

Civil Engineering Report

Saint Ignatius' College Riverview, Stage 2

State Significant Development Application

Prepared for epm Projects / 16.10.2020

191740 CAAA

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PREPARED BY	APPROVED BY	STATUS	ISSUE	DATE
Duncan Marshall	Stephen Brain	Draft Approval	Α	30.07.20
Duncan Marshall	Stephen Brain	Issue for SSDA	В	16.10.20

1.0 Introduction

1.1 Executive Summary

Taylor Thomson Whitting Pty Ltd (TTW) has been engaged to provide civil engineering consulting services for the proposed developments across the three Meriden School campuses.

This report supports a State Significant Development Application (SSDA) submitted to the Department of Planning and Environment (DPE) pursuant to Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This proposed development is identified as a State Significant Development by way of Clause 15(2) of Schedule 1 under *State Environmental Planning Policy (State and Regional Development) 2011* on the basis that the development is for the purpose of an existing school and has a Capital Investment Value of more than \$20 million.

1.2 Secretary's Environmental Assessment Requirements (SEARs)

Under application number SSD-10424, we have been provided with Secretary's Environmental Assessment Requirements (SEARs) issued on the 5th of February 2020. This report provides a response (in part or full where relevant) to the following SEARs:

Condition	Description	Reference within this report		
16	 Drainage: Detail measures to minimise operational water quality impacts on surface waters and groundwater. Stormwater plans detailing the proposed methods of drainage without impacting on the downstream properties. 	Refer to Section 3.0		
17	Identify flood risk on-site (detailing the most recent flood studies for the project area) and consideration of any relevant provisions of the NSW Floodplain Development Manual (2005), including the potential effects of climate change, sea level rise and an increase in rainfall intensity. If there is a material flood risk, include design solutions for mitigation.	Refer to Section 4.0		
19	Sediment, Erosion and Dust Controls: Detail measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles.	Refer to Section 5.0		

Relevant Documents

- ANZECC (2000) Guidelines for Fresh and Marine Water Quality
- Lane Cove Local Environmental Plan 2009
- Lane Cove Council DCP Part O Stormwater Management (2010)
- Lane Cover River Coastal Zone Management Plan Draft Report (2012)
- Managing Urban Stormwater: Soils and Construction (Landcom NSW)
- NSW Floodplain Development Manual (2005)
- Australian Rainfall and Runoff 2019 Guidelines

The details of this report are preliminary and based on current available information and correspondence undertaken at the time of writing.

2.0 Overview of Proposed Development

2.1 Development Description

Client: St Ignatius' College, Riverview

Client Acronym: SICR

State Significant Development Number: SSD 7140 Project Name: Senior School Redevelopment

Project Address: Tambourine Bay Road, Lane Cove NSW 2066

The St Ignatius' College Redevelopment – Ignis Stage 2 project proposes a significant expansion of the current facilities on site (Refer to Site Concept in Figure 1). The proposed works are as follows:

- Construction of new five (5) storey building with a maximum RL52.00 at the heart of the Campus to accommodate modern, flexible teaching and learning spaces;
- Provide improved learning opportunities for Science, Technology, Engineering, Mathematics and PDHPE as a STEMP facility, along with six (6) Pastoral Care House areas, and staff rooms;
- The ground floor will accommodate a C.O.L.A, multi-purpose Hall and Canteen (Food and Beverage) with servicing by a loading area on basement level;
- Refurbishment of existing O'Neil Building to allow integration of New Ignis Stage 2 STEMP Building to connect to existing fabric;
- New North Landscaped Area;
- New Landscaped Area between the existing Wallace Building and the New Ignis Stage 2 STEMP Building; and
- Upgrade courtyard to improve the integration of the learning space and create a sense of place.

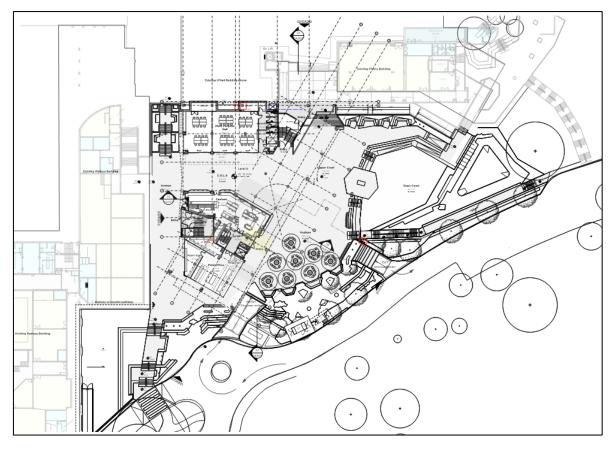


Figure 1 - Concept Layout Plan (Source: PMDL)

2.2 Site Background

The site is located at 2-60 Riverview Street, Riverview (Lot 10 DP 1142773) at the Saint Ignatius' College Riverview campus. The college was established in 1880 and sits elevated above the Lane Cove River between Tambourine Bay and Burns Bay. The site falls within the Lane Cove Council local government area with primary access to the site via Riverview Street and Tambourine Bay Road from the north. A ferry service is also operated for students to arrive at Riverview College Wharf on the Lane Cove River.

The campus includes several classroom and education buildings, several large playing fields, circulating access road (Loyola Drive) and surrounding bushland along the south embankment.



Figure 2 - Locality plan of existing site

The natural topography divides the campus site into three catchments. The western and southern catchments outside the proposed development area drains via surface flow or localised piped networks into Burns Bay and the Lane Cover River. Roof and surface runoff in the eastern catchment is collected via a network of grated pits, swales which discharges into Tamborine Bay via a 1200mm outlet pipe.

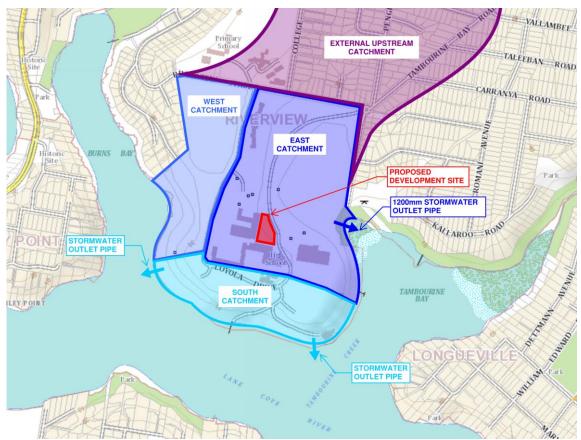


Figure 3 - Catchment areas and existing stormwater discharge locations

3.0 Drainage

The purpose of this section is to address the following items relating to SEARs Condition 16 - Drainage;

- Detail measures to minimise operational water quality impacts on surface waters and groundwater.
- Stormwater plans detailing the proposed methods of drainage without impacting on the downstream properties.

3.1 Pre-Development Stormwater Management Approach

Much of the proposed development area is covered by existing hardstand playing courts and surrounded by grassed or landscaped areas. Surveying works carried out in 2016 and 2020 reveals an extensive network of stormwater pits and pipes servicing the area around the proposed development. Surface drainage from the playing courts and road pavement is collected via grated inlet pits and drains into a 375mm diameter pipe running along the western edge of Loyola Drive. This runoff passes through an existing gross pollutant trap (GPT) adjacent to existing pavilion to remove trash and other pollutants. Runoff then exits the GPT a via 600mm pipe and runs to downstream junction pit at the edge of the playing fields, from here the runoff discharges freely into Tambourine Bay via a 1200mm diameter pipe.

Roof and surface drainage from the Wallace, Vaughan and Therry buildings is collected via pits and pipes and passes underneath the existing playing courts. A steep 375mm diameter pipe then conveys this upstream runoff to the stormwater receiving point at Tambourine Bay.

3.2 Proposed Stormwater Management Approach

Lane Cove Council DCP Part O requires the proposed piped flow conveyance for up to a 50 year Annual Recurrence Interval (ARI), equivalent to a 2% Annual Exceedance Probability (AEP) under Australian Rainfall Runoff 2016. Overland flowpaths are to be designed for the 100 year ARI, equivalent to 1% AEP. Roof water is collected in roof gutters and downpipes and conveyed via a separate pipe system into the 10kL rainwater tank located in the basement for re-use. Surface stormwater runoff will be collected through site grading, overland flowpaths and inlet pits and conveyed by in-ground pipe system into the trunk main discharging to Tamborine Bay.

3.1 Design Average Recurrence Intervals							
Drainage systems shall be designed to provide both minor and major flow conveyance systems as detailed in Australian Rainfall and Runoff (AR&R).							
Element of Stormwater System	Design ARI						
All pipes and associated components for:							
single occupancy developments	20 Year						
Residential flat buildings, commercial and industrial developments	50 Year						
Overland flowpaths	100 Year						

Figure 4 - Design Average Recurrence Intervals (Source: LCC DCP. 2010)

The existing 375mm pipe from the Vaughan and Therry Buildings and the 300mm pipe from the Wallace Building will be reconstructed to a new alignment to allow for the basement structure. Both pipes will reconnect into the downstream 375mm pipe.

In order to reduce the risk of flooding the basement in the event of a blockage downstream, a surcharge pit with an top of grate level 150mm below the basement finished floor level will be provided adjacent to Loyola Drive. This will allow any stormwater surcharging in the system to safely discharge across the oval towards Tamborine Bay instead of inundating the basement.

Refer to Stormwater Management Plans in Appendix A.

3.3 Stormwater Quantity

Appendix 12 of the Lane Cove Council DCP Part O identifies the site of the proposed development as exempt from on-site detention requirements due to proximity to the Lane Cove River foreshore. This has also been confirmed directly with Lane Cove Council's stormwater development engineer.

Although the new building structure will utilise the footprint of the hardstand playing courts, the additional paved areas shown in proposed landscaping plans will result in an overall reduction in the pervious area compared the existing site condition. One of the key issues for the development was ensuring that all minor storm events up to the 50-year storm can still be conveyed by the piped system.

As there are no downstream developments from the project site, there is no risk of flooding to other buildings, habitable or otherwise. However, in major storm events up to the 100-year storm, overland flows paths will need to be designed to safely discharge any excess runoff into Tamborine Bay.

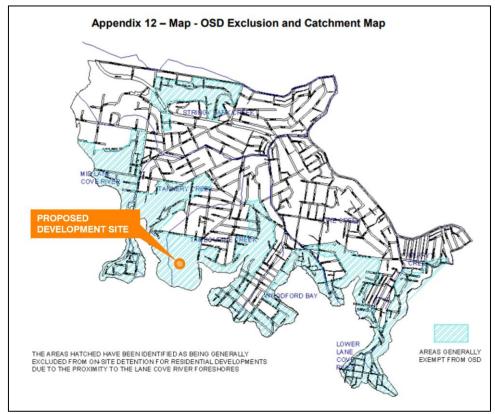


Figure 5 - OSD Exemption Areas (Source: LCC DCP, 2010)

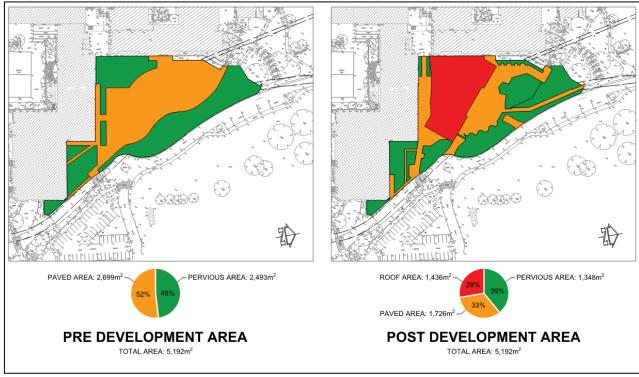


Figure 6 - Comparison of Pre and Post Development Catchment Areas

3.4 Stormwater Quality

As a requirement stated in Lane Cove Council DCP Part O, a gross pollutant trap (GPT) is to be installed downstream on the development site. One existing GPT is currently located north of the development site adjacent to the pavilion structure and will be utilised to filter surface runoff collected from the road pavement and external areas of the development site. An additional GPT will be positioned alongside Loyola Drive at the connection point into the existing 375mm diameter pipe which will filter additional external area runoff and roof water. A suitable proprietary GPT product would be the Ocean Protect OceanSave OS1515 which has the following treatment specifications:

	OceanSave OS1515	Post Development Flows at GPT location
Treatable Flow Rate	290 L/s	247 L/s (1 in 1 year storm event)
Maximum Total Flow Rate	690 L/s	605 L/s (1 in 100 year storm event)

The selected GPT unit will be able to capture all litter, debris and sediment particles greater than 5mm in size. A submerged outlet also allows for grease and to oil remain trapped in the GPT. Where possible in the external catchment areas, surface drainage will be conveyed by grassed swales - this method increases infiltration in pervious areas, reduces runoff entering the roadway and assists in filtering sediment.

3.4.2 Gross Pollutant Traps

GPT's are installed to remove contaminants such as sediment, oil and other pollutants from the stormwater before it discharges into the receiving system.

GPT's must be installed for the following developments:

- a) Residential developments with more than six dwellings.
- All Commercial Developments that may involve the use, storage or transportation of contaminants.
- c) Commercial developments on allotments greater than 5,000m².
- d) All industrial developments.

Figure 7 - Requirements for Gross Pollutant Traps (Source: LCC DCP, 2010)

3.5 DRAINS Modelling

Roof and surface run-off have been modelled using DRAINS modelling software. Blockage factors have been applied as specified in Lane Cove Council DCP Part O.

9.1.3 Pit Inlet Capacities							
The inlet capacity of on grade and sag inlet pits shall be determined using equations given in Aus Rainfall & Runoff. Allowances shall be made for blockage in accordance with the following table.							
Inlet Type	% Capacity Blockage						
Side Entry	10%						
Grated	+30% 100% Side Inlet Capacity only						
Combination							
Letterbox	50%						

Figure 8 - Blockage Factors (Source: LCC DCP, 2010)

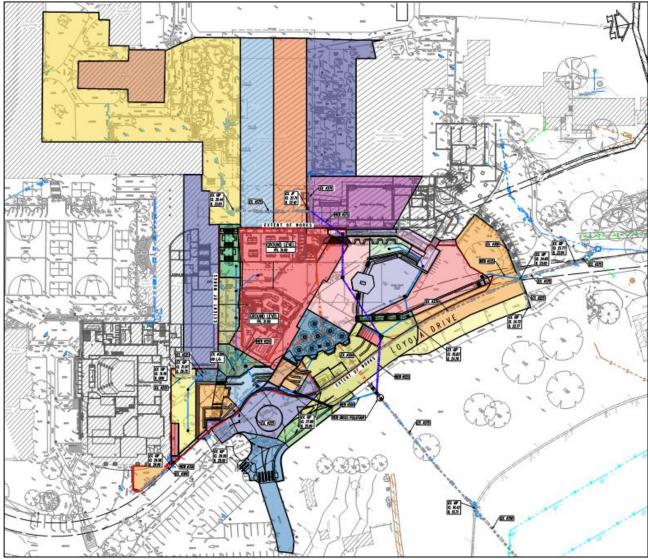


Figure 9 - Plan of Contributing Sub-catchments for DRAINS modelling

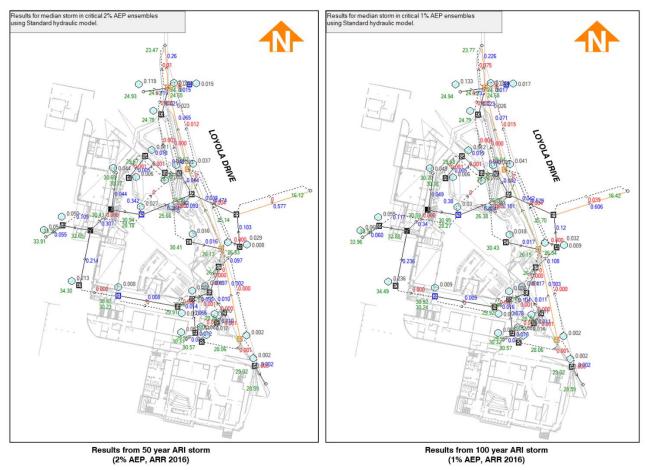


Figure 10 - Results from DRAINS modelling

Results from the DRAINS model demonstrates for the 50 year ARI storm stormwater runoff is fully conveyed by the in-ground system without upwelling. Results for the 100 year storm shows that any surcharging stormwater in safely conveyed via overland flow path towards Tamborine Bay.

4.0 Flooding

The purpose of this section is to address the following items relating to SEARs Condition 17 - Flooding;

• Identify flood risk on-site (detailing the most recent flood studies for the project area) and consideration of any relevant provisions of the NSW Floodplain Development Manual (2005), including the potential effects of climate change, sea level rise and an increase in rainfall intensity. If there is a material flood risk, include design solutions for mitigation.

The is no risk of flooding due to the high elevation of the development site above the Lane Cove River. Lane Cove Council LEP does not identify the project site falling within any flood planning area. As such no additional flood planning controls or mitigation measures will be implemented for the proposed development. This has also been confirmed directly with Lane Cove Council's stormwater development engineer.

Design considerations have been made for any existing overland flow paths to ensure there is no significant water ingress or erosion damage through the development site. As outlined in Lane Cove Council DCP Part O Section 10.5 a minimum of 150mm freeboard will be provided between finished floor levels and adjacent finished surfaces. A minimum of 150mm freeboard will also be provided at the basement loading dock entry and exit ramps to limit the ingress of stormwater runoff into the basement.

5.0 Sediment and Erosion Control

The purpose of this section is to address the following items relating to SEARs Condition 19 - Sediment, Erosion and Dust Controls:

 Detail measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles.

5.1 Strategies

Refer to Sediment and Erosion Control Plan in Appendix A. The proposed sedimentation and erosion control measures to manage runoff and ensure no detriment to the receiving environments have been divided into temporary and permanent strategies as summarised below.

STRATEGY	DESCRIPTION
Temporary	Temporary strategies generally refer to the control of sediment erosion and water pollution during the construction phase. The primary risks occur when soil is excavated and exposed to the elements during construction works. It is at this stage that suspended solids and other construction activity associated pollutants can be washed into the receiving stormwater network and subsequently the downstream waterways. The strategies that are implemented to prevent potential soil degradation and pollution of waterways include the adequate provision of sedimentation and erosion control measures. Generally the measures outlined in this report form a minimum basis that should be considered and further documented by the contractor prior to commencement of the works through a Soil and Water Management Plan (SWMP). The temporary controls that are proposed in the concept plans by TTW will limit the displacement of sediment caused by runoff from disturbed areas, and are designed to remove sediment prior to discharging from site.
Permanent	For the permanent water quantity and quality measures refer to Section 3 of this report.

5.2 Installation of Measures

The measures are to be installed as per the requirements outlined below:

- Clearly visible barrier, site fencing and hoarding shall be installed at the discretion of the Superintendent to ensure site security, safety of the public, manage traffic control and prohibit any unnecessary site disturbance. Vehicular access to the site shall be limited to only what is essential for the construction activities and shall enter the site only through the stabilised access points.
- All disturbed areas are to be stabilised within 14 working days of the completion of earthworks. All disturbed areas are to be protected so that the land is permanently stabilised within six months.
- Proprietary silt fencing shall be installed by the Contractor in accordance with the final approved Sedimentation and Erosion Control Plan and elsewhere at the discretion of the site superintendent to contain sedimentation to as near as possible to the original source.
- Sediment removed from any sediment trapping device shall be relocated where further pollution to downslope lands and waterways cannot occur.
- Stockpiles shall be located by the Contractor in accordance with the final approved Sedimentation and Erosion Control Plan and elsewhere at the discretion of the Project Manager and/or Superintendent. Where stockpiles are to be in place longer than 30 days they shall be stabilised.
- Water shall be prevented from entering the permanent drainage system unless it is sediment free.
 Drainage pits are to be protected in accordance with the final approved Sediment and Erosion Control Plan
- Temporary sediment traps located at pits shall be retained throughout the early works stage and until the appropriate replacement measures for the subsequent stages are installed.

5.3 Land Disturbance

Where practicable, the soil erosion hazard shall be kept as low as possible. Limitations to access are to be in accordance with the following table:

Land Use	Limitation					
Access areas	Access is to be limited to the designated work zones via the stabilised site access.					
Truck cleaning areas	Any truck exiting out of the site shall be thoroughly cleaned and limit the exportation of soil and sediment on public roads.					
Remaining undisturbed areas.	Access to any undisturbed areas and remaining lands is only permitted with permission from the Project Manager and/or Superintendent.					

- Any spilled material shall be immediately removed from areas subject to runoff or concentrated flow;
- Trapped sediment shall be removed where the capacity of the sedimentation trapping device falls below 60%;
- Sedimentation traps are to be inspected after each rainfall event and/or weekly to;
 - Ensure that all sediment is removed once the sediment storage zone is full;
 - Ensure that outlet and emergency spillway works are maintained in a fully operational condition at all times;
 - Ensure rehabilitated lands have effectively reduced the erosion hazard and initiate upgrading or repair as appropriate;
- Additional erosion or sediment control works may be required to be constructed as appropriate to
 ensure the protection of downslope lands and waterways;
- Erosion and sediment control measures are to be maintained in a fully functioning condition at all times until the site is rehabilitated or secondary stage measures are installed;
- Revegetation schemes are to be adhered to and that any grass coverings are kept healthy, including watering and mowing;
- The removal of the temporary soil conservation and sedimentation control structures is to be the last activity in the rehabilitation program.

5.4 Air Quality and Dust Management

Prior to construction, the Contractor shall prepare a Construction Environmental Management Plan (CEMP), which will include a section on Air Quality and/or Dust Management). The CEMP will include but not be limited to:

- Plant and equipment emissions shall be as per the relevant regulations and standards;
- Areas of exposed soil shall be minimised and long term stockpiles shall be stabilized with vegetation or covered;
- A water cart shall be available at all times for surface spraying exposed soil surfaces to reduce dust generation;
- The site compound and haul roads are to be covered with gravel or kept moist (by spraying with water cart) to reduce dust generation;
- Materials transported in open trucks shall be covered to prevent possible dust generation;
- Tailgates of all vehicles transporting soil materials to and from the construction site shall be securely fixed so as to prevent soil spilling which in turn could generate dust;
- The burning of materials is not permitted on site at any time

6.0 Conclusion

To summarise the findings of this civil report, stormwater for the redevelopment can be managed in accordance with Council requirements. The proposed development poses no adverse flooding impacts to downstream developments. The implementation of an additional gross pollutant trap will reduce the amount of common pollutants entering Council's receiving stormwater system. Any risk of flooding or water ingress into the building entry points has been minimised through suitable overland flow path design in accordance with Council requirements. Sedimentation and erosion can be mitigated during the construction and operation of the development to reduce adverse impacts on the receiving Tambourine Bay and Lane Cove River environments.

The findings in this report represent a SSDA level assessment based on current available information and correspondence undertaken at the time of writing. As more information on existing drainage infrastructure becomes available and design development continues, a more detailed assessment will be undertaken.

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Appendix A

Civil Engineering Drawings

TAMBOURINE BAY ROAD, LANE COVE CIVIL WORKS

GENERAL NOTES

- 1. Contractor must verify all dimensions and existing levels on site prior to commencement of works. Any discrepancies to be reported to the
- 2. Strip all topsoil from the construction area. All stripped topsoil shall be disposed of off-site unless directed otherwise. 3. Make smooth connection with all existing works. 4. Compact subgrade under buildings and pavements to minimum 98%
- standard maximum dry density in accordance with AS 1289 5.1.1. Compaction under buildings to extend 2m minimum beyond building 5. All work on public property, property which is to become public

property, or any work which is to come under the control of the

Statutory Authority: the Contractor is to ensure that the drawings used for construction have been approved by all relevant authorities prior to commencement site. 6. 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. 7. For all temporary batters refer to geotechnical recommendations.

REFERENCE DRAWINGS

Consultant Dwg Title

 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	2	2 9	1100	Date
	PMDL (ARCH)	LEVEL -1 PLAN	DA130	P4	11.09.20
	FMDL (ANGII)	LEVEL O PLAN	DA131	P4	11.09.20
	ARCADIA (LANDSCAPE)	LANDSCAPE CONCEPT	101	A	13.07.20
	LTS LOCKLEY (SURVEY)	PLAN OF DETAILS AND LEVELS	43468 004DT	A	26.05.20
	DOUGLAS PARTNERS (GEOTECH)	GEOTECHNICAL INVESTIGATION	85108.04 R.001	0	03.03.20

SURVEY AND SERVICES INFORMATION

: RL37.82, NAIL IN CONC. (SMEC DWG 75099.18D06) : A.H.D. AUSTRALIAN HEIGHT DATUM Datum of levels

Coordinate system : MGA Survey prepared by: LTS LOCKLEY : CONTACT THE SURVEYOR Setout Points

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

UNDERGROUND SERVICES - WARNING

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

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

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

in the services information shown from any cause whatsoever. The Contractor must confirm the exact location and extent of services prior to construction and notify any conflict with the drawings

immediately to the Engineer/Superintendent.

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

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

SAFETY IN DESIGN

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

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

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

EXISTING TREES

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

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

EXCAVATIONS

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

GROUND CONDITIONS

Contractor to be aware of the site geotechnical conditions. Refer to geotechnical report by Douglas Partners (Rpt No. 85108.04 R.001) for details.

HAZARDOUS MATERIALS Existing asbestos products & contaminated material may be present on site. Contractor to ensure all hazardous materials are identified prior to commencing works. Safe working practices as per relevant authority to be adopted and appropriate PPE to be used when handling all hazardous materials. Refer to geotechnical/environmental report by Douglas Partners (Rpt No. 85108.04 R.001) for details.

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

WATER POLLUTION

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

SITE ACCESS/EGRESS

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

VEHICLE MOVEMENT

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

BOUNDARY AND EASEMENT NOTE

The property boundary and easement locations shown on Taylor Thomson Whitting drawing's have been based from information received from: No boundary information received.

Refer architect for boundary information and locations Taylor Thomson Whitting makes no guarantees that the boundary or easement information shown is correct. Taylor Thomson Whitting will accept no liabilities for boundary inaccuracies. The contractor/builder is advised to check/confirm all boundaries in relation to all proposed work prior to the commencement of construction. Boundary inaccuracies found are to be reported to the superintendent prior to construction starting.

DBYD SERVICES NOTE

"Public Service Utility information shown on plan has been complied from information received from Dial Before You Dia inquiry, reference Number 14788291, which was obtained on 21/08/2018. Unless specifically shown otherwise, this location and depth of services shown on this plan have not been verified.

The location of services shown on this drawing have been plotted as accurately as possible from diagrams provided by service authorities and should be confirmed by site inspection."

STORMWATER DRAINAGE NOTES

Stormwater Design Criteria: (A) Average exceedance probability 1% AEP for roof drainage to first external pit 2% AEP for paved and landscaped areas (B) Rainfall intensities -Time of concentration: 5 minutes 1% AEP = 18.0 mm2% AEP = 16.1 mm(C) Rainfall losses Impervious areas: IL = 1.5 mm, CL = 0 mm/hr

- Pervious areas: IL = 23.1 mm, CL = 1.6 mm/hr2. Pipes 300 dia and larger to be reinforced concrete Class "2" approved spigot and socket with rubber ring joints U.N.O. i. Pipes up to 300 dia may be sewer grade uPVC with solvent welded joints, subject to approval by the engineer
- 4. 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
- fittings where pipes are less than 300 dia. '. Where subsoil drains pass under floor slabs and vehicular pavements. unslotted uPVC sewer grade pipe is to be used. 8. Grates and covers shall conform with AS 3996—2006, and AS 1428.1 for access requirements.
- 9. Pipes are to be installed in accordance with AS 3725. All bedding to be type H2 U.N.O. 10. Care is to be taken with invert levels of stormwater lines. Grades shown are not to be reduced without approval. 1. All stormwater pipes to be 150 dia at 1.0% min fall U.N.O. Subsoil drains to be slotted flexible uPVC U.N.O. 13. Adopt invert levels for pipe installation (grades shown are only nominal).

RETAINING WALLS

1. Drainage shall be provided as shown on the drainage drawings. 2. Backfilling shall be carried out after grout or concrete has reached a minimum strength of 0.85 f'c. Backfilling shall be approved granular material compacted in layers not exceeding 200mm to 95% Standard compaction unless noted otherwise. . Provide waterproofing to back of walls as specified or noted. 4. 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. 5. For all temporary batters obtain geotechnical engineers recommendations

SITEWORKS NOTES

1. All basecourse material to comply with RMS specification No 3051 and compacted to minimum 98% modified standard dry density in accordance with AS 1289 5.2.1. 2. All trench backfill material shall be compacted to the same density

as the adjacent material. 3. 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.

CONCRETE FINISHING NOTES

1. All exposed concrete pavements are to be broomed finished. 2. All edges of the concrete pavement including keyed and dowelled joints are to be finished with an edging tool.

3. Concrete pavements with grades greater than 10 % shall be heavily broomed finished.

. Carborundum to be added to all stair treads and ramped crossings U.N.O.

KERBING NOTES

are shown.

Includes all kerbs, gutters, dish drains, crossings and edges.

1. 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 5.2.1. 2. Expansion joints (EJ) to be formed from 10mm compressible cork filler board for the full depth of the section and cut 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 3mm wide and located at 3m centres except for integral kerbs where weakened plane joints are to

match the joint locations in slabs. 4. Broomed finished to all ramped and vehicular crossings, all other kerbing or dish drains to be steel float finished. 5. 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

17 / 124 WALKER STREET.

NORTH SYDENY, NSW 2060

SURVEY LEGEND

МН

□ G

□ SV

□ W

TEL

TRAP

O ELP

O II

☐ TLB

O PKM

Surface level Contour Retaining wall Stormwater drainage line Telecommunications line

EASEMENT FOR _____(__m WIDE) Easement

Boundary Hydrant Manhole Gas

Stop Valve Water Telecomunications Grate Sewer Manhole

Electricity Electric Light Pole Traffic Light Traffic Light Lid Traffic Light Box Telephone Box

Parking Meter Permanent Mark

Bench Mark Borehole

Test Pit

EXISTING SERVICES LEGEND -S - - S - - Existing sewer - - - W - - Existing water

- - - G - - Existing gas Existing stormwater

——— — EU ——— Existing underground electrical ——— — Existing aerial electrical - - - \top - - Existing communications

MASONRY NOTES

Temporary bracing shall be provided by the contractor to keep the masonry stable at all times.

Masonry to be in accordance with AS 3700 Masonry units shall comply with AS/NZS 4455 and as follows: Type of masonry unit | Characteristic unconfined | Characteristic lateral

compressive strength (f'uc) modulus of rupture (f'ut) Clay & Calcium silicate | 15 MPa Concrete (used in 4.5 MPa (hollow units) 3.0 MPa (solid or l non-loadbearina linternal walls) cored units) 15 MPa (hollow units) Concrete (used in unreinforced loadbearing | 10 MPa (solid or walls, reinforced masonry cored units) and non-loadbearing external walls)

Mortar shall consist of the following:

M3 for general applications 1 part Type GP cement: 5 parts sand plus water thickener M4 for elements in interior environments subject to saline wetting and drying; below a damp-proof course or in contact with ground in aggressive soils; in severe marine environments in saline or contaminated water including tidal splash zones: and within 1km of an industry producing chemical pollutants. I part Type GP cement: 4 parts sand plus water thickener

joints and as per the architectural drawings. Masonry walls shown on the structural plans are load-bearing UNO Non-loadbearing walls shall be separated from the concrete structure above with 20mm compressible filler. Masonry walls supporting slabs shall have a layer of mortar troweled smooth on top. Provide M.E.T. slipjoint to separate floor slabs and mason Provide Hercules HERCUSLIP COMPOSITE to separate roof slabs and masonry.

Provide vertical control joints in masonry over permanent floor

Other than what is allowed in the specification no chasing or ebates may be made in masonry walls without written approval. The contractor shall provide records that demonstrate all masonry bed joint reinforcement, masonry ties and masonry wall stiffeners have been installed in accordance with the drawings and

All load bearing concrete masonry walls shall have all cores filled with grout UNO. Core filling grout shall be thoroughly compacted. Grout to be in accordance with AS3700 and as follows: f'cg MPa | Specified Slump | Maximum Aga. Size 20 230

10. All core filled blockwalls shall be constructed with "Double U" blocks 1. In core filled blockwalls cleanout openings shall be provided at the bottom of each core and shall be cleaned of mortar protrusions before arouting.

12. All core filled block walls shall have all cores filled with grout UNO. Core filling grout to be in accordance with note 9. 13. Cover to reinforcement to be 50mm to face of block UNO. 14. Provide bed joint reinforcement as follows M.E.T. galvanized masonry reo where M3 mortar is used (supplied by DUNSTONE MAZE in NSW)

Ancon CCL stainless steel where M4 mortar is used and locate as follows - in 2 bed joints below and above head and sill flashings

- in 2 bed joints below and above openings — in third béd joint above bottom of wall - in second bed joint below top of wall

REINFORCEMENT NOTES Fix reinforcement as shown on drawings. The type and grade

this is followed by a numeral which indicates the size in millimetres of the reinforcement. Hot rolled ribbed bar grade D500N grade R250N Plain round bar

is indicated by a symbol as shown below. On the drawings

grade 500L SL. Sauare mesh RL. Rectangular mesh grade 500L Provide bar supports or spacers to give the following concrete

cover to all reinforcement unless otherwise noted on drawings. Footings - 50 top, 50 bottom, 50 sides.

- 30 when cast in forms but later exposed to - .. when cast directly in contact with ground. . Cover to reinforcement ends to be 50 mm u.n.o. Provide N12-450 support bars to top reinforcement as required, Lap 500 U.N.O.

Maintain cover to all pipes, conduits, reglets, drip grooves etc All cogs to be standard cogs unless noted otherwise. Fabric end and side laps are to be placed strictly in accordance with the manufacturers requirements to achieve a full tensile lap. Fabric shall be laid so that there is a maximum of 3 layers at any location.

8. Laps in reinforcement shall be made only where shown on the drawings unless otherwise approved. Lap lengths as per table

JOINTING NOTES

- Vehicular Pavement Jointing 1. All vehicular pavements to be jointed as shown on drawings. 2. Keyed construction joints should generally be located at a
- maximum of 6m centres. 3. Sawn 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 30m centres. 4. Provide 10mm wide full depth expansion joints between buildings and all concrete or unit pavers.
- 5. 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. 6. Vehicular pavement jointing as follows.

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		6m MA	X				6m MAX					
	DEJA				 30m 	MAX				_	Ī	
- 	EJ	F	H A	CF (_F	B U) I	l N G			+

Pedestrian Footpath Jointing

the pavement.

1. 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

6. Where possible joints should be located to match kerbing and / or adjacent pavement joints.

4. All pedestrian footpath jointings as follows (uno). FACE OF KERB $1.5 x_1 W (1.5 m_1 MAX)$

DRAWING SCHEDULE

DWG No Drawing Title

COVER SHEET AND GENERAL NOTES

CONCEPT SEDIMENT & EROSION CONTROL PLAN SKC20 CONCEPT SITE PLAN

SKC21 CONCEPT STORMWATER MANAGEMENT PLAN - BASEMENT LEVEL SKC22 CONCEPT STORMWATER MANAGEMENT PLAN - GROUND LEVEL

SKC50 DETAILS SHEET

PRELIMINARY NOT TO BE USED FOR CONSTRUCTION

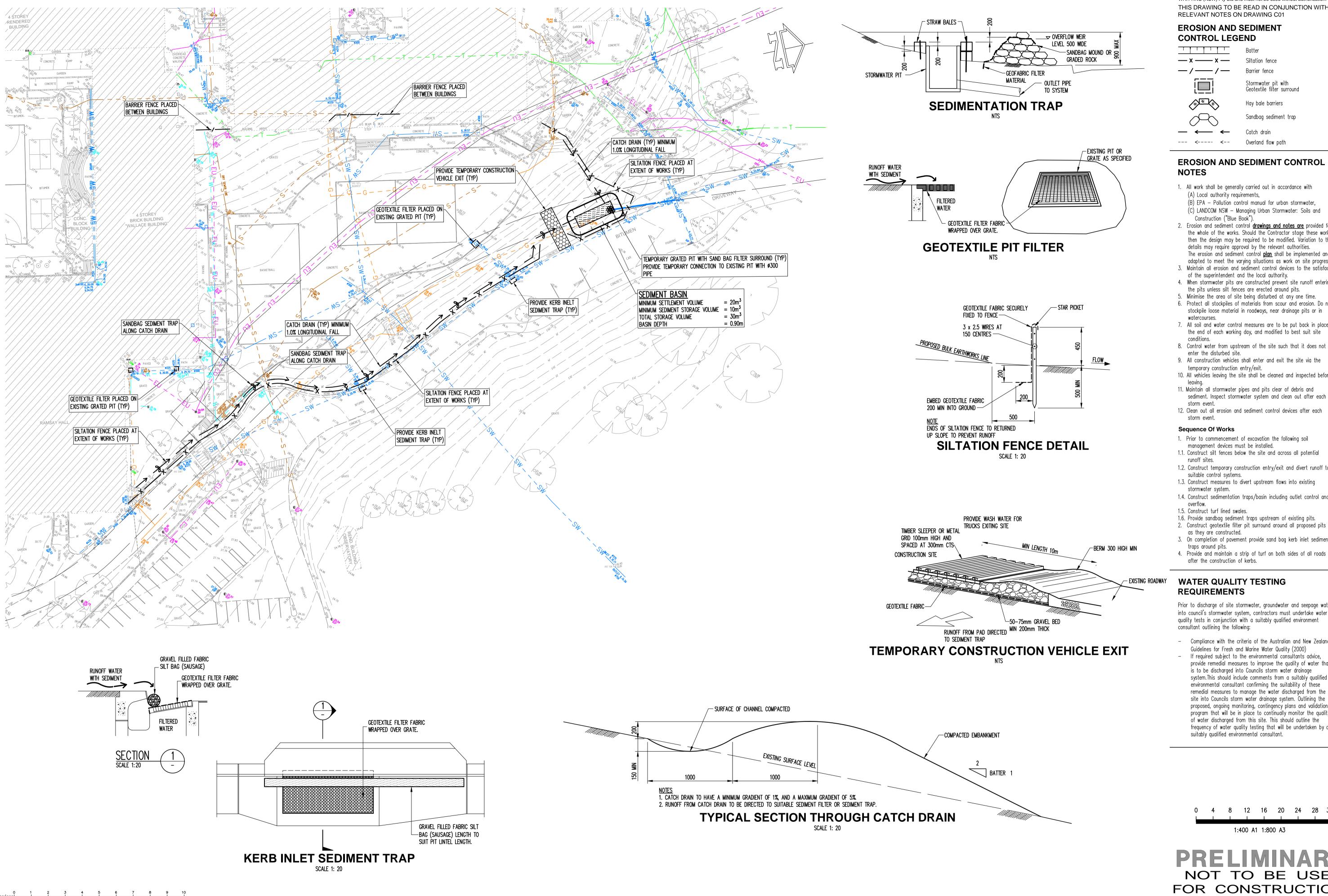
P3 PRELIMINARY DM DM 15.10.20 DM DM 30.07.20 P2 DRAFT FOR APPROVAL P1 ISSUE FOR QS DM DM 08.07.20 Eng Draft Date Rev Description Rev Description Eng Draft Date Rev Description Eng Draft Date

Structural 612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

SAINT IGNATIUS' COLLEGE RIVERVIEW - STAGE 2

COVER SHEET AND GENERAL NOTES

Scale: A1 Drawn Authorised DM NTS SKC00 191740 Plot File Created: Oct 15, 2020 - 6:34pm



Architect

PMDL

Eng Draft Date

Eng Draft Date Rev Description

P4 PRELIMINARY

P2 ISSUE FOR QS

P1 PRELIMINARY

Rev Description

P3 DRAFT FOR APPROVAL

DM DM 15.10.20

DM DM 30.07.20

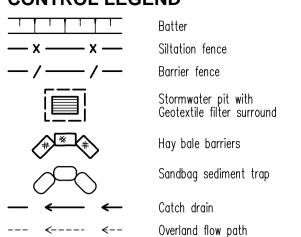
DM DM 08.07.20

DM DM 26.03.20

Eng Draft Date Rev Description

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EROSION AND SEDIMENT CONTROL LEGEND



EROSION AND SEDIMENT CONTROL

1. 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

2. Erosion and sediment control <u>drawings and notes are</u> provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities. The erosion and sediment control **plan** shall be implemented and

- adapted to meet the varying situations as work on site progresses. 3. Maintain all erosion and sediment control devices to the satisfaction
- of the superintendent and the local authority. 4. When stormwater pits are constructed prevent site runoff entering
- the pits unless silt fences are erected around pits. 5. Minimise the area of site being disturbed at any one time. 6. Protect all stockpiles of materials from scour and erosion. Do not
- stockpile loose material in roadways, near drainage pits or in watercourses. 7. All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site
- 8. Control water from upstream of the site such that it does not
- enter the disturbed site. 9. All construction vehicles shall enter and exit the site via the
- temporary construction entry/exit 10. All vehicles leaving the site shall be cleaned and inspected before
- 11. Maintain all stormwater pipes and pits clear of debris and
- 12. Clean out all erosion and sediment control devices after each

Sequence Of Works

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

WATER QUALITY TESTING **REQUIREMENTS**

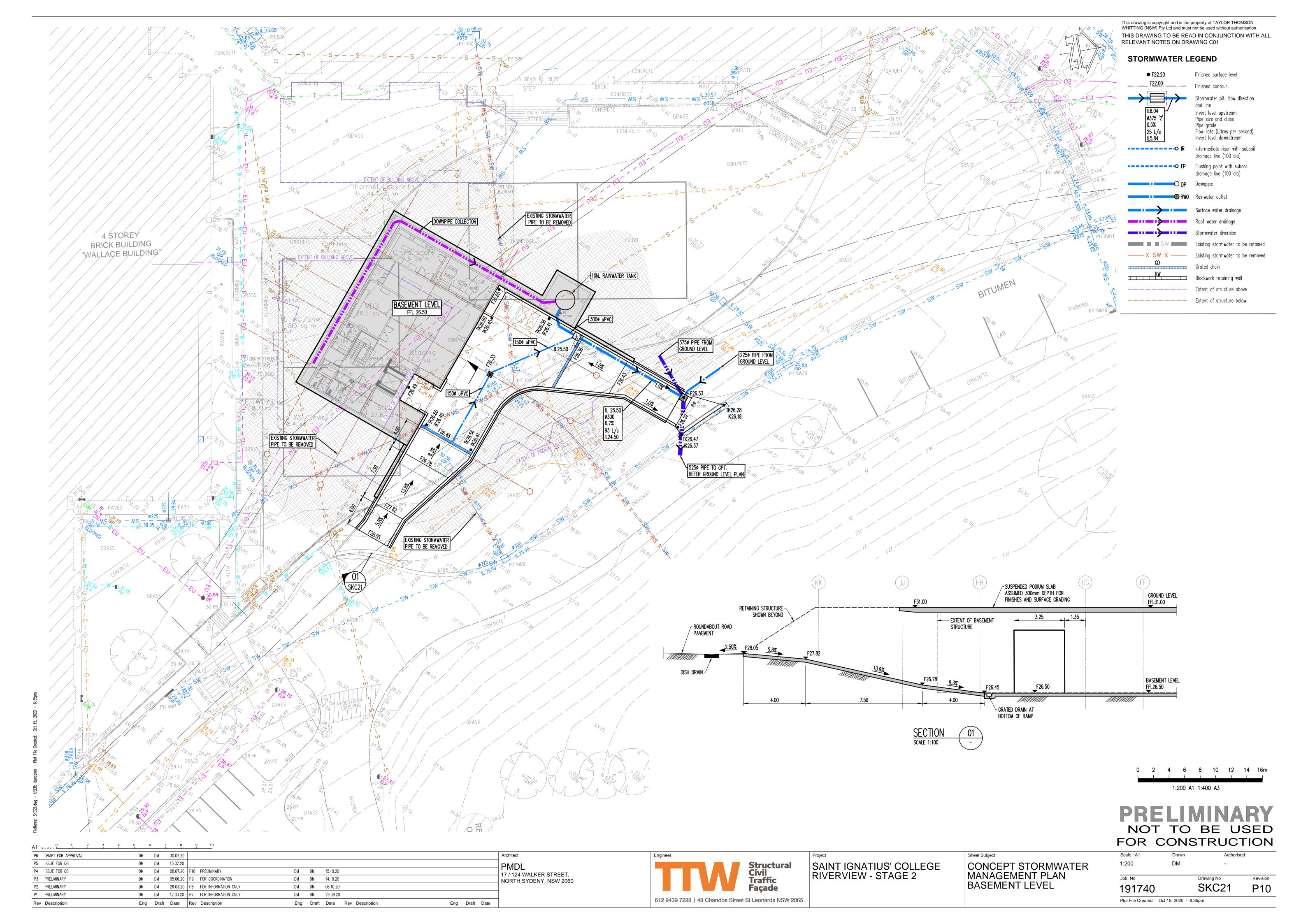
Prior to discharge of site stormwater, groundwater and seepage water into council's stormwater system, contractors must undertake water quality tests in conjunction with a suitably qualified environment consultant outlining the following:

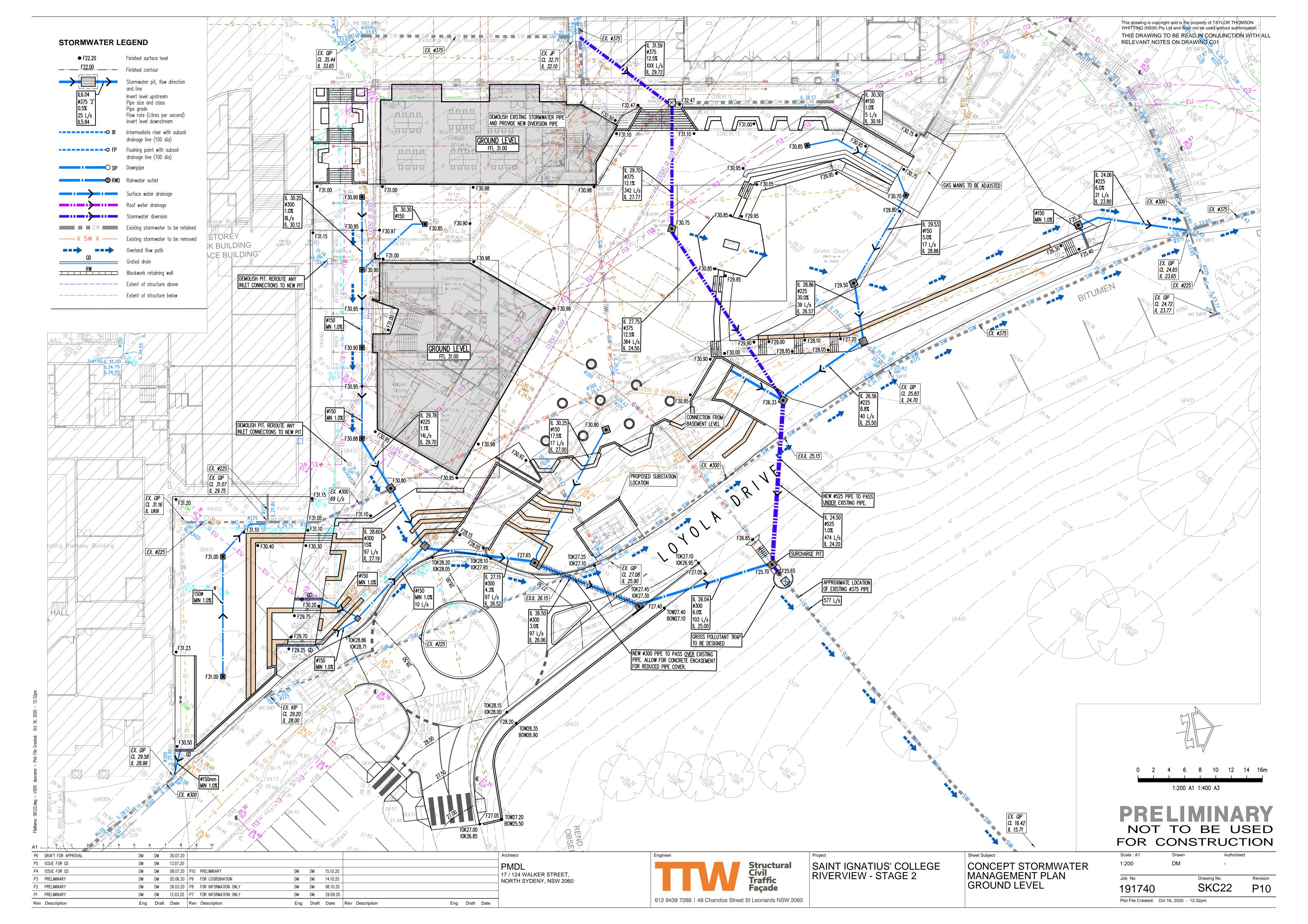
- Compliance with the criteria of the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (2000)
- If required subject to the environmental consultants advice, provide remedial measures to improve the quality of water that is to be discharged into Councils storm water drainage system.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

4 8 12 16 20 24 28 32m 1:400 A1 1:800 A3

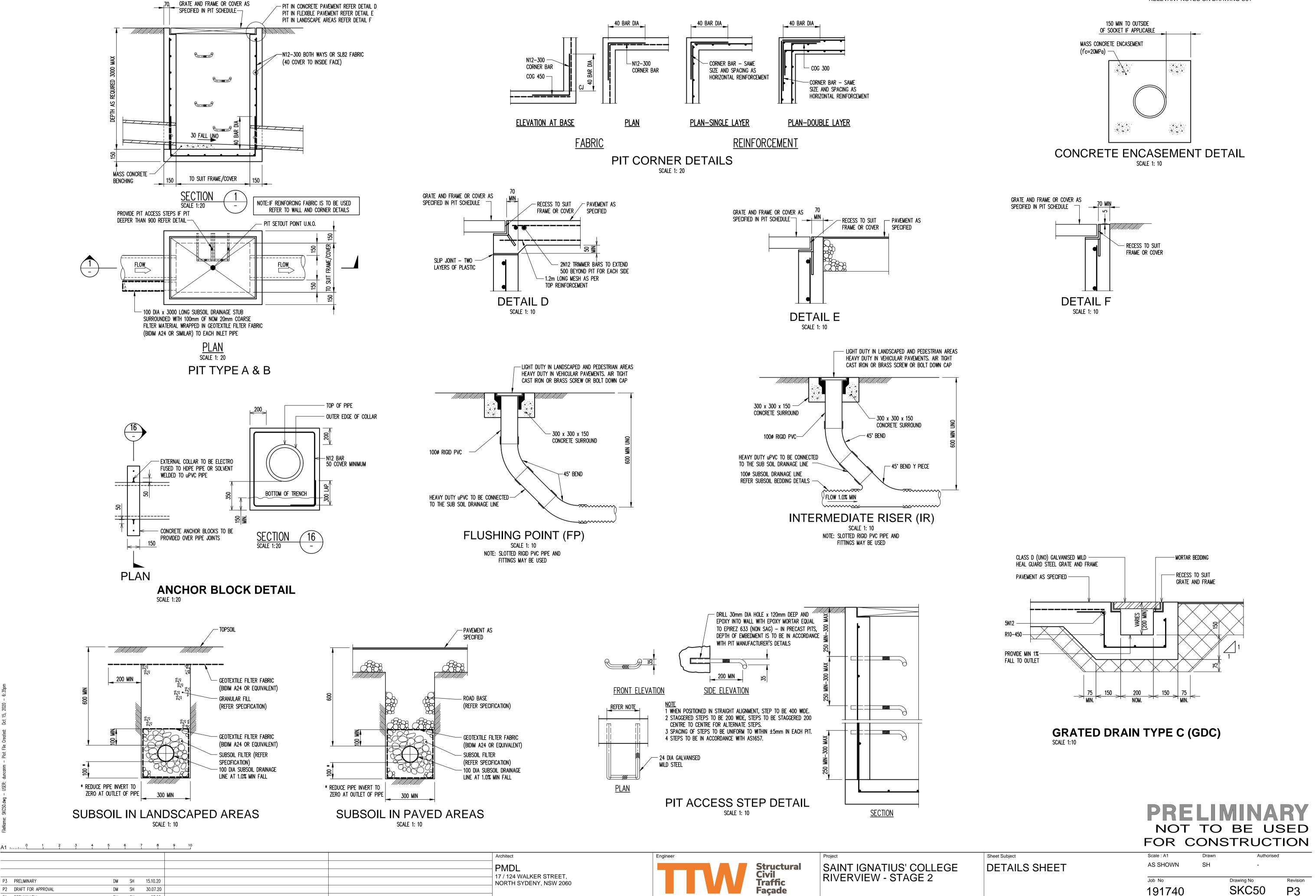
NOT TO BE USED FOR CONSTRUCTION

Scale : A1 Authorised Sheet Subject Structural Civil Traffic CONCEPT SEDIMENT AND DM 1:400 SAINT IGNATIUS' COLLEGE RIVERVIEW - STAGE 2 **EROSION CONTROL** 17 / 124 WALKER STREET, NORTH SYDENY, NSW 2060 SITE PLAN SKC10 191740 P4 Plot File Created: Oct 15, 2020 - 6:34pm 612 9439 7288 | 48 Chandos Street St Leonards NSW 2065





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Eng Draft Date Rev Description

P3 PRELIMINARY

P1 PRELIMINARY

Rev Description

DM SH xx.07.20

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