

Civil Engineering Review of Environmental Factors

Oxford Falls Grammar School - Library

Prepared for Oxford Falls Grammar School / 21 July 2022

191571 CAAA

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Rev	Date	Prepared By	Approved By	Remarks
1	08/07/2022	ML	GC	For Issue
1.1	19/07/2022	ML	GC	For Issue
1.2	21/07/2022	ML	GC	For Issue

1.0 Introduction

1.1 Development Site

Oxford Fall Grammar School is located within the bounds of Northern Beaches Council in Oxford Falls at Deposited Plan 1240806 Lot 100. The development site covered under this Review of Environmental Factors (REF) is located in the southern portion of the School (refer to Figure 1.1). A first order stream flows through the school in a north-west direction.



Figure 1.1: Site Location

1.2 Reference Documents

This report has been prepared with reference to the following documents:

- Northern Beaches Council's On-Site Stormwater Detention Technical Specification
- Northern Beaches Council's WSUD and MUSIC Modelling Guidelines
- Warringah Council's Development Control Plan
- Australian Rainfall and Runoff 2016
- Relevant Australian Standards include AS3500.3
- TTW's Civil Engineering REF, Oxford Falls Grammar School – Carpark package dated 11/03/2021

2.0 Proposed Works

The proposed development includes the implementation of a first-floor library addition. The scope of works are to be confined to the interior of this building and therefore no alterations to the external design of that package are proposed. Details of this previous REF package produced by TTW are provided in the Oxford Falls Grammar School – Carpark Civil Engineering report dated 11/03/2021.

Implementation of the library addition will be provided on the first level of site. The proposed layout of these rooms is provided in **Figure 2.1** below. Works proposed as part of the previous REF package incorporating stormwater quality and stormwater quantity design measures including OSD are expected to be installed prior to the commencement of works outlined within this report.

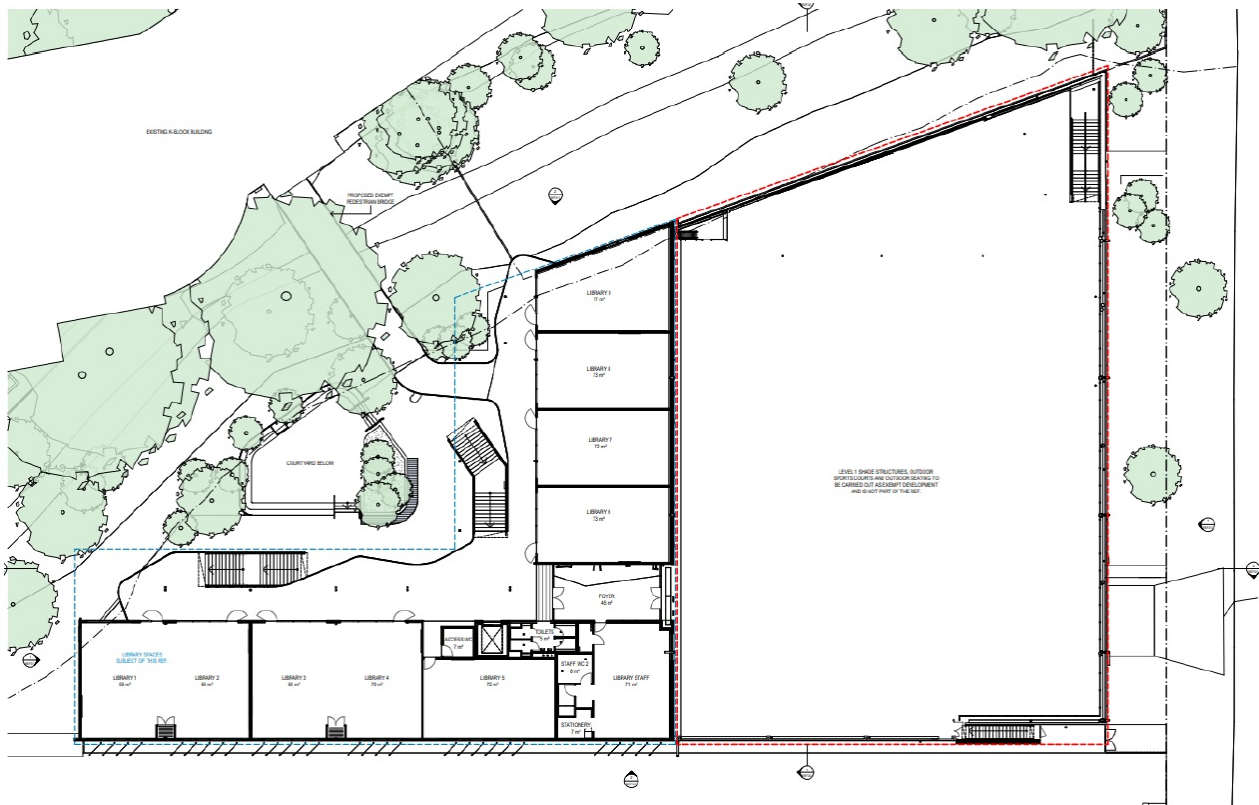


Figure 2.1: Proposed Level 1 Floor Plan
Source: Ground Floor Plan prepared by AJC

2.1 Stormwater Quantity

The scope of works outlined within this REF package are to be confined to the implementation of a first-floor library addition. It can therefore be concluded that no change to impervious area will result as part of the proposed development. Onsite Stormwater Detention (OSD) and discharge of site requirements are covered within the Oxford Falls Grammar School – Carpark REF package previously produced by TTW and will be summarised in Section 0 to confirm that discharge requirements are satisfied by the design of site.

No additional stormwater quantity design measures are therefore proposed as part of the works outlined within this report.

2.1.1 Stormwater Quantity Approved as Part of Previous REF Package

The Northern Beaches Council On-Site Stormwater Detention (OSD) Technical Specification details requirements for stormwater outflows from proposed development sites. The specification requires the post-development permissible site discharge (PSD) to be equal to pre-development runoff for the 5-year, 20-year and 100-year ARI storm event.

Although the site is flood affected, the specification states that “OSD will not be required where the site of the development is located within a Council established 1 in 100 year ARI flood plain, and that it can be demonstrated that lesser storm events will also flood the site. Otherwise it will be necessary to provide OSD to control the runoff for the minor storm events.” While the development is partially located within the 1 in 100 year ARI flood plain, the site is not affected during the 5 year and 20 year storm events, therefore OSD has been provided to meet the PSD for lesser storms in accordance with Council’s policy.

The pre- and post-development flow from the site was modelled in DRAINS software to determine the required OSD and plate orifice size using the methodology of Australian Rainfall and Runoff 2016. It was calculated that a volume of 40m³ with an orifice size of 237mm would be required to detain the post-development flows to the pre-development flows. The DRAINS schematic and modelling results are detailed in Figure 2.2 and

Table 2.1 respectively.

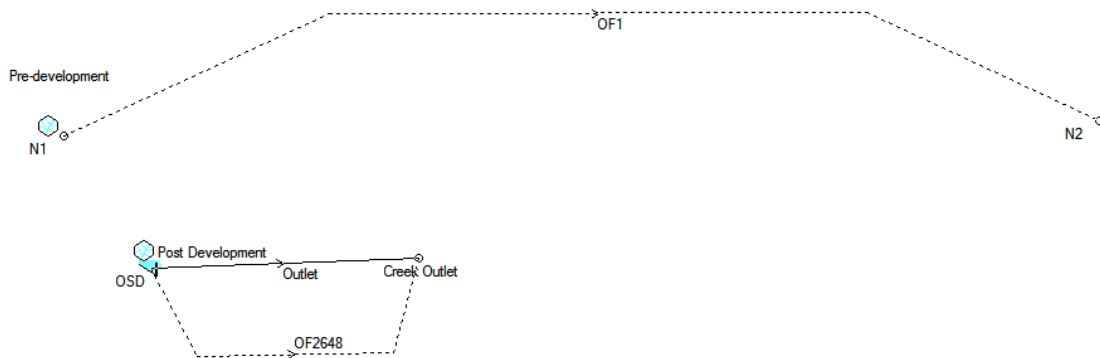


Figure 2.2: DRAINS Modelling Schematic

Table 2.1: DRAINS Modelling Results

	Pre-Development Flows	Post-Development Flows	Post-Development Flows with OSD
5 Year ARI	80 L/s	146 L/s	73 L/s
20 Year ARI	143 L/s	198 L/s	129 L/s

2.2 Stormwater Quality

The scope of works outlined within this REF package are to be confined to the implementation of a first-floor library addition. It can therefore be concluded that no change to impervious area will result as part of the proposed development. Water Sensitive Urban Design (WSUD) parameters including the pollutant load reduction targets required for the site are covered within the Oxford Falls Grammar School – Carpark REF package previously produced by TTW and will be summarised in Section 2.2.1 to confirm that discharge requirements are satisfied by the design of site.

No additional stormwater quality design measures are therefore proposed as part of the works outlined within this report.

2.2.1 Stormwater Quality Approved as Part of Previous REF Package

Northern Beaches Council’s WSUD and MUSIC Modelling Guidelines stipulate stormwater quality targets as shown in Table 2.2. The post-development carpark site was modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) with model inputs in accordance with Council’s guidelines to determine the required stormwater treatment to meet quality requirements.

The proposed stormwater quality treatment train includes a 250kL Rainwater Tank (to provide irrigation to the sportsfield) and OceanProtect’s OceanGuard and Stormfilter cartridges.

The MUSIC model schematic and results are summarised in Figure 2.3 and Figure 2.4 respectively.

Table 2.2: Water Quality Requirements

Pollutant	Performance Requirements
Total Phosphorus	65% reduction in the post development mean annual load
Total Nitrogen	45% reduction in the post development mean annual load
Total Suspended Solids	85% reduction in the post development mean annual load
Gross Pollutants	90% reduction in the post development mean annual load
pH	6.5 – 8.5
Hydrology	The post-development peak discharge must not exceed the pre-development peak discharge for flows up to the 2-year ARI

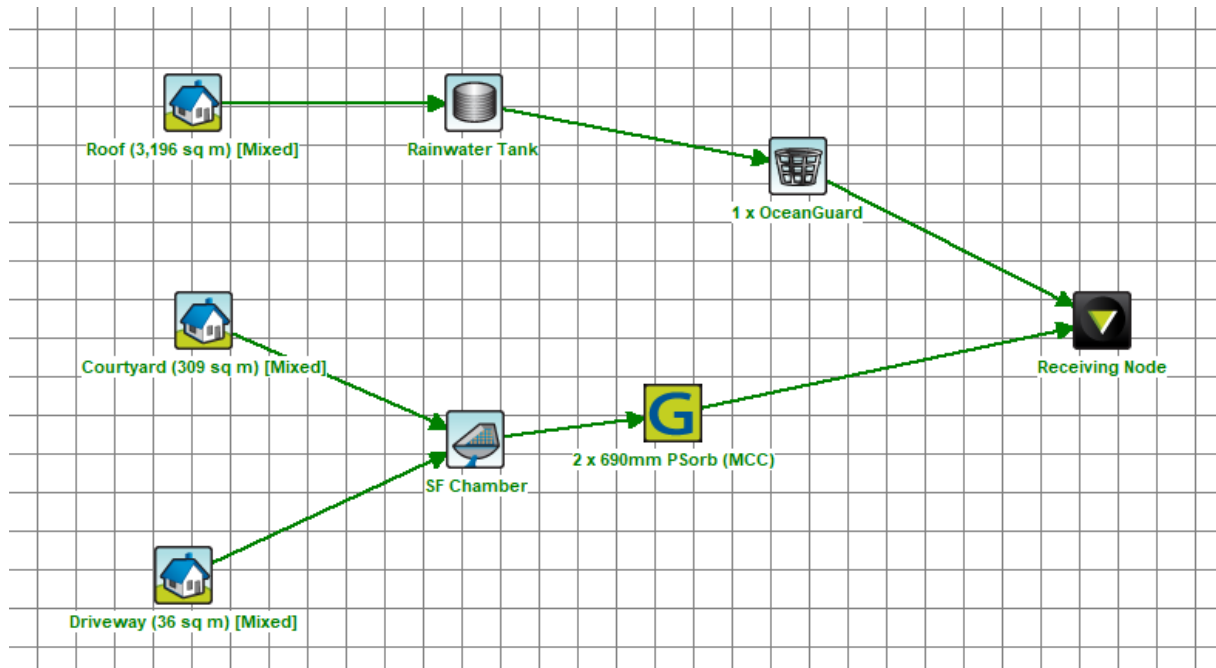


Figure 2.3: MUSIC Modelling Schematic

	Sources	Residual Load	% Reduction
Flow (ML/yr)	4.17	1.99	52.3
Total Suspended Solids (kg/yr)	166	21.5	87.1
Total Phosphorus (kg/yr)	0.69	0.189	72.6
Total Nitrogen (kg/yr)	9.21	2.92	68.2
Gross Pollutants (kg/yr)	108	0	100

Figure 2.4: MUSIC Modelling Results

2.3 Riparian Zone

There is a Riparian Zone located to the east of the proposed development. As the extent of works is confined to the first level of the previously approved building, it is not expected that design of site is to be influenced by proximity to the Riparian Zone.

3.0 Summary

Key aspects of the proposed civil engineering for the Oxford Falls Library Project include:

- Extent of works to be confined to the fitout of nine Library rooms and associated facilities within the first level of a proposed building approved as part of a separate REF package.
- No additional WSUD measures including stormwater quantity or stormwater quality design are required as part of proposed works, and
- The works will extend within the neighbouring riparian zone.

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GRACE CARPP
Associate

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Appendix A

Concept Civil Engineering Drawings

OXFORD FALLS GRAMMAR SCHOOL CARPARK CONCEPT CIVIL WORKS

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 5.1.3. 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 of work.
- 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 barriers 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
A+C	GROUND LEVEL PLAN	REF201	3	02.03.21
Pyggle Surveyors	OXFORD GRAMMAR SCHOOL	73016	E	20.06.17
EP	General Arrangement	3344-1D-3	3	March 2021
	Masterplan	CA_MP		

SURVEY AND SERVICES INFORMATION

SURVEY
 Origin of levels : PM 33511
 Datum of levels : AHD AUSTRALIAN HEIGHT DATUM
 Coordinate system : MGA
 Survey prepared by : PTGITE
 Survey 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 Whitting 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 applied 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), colonial 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.

BOUNDARY AND EASEMENT NOTE

The property boundary and easement locations shown on Taylor Thomson Whitting drawings have been based from information received from the boundary information provided.

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.

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 demobilise 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 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 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 barriers adequately supported to approval of Geotechnical Engineer.

GROUND CONDITIONS

Contractor to be aware of the site geotechnical conditions. Refer to geotechnical report by JK Geotechnics Ref:300751rpt 23.04.2017 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 of hazardous materials. Refer to geotechnical/environmental report by JK Geotechnics Ref:300751rpt 23.04.2017 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 apply and comply with traffic management plan and provide adequate site traffic control including a certified traffic marshal to supervise vehicle movements where necessary.

RETAINING WALLS

- Drainage shall be provided as shown on the drainage drawings.
- Backfilling shall be carried out after grout or concrete has reached a minimum strength of 0.85 f_{ck}. Backfilling shall be approved granular material compacted in layers not exceeding 200mm to 98% Standard compaction unless noted otherwise.
- Provide waterprooing to back of walls as specified or noted.
- Where retaining walls rely on connecting structural elements for stability, do not backfill against the wall unless it is adequately propped or the elements have been constructed and have sufficient strength to withstand the loads.
- For all temporary barriers obtain geotechnical engineers recommendations.

SITWORKS NOTES

- All basecourse material to comply with RMS specification No. 3051 and compacted to minimum 98% modified standard dry density in accordance with AS 1289 5.1.1.
- All trench backfill material shall be compacted to the same density as the adjacent material.
- All service trenches under vehicular pavements shall be backfilled with an approved select material and compacted to a minimum 98% standard maximum dry density in accordance with AS 1289 5.1.1

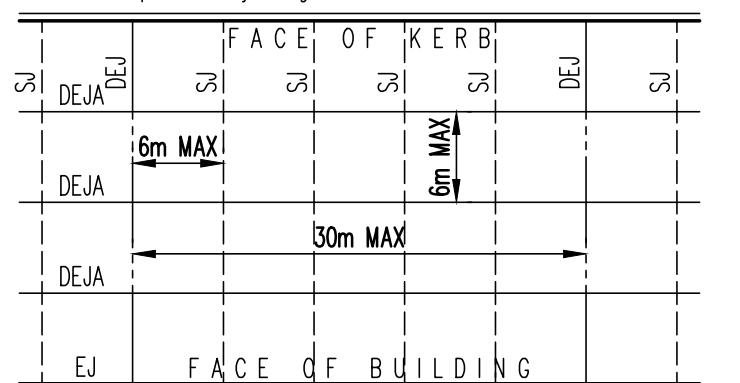
STORMWATER DRAINAGE NOTES

- Stormwater Design Criteria
- Average exceedance probability = 1% AEP for roof drainage to first external pit. 5% AEP for paved and landscaped areas.
 - Rainfall Intensity = 1% AEP = mm/hr. 5% AEP = mm/hr.
 - Rainfall losses = Impervious areas: L = 1.5 mm, CL = 0 mm/hr. Pervious areas: L = mm, CL = mm/hr.

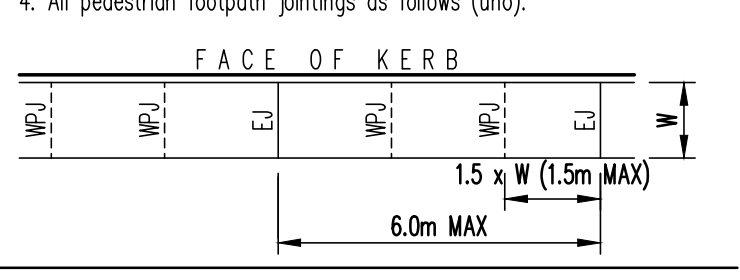
- Pipes 300 dia and larger to be reinforced concrete Class *2* approved spigot and socket with rubber ring joints U.N.O.
- Pipes up to 300 dia may be sewer grade uPVC with solvent welded joints, subject to approval by the engineer.
- Equivalent strength VCP or FRP pipes may be used subject to approval.
- Precast pits may be used external to the building subject to approval by Engineer.
- Enlargers, connections and junctions to be manufactured in situ where pipes are less than 300 dia.
- Where subsoil strata pass under floor slabs and vehicular pavements, uncoated uPVC sewer grade pipes is to be used. Grades 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 1/2 U.N.O.
- Core 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% min fall U.N.O.
- Subsoil drains to be detailed flexible uPVC U.N.O.
- Adopt invert levels for pipe installation (grades shown are only nominal).

JOINTING NOTES

- Vehicular Pavement Jointing
- All vehicular pavements to be jointed as shown on drawings.
 - Keyst construction joints should generally be located at a maximum of 6m centres.
 - Saw joints should generally be located at a maximum of 6m centres or 1.5 x the spacing of keyed joints, where key joint spacing is less than 4m, with dowelled expansion joints at maximum of 20m centres.
 - Provide 10mm wide full depth expansion joints between buildings and all concrete or unit pavers.
 - The timing of the saw cut is to be confirmed by the contractor on site. Site conditions will determine how many hours after the concrete pour before the saw cuts are commenced. Refer to the specification for weather conditions and temperatures required.
 - Vehicular pavement jointing as follows.



- Pedestrian Footpath Jointing
- Expansion joints are to be located where possible at tangent points of curves and elsewhere at max 6.0m centres.
 - Weakened plane joints are to be located at a max 1.5 x width of the pavement.
 - Where possible joints should be located to match kerbing and / or adjacent pavement joints.
 - All pedestrian footpath jointings as follows (ano).



KERBING NOTES

- Includes all kerbs, gutters, dish drains, crossings and edges.
- All kerbs, gutters, dish drains and crossings to be constructed on minimum 75mm granular basecourse compacted to minimum 98% modified maximum dry density in accordance with AS 1289 5.1.1.
 - Expansion joints (EJ) to be formed from 10mm compressible cork filler board for the full depth of the section and out to profile. Expansion joints to be located at drainage pits, on tangent points of curves and elsewhere at 12m centres except for integral kerbs where the expansion joints are to match the joint locations in slabs.
 - Weakened plane joints to be min. 50mm wide and located at 2m centres except for integral kerbs where weakened plane joints are to match the joint locations in slabs.
 - Broomed finished to all compacted and vehicular crossings, all other kerbing or dish drains to be steel float finished.
 - In the replacement of kerbs - Existing road pavement is to be sawcut 900mm from lip of gutter. Upon completion of new kerbs, new basecourse and surface is to be laid 900mm wide to match existing materials and thicknesses. Existing allotment drainage pipes are to be built into the new kerb with a 100mm dia hole. Existing kerbs are to be completely removed where new kerbs are shown.

SURVEY LEGEND

- +10.10 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
- Gully
- Grate
- Sewer Manhole
- Electricity
- Electric Light Pole
- Traffic Light
- Traffic Light Lid
- Traffic Light Bar
- Telephone Box
- Parking Meter
- Permanent Mark
- BM 51.10
- BH 0
- TP No

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

CONCRETE FINISHING NOTES

- All exposed concrete pavements are to be broomed finished.
- All edges of the concrete pavement including keyed and dowelled joints are to be finished with an edging tool.
- Concrete pavements with grades greater than 10 % shall be heavily broomed finished.
- Carburendum to be added to all stair treads and ramped crossings U.N.O.



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

DRAWING SCHEDULE

Drawing No.	Drawing Title
C200	NOTES AND LEGENDS SHEET
C201	CONCEPT EROSION & SEDIMENT CONTROL PLAN AND DETAILS
C210	CONCEPT BULK EARTHWORKS CUT AND FILL PLAN
C220	CONCEPT SITWORKS & STORMWATER MANAGEMENT PLAN
C230	CONCEPT DETAILS SHEET 1
C231	CONCEPT DETAILS SHEET 2

Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
P5	FOR APPROVAL	OC	SH	12.03.21					
P4	PRELIMINARY	OC	SH	23.02.21					
P3	FOR APPROVAL	OC	JH	16.03.20					
P2	FOR APPROVAL	OC	DW	12.03.20					
P1	FOR APPROVAL	OC	DW	26.12.19					

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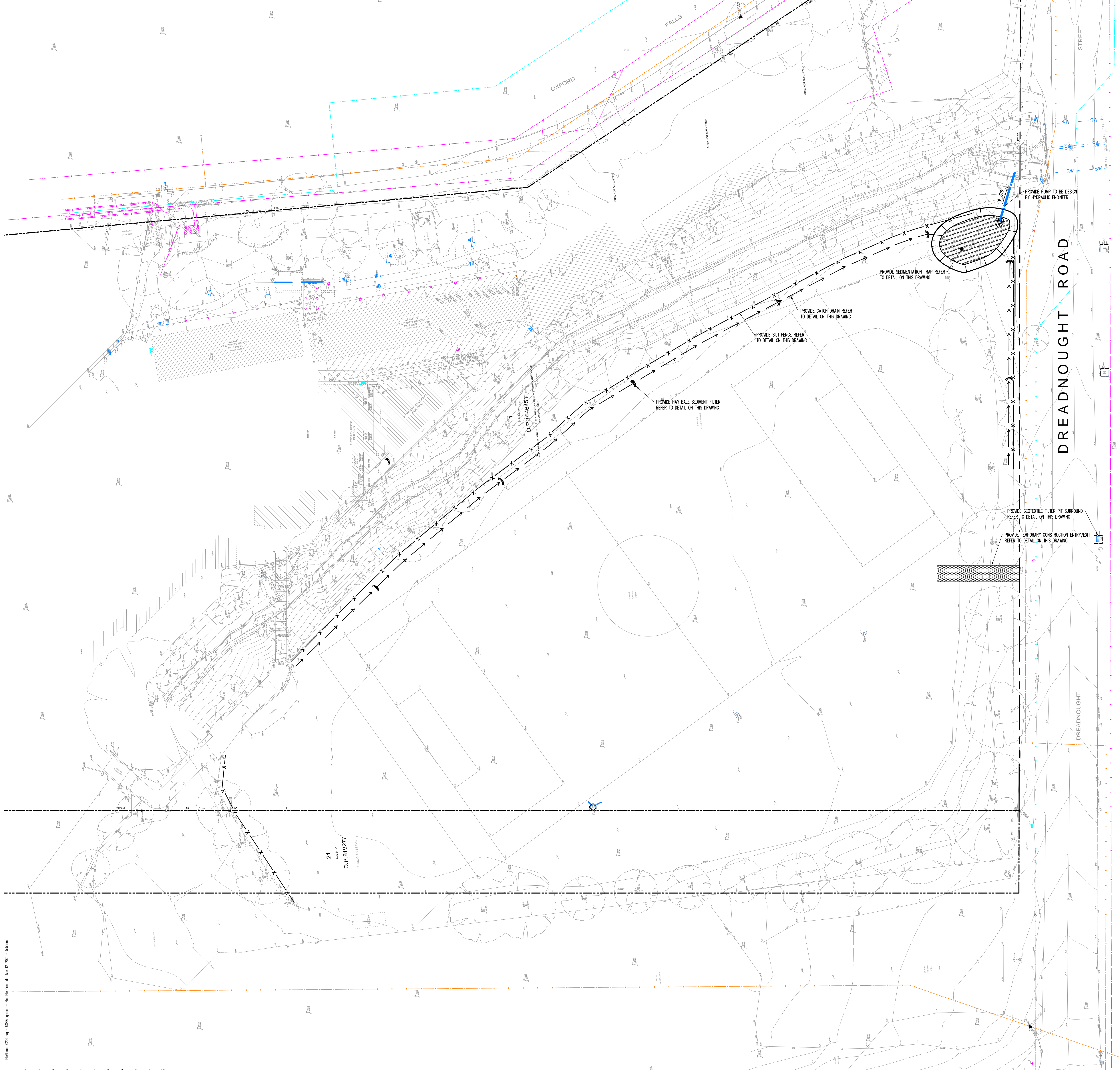
Engineer
TTW Structural
 Civil Traffic
 Façade
 612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Project
OXFORD FALLS GRAMMAR SCHOOL - CARPARK

Sheet Subject
NOTES AND LEGENDS SHEET

Scale: AS Drawn: Authorised
 NOT TO SCALE DM
 Job No: 191571 Drawing No: C200 Revision: P5
 Plot File Created: Mar 12, 2021 - 5:53pm

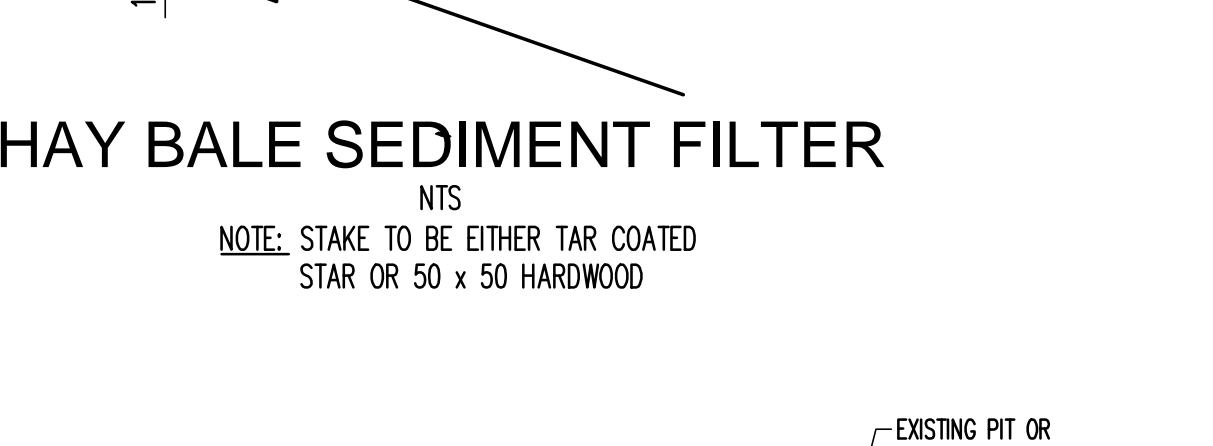
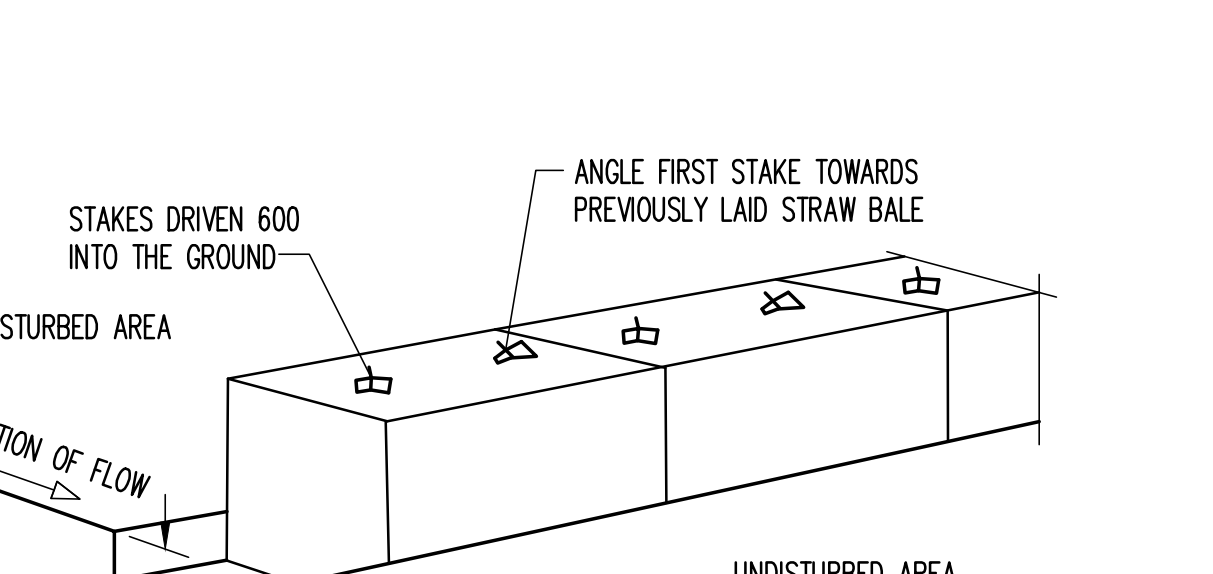
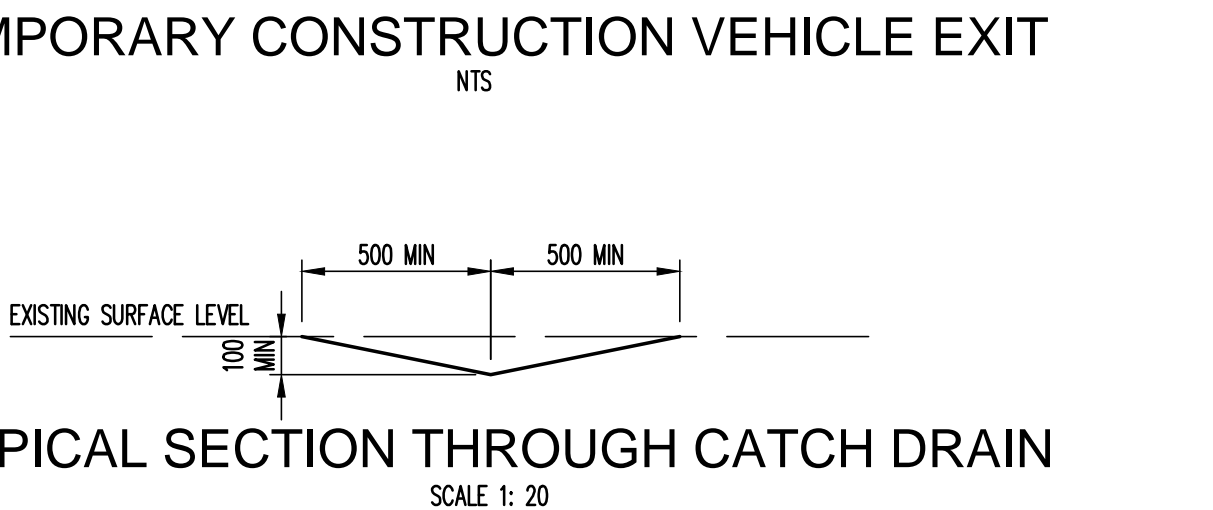
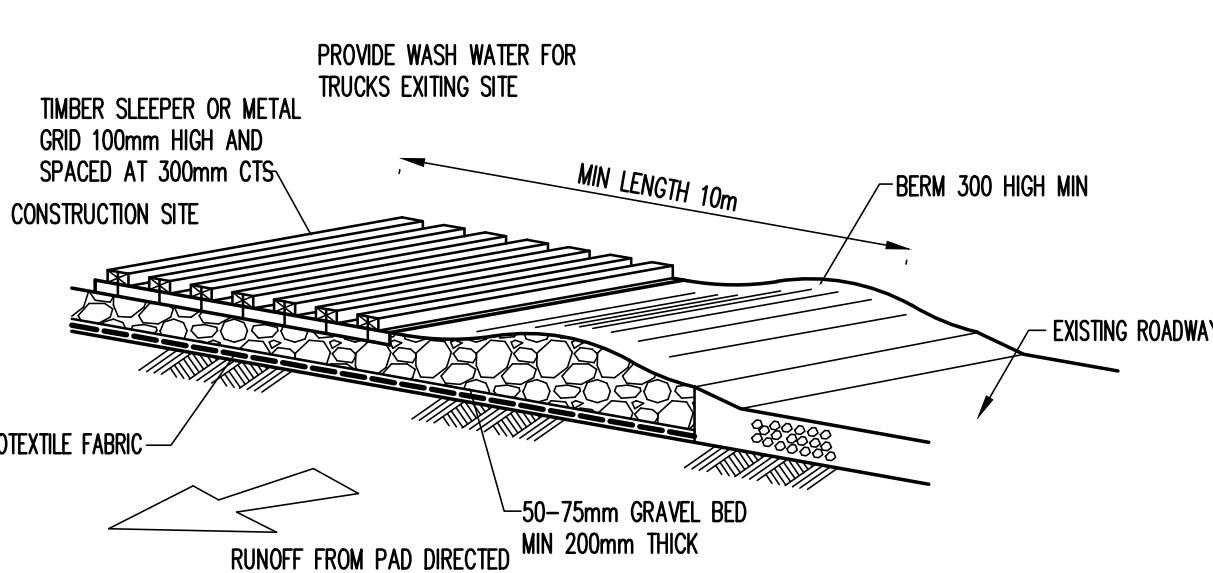
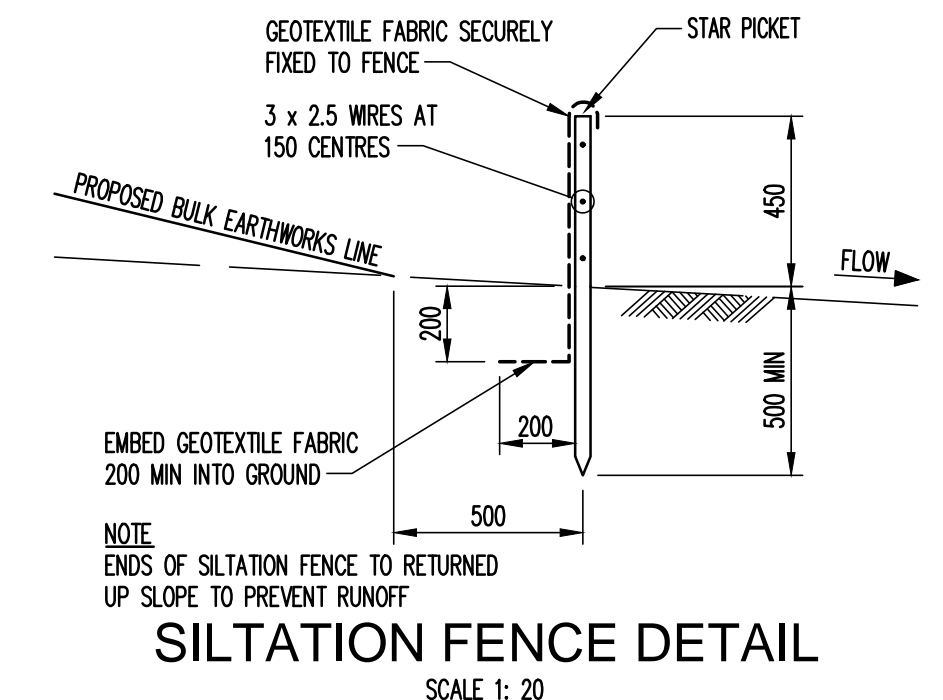
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EROSION AND SEDIMENT CONTROL NOTES

- 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).
 - Erosion and sediment control drawings and notes are provided for the whole of the works. Should the Contractor stage these works when the design may be required to be modified, variation to these details may require approval by the relevant authorities. The erosion and sediment control shall be implemented and adapted to meet the varying situations as work on site progresses.
 - Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
 - When stormwater pits are constructed prevent site runoff entering the pits unless silt fences are erected around pits.
 - Minimise the area of site being disturbed at any one time.
 - Protect all stockpiles of materials from scour and erosion. Do not stockpile loose material in roadways, near drainage pits or in watercourses.
 - 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.
 - Control water from upstream of the site such that it does not enter the disturbed site.
 - All construction vehicles shall enter and exit the site via the temporary construction entry/exit.
 - All vehicles leaving the site shall be cleaned and inspected before leaving.
 - Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
 - Clean out erosion and sediment control devices after each storm event.
- Sequence Of Works**
- Prior to commencement of excavation the following soil management devices must be installed.
 - Construct all fences before the site and across all potential runoff sites.
 - Construct temporary construction entry/exit and divert runoff to suitable control systems.
 - Construct measures to divert upstream flows into existing stormwater system.
 - Construct sedimentation traps/basins including outlet control and overflow.
 - Construct turf lined swales.
 - Provide sandbag sediment traps upstream of existing pits.
 - Construct geotextile filter pit surround around all proposed pits as they are constructed.
 - On completion of pavement provide sand bag kerb inlet sediment traps around pits.
 - Provide and maintain a strip of turf on both sides of all roads after the construction of kerbs.



WATER QUALITY TESTING REQUIREMENTS

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 environmental consultant outlining the following:

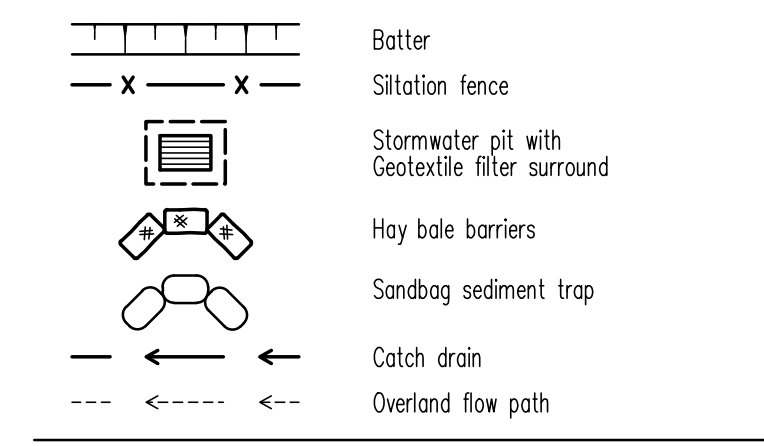
- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000).
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Council's storm water drainage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

EROSION AND SEDIMENT CONTROL PUMP OUT NOTES

Any accumulated water contaminated with sediment, from a sediment basin or excavation pit, is to be flocculated or filtered in order to lower the suspended solid load to less than 50mg per litre. gisium gas or other approved flocculant should be applied within 24 hours of the end of the storm event. The gisium must be spread evenly over the entire water surface. Pumping is not to occur for at least 36 hours and preferably 48 hours after application. Clean water is to be discharged to the water table via a hole ball sediment filter in a way that does not pick up sediment that has dropped to the bottom.

Note: gisium is a hydrated form of calcium sulphate and is available at many swimming pool shops and hardware stores.

EROSION AND SEDIMENT CONTROL LEGEND



Scale: A0
Drawing: JH
Authorised: -

Project: OXFORD FALLS GRAMMAR SCHOOL - CARPARK
Sheet Subject: CONCEPT EROSION & SEDIMENT CONTROL PLAN AND DETAILS

Job No: 191571
Drawing No: C201
Revision: P4

Plot File Created: Mar 12, 2021 5:53pm

Scale: A0
Drawing: JH
Authorised: -

Project: OXFORD FALLS GRAMMAR SCHOOL - CARPARK
Sheet Subject: CONCEPT EROSION & SEDIMENT CONTROL PLAN AND DETAILS

Job No: 191571
Drawing No: C201
Revision: P4

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Reference: C011749 - OES - Issue - Plot File Created: Mar 12, 2021 5:53pm

Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
P4	FOR APPROVAL	GC	SH	12.03.21					
P3	PRELIMINARY	GC	SH	23.02.21					
P2	FOR APPROVAL	GC	JH	12.03.20					
P1	FOR APPROVAL	GC	JH	26.12.19					

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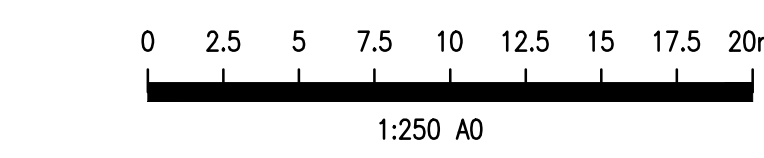
Engineer: **TTW** Structural Civil Traffic Façade
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Scale: A0
Drawing: JH
Authorised: -

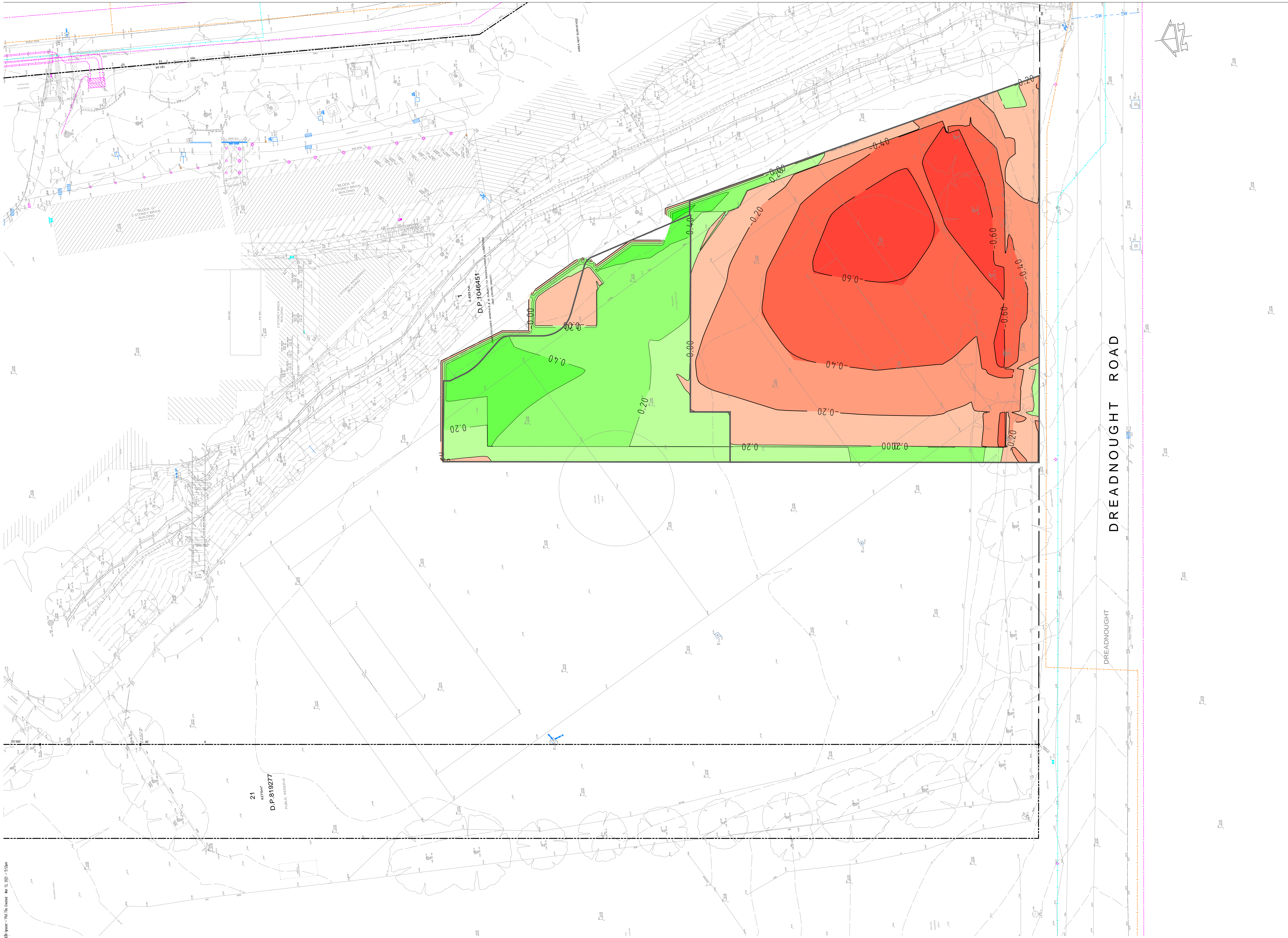
Project: OXFORD FALLS GRAMMAR SCHOOL - CARPARK
Sheet Subject: CONCEPT EROSION & SEDIMENT CONTROL PLAN AND DETAILS

Job No: 191571
Drawing No: C201
Revision: P4

Plot File Created: Mar 12, 2021 5:53pm



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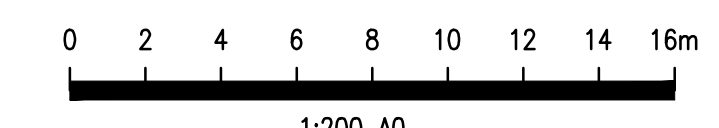
DEPTH OF BULK EARTHWORKS CUT/FILL		Colour
Lower_value	Upper_value	
-99999	-2	Dark Red
-2	-1.8	Red
-1.8	-1.6	Dark Red
-1.6	-1.4	Red
-1.4	-1.2	Dark Red
-1.2	-1	Red
-1	-0.8	Dark Red
-0.8	-0.6	Red
-0.6	-0.4	Dark Red
-0.4	-0.2	Red
-0.2	0.00	Dark Red
0.000	0.2	Light Green
0.2	.4	Green
.4	.6	Light Green
.6	.8	Green
.8	1	Light Green
1	1.2	Green
1.2	1.4	Light Green
1.4	1.6	Green
1.6	1.8	Light Green
1.8	2	Green
2	9999	Dark Green

DREADNOUGHT ROAD

DREADNOUGHT

21
4275m²
D.P. 819277
PUBLIC RESERVE

D.P. 1046451



PRELIMINARY
NOT TO BE USED
FOR CONSTRUCTION

Reference: C:\Users\j\OneDrive - PWT Pty Limited\My Documents - 5.5.2021

Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
P5	FOR APPROVAL	OC	SH	12.03.21					
P4	PRELIMINARY	OC	SH	23.02.21					
P3	FOR APPROVAL	OC	JH	16.03.20					
P2	FOR APPROVAL	OC	DW	12.03.20					
P1	FOR APPROVAL	TM	JK	20.12.19					

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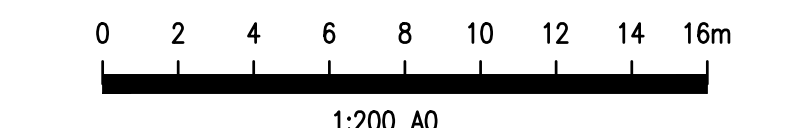
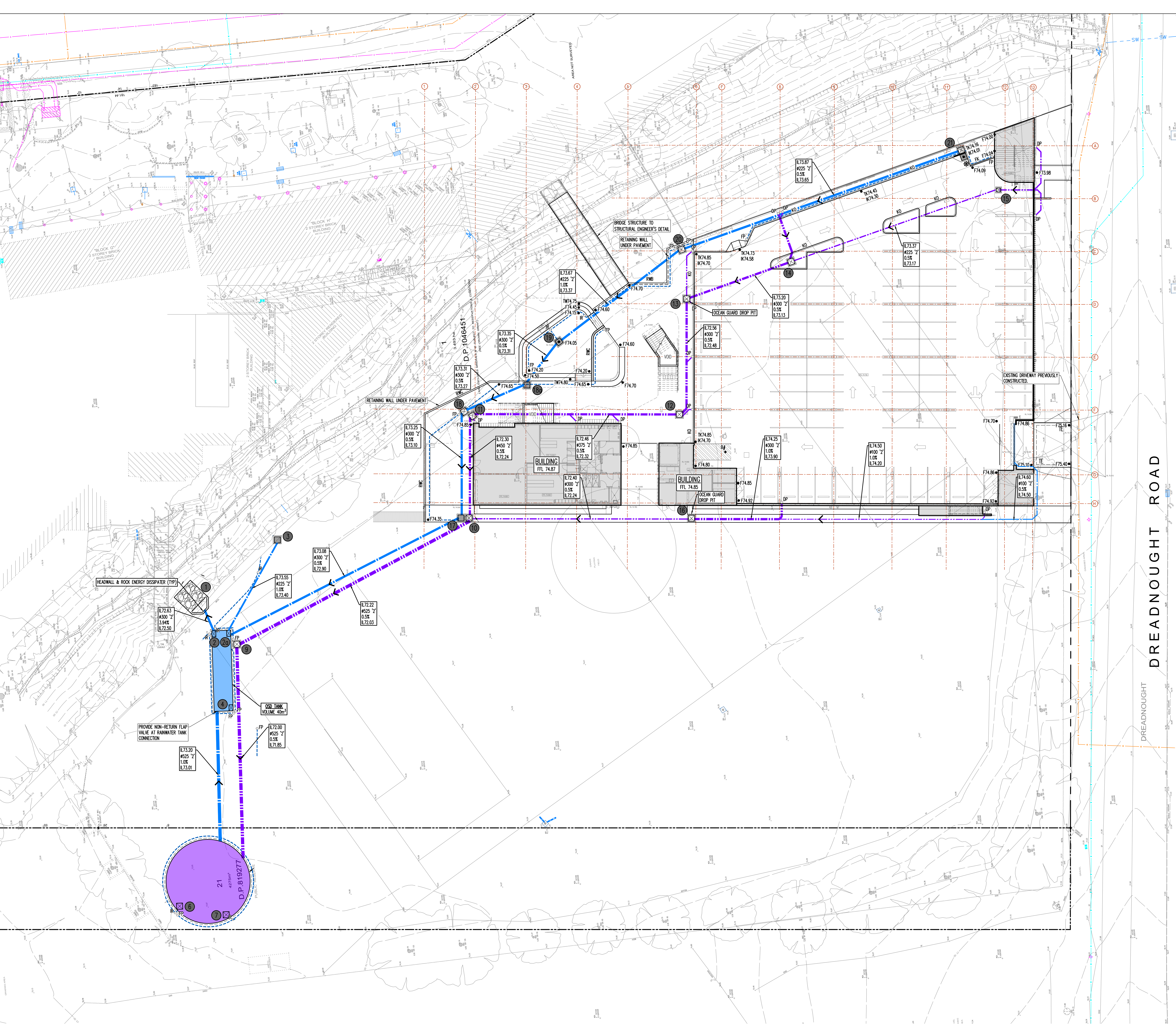
Project
OXFORD FALLS GRAMMAR
SCHOOL - CARPARK

Sheet Status:
CONCEPT BULK EARTHWORKS
CUT AND FILL PLAN

Scale: AO
1:200
Drawn: DM
Authorised: -
Job No: 191571
Drawing No: C210
Revision: P5
Plot File Created: Mar 12, 2021 5:53pm

SITeworks LEGEND

- F22.20 Finished surface level
- F22.00 Finished contour
- K&G Kerb & gutter
- K0 Kerb only
- FK Flush kerb
- DD Dish drain
- Stormwater pit, flow direction and line with invert level upstream, Pipe size and class, Pipe grade, Flow (Litres per second), Invert level downstream
- Grated drain
- Subsoil drainage line (100 dia) - refer detail sheets
- Intermediate riser with subsoil drainage line (100 dia)
- Flushing point with subsoil drainage line (100 dia)
- Down pipe
- Concrete retaining wall
- Taper kerb to zero height over 500mm



**PRELIMINARY
NOT TO BE USED
FOR CONSTRUCTION**

Date	Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
12.03.21										
23.02.21										
16.03.20										
12.03.20										
20.12.19										

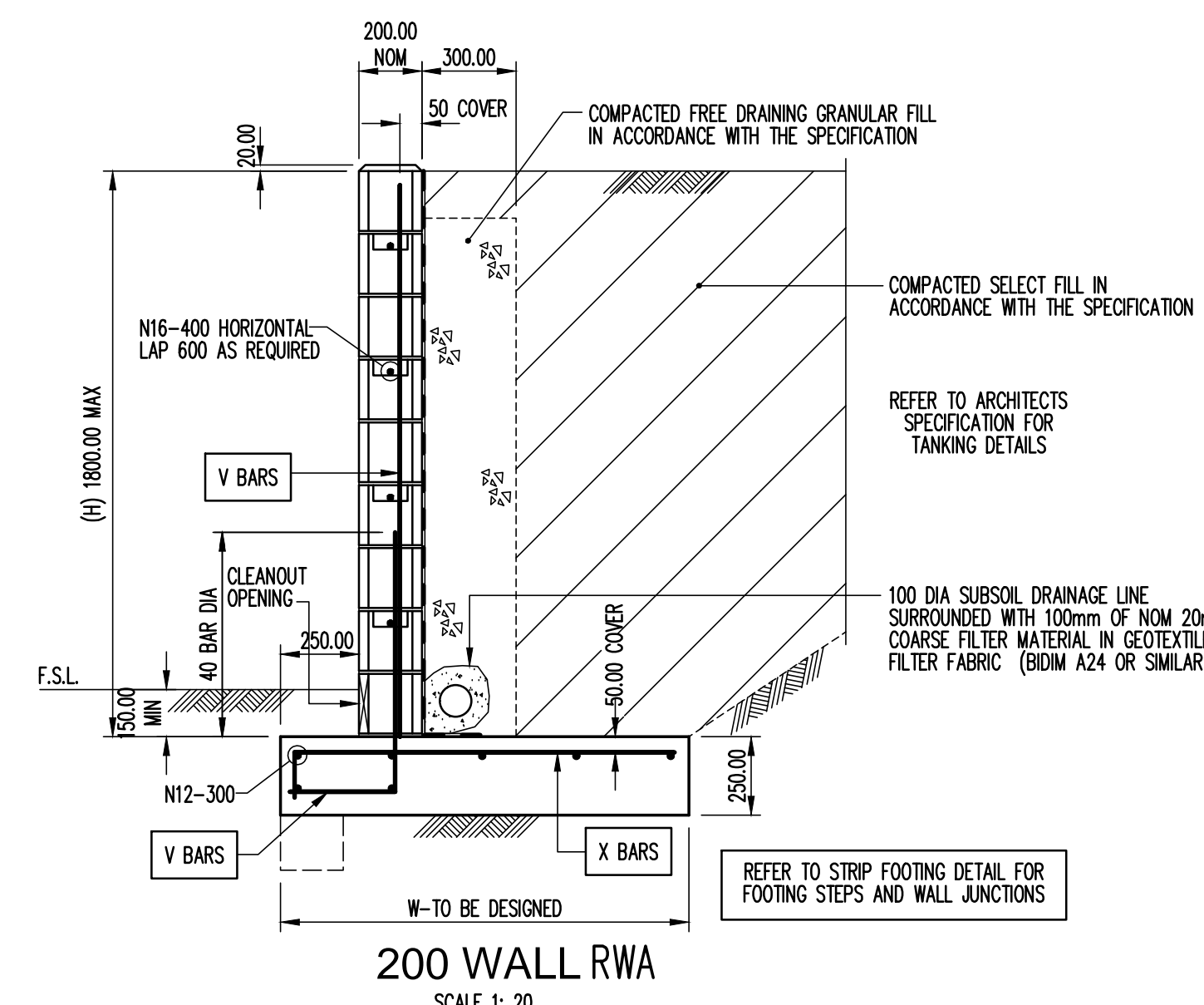
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Project
**OXFORD FALLS GRAMMAR
 SCHOOL - CARPARK**

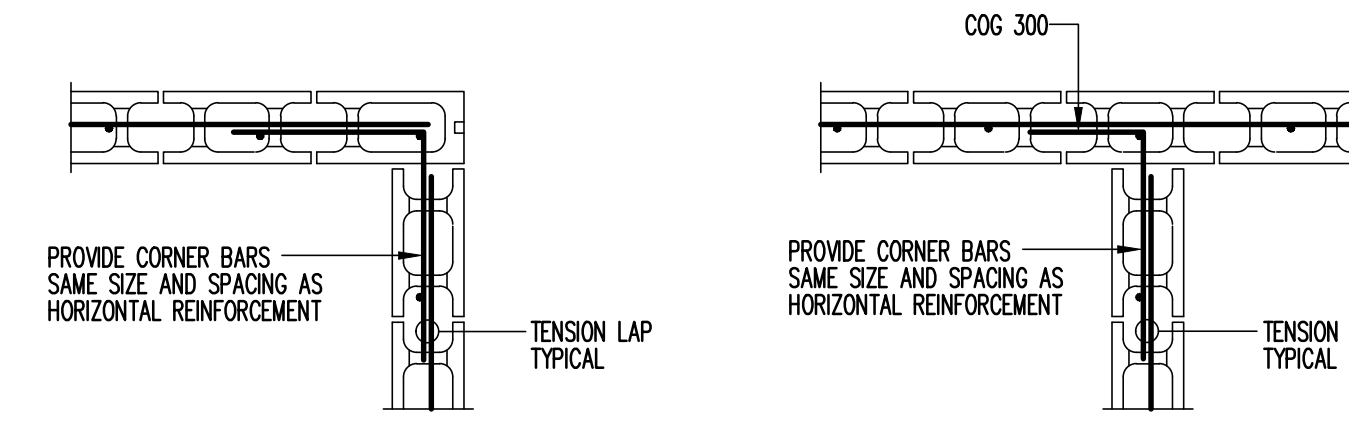
Sheet Subject
**CONCEPT SITeworks &
 STORMWATER MANAGEMENT
 PLAN**

Scale: A0
 1:200
 Drawn: DM
 Authorised: -
 Job No: 191571
 Drawing No: C220
 Revision: P5
 Plot File Created: Mar 12, 2021 - 5:53pm

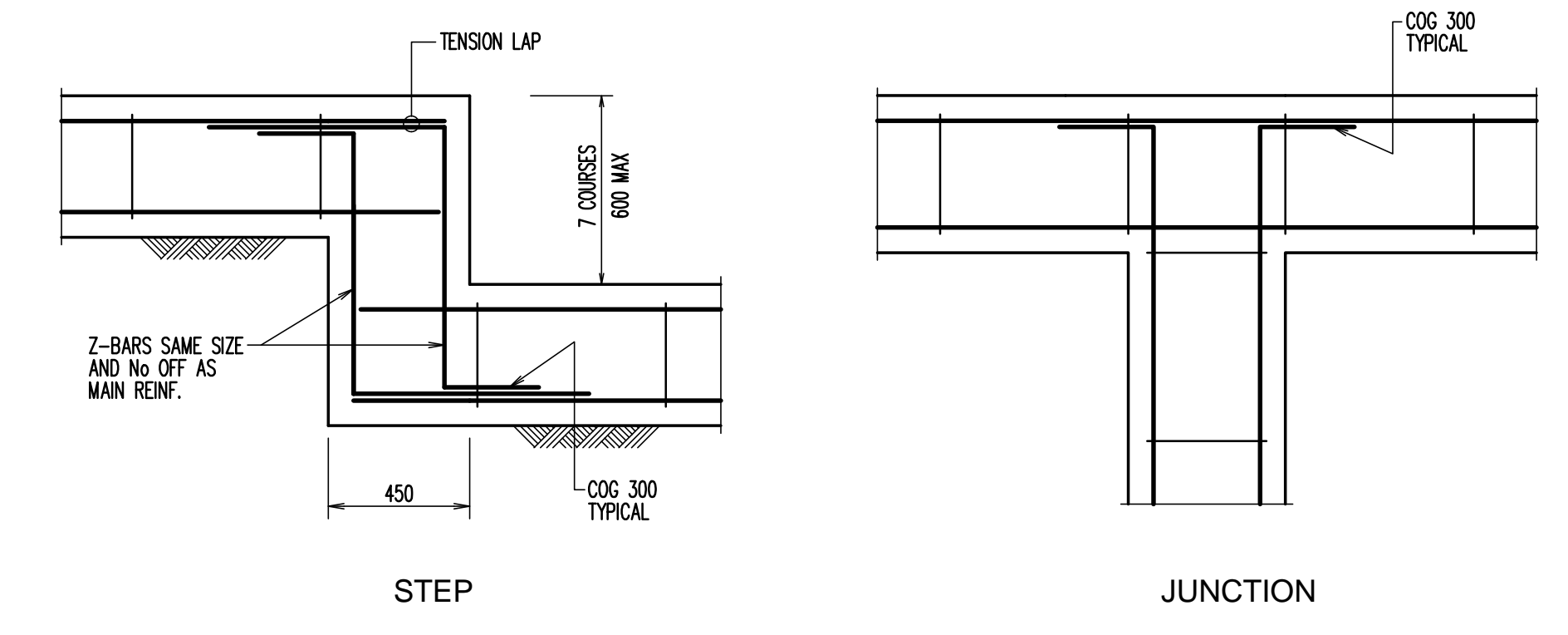


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A	2200	2050	N20-400	N20-400

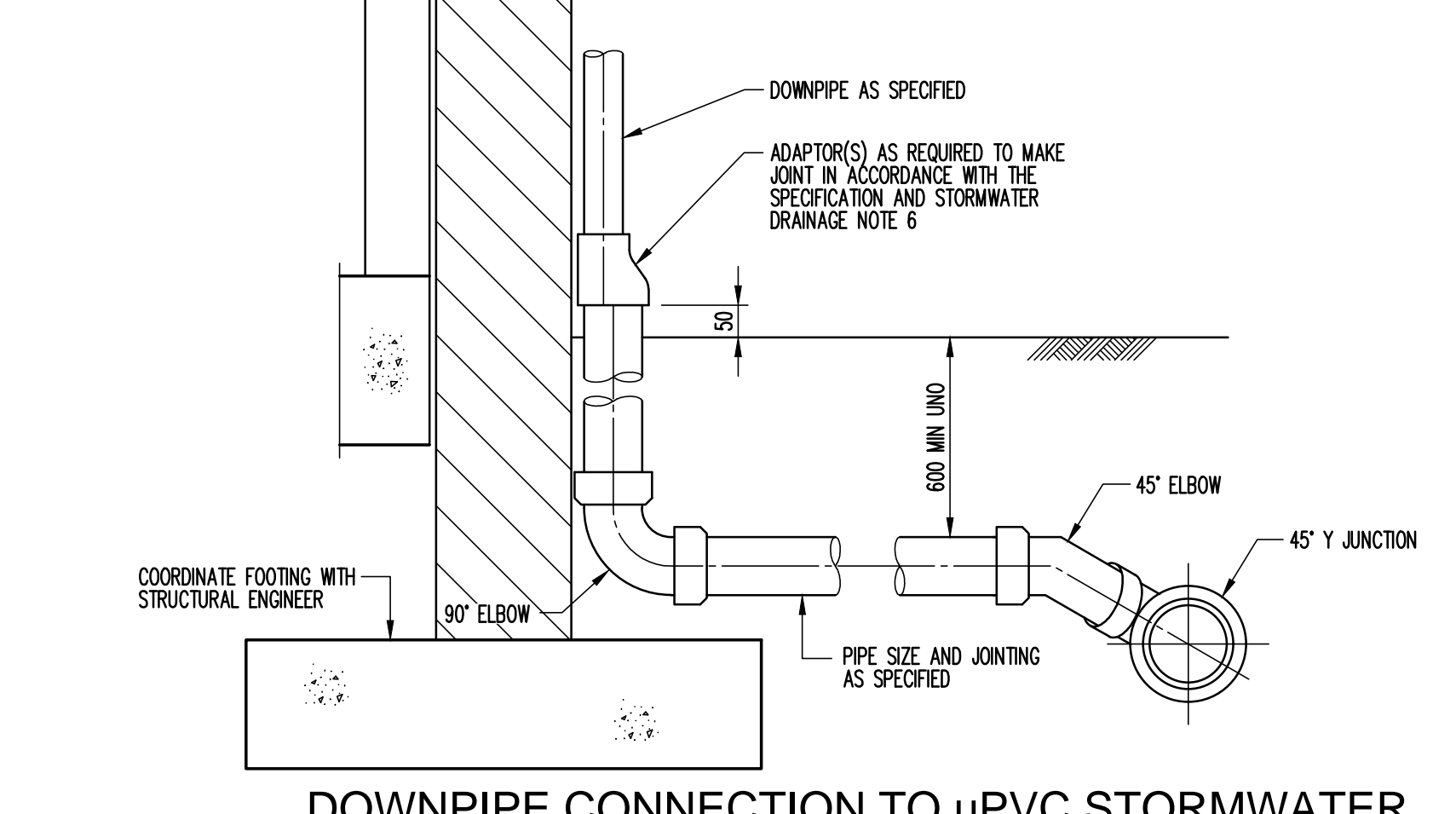
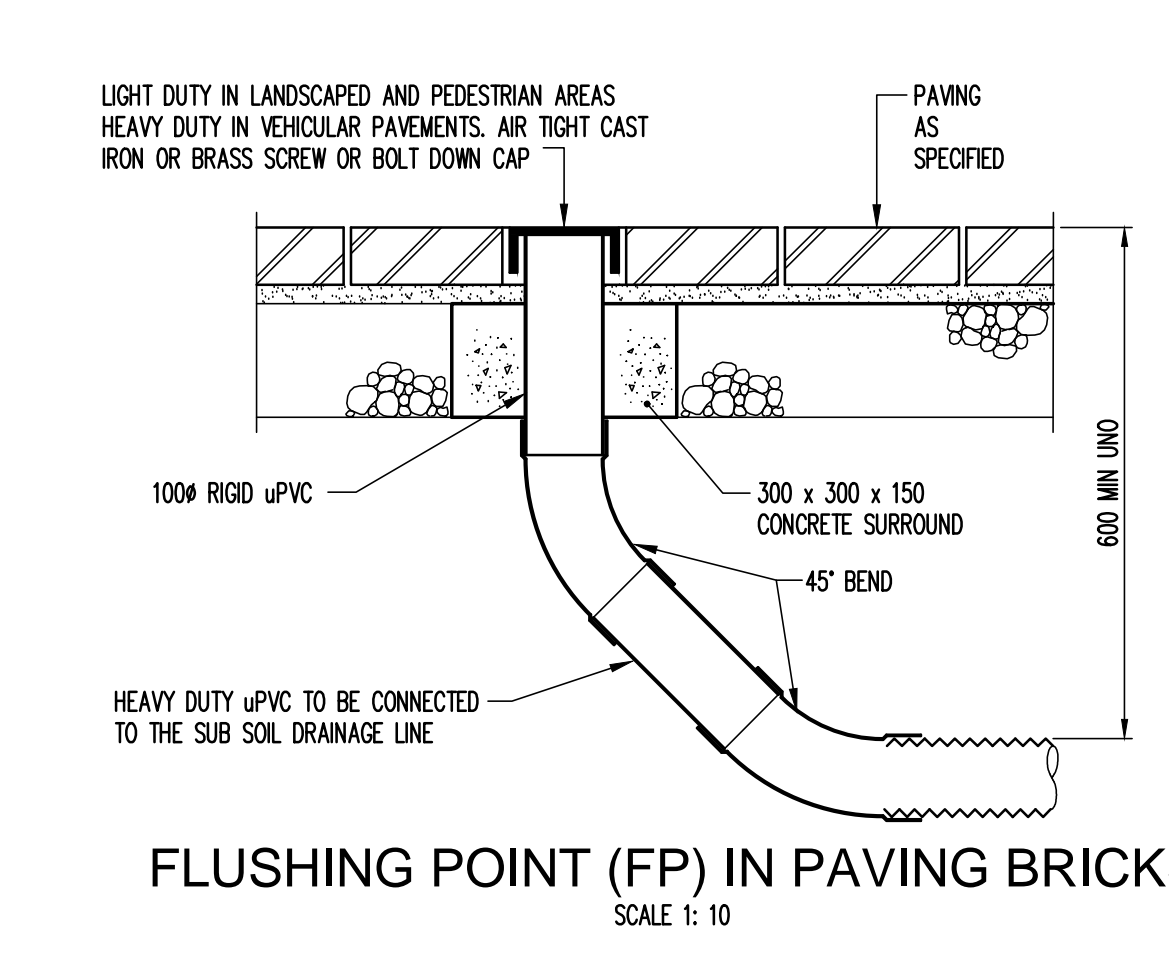
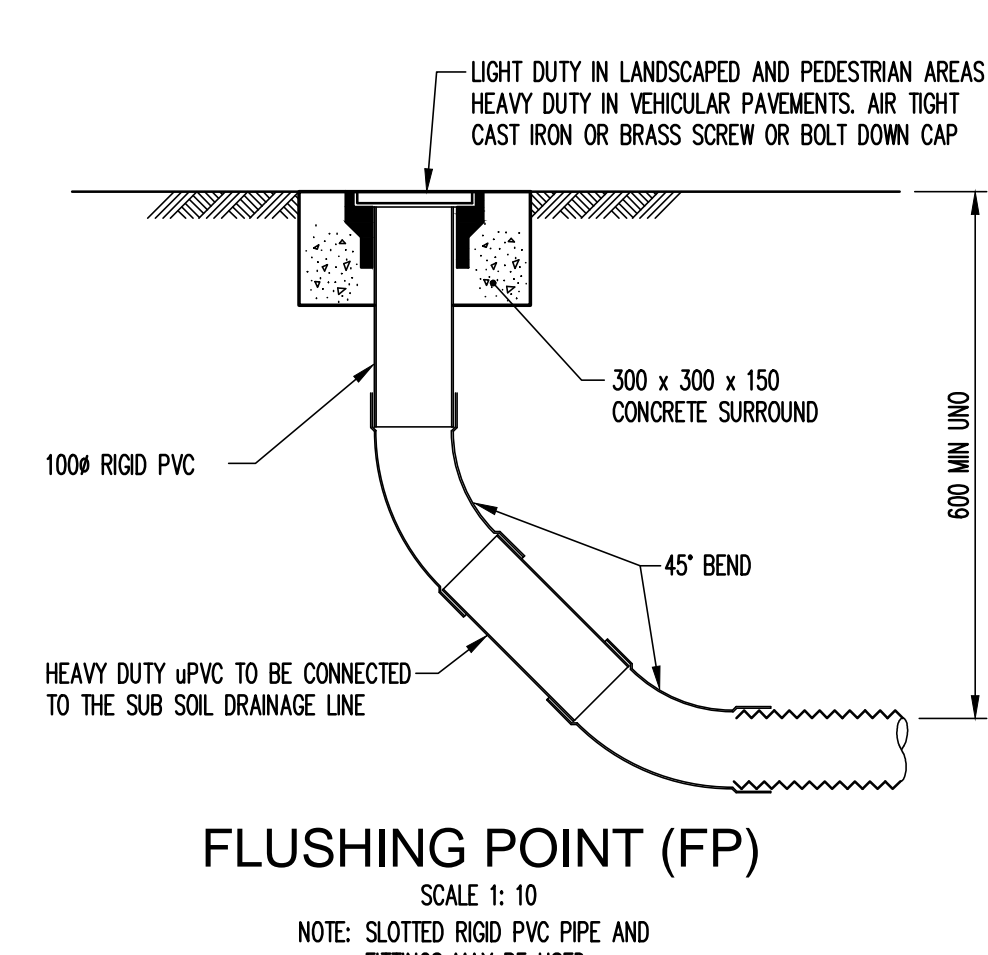
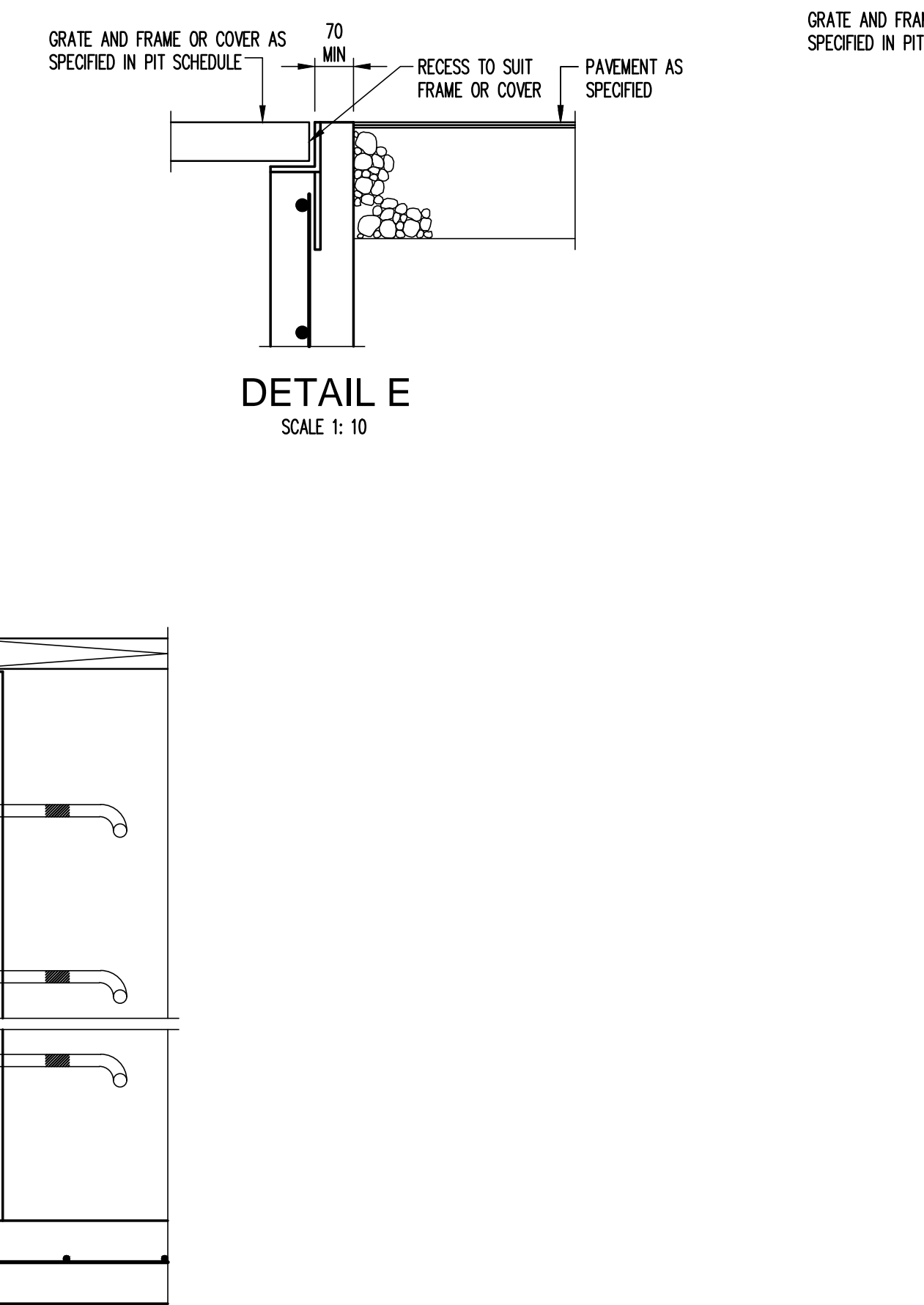
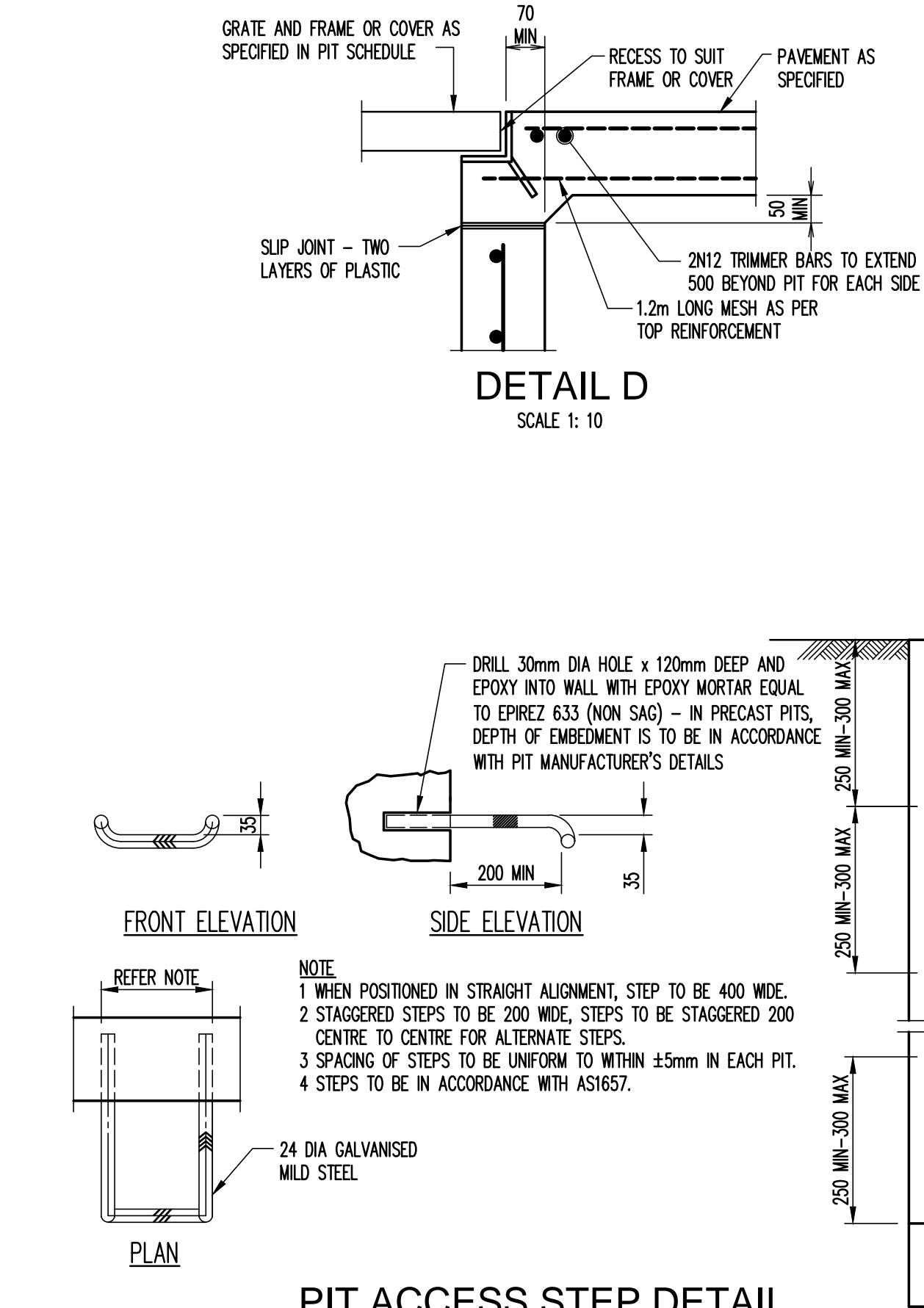
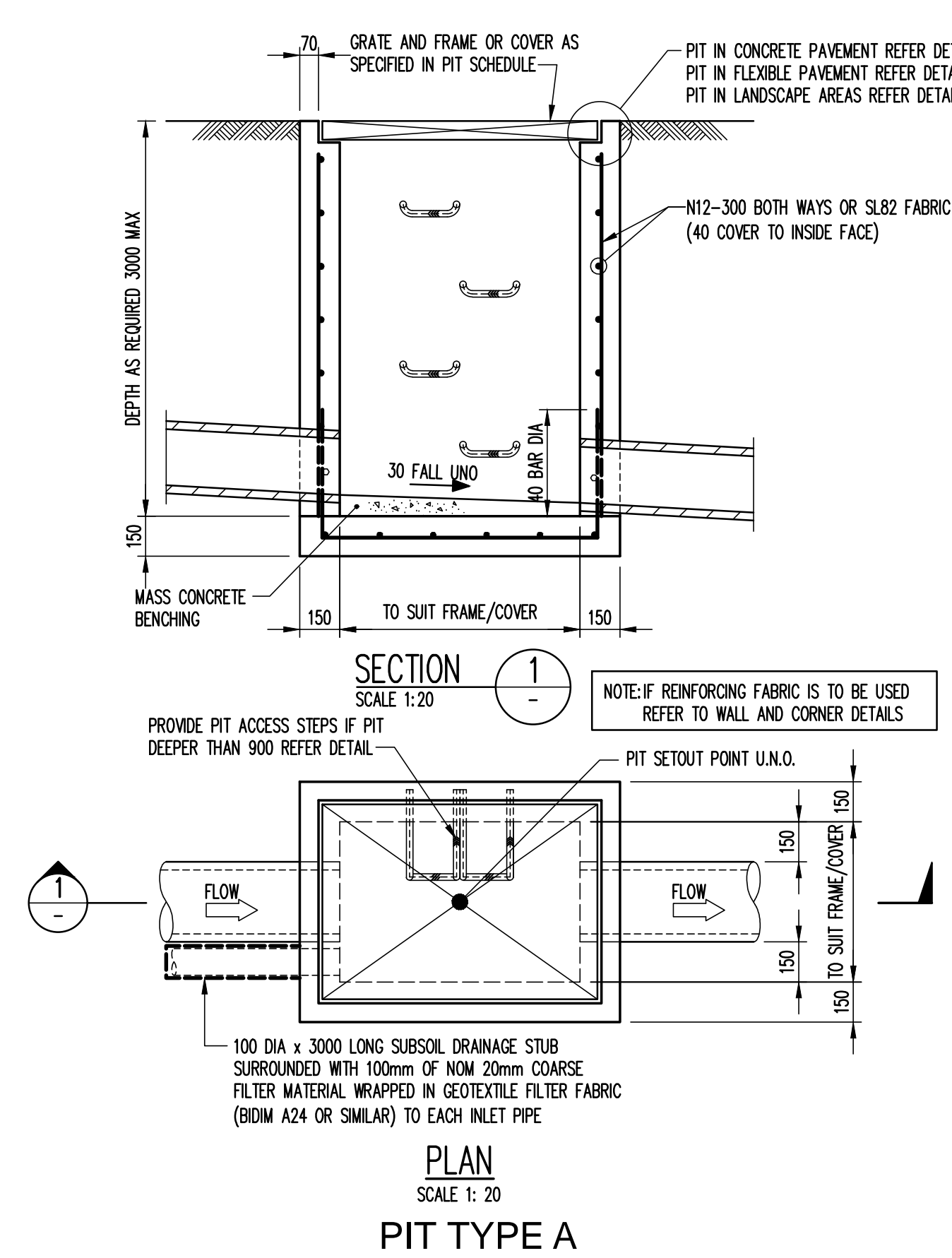
TYPICAL CONTROL JOINT DETAIL (8000 MAX. CTS U.K.O.)



JUNCTION DETAILS



STRIP FOOTING DETAILS



Reference: C200.dwg - USIS - project - Pit File Download Mar 12, 2021 - 5:54pm

AD 1 2 3 4 5 6 7 8 9 10

Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
P5	FOR APPROVAL	OC	SH	12.03.21					
P4	PRELIMINARY	OC	SH	23.05.21					
P3	FOR APPROVAL	OC	JH	16.03.20					
P2	FOR APPROVAL	OC	JH	12.03.20					
P1	FOR APPROVAL	OC	JH	20.12.19					

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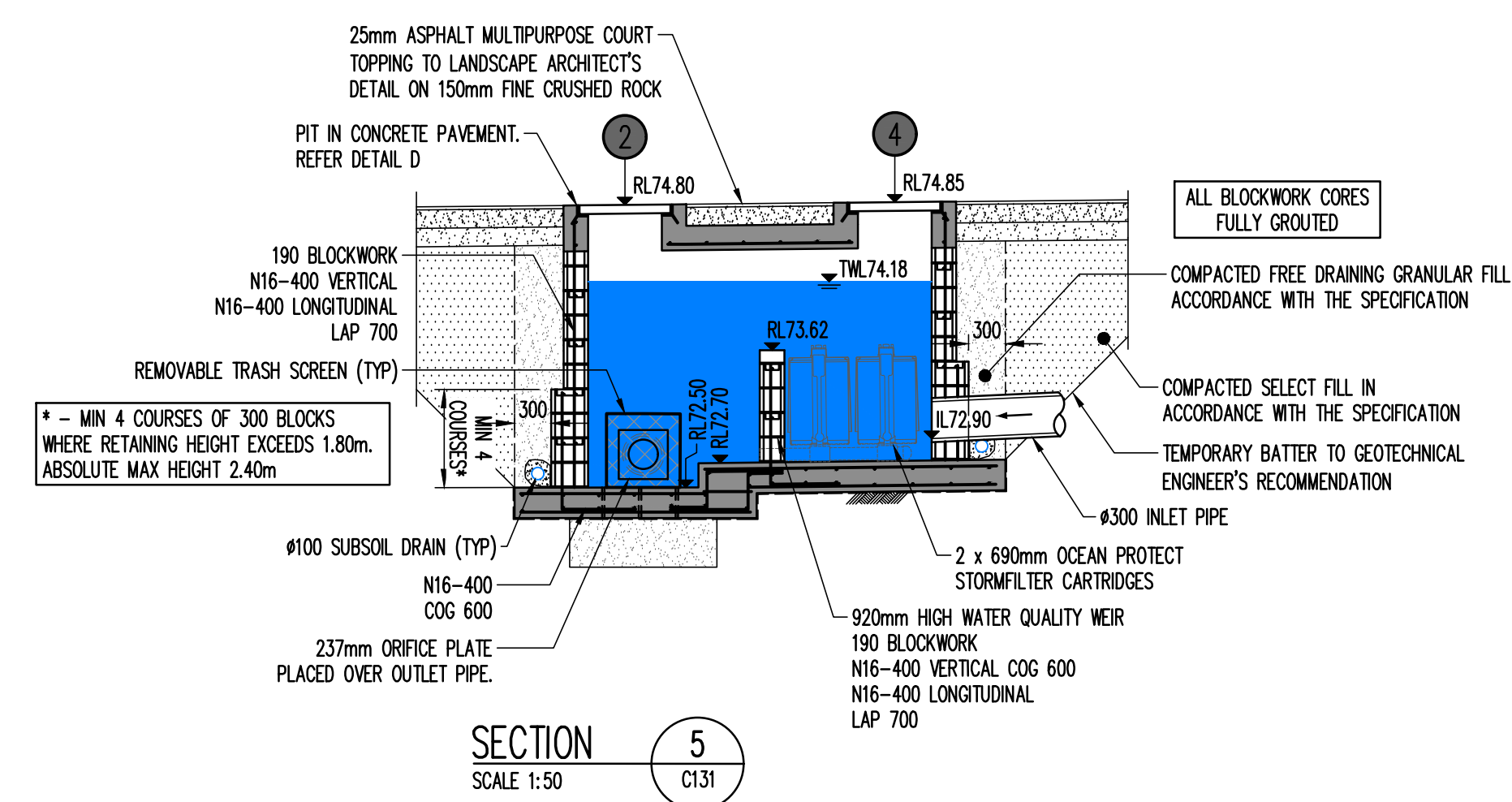
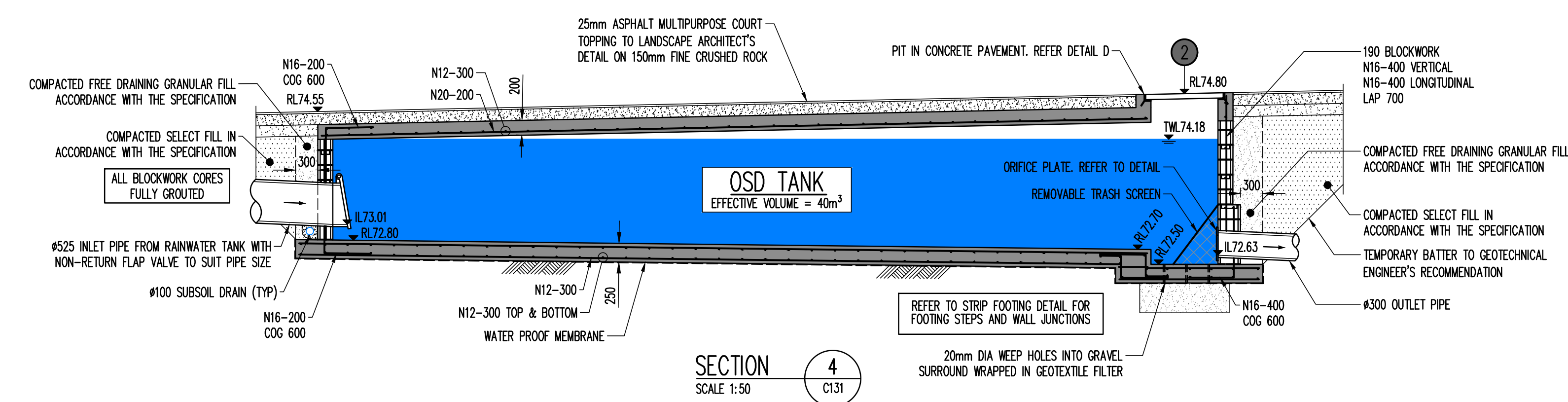
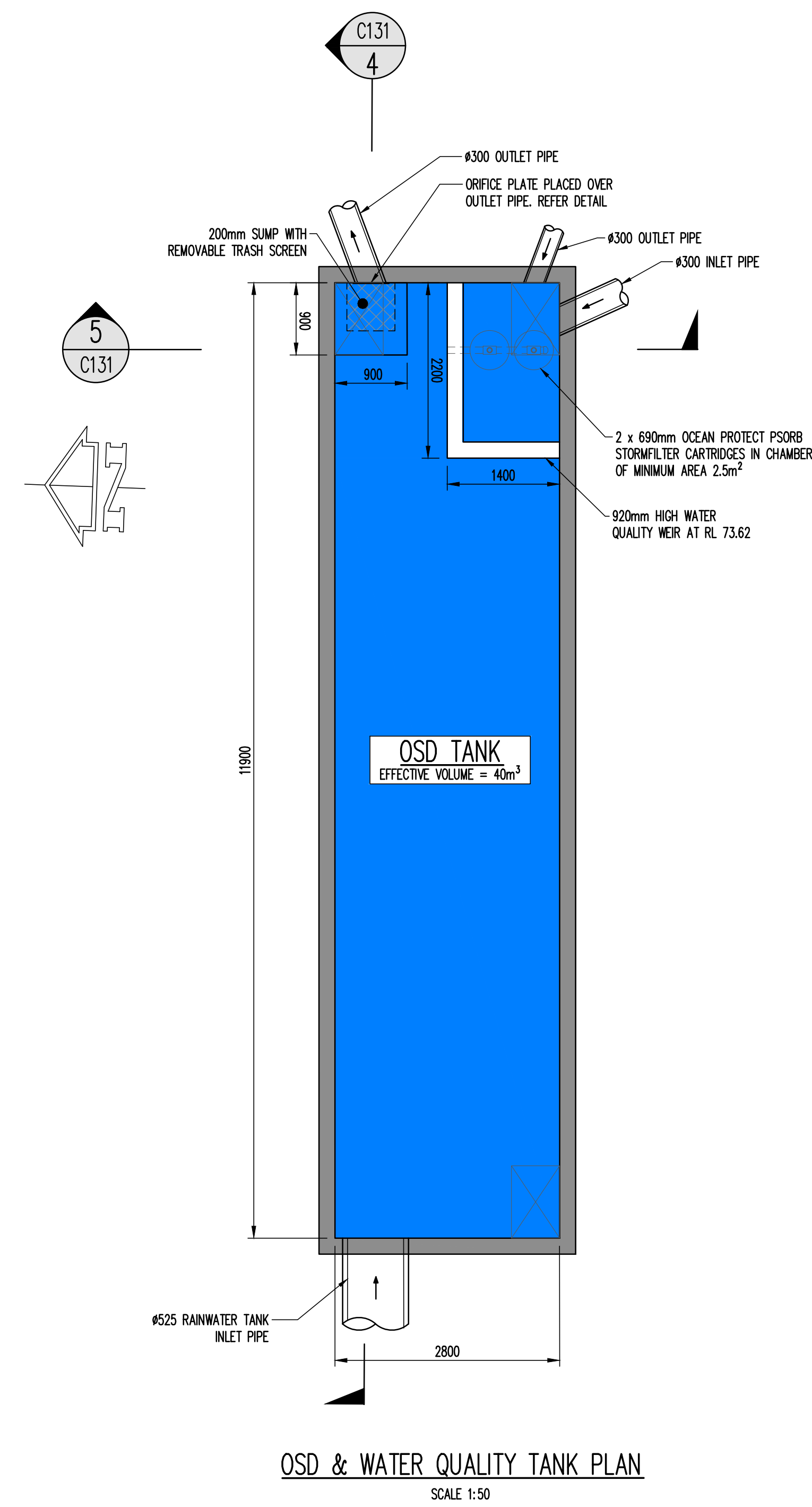
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Project
OXFORD FALLS GRAMMAR SCHOOL - CARPARK

Sheet Subject
CONCEPT DETAILS SHEET 1

PRELIMINARY NOT TO BE USED FOR CONSTRUCTION

Scale: AS Drawn: AS SHOWN Authorised: JH
 Job No: 191571 Drawing No: C230 Revision: P5
 Plot File Created: Mar 12, 2021 - 5:54pm



Reference: C231.dwg - OSD - plans - Rev 04 - 12/2021 - 5:54pm

Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
P5	FOR APPROVAL	OC	SH	12.03.21					
P4	PRELIMINARY	OC	SH	23.05.21					
P3	FOR APPROVAL	OC	JH	18.03.20					
P2	FOR APPROVAL	OC	DW	12.03.20					
P1	FOR APPROVAL	OC	DW	20.12.19					

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Project
**OXFORD FALLS GRAMMAR
SCHOOL - CARPARK**

Sheet Subject
**CONCEPT
DETAILS SHEET 2**

Scale: AS
AS SHOWN

Drawn: DM

Authorised: -

Job No: 191571

Drawing No: C231

Revision: P5

Plot File Created: Mar 12, 2021 - 5:54pm

**PRELIMINARY
NOT TO BE USED
FOR CONSTRUCTION**