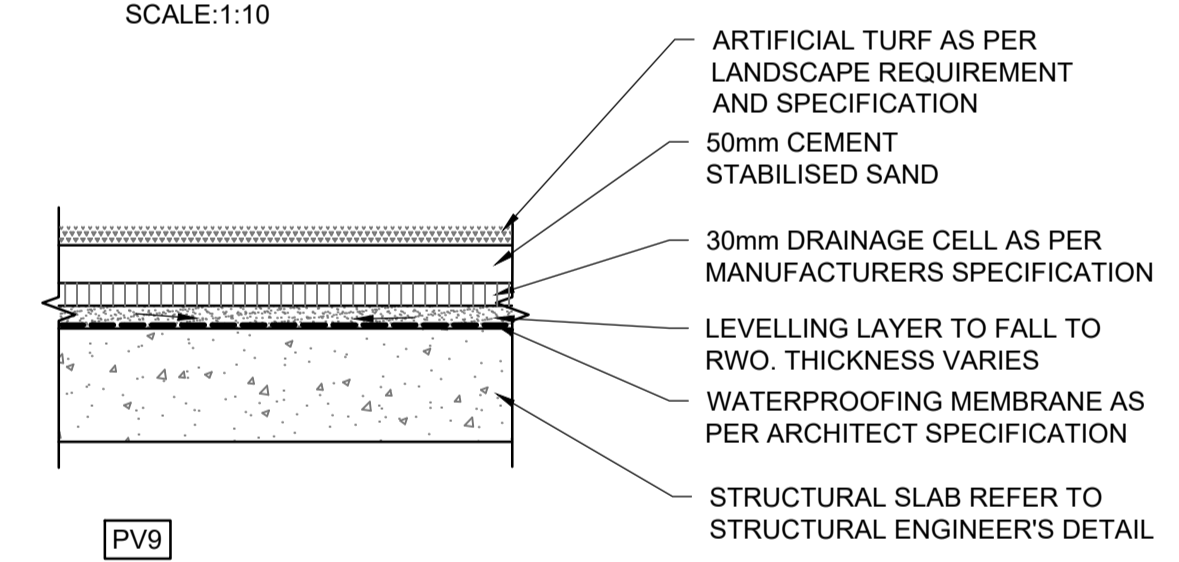
PV4
 PAVEMENT P4
 RECYCLED BRICK PAVING
 SCALE:1:10



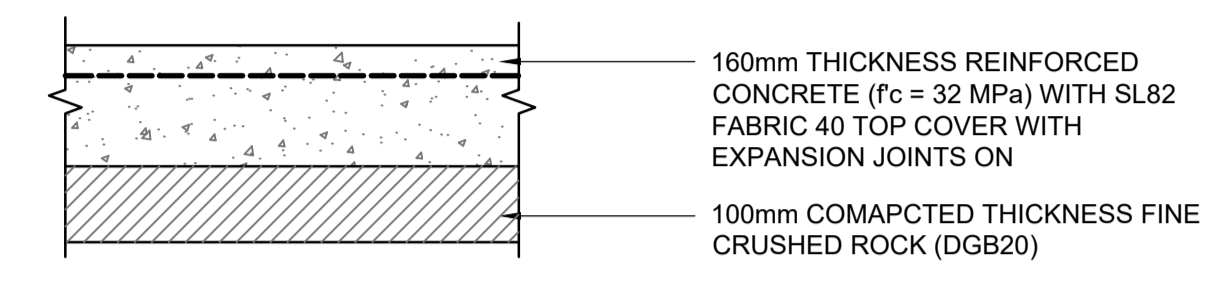
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 PAVEMENT P6
 DECOMPOSED GRANITE GRAVEL
 SCALE:1:10



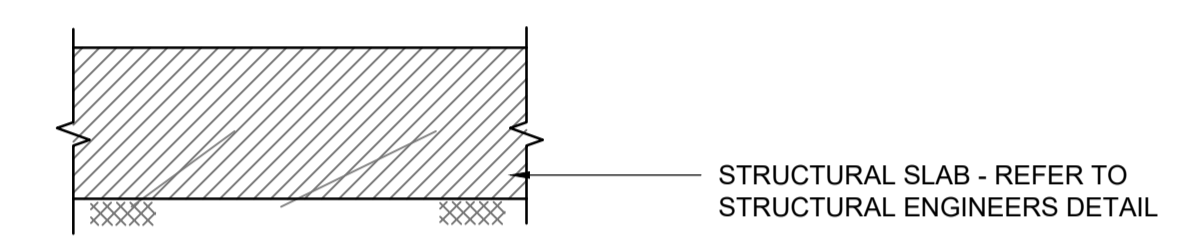
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 PAVEMENT P8
 SPORTS COURT
 SCALE:1:10



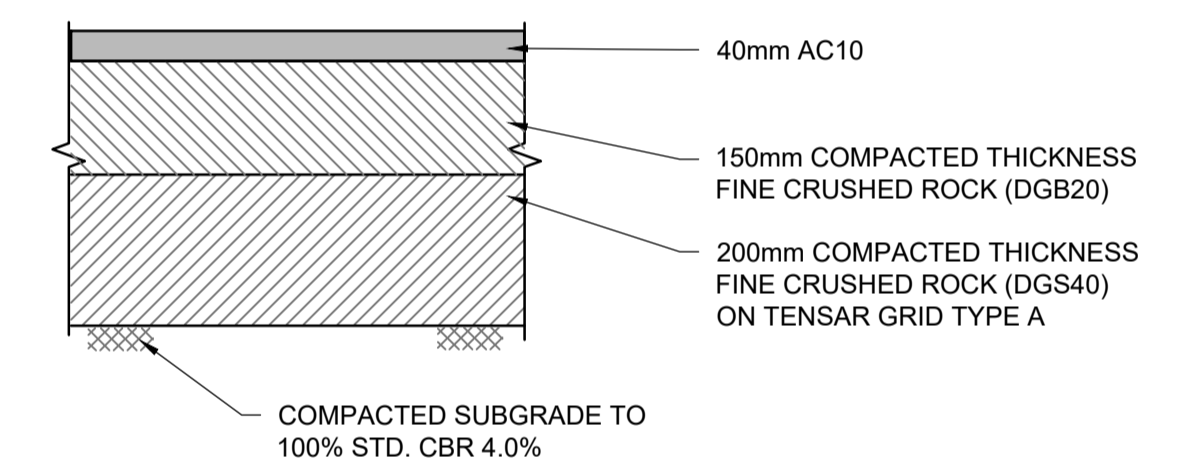
PV9
 PAVEMENT P9
 SPORTS FIELD ON SUSPENDED SLAB
 SCALE:1:10



PV10
 PAVEMENT P10
 INSITU CONCRETE PAVING
 SCALE:1:10



PV11
 PAVEMENT P11
 UNDERCOVER PARKING & LOADING DOCK
 SCALE:1:10



PV12
 PAVEMENT P12
 ACCESS ROAD
 SCALE:1:10

rev	date	description	dm	ch/k
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E	02/09/22	REISSUE FOR 100% SD	BEJ	PAL
D	12/08/22	REISSUE FOR 100% SD	MZV	PAL
C	03/12/21	EMERGENCY ACCESS ROAD ADDED	PAD	PAL
B	24/11/21	ISSUE FOR 100% SD	PAD	PAL
A	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL

rev	date	description	dm	ch/k



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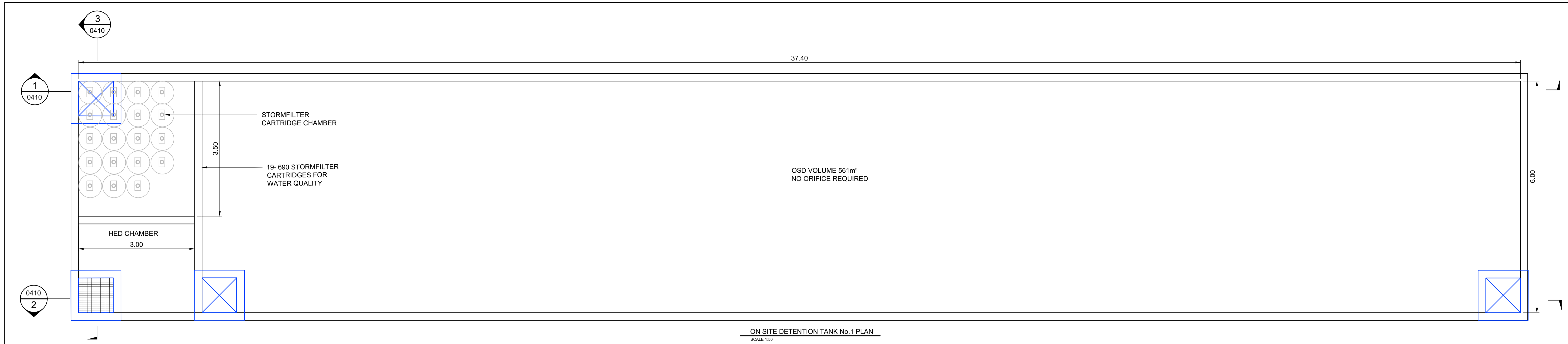
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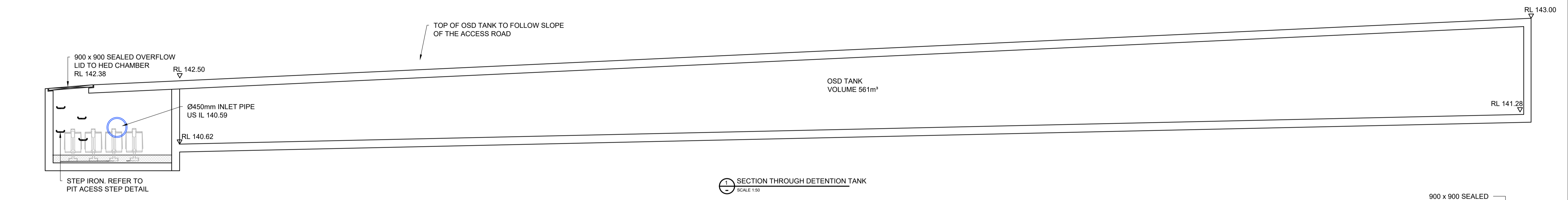
project	THE FOREST HIGH SCHOOL
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drawing title	PAVEMENT DETAIL
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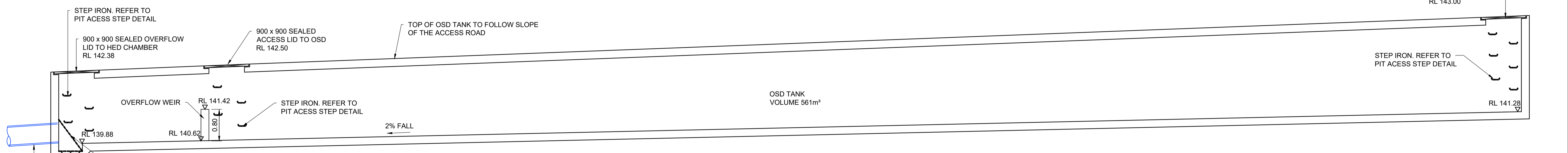
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6310	CV-0405	F					



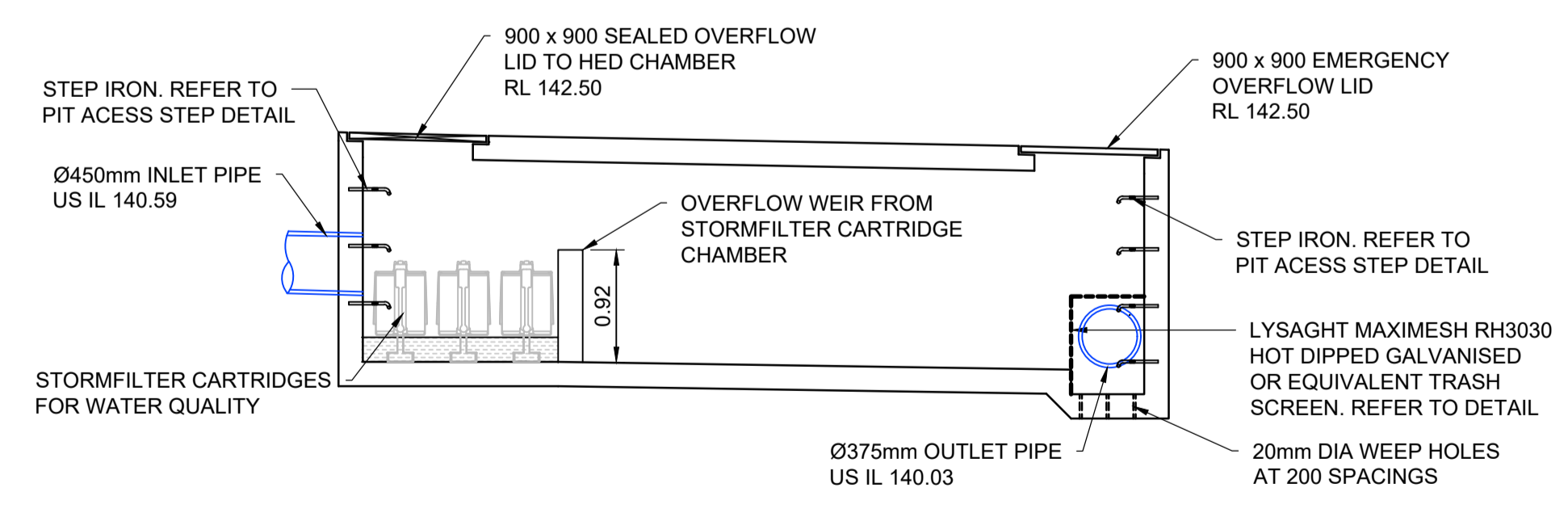
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SCALE 1:50



SECTION THROUGH DETENTION TANK
SCALE 1:50



SECTION THROUGH DETENTION TANK
SCALE 1:50



SECTION THROUGH DETENTION TANK
SCALE 1:50

NOTE: DRAWINGS ARE SUBJECT TO FURTHER DETAILED CHANGES.

rev	date	description	dwn	ch/k
D	15/09/22	REISSUE FOR 100% SD	MZV	PAL
C	12/08/22	REISSUE FOR 100% SD	MZV	PAL
B	24/11/21	ISSUE FOR 100% SD	PAD	PAL
A	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL

rev	date	description	dwn	ch/k



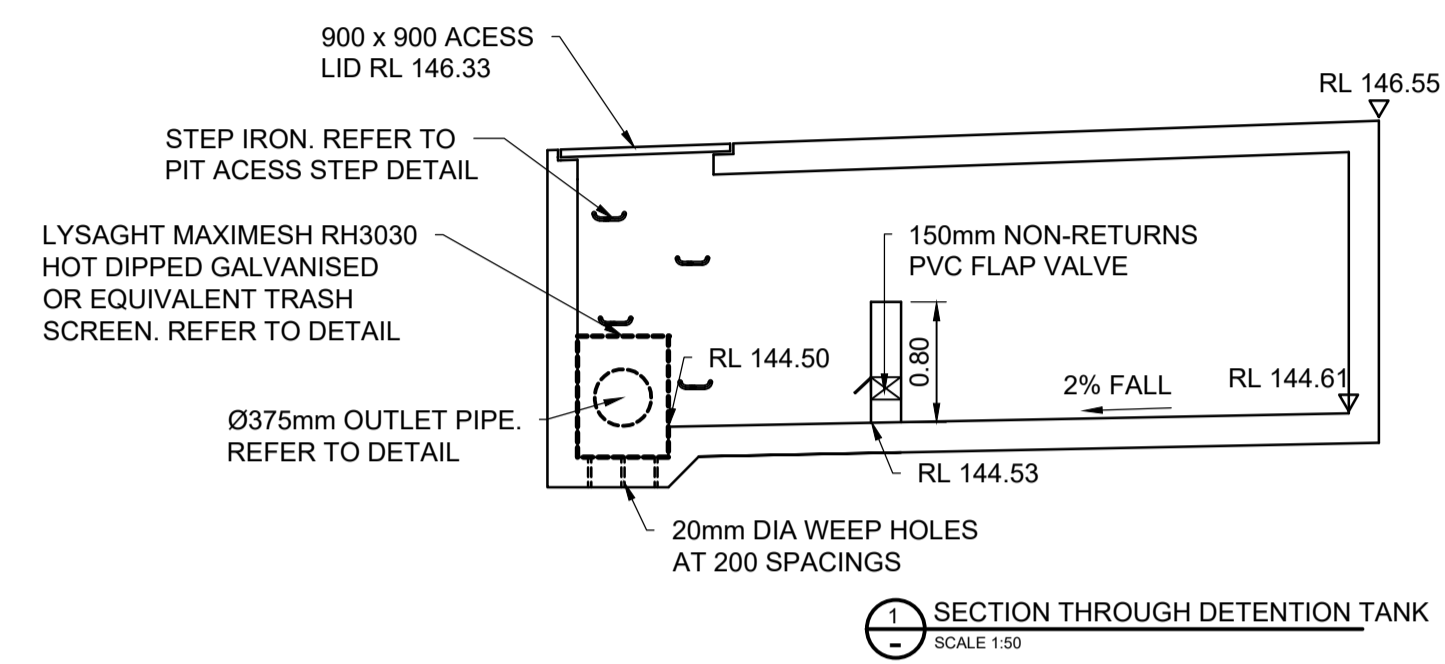
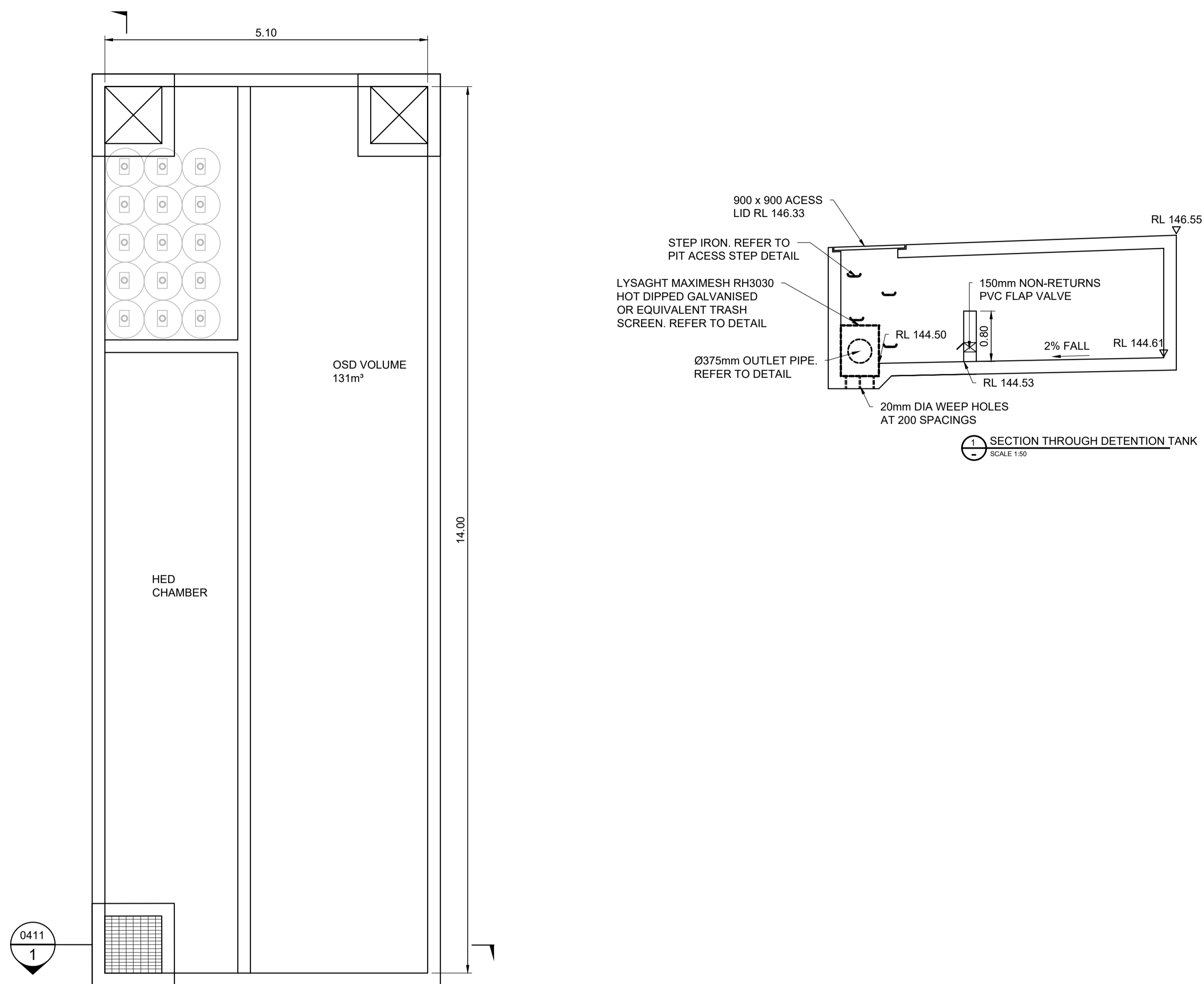
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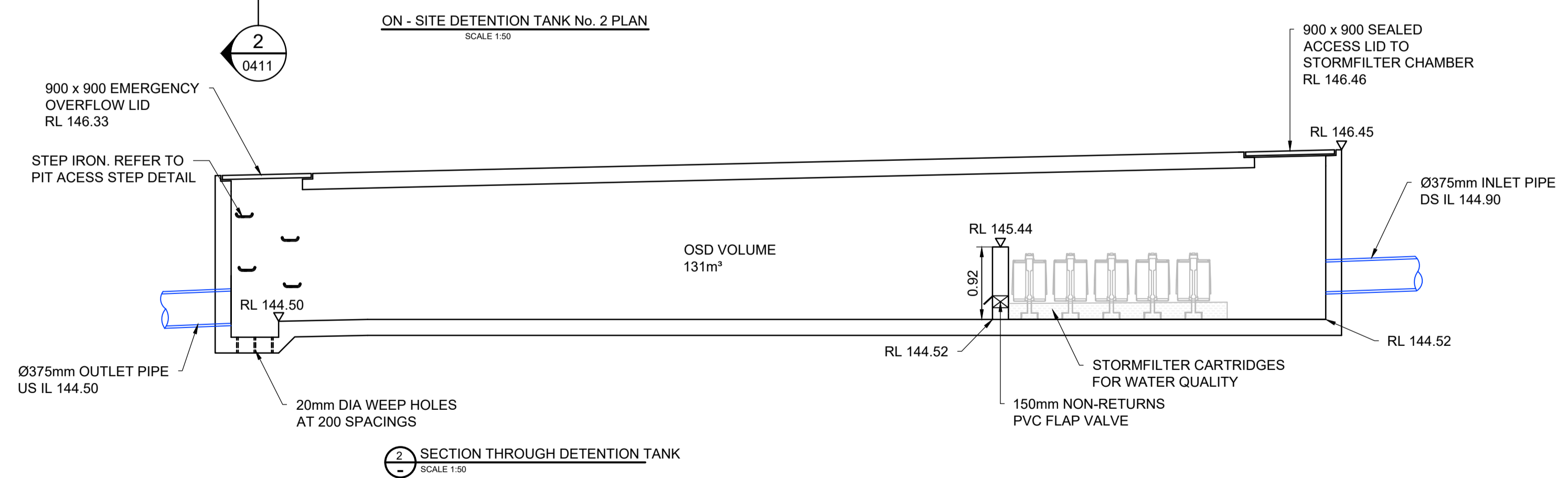
project
THE FOREST HIGH SCHOOL

drawing title
**ONSITE DETENTION TANK
SECTION SHEET 1**

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project no. 6310	drawing no. CV-0410	rev. D	



ON - SITE DETENTION TANK No. 2 PLAN
SCALE 1:50



SECTION THROUGH DETENTION TANK
SCALE 1:50

rev	date	description	dm	ch/k
D	15/09/22	REISSUE FOR 100% SD	MZV	PAL
C	12/08/22	REISSUE FOR 100% SD	MZV	PAL
B	24/11/21	ISSUE FOR 100% SD	PAD	PAL
A	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL

rev	date	description	dm	ch/k



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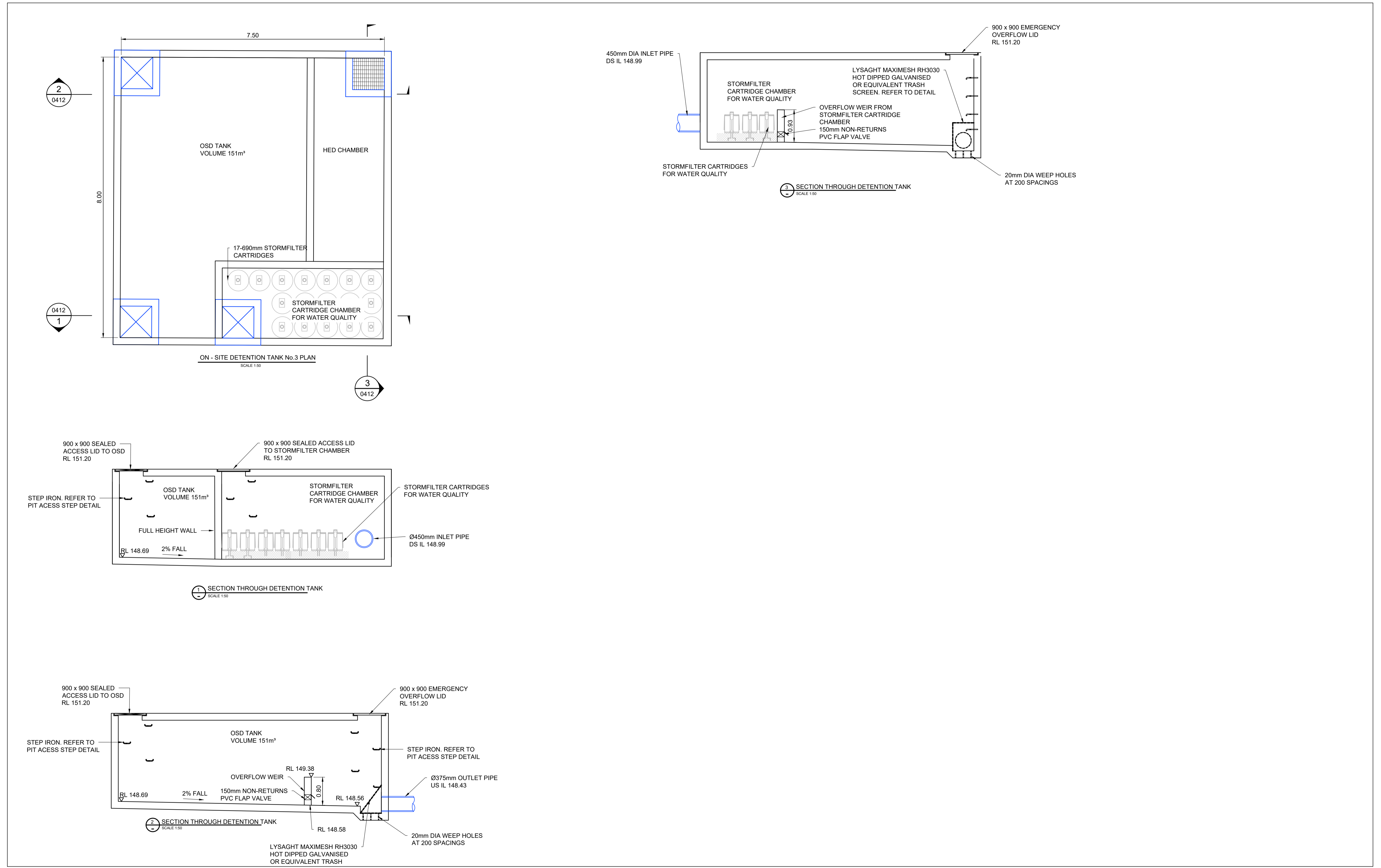
Telephone (02) 8904 1444
Facsimile (02) 8904 1555
www.enstruct.com.au



project	THE FOREST HIGH SCHOOL
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drawing title	ONSITE DETENTION TANK SECTION SHEET 2
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status				FOR INFORMATION ONLY			
scale at A1	drawn by	checked	date				
1:50	PAD	PAL	NOV-21				
project no.	drawing no.	rev.					
6310	CV-0411	D					



rev	date	description	dm	ch/k
D	15/09/22	REISSUE FOR 100% SD	MZV	PAL
C	12/08/22	REISSUE FOR 100% SD	MZV	PAL
B	24/11/21	ISSUE FOR 100% SD	PAD	PAL
A	19/11/21	ISSUE FOR DRAFT 100% SD	PAD	PAL

rev	date	description	dm	ch/k



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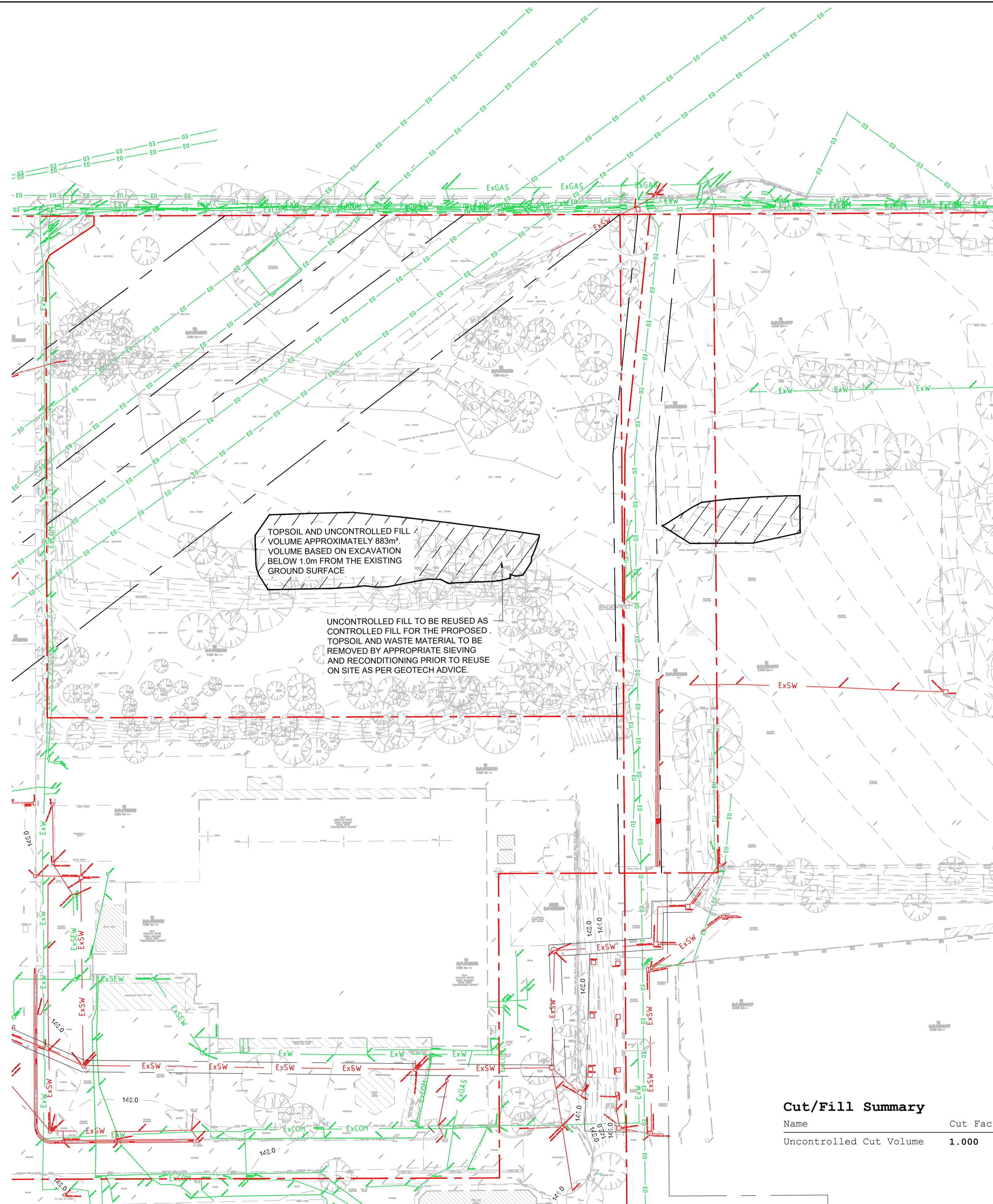
Telephone (02) 8904 1444
Facsimile (02) 8904 1555
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project	THE FOREST HIGH SCHOOL
---------	------------------------

drawing title	ONSITE DETENTION TANK SECTION SHEET 3
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status				FOR INFORMATION ONLY			
scale at A1	drawn by	checked	date				
1:50	PAD	PAL	NOV-21				
project no.	drawing no.	rev.					
6310	CV-0412	D					



Cut/Fill Summary

Name	Cut Factor	Fill Factor	2d Area	Cut	Fill	Net
Uncontrolled Cut Volume	1.000	0.000	4218.439sq.m	1135.994 Cu. M.	0.000 Cu. M.	1135.994 Cu. M.<Cut>

rev	date	description	dm	ch/k
F	15/09/22	REISSUE FOR 100% SD	MZV	PAL
E	12/08/22	REISSUE FOR 100% SD	BEJ	PAL
D	25/02/22	FOR REVIEW	PAD	PAL
C	9/12/21	CONTAMINATION AREA UPDATED	PAD	PAL
B	24/11/21	ISSUE FOR 100% SD	PAD	PAL
A	18/11/21	DRAFT 100% SD	PAD	PAL

rev	date	description	dm	ch/k



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project
THE FOREST HIGH SCHOOL

drawing title
CONTAMINATION PLAN

status			
FOR INFORMATION ONLY			
scale at A1 1:500	drawn by BEJ	checked PAL	date NOV-21
project no. 6310	drawing no. CV-0600	rev. F	

APPENDIX D

NORTHERN BEACHES COUNCIL FLOODING CORRESPONDENCE

Flood Information Report for 187 Allambie Rd and Aquatic Drive Allambie Heights



Patrick Stuart <Patrick.Stuart@northernbeaches.nsw.gov.au>

To Natalie Killingsworth

Follow up. Start by Tuesday, 8 February 2022. Due by Tuesday, 8 February 2022.

You replied to this message on 9/02/2022 9:50 AM.

Reply Reply All Forward

Mon 7/02/2022 5:21 PM

Hi Natalie,

Thanks for applying for the Flood Information for 187 Allambie Rd and Aquatic Drive, Allambie Heights. Sorry for the delay while I've been looking into it.

Council's flood modelling in Manly Lagoon Catchment isn't suitable to be used for development purposes because the modelling is for mainstream flooding and too coarse for the overland flow flooding in the top of the catchment there. However, I assume the State Government is the client for the project and as funding body for our Flood Model. If so, we can provide our TUFLOW model at no extra charge (it normally has a \$3630 fee), to be used as a starting point to accessing the flood risk there and modelling any changes to flooding caused by the development.

If you can fill in the first 2 pages of the below form, then I can send link to a OneDrive folder with the model.

<https://files.northernbeaches.nsw.gov.au/sites/default/files/documents/pdf-forms/flood-model-provision-application/4094-flood-model-provision-application-jun21.pdf>

Regards,

Patrick.

Patrick Stuart

Senior Floodplain Management Officer

Stormwater, Floodplain Engineering

t 02 8495 6649 m 0435 966 850

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Northern Beaches Council

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