

Irrawang High School

Stormwater Management Report

Prepared for: NSW Department of Education

Date: 1st December 2022

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Revision

Site Address: 80 Mount Hall Road, Raymond Terrace,
NSW 2324

Real Property Description: Lot 1, DP584122
Lot 2, DP584122
Lot 112, DP71952

Proposed Development: Education Facility

Client: NSW Department of Education

Local Authority Port Stephens Council

Authority Reference #: N/A

Stantec Reference: 301350956-SWMP_002



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001	26.07.22	Draft Schematic Design	JMB	RET
002	08.08.22	Final Schematic Design	JMB	RET
003	01.12.22	DA Issue	JMB	RET

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1. Introduction

Stantec have been commissioned by NSW Department of Education to prepare this Stormwater Management Plan (SWMP) in support of the Development Application for the additions to the existing High School development at 80 Mount Hall Road, Raymond Terrace, NSW 2324.

This SWMP outlines the conceptual DA level stormwater design for the proposed development of an upgraded secondary school.

This SWMP illustrates that the proposed development complies with the conditions set out by Port Stephens Council, Australian Rainfall and Runoff, Australian Standards and best engineering practices.

The purpose of this SWMP is to evaluate the quantity and quality of stormwater associated with the proposed development plan so as to demonstrate to Council that an appropriate stormwater management strategy has been adopted.

The DA seeks consent for the upgrade of Irrawang High School. Specifically, the DA seeks consent for:

- Demolition works.
- Excavation and remediation.
- New Learning Hub including general learning spaces and support learning spaces.
- Library extension and renovation.
- Augmentation of, and connection to, existing services as required.
- Tree removal

This SWMP specifically addresses the following items for both the construction and operational phases of the development:

- Stormwater runoff volumes;
- Stormwater quality treatment measures;
- Water Sensitive Urban Design (WSUD) measures
- Erosion Sedimentation Control
- Stormwater Network Maintenance during Operation

The following will be achieved with the correct application of this SWMP report:

- Appropriate standards to be maintained on all aspects of stormwater within the site,
- Pollution control to be maintained,
- Establishment of a unified, clear, and concise stormwater management strategy.



2. Abbreviations Definitions

- **AEP** Annual Exceedance Probability
- **AHD** Australian Height Datum
- **ARI** Average Recurrence Interval
- **ARR** Australian Rainfall and Runoff
- **DA** Development Application
- **DCP** Development Control Plan
- **DN** Diameter Nominal (mm)
- **EY** Exceedances per Year
- **GPT** Gross Pollutant Trap
- **IFD** Intensity-Frequency-Duration
- **IL** Invert Level
- **L/s** Litres per second
- **m/s** Metres per second
- **MUSIC** Model for Urban Stormwater Improvement Conceptualisation
- **OSD** On-site Stormwater Detention
- **PSD** Permissible Site Discharge
- **RCP** Reinforced Concrete Pipe
- **RL** Relative Level
- **SID** Safety In Design
- **SQID's** Stormwater Quality Improvement Devices
- **SSR** Site Storage Requirement
- **WQO's** Water Quality Objectives
- **WSC** Water Services Coordinator
- **WSUD** Water Sensitive Urban Design



3. Relevant Policies, Standards and Guidelines

The following listed policies, standards and guidelines were referred to in the preparation of this report:

- Port Stephens Council DCP (Section B General Provisions) 2022
- Port Stephens 0074 Stormwater Drainage Design (Development Design Specification) 2022
- Port Stephens 0043 Subsurface Drainage Design (Development Design Specification) 2022
- Australian Rainfall & Runoff 2016;
- AS3500 parts 0-5: 2013 Plumbing and Drainage
- Landcom Managing Urban Stormwater: Soils and Construction Volume 1 2004
- NSW Floodplain Development Manual 2005
- Guidelines for development adjoining land and water managed by DECCW (OEH, 2013)
- Educational Facilities Standards & Guidelines (EFSG), NSW Department of Education



4. Existing Site Characteristics

4.1 Property Detail

The proposed development forms part of the site with the following property details:

Site Address: 80 Mount Hall Road, Raymond Terrace,
NSW 2324

Real Property Description: Lot 1, DP584122
Lot 2, DP584122
Lot 112, DP71952

Development Area: 67,175m²

The proposed development can be seen on the Civil Design Documentation shown in Appendix A of this report.

The proposed mixed-use development consists of 14 new General Learning Spaces (GLS) including Senior Learning Unit, Modification of existing GLS in Building G to provide flexible teaching spaces, Fitness Learning Unit, New/ Upgraded Library, Support Unit Upgrade and Expansion, 10 Classes and 3 Specialist Spaces, and Additional Student Amenities.

The overall site is bounded by:

- Mount Hall Road to the South
- Pacific Highway and Raymond Terrace to the West
- Residential Neighbouring Properties to the East
- Residential Neighbouring Properties and Benjamin Lee Drive to the North

Refer to locality plan in Figure 1 for further clarification.

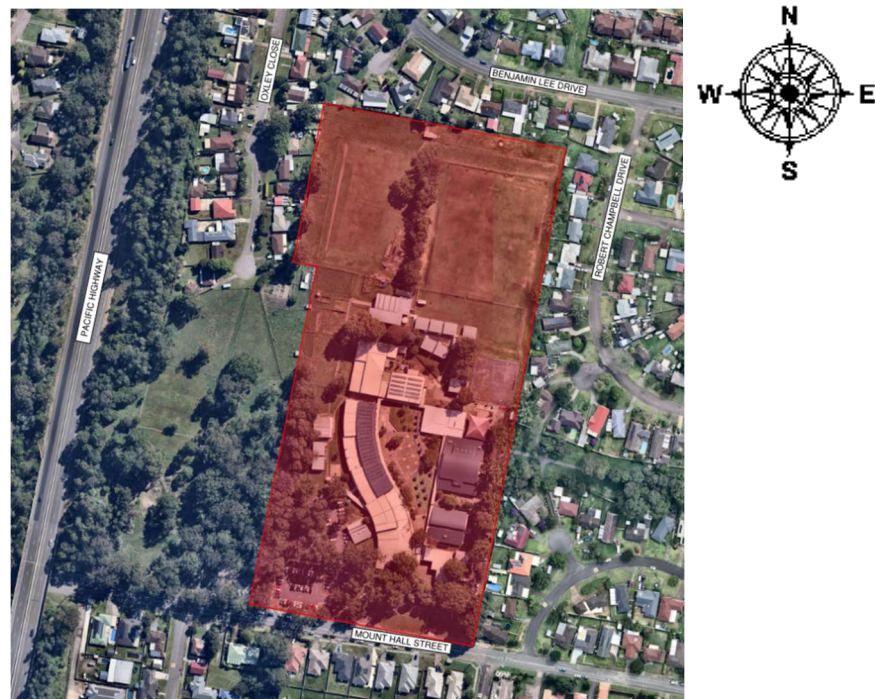


Figure 1: Site Location Plan (Source: Nearmaps 2022)



4.2 Topography

The local topography around the site shows that the site primarily falls North to South-West. The high point of the site is located along the Northern boundary at a level of RL 30 m AHD and the low point located along the South-Western boundary at a level of RL 15 m AHD this is an average slope of approximately 4.3%.



Figure 2: Site Topography (Mecone Mosaic 2022)

4.3 Stormwater Catchments

The surrounding area has been investigated to determine the likely impact of existing external stormwater catchments on the proposed site.

The site is currently surrounded by minor residential developments and roadways intercepting upstream runoff, so it is believed that no external catchments impact the development site. All of the school site's runoff is intercepted by Mt Hall Road and nearby adjacent reserve, so it is not expected to impact downstream catchments negatively.

4.4 Existing Stormwater Infrastructure

Through review of survey information, it has been determined that the site contains stormwater infrastructure around the existing carparks. It is assumed that all roof catchments are conveyed through formalised gutter and downpipe systems and discharged into on lot inground drainage infrastructure before discharging from the site. The site contains existing stormwater pits on Mount Hall Road, refer to Figure 3 below.

Existing stormwater connecting to council road drainage infrastructure is proposed to be retained post development.



Figure 3: Existing Stormwater Infrastructure (Google Maps, 2018)

4.5 Existing Stormwater Discharge

Analysis of survey information indicates that the site discharges stormwater through a piped network into a kerb inlet pit in Mount Hall Road.

Refer to Figure 3 for further information.

5. Local Authority Requirements

Design requirements for stormwater management on the site have been set out in The Port Stephens Council DCP (2022). These requirements are summarised in the sections below.

5.1 Stormwater Conveyance Requirements

The Port Stephens Council DCP (2022) states that the following design storm Annual Exceedance Probabilities (AEP)'s should be allowed for when designing the Stormwater runoff conveyance systems for the development.

Design Parameter	Annual Exceedance Probability (AEP)	Conveyance Method
Minor Drainage System	10% Flood Event	In Ground (Piped)
Major Drainage System	1% Flood Event	Overland

Table 1: Stormwater Drainage Serviceability

However, the Educational Facilities Standards & Guidelines (EFSG) nominates that "Design the inground drainage piped system for a 20 year ARI Storm event or to the requirements of the Local Council whichever is more severe. Provide above ground overland flow paths for 100 year ARI storm events in accordance to NSW Floodplain Management Manual (2001)."

For the minor drainage system, a 5% AEP storm event will be adopted, aligning with the EFSG's 20yr ARI storm event. The major storm design requirements of Council and the EFSG and the 1% AEP storm will be adopted.

5.2 On Site Detention Requirements

The Port Stephens Council DCP (2022) states that On-site detention systems shall be provided where post-development flow rate or volume exceeds the pre-development flow rate or volume, exceeds the total percentage of site area. The OSD tank is to be sized so that post-development flow rate and volume equals the pre-development flow rate and volume for all storm events up to and including the 1% AEP.

The OSD tank should be provided by either underground chambers, surface storage or a combination of the two and positioned under grassed areas for any cellular system, or under hardstand areas such as driveways or any concrete tank structures.

OSD will be required due to increased impervious surfaces. This can be achieved through an underground system in the site. OSD tanks are also required on work sites or redevelopment sites where under-capacity drainage systems exist.

5.3 Stormwater Quality

The Port Stephens Council DCP (2022) states that the post-development stormwater runoff quality shall be improved to achieve the following reduction targets when compared to pre-development levels:

Total Suspended Solids	90% reduction in the average annual load of Total Suspended Solids
Total Nitrogen	45% reduction in the average annual load of Total Nitrogen
Phosphorus	60% reduction in the average annual load of Total Phosphorus
Gross Pollutants	90% reduction in the average annual load of Gross Pollutants (>5mm)

Table 2: Pollution Reduction Targets



6. Flood Impact Assessment

When considering a new development, it is important to assess the impact of existing flooding on the proposed development and also the impact of the proposed development on existing or potential flooding both upstream and downstream of the development.

6.1 Existing Flooding

6.1.1 Regional Flooding

The site has been considered as a low-risk flood area by Port Stephens Council. However, ACOR Consultants have recommended that the overland flow may cause issues and should be investigated in conjunction with the proposed works being undertaken. The overland flow may cause issues with the location of the proposed new building that may be partially in the flow zone which may be detrimental to ensuring the new building will not be flood damaged during heaving storms.

Potential overland flow issues identified by ACOR Consultants will be managed as part of local flooding issues within the proposed design.

6.1.2 Local Flooding

Local or Nuisance flooding describes flooding occurring due to site specific constraints. Local flooding is often caused by local topographical constraints and stormwater drainage system capacity restrictions.

Stantec have assessed the local constraints surrounding and through the site to ascertain any areas where local flooding may be an issue.

The topography of the site is such that there is no risk of flooding on the site as it currently exists. The proposed stormwater network captures the majority of runoff in all storm events, with only overland flow paths exceeding 0.05m flow depth existing in the 1% AEP storm and greater. Overland flow paths through the site are to be verified that Velocity x Depth ratios are adequate to meet Council and EFSG requirements.



7. Stormwater Conveyance

This section of the report discusses the systems proposed to allow for stormwater to be conveyed across the site to the legal point of discharge.

As discussed in Section 5.1 of this report council have set serviceability requirements for the stormwater conveyance network such that minor flows are conveyed through piped drainage, and major flows are discharged via controlled overland flow.

7.1 Roof Drainage

The drainage system will be designed in accordance with AS3500.3-2003 to convey the minor design storm runoff from the roof to the in-ground drainage system. For storm events exceeding the design storm event, flows will surcharge the roof drainage system and discharge onto the surrounding ground where it will then convey through the inground pits to the stormwater network within the site.

7.2 Surface Drainage

The surface areas will be drained through a variety of methods, discussed below, in accordance with AS3500.3:2003 and Council's stormwater drainage guidelines.

7.2.1 In Ground Drainage

The in-ground drainage has been designed to meet the following criteria:

- In the minor design storm event (5% AEP) there will be no surcharging of the in-ground drainage system and;
- In the major design storm event (1% AEP) there will be no uncontrolled discharge from the site onto neighbouring properties or the surrounding street

Surface runoff from the carpark and surrounding landscapes areas will be directed to stormwater inlet structures using the design topography of these elements. The inlet structures have been designed to adequately convey the surface runoff into the in-ground drainage network.

The runoff will then be conveyed underground across the site to the on-site detention basin and then the legal point of discharge using gravity and the geometric falls of the pipe system. There will be minor overland flow which will be conveyed in a controlled manner in the 1% AEP major storm events that aligns with Council and EFSG minimum requirements.

7.3 Legal Point of Discharge

As discussed in Section 4.5, the development area will have one legal point of discharge, which is a kerb inlet pit located on Mount Hall Road in front of Lot 2/ DP584122.



8. Stormwater Attenuation

As discussed in section 4.2 the attenuation of stormwater discharge from the site will be provided in accordance with The Port Stephens Council Development Control Plan requirements (2022). Hydraulic modelling in DRAINS software has been used to determine the required on-site detention so as to restrict discharge from the development site back to pervious predevelopment discharge rates for storm events from the 10% AEP event up to the 1% AEP event.

One OSD tank has been proposed for the site. The tank incorporates an orifice plate leading into a discharge control pit to control the minor storm events (10% AEP) and an overflow weir for the major (1% AEP) storm events. Details of tank and orifice sizes can be seen in the table below.

	Detention Volume Provided (m ³)	Orifice Plate Diameter (mm)
OSD Tank 1	70	300

Table 3: On-Site Detention Tank Specifications

DRAINS modelling results show that the tanks indicated above adequately restrict discharge back to predevelopment fully pervious conditions. Results have been summarised in the table below.

AEP Rainfall Event	Predevelopment Discharge (m ³ /s)	OSD Tank Discharge (m ³ /s)	Total Site Peak Discharge (m ³ /s)
10%	0.333	0.059	0.066
1%	0.557	0.088	0.102

Table 4: DRAINS Results Summary

9. Water Quality Treatment

As discussed in section 5.3 of this report The Port Stephens Council DCP (2022) require stormwater quality treatment on new developments to reduce the pollutant loading of stormwater discharged into the council drainage system.

This section of the report describes the proposed Stormwater Quality Improvement Devices (SQID's) and the effectiveness of the treatment system in achieving the reduction targets set by council for the proposed development.

9.1 Potential Pollutants

There are a wide range of potential stormwater pollutant sources which occur from urbanised catchments, many which can be managed through appropriate stormwater quality treatment. Typical urban pollutants may include:

- Atmospheric deposition
- Erosion (including that from subdivision and building activities)
- Litter and debris
- Traffic emissions and vehicle wear
- Animal droppings
- Pesticides and fertilisers
- Application, storage and wash-off of car oil, detergents and other household and commercial solvents and chemicals
- Solid's accumulation and growth in stormwater systems
- Weathering of buildings

The following specific pollutants in urban stormwater assessed through water quality modelling and management include:

- Suspended Solids
- Litter
- Nutrients such as Nitrogen and Phosphorous
- Biological oxygen demand (BOD) and chemical oxygen demand (COD) materials
- Micro-organisms
- Toxic organics
- Trace metals
- Oils and surfactants

While only the key pollutants underlined above will be examined within the modelling, the Stormwater Quality Improvement Devices implemented are expected to assist in reducing a wide range of pollutants. For example, heavy metals are commonly associated with, and bound to fine sediments. This reduces the discharge of fine sediment during the construction and operational phases will also reduce the discharge of heavy metals to existing stormwater systems.



9.2 Pollutant Reduction System

In order to achieve the pollutant reduction targets specified in section 5.3 of this report, a series of treatment devices are proposed within the stormwater network which form a treatment train.

The diagram below shows a typical treatment train:

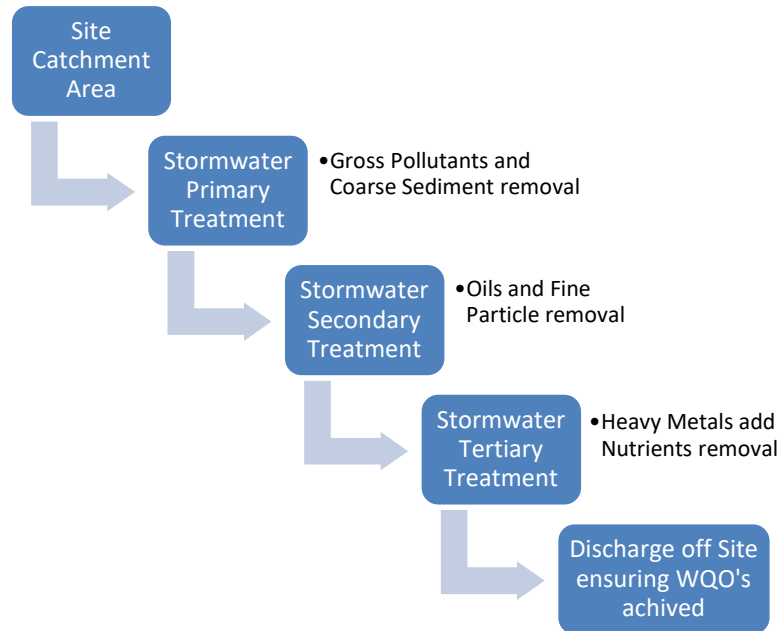


Figure 4: Treatment Train

9.2.1 Water Treatment Modelling

In order to demonstrate that the proposed treatment train meets the required reduction targets, a pollutant reduction model has been generated using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) Software program Version 6.3 by eWater CRC. Pollutant export rates are currently only available for Total Suspended Solids (TSS), Total Nitrogen (TN), Total Phosphorus (TP) and Gross Pollutants (GP). Therefore, only quantitative modelling for TSS, TN, TP & GP has been undertaken using MUSIC.

Modelling has only been undertaken on the post-development proposal with SQID's installed so as to demonstrate the percentage reduction for each pollutant type.

The proposed treatment train includes the following:

- StormFilter Cartridges proposed within chamber in On-Site Detention Tank
- Ocean Guard Pit Baskets proposed within the stormwater inlet pits

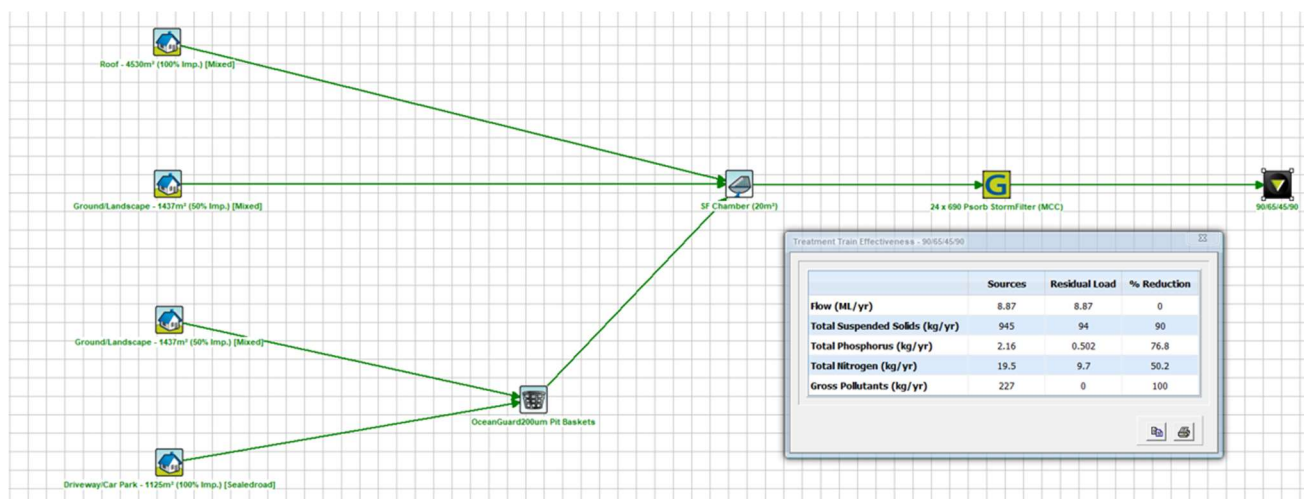


Figure 5: MUSIC Model Treatment Train

Pollutant/Issue	Target	Reduction	Target Achieved
TSS	90%	90%	YES
Phosphorus	60%	76.8%	YES
Nitrogen	45%	50.2%	YES
Gross Pollutants	90%	100%	YES

Table 5: MUSIC Results vs. Site Targets

As can be seen in the table above, the MUSIC model show that the proposed design meets council's reduction target. Refer to Appendix C for the Port Stephens Council MUSIC Link report.

9.2.2 Ocean Protect StormFilter Cartridges

The Ocean Protect StormFilter Cartridges clean stormwater through a patented passive filtration system, effectively removing pollutants to meet regulatory requirements. This treatment system uses rechargeable, self-cleaning, media-filled cartridges to absorb and retain pollutants from stormwater runoff including total suspended solids, hydrocarbons, nutrients, soluble heavy metals and other common pollutants.

- The OSD tank will consist of 24 x 690 Psorb StormFilter cartridges

9.2.3 Ocean Guard Pit Baskets

The OceanGuard Basket is a gully pit basket designed to capture pollution that runs into stormwater drains. It can be installed into existing and new stormwater pits. The system includes filtration bag liners, designed to remove gross pollutants, total suspended solids and attached pollutants.

The filtration bag, filtration cage and flow diverter work together to maximise the flow treated and pollutants captured. This efficient hydraulic design ultimately results in captured pollutants being retained in a dry state.

OceanGuard Baskets are cost-effective, highly efficient, easy to install and simple to maintain. OceanGuard Baskets have been proposed for the site and will be installed into the proposed grated pits within the main courtyard area.



10. Water Sensitive Urban Design Strategy

WSUD Background Information

Design guidelines for Water Sensitive Urban Design (WSUD) on the site have been set out in the Port Stephens Council DCP (2022). WSUD integrates land use and water management in the aim of minimising impacts of urban development on the natural water cycle. The WSUD design strategy for the proposed development is as follows. No previous WSUD studies have been done for this site.

Site Context

Full site context has been provided in Section 4 above.

Proposed Development

The proposed development has been outlined in Section 7-9 above, as well as in Appendix A with the Civil Design Documentation.

WSUD Objectives and Targets

As discussed in Section 9 above, the site will implement ocean guard inlet filters, as well as cartridge filters in order to minimise the development impact on the natural water cycle.

Constraints and Opportunities

There are always opportunities to adopt a range of WSUD measures for any development. There were no major constraints within or neighbouring the site such as flood plains, watercourses or sensitive environments that are required to be preserved or remediated as part of the proposed works.

Stormwater Management

The proposed stormwater system has been designed as per the Port Botany Council Development Control Plan (DCP) 2022. The full extent of the stormwater management procedures undertaken in the design has been explored throughout the entirety of this SWMP.

Water Table Management

It is not expected that the proposed development will have any impact on the existing water table. No impervious areas of the site will discharge to the ground and hence no groundwater quality measures are required to ensure WSUD requirements are met.



11. Stormwater Network Maintenance Schedule

In order to ensure the ongoing effective operation of the stormwater network and water quality treatment devices, the devices must be maintained in accordance with manufacturer recommendations/requirements and general best practice. It is noted that all pits are to be inspected in a safe manner that assesses localised risk and in accordance with maintenance contractor safe work method statements (SWMS).

The below summaries the various stormwater network components that will need to be maintained, whilst Schedule 1 below details required maintenance of specific items within the network requiring maintenance.

11.1 Pit and Pipe Network

A general inspection of the stormwater pit network is to be undertaken every six (6) months and after major storm events. The general inspection involves visual inspection inside pits, removal and disposal of larger gross pollutants within pits in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Inspection of general pits can coincide with inspection and maintenance of water quality pit inlets (if applicable).

11.2 OSD Tanks

A general inspection of the OSD tank is to be undertaken at a minimum every six (6) months and after major storm events. The general inspection involves visual inspection inside the tank, condition of components such as orifice plates and valves, removal and disposal of larger gross pollutants within pits in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Inspection of general pits can coincide with inspection and maintenance of water quality pit inlets (if applicable). It is expected that the tanks are hosed out and cleaned on an annual basis to ensure required performance can be achieved.

11.3 Water Quality Treatment Devices

The filtration inserts, located within the pits, are to undergo minor service every three (3) months and after major storm events or a hazardous material spill. This involves inspection and evaluation of the filter bad and its condition, removal of captured pollutants, and the appropriate disposal of captured material in accordance with waste disposal regulations. The minor service is designed to return the ocean guard back to optimal operating performance. An inspection of the condition is to be particularly undertaken following major storm events to check for damage and higher than normal sediment accumulation. Refer to manufacturer's maintenance procedures for details of safely undertaking hand maintenance or vacuum maintenance of the ocean guards.

A major service of the ocean guards is undertaken on an as-required basis and involves the inspection of ocean guards to determine the need for filter bag replacement and support frame rectification. Replacement is based on the outcomes from the minor service whereby damage is detected. Contact manufacturer for assessment and replacement components and refer to manufacturer's maintenance procedures for safely replacing components.

A general inspection of the filtration cartridges located in a Stormfilter chamber within the OSD tank, is to be undertaken every six (6) months and after major storm events or a hazardous material spill. The general inspection involves visual inspection of the Stormfilter cartridges and chamber, removal and disposal of larger gross pollutants from the device in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Cartridges are also to be checked to ensure they are all firmly connected to the connectors.

A minor service of the Stormfilters, undertaken every twelve (12) months and after major storm events or a hazardous material spill, involves the evaluation of the Stormfilter cartridges and media, removal of accumulated sediment and a wash-down of the Stormfilter chamber. Refer to Ocean Protect maintenance procedures for details of safely undertaking maintenance of the Stormfilter cartridges. During this service, the cartridge media is to be inspected and replaced if it is revealed that the cartridge media is exhausted. If this is the case, a major service is to be undertaken to replace the Stormfilter cartridge media. Contact manufacturer for assessment and replacement components and refer to manufacturer's maintenance procedures for details of safely replacing the media components.



11.4 Above Ground Storage and Biofiltration

A general inspection of above ground features and components within a stormwater network such as storage basins and biofiltration bases is to be undertaken every six (6) months and after major storm events. The general inspection involves visual inspection inside pits, removal and disposal of larger gross pollutants within pits in accordance with waste disposal regulations to prevent blockages, and minimal rectification works as required. Detailed inspections for treatment performance and stabilisation of earthworks structure should occur either annually or biannually.

11.5 Civil Structures

A general inspection of civil structures and associated drainage across a site should be undertaken annually. The general inspection involves visual inspection, with identified defects assessed by applicable qualified engineers



11.6 Stormwater and OSD Maintenance Schedule

Maintenance Action	Frequency	Responsibility	Procedure
Pit and Pipe Network			
Blockages of inlet and outlet pipes within pits	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge from within pits.
Condition of inlet grates	Six Monthly	Maintenance Contractor	Clear vegetation and any debris from the pit grate and repair as required.
Condition of pit structures and section of pipes at inlets/ outlets.	Two Years	Maintenance Contractor	Remove grate to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required. Notify structural engineer if detrimental features observed.
Overland flow paths and drainage swales	Six Monthly	Maintenance Contractor	Walk along the flow path and swale. Check batters and condition of path extent. Remove any debris/litter/sludge.
Survey pipe condition with CCTV's and repair defects as necessary	Five Years	Maintenance Contractor	Remove grate. Clear blockages for camera access. Operate camera in accordance with manufacturer specifications and operator standard procedures.
OSD and Discharge Control			
Blockage of orifice plate	Six Monthly	Maintenance Contractor	Remove grate and screen to inspect orifice. See attached Site Stormwater plan for location of Discharge Control Pit.
Orifice structure size and connection to wall	Five Years	Maintenance Contractor	Compare orifice diameter to approved design (see Works as Executed Drawing) and ensure edge of orifice is not pitted or damaged.
Trash rack blockage	Six Monthly	Maintenance Contractor	Remove grate and screen if required to clean it.
Trash rack condition and connection to wall.	Annually	Maintenance Contractor	Remove grate and rack screen. Check corrosion in particular corners. Check screen fixings to wall for stability and corrosion. Repair as required.
Condition and performance of flap valves	Annually	Maintenance Contractor	Remove grate. Test valve hinge by moving flap to full extent and allowing it to drop back into normal position. Flap should freely swing at hinge.



Blockage of overflow weirs	Six Monthly	Maintenance Contractor	Remove grate and open cover to ventilate underground storage if present. Ensure weir clear of blockages.
Tank and pit wall defects and structural adequacy.	Two Years	Maintenance Contractor	Remove grate to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required.
Tank slab build-up of sediment and sludge.	Six Monthly	Maintenance Contractor	Remove grate and screen. Remove sediment/ sludge build up, check orifice and flap valves are clear.
Condition and fixing of step irons	Two Years	Maintenance Contractor	Remove grate to inspect step irons and connection into wall. Repair as required. Notify structural engineer if detrimental features observed.
OSD warning signage	Two Years	Maintenance Contractor	Remove grate to inspect signage and connections. Check for fading in sign and any vegetation growth over or near sign impacting visibility. Repair as required.
Water Quality Devices			
Blockages and debris within stormwater pit filtration inserts/ storm sacks	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge from within inserts.
Blockages and debris within filtration tanks and devices	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge. Hose out tank and devices from outside tank.
Blockages and debris within filtration cartridges inside storage tanks.	Six Monthly	Maintenance Contractor	Remove grate. Remove any debris/litter/sludge. Hose out tank and devices from outside tank.
Blockages and water conveyance within filtration stormwater lines	Annual	Maintenance Contractor	Remove grate. Flow water through filtration stormwater line from inspection openings to remove blockages.
Condition of stormwater pit filtration inserts/ storm sacks	Annual	Manufacturer's Contractor	Remove inserts from pit to inspect. Repair as required.
Condition and performance of treatment tank components	Annual	Manufacturer's Contractor	Remove grate and follow SWMS procedures to enter into the tank. View and repair damaged components.
Condition and performance of filtration cartridges	Annual	Manufacturer's Contractor	Remove cartridges from pit to inspect. Repair as required.
Above Ground Storage and Bioretention			
Blockages of inlet and outlet pipes within pits	Six Monthly	Maintenance Contractor	Blast with hose, water into inspection openings and pits to ensure conveyance through lines.



Condition of inlet grates	Six Monthly	Maintenance Contractor	Clear vegetation and any debris from the pit grate condition, inspect and repair as required.
Condition of pit structures and section of pipes at inlets/ outlets.	Two Years	Maintenance Contractor	Remove grate to inspect internal walls. Repair as required. Clear vegetation from external walls if necessary and repair as required. Notify structural engineer if detrimental features observed.
Embankments and storage area condition, in particular scour and vegetation loss in landscaped areas	Six Monthly	Maintenance Contractor	Walk along bottom of embankments where possible. Compare total above ground storage volume and levels to WAE documentation. Check batter stability and vegetation. Notify civil engineer if detrimental features observed, eg >5% storage lost, embankment destabilisation.
Subsoil line blockages	Annual	Maintenance Contractor	Blast with hose, water into inspection openings and pits to ensure conveyance through lines. Review outlets to ensure flow through line.
Planting condition within bioretention areas, including development of weeds.	Six Monthly	Maintenance Contractor	Physical inspection by qualified contractor to review vegetation growth, removal of weeds, removal of debris and soil arrangement.
Filtration media quality	Two Years	Maintenance Contractor	Inspection by qualified contractor. Samples to be taken of material to confirm requirements are achieved.
Civil Structures			
Check subsoil behind retaining walls drainage capacity via hose flushing	Annual	Maintenance Contractor	Blast with hose, water into inspection openings and pits to ensure conveyance through lines. Review outlets to ensure flow through line.
Condition of retaining walls and other structures, including cracking and stability	Annual	Maintenance Contractor	Walk along and inspect all visible faces of wall structure. Observe for cracking, crack width, any lean in on wall and moisture within structure. Notify structural engineer if detrimental features observed.
Check batters for signs of scour and erosion	Annual	Maintenance Contractor	Walk along bottom of embankments where possible. Check batter stability and vegetation. Notify civil engineer if detrimental features observed.



12. Erosion & Sedimentation Control

Landcom have published a design guide entitled “Managing Urban Stormwater - Soils and Construction” which is regarded as the standard to which erosion and sedimentation control should be designed to within NSW.

The control of erosion and sedimentation describes the measures incorporated during and following construction of a new development to prevent the pollution and degradation of the downstream watercourse.

A Soil and Water Management Plan has prepared as part of the development application documentation and is included in Appendix A of this report.

12.1 Stormwater Drainage Infrastructure Inlets

Risk:

- Sediment from the construction site washing into the existing stormwater drainage inlet infrastructure.

Consequence:

- The sediment will then be conveyed into the downstream waterbody by stormwater runoff, contaminating the waterbody.
- The sediment will build up blocking the stormwater infrastructure and preventing stormwater conveyance to the downstream waterbody and impacting drainage upstream.

Mitigation:

- Sediment traps protection will be installed surrounding all existing stormwater drainage infrastructure inlets to prevent sediment entering the system.
- Temporary Stormwater Systems are to be installed where required to capture all site runoff within the zone of excavation. Runoff will be allowed to settle out suspended particles and debris, and an acceptable water of 50mg per litre of Non Filterable Residues (NFR) is required to be achieved prior to discharge.
- Installation of a fence around the perimeter of the basin is required as well as a rip rap to allow for bobcat access for periodic removal of sediment. Also, a perforated riser outlet pipe needs to be placed for the connection and discharge to an existing pit.

Maintenance:

- Frequent inspection of the sandbags to ensure they are arranged in a manner that prevents sediment from accessing the drainage system. If sediment is building up on the sandbags they should be cleared of sediment and re-established.
- All soil erosion and sediment control structures including temporary sediment basins and sediment traps shall be inspected following each storm event and any necessary maintenance work shall be undertaken to ensure their continued proper operation.

12.2 Construction Exit Protection

Risk:

- Spoil such as soil being conveyed from the site on the wheels of vehicles.



Consequence:

- Spoil being tracked onto the public road corridors where it is then washed into the existing stormwater drainage infrastructure and is then washed downstream polluting the downstream waterbody.
- Spoil being tracked onto the public road creating dangerous driving conditions for other road users.

Mitigation:

- A shaker grid and wash down facility will be installed at all exits from the construction site. All vehicles leaving the site will have their wheels washed down and pass over the shaker grid to remove any spoil collected on their wheels and retaining the spoil on site.

Maintenance:

- Frequent inspection of the shaker grid to ensure it is clean and still functioning.

12.3 Downstream Site Boundaries

Risk:

- Rainfall runoff falling on the site collecting sediment from the construction site and conveying it overland onto downstream properties and waterbodies.

Consequence:

- Sediment discharge polluting downstream properties and waterbodies.

Mitigation:

- Installation of sediment fences on all downstream boundaries of the site to collect sediment and prevent it discharging onto downstream properties or waterbodies.

Maintenance:

- Regular inspection of the sediment fences to ensure they are functioning correctly and are intact.
- If sediment build up is present it should be removed to ensure correct functionality of the fences.

12.4 Sediment Runoff

Risk:

- Sediment from the construction site washing into the existing stormwater drainage inlet infrastructure.

Consequence:

- The sediment will build up blocking the stormwater infrastructure and preventing stormwater conveyance to the downstream waterbody and impacting drainage upstream.

Mitigation:

- A sediment basin will be installed, and all overland flow directed towards it. The basin will attenuate stormwater flows allowing for the settlement of sediment preventing discharge into the downstream infrastructure.

Maintenance:

- Frequent inspection of the basin to ensure there is sufficient volume for the storage of settlement. If there is insufficient storage the basin should be cleared of sediment and re-established.



Appendix A Civil Design Documentation





SCHOOL INFRASTRUCTURE
NSW



80 MOUNT HALL
ROAD, RAYMOND
TERRACE NSW 2324

FINAL PHASE 3 ISSUE
08.08.2022

Stantec Project Number: 301350909

DRAWING LIST	
NO.	DRAWING NAME
IHS-STNC-XX-XX-DR-C-000001	COVER SHEET, DRAWING REGISTRY AND LOCALITY PLAN
IHS-STNC-XX-XX-DR-C-007001	GENERAL NOTES
IHS-STNC-XX-XX-DR-C-050001	EXISTING CONDITIONS PLAN
IHS-STNC-XX-XX-DR-C-055001	DEMOLITION PLAN
IHS-STNC-XX-XX-DR-C-060001	GENERAL ARRANGEMENT PLAN SITE WIDE
IHS-STNC-XX-XX-DR-C-060101	SITEWORKS PLAN- SHEET 1
IHS-STNC-XX-XX-DR-C-060102	SITEWORKS PLAN- SHEET 2
IHS-STNC-XX-XX-DR-C-060103	SITEWORKS PLAN- SHEET 3
IHS-STNC-XX-XX-DR-C-070001	EROSION AND SEDIMENTCONTROL PLAN
IHS-STNC-XX-XX-DR-C-076001	EROSION AND SEDIMENTCONTROL DETAILS
IHS-STNC-XX-XX-DR-C-100001	BULK EARTHWORKS PLAN
IHS-STNC-XX-XX-DR-C-406001	ROADS DETAILS SHEET 1
IHS-STNC-XX-XX-DR-C-406002	ROADS DETAILS SHEET 2
IHS-STNC-XX-XX-DR-C-406003	ROADS DETAILS SHEET 3
IHS-STNC-XX-XX-DR-C-440001	PAVEMENT PLAN SHEET 1
IHS-STNC-XX-XX-DR-C-440002	PAVEMENT PLAN SHEET 2
IHS-STNC-XX-XX-DR-C-440003	PAVEMENT PLAN SHEET 3
IHS-STNC-XX-XX-DR-C-520101	STORMWATER DRAINAGE PLAN
IHS-STNC-XX-XX-DR-C-526001	STORMWATER DRAINAGE DETAILS SHEET 1
IHS-STNC-XX-XX-DR-C-526002	STORMWATER DRAINAGE DETAILS SHEET 2
IHS-STNC-XX-XX-DR-C-526003	STORMWATER DRAINAGE DETAILS SHEET 3
IHS-STNC-XX-XX-DR-C-527001	STORMWATER DRAINAGE PIT SCHEDULE



The professional's seal on the cover sheet represents that the information on the cover sheet is accurate in designer's professional opinion but does not assume professional responsibility for documents sealed by others that are referenced on the cover sheet. All professionals sealing drawings as a part of the design are professionally responsible for their own sealed documents.

C

B

A

GENERAL NOTES

- ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH COUNCIL / RELEVANT AUTHORITY SPECIFICATIONS AND DETAILS.
- THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH OTHER CONSULTANTS' DRAWINGS AND SPECIFICATIONS AND WITH OTHER SUCH WRITTEN INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ANY DISCREPANCY SHALL BE REFERRED TO THE ENGINEER BEFORE PROCEEDING WITH THE WORK.
- ALL DIMENSIONS ARE IN MILLIMETRES & ALL LEVELS ARE IN METRES, UNO (UNLESS NOTED OTHERWISE)
- NO DIMENSION SHALL BE OBTAINED BY SCALING THE DRAWINGS.
- ALL LEVELS AND SETTING OUT DIMENSIONS SHOWN ON THE DRAWINGS SHALL BE CHECKED ON SITE PRIOR TO COMMENCEMENT OF WORKS.
- EXISTING SERVICES WHERE SHOWN HAVE BEEN PLOTTED FROM SUPPLIED DATA AND SUCH THEIR ACCURACY CAN NOT BE GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH THE LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF WORK.
- CAD FILES / DTM FILES TO BE SUPPLIED IN AUTOCAD FORMAT FOR SETOUT PURPOSES (UPON REQUEST).

SITEWORKS NOTES

- ORIGIN OF LEVELS:- REFER SURVEY NOTES.
- CONTRACTOR MUST VERIFY ALL DIMENSIONS AND EXISTING LEVELS ON SITE PRIOR TO COMMENCEMENT OF WORK. ANY DISCREPANCIES TO BE REPORTED TO STANTEC.
- CONTRACTOR TO CONFIRM ALL CBR VALUES PRIOR TO COMMENCEMENT OF WORKS.
- MAKE SMOOTH CONNECTION WITH EXISTING WORKS.
- 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 SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% MODIFIED MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75).
- PROVIDE 10mm WIDE EXPANSION JOINTS BETWEEN BUILDINGS AND ALL CONCRETE OR UNIT PAVEMENTS.
- ASPHALTIC CONCRETE SHALL CONFORM TO RMS. SPECIFICATION R116.
- ALL BASECOURSE MATERIAL SHALL BE IGNEOUS ROCK QUARRIED MATERIAL TO COMPLY WITH RMS. FORM 3051 (UNBOUND), RMS. FORM 3052 (BOUND) COMPACTED TO MINIMUM 98% MODIFIED DENSITY IN ACCORDANCE WITH AS 1289 5.2.1.
- FREQUENCY OF COMPACTION TESTING SHALL NOT BE LESS THAN 1 TEST PER 50m² BASECOURSE MATERIAL PLACED.
- ALL SUB-BASE COURSE MATERIAL SHALL BE IGNEOUS ROCK QUARRIED MATERIAL TO COMPLY WITH RMS. FORM 3051, 3051.1 AND COMPACTED TO MINIMUM 95% MODIFIED DENSITY IN ACCORDANCE WITH AS 1289 5.2.1.
- FREQUENCY OF COMPACTION TESTING SHALL NOT BE LESS THAN 1 TEST PER 50m² OF SUB-BASE COURSE MATERIAL PLACED.
- AS AN ALTERNATIVE TO THE USE OF IGNEOUS ROCK AS A SUB-BASE MATERIAL IN (B) A CERTIFIED RECYCLED CONCRETE MATERIAL COMPLYING WITH RMS. FORM 3051 AND 3051.1 WILL BE CONSIDERED, SUBJECT TO MATERIAL SAMPLES AND APPROPRIATE CERTIFICATIONS BEING PROVIDED TO THE SATISFACTION OF STANTEC.
- SHOULD THE CONTRACTOR WISH TO USE A RECYCLED PRODUCT THIS SHALL BE CLEARLY INDICATED IN THEIR TENDER AND THE PRICE DIFFERENCE BETWEEN AN IGNEOUS PRODUCT AND A RECYCLED PRODUCT SHALL BE CLEARLY INDICATED.
- WHERE NOTED ON THE DRAWINGS THAT WORKS ARE TO BE CARRIED BY OTHERS, (eg. ADJUSTMENT OF SERVICES), THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CO-ORDINATION OF THESE WORKS.

SURVEY NOTES

- THE EXISTING SITE CONDITIONS SHOWN ON THE FOLLOWING DRAWINGS HAVE BEEN SHOWN AS PER THE TOPOGRAPHIC SURVEY RECEIVED ON 16/06/2022 PREPARED BY ADW JOHNSON PTY LIMITED, REFERENCE '240036', DATED 16/06/2022.
- THE INFORMATION IS SHOWN TO PROVIDE A BASIS FOR DESIGN. STANTEC DOES NOT GUARANTEE THE ACCURACY OR COMPLETENESS OF THE SURVEY BASE OR ITS SUITABILITY AS A BASIS FOR CONSTRUCTION DRAWINGS. SHOULD DISCREPANCIES BE ENCOUNTERED DURING CONSTRUCTION BETWEEN THE SURVEY DATA AND ACTUAL FIELD DATA, CONTACT STANTEC.

CONCRETE NOTES

- ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH AS 3600 CURRENT EDITION WITH AMENDMENTS, EXCEPT WHERE VARIED BY THE CONTRACT DOCUMENTS.
- CONCRETE QUALITY ALL REQUIREMENTS OF THE CURRENT ACSE CONCRETE SPECIFICATION DOCUMENT 1 SHALL APPLY TO THE FORMWORK, REINFORCEMENT AND CONCRETE UNLESS NOTED OTHERWISE.

ELEMENT	AS 3600 F _c MPa AT 28 DAYS	SPECIFIED SLUMP	NOMINAL AGG. SIZE
VEHICULAR BASE	32	60	20
KERBS, PATHS, AND PITS	25	80	20

- CEMENT TYPE SHALL BE (ACSE SPECIFICATION) TYPE SL
- PROJECT CONTROL TESTING SHALL BE CARRIED OUT IN ACCORDANCE WITH AS 1379.
- NO ADMIXTURES SHALL BE USED IN CONCRETE UNLESS APPROVED IN WRITING BY STANTEC.
 - CLEAR CONCRETE COVER TO ALL REINFORCEMENT FOR DURABILITY SHALL BE 40mm TOP AND 70mm FOR EXTERNAL EDGES UNLESS NOTED OTHERWISE.
 - ALL REINFORCEMENT SHALL BE FIRMLY SUPPORTED ON MILD STEEL PLASTIC TIPPED CHAIRS, PLASTIC CHAIRS OR CONCRETE CHAIRS AT NOT GREATER THAN 1m CENTRES BOTH WAYS. BARS SHALL BE TIED AT ALTERNATE INTERSECTIONS.
 - THE FINISHED CONCRETE SHALL BE A DENSE HOMOGENEOUS MASS, COMPLETELY FILLING THE FORMWORK, THOROUGHLY EMBEDDING THE REINFORCEMENT AND FREE OF STONE POCKETS. ALL CONCRETE INCLUDING SLABS ON GROUND AND FOOTINGS SHALL BE COMPACTED AND CURED IN ACCORDANCE WITH R.M.S. SPECIFICATION R83.
 - REINFORCEMENT SYMBOLS:

N DENOTES GRADE 450 N BARS TO AS/NZS 4671 GRADE N

R DENOTES 230 R HOT ROLLED PLAIN BARS TO AS/NZS 4671

SL DENOTES HARD-DRAWN WIRE REINFORCING FABRIC TO AS/NZS 4671

NUMBER OF BARS IN GROUP

BAR GRADE AND TYPE

17 N 20 250

NOMINAL BAR SIZE IN mm

SPACING IN mm

THE FIGURE FOLLOWING THE FABRIC SYMBOL, SL IS THE REFERENCE NUMBER FOR FABRIC TO AS/NZS 4671.
 - FABRIC SHALL BE LAPPED IN ACCORDANCE WITH THE FOLLOWING DETAIL:

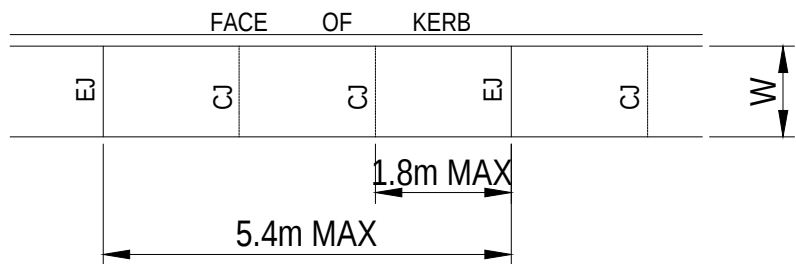
MIN 25

LAP TWO WIRES

JOINTING NOTES

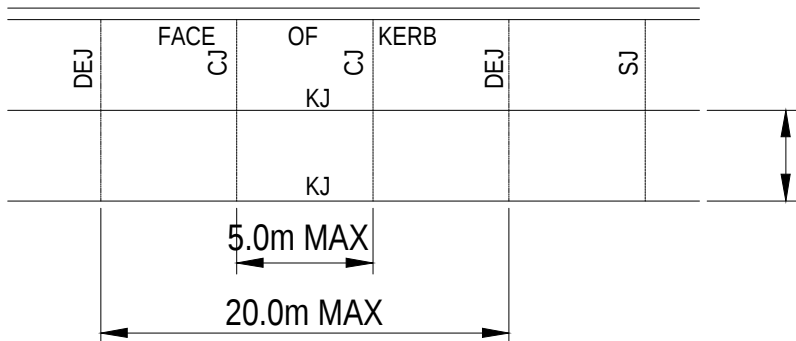
PEDESTRIAN PAVEMENT JOINTS

- ALL PEDESTRIAN PAVEMENTS ARE TO BE JOINTED AS FOLLOWS. (U.N.O)
- EXPANSION JOINTS ARE TO BE LOCATED WHERE POSSIBLE AT TANGENT POINTS OF CURVES AND ELSEWHERE AT MAX. 5.4m CENTRES.
- CONTRACTION JOINTS ARE TO BE LOCATED AT A MAX. SPACING OF 1.8m
- WHERE POSSIBLE JOINTS SHOULD BE LOCATED TO MATCH KERBING AND OR ADJACENT PAVEMENT JOINTS.
- PEDESTRIAN PAVEMENT JOINT DETAIL:



VEHICULAR PAVEMENT JOINTS

- ALL VEHICULAR PAVEMENTS TO BE JOINTED AS FOLLOWS. (U.N.O)
- CONTRACTION JOINTS SHOULD GENERALLY BE LOCATED AT A MAX OF 5.0m CENTRES WITH DOWELED EXPANSION JOINTS AT MAX 20.0m CENTRES
- VEHICULAR PAVEMENT JOINT DETAIL:



KERBING NOTES

- ALL CONCRETE TO HAVE A MINIMUM COMPRESSIVE STRENGTH OF 25 MPa U.N.O IN REINFORCED CONCRETE NOTES.
- ALL KERBS, GUTTERS, DISH DRAINS AND CROSSINGS TO BE CONSTRUCTED ON 100mm GRANULAR BASECOURSE COMPACTED TO MINIMUM 95% MODIFIED DRY DENSITY (AS 1289 5.2.1).
- EXPANSION JOINTS (E.J) 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 MAX 12m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE EXPANSION JOINTS ARE TO MATCH THE JOINT LOCATIONS IN THE SLABS.
- WEAKENED PLANE JOINTS TO BE MIN 3mm WIDE AND LOCATED AT 3m CENTRES EXCEPT FOR INTEGRAL KERBS WHERE THE WEAKENED PLANE JOINTS ARE TO MATCH THE JOINT LOCATIONS IN THE SLABS.
- BROOMED FINISH TO ALL RAMPED AND VEHICULAR CROSSINGS. ALL OTHER KERBING OR DISH DRAINS TO BE STEEL FLOAT FINISHED.
- IN THE REPLACEMENT OF KERB AND GUTTER -> EXISTING ROAD PAVEMENT IS TO BE SAWCUT 900mm U.N.O FROM THE LIP OF GUTTER. UPON COMPLETION OF THE NEW KERB AND GUTTER NEW BASECOURSE AND SURFACE TO BE LAID 600mm WIDE U.N.O.
- EXISTING ALLOTMENT DRAINAGE PIPES ARE TO BE BUILT INTO THE NEW KERB AND GUTTER WITH 100mm DIA HOLE.
- EXISTING KERB AND GUTTER IS TO BE COMPLETELY REMOVED WHERE NEW KERB AND GUTTER IS SHOWN.

PROPOSED SERVICES NOTES

- THIS DRAWING IS TO BE READ IN CONJUNCTION WITH RELEVANT SERVICE AUTHORITY DOCUMENTATION AND CURRENT NSW STREETS OPENING CONFERENCE GUIDE TO CODES AND PRACTICES FOR STREETS OPENING LITERATURE.
- THE CONTRACTOR SHALL ATTEND, MANAGE & SUPERVISE THE PROVISION OF PUBLIC UTILITY SERVICES TO THE WORKS GENERALLY AS INDICATED ON THE SERVICES PLANS, NOTING THAT PRIOR & DURING CONSTRUCTION THE PUBLIC UTILITY AUTHORITIES WILL FINALISE THEIR DOCUMENTATION TO CONSTRUCTION ISSUE STANDARD.
- THE CIVIL CONTRACTOR (TRENCH PROVIDER) IS TO ARRANGE ON SITE MEETING WITH ALL SERVICE AUTHORITIES PRIOR TO THE INSTALLATION OF CONDUITS.
- THE CIVIL CONTRACTOR TO CO-ORDINATE INSTALLATION OF ELECTRICITY, GAS, TELECOMMUNICATION, WATER AND SEWER SERVICES.
- ELECTRICITY, GAS AND TELECOMMUNICATION SERVICES ARE TO BE LAID FOLLOWING THE INSTALLATION OF STORMWATER, SEWER AND WATER SERVICES AND KERB AND GUTTER.
- ALL UTILITY AUTHORITY REPRESENTATIVES TO INSPECT ROAD CROSSINGS PRIOR TO SEALING.
- ALL ELECTRICAL ROAD CROSSINGS TO BE CLASS 6 (ORANGE) uPVC CONDUITS.
- ALL GAS ROAD CROSSINGS TO BE uPVC GREY SEWER GRADE CONDUITS.
- ALL STREET POLES TO BE POSITIONED THE APPROPRIATE DISTANCE FROM FACE OF KERB TO FACE OF POLE ACCORDING TO THE CURRENT NSW STREETS OPENING CONFERENCE GUIDE TO CODES AND PRACTICES FOR STREETS OPENING LITERATURE. CONTRACTOR TO ALLOW TO EXCAVATE AND BACKFILL TRENCH GENERALLY IN ACCORDANCE WITH NOTE 2.
- ALL SERVICE PIT COVERS AND MARKERS ARE TO BE LAID WHOLLY WITHIN THE CONCRETE FOOTPATH. CONTACT SUPERINTENDANT SHOULD DIFFICULTIES ARISE.

TELSTRA - DUTY OF CARE NOTE

TELSTRA'S PLANS SHOW ONLY THE PRESENCE OF CABLES AND PLANT. THEY ONLY SHOW THEIR POSITION RELATIVE TO ROAD BOUNDARIES, PROPERTY FENCES ETC. AT THE TIME OF INSTALLATION AND TELSTRA DOES NOT WARRANT OR HOLD OUT THAT SUCH PLANS ARE ACCURATE THEREAFTER DUE TO CHANGES THAT MAY OCCUR OVER TIME. DO NOT ASSUME DEPTH OR ALIGNMENT OF CABLES OR PLANT AS THESE VARY SIGNIFICANTLY. THE CONTRACTOR HAS A DUTY OF CARE WHEN EXCAVATING NEAR TELSTRA CABLES AND PLANT. BEFORE USING MACHINE EXCAVATORS TELSTRA PLANT MUST FIRST BE PHYSICALLY EXPOSED BY SOFT DIG POT-HOLING TO IDENTIFY IT'S LOCATION TELSTRA WILL SEEK COMPENSATION FOR DAMAGES CAUSED TO IT'S PROPERTY AND LOSSES CAUSED TO TELSTRA AND IT'S CUSTOMERS.

EROSION AND SEDIMENT CONTROL NOTES

GENERAL INSTRUCTIONS

- THE SITE SUPERINTENDENT/ENGINEER WILL ENSURE THAT ALL SOIL AND WATER MANAGEMENT WORKS ARE LOCATED AS DOCUMENTED.
- ALL WORK SHALL BE GENERALLY CARRIED OUT IN ACCORDANCE WITH 2.1. LOCAL AUTHORITY REQUIREMENTS
- EPA REQUIREMENTS
- NSW DEPARTMENT OF HOUSING MANUAL "MANAGING URBAN STORMWATER, SOILS AND CONSTRUCTION", 4th EDITION, MARCH 2004.
- MAINTAIN THE EROSION CONTROL DEVICES TO THE SATISFACTION OF THE SUPERINTENDENT AND THE LOCAL AUTHORITY.
- WHEN STORMWATER PITS ARE CONSTRUCTED, PREVENT SITE RUNOFF ENTERING UNLESS SEDIMENT FENCES ARE ERECTED AROUND PITS.
- CONTRACTOR IS TO ENSURE ALL EROSION & SEDIMENT CONTROL DEVICES ARE MAINTAINED IN GOOD WORKING ORDER AND OPERATE EFFECTIVELY. REPAIRS AND OR MAINTENANCE SHALL BE UNDERTAKEN AS REQUIRED, PARTICULARLY FOLLOWING STORM EVENTS.

LAND DISTURBANCE

- WHERE PRACTICAL, THE SOIL EROSION HAZARD ON THE SITE WILL BE KEPT AS LOW AS POSSIBLE. TO THIS END, WORKS SHOULD BE UNDERTAKEN IN THE FOLLOWING SEQUENCE:
 - INSTALL A SEDIMENT FENCE ALONG THE BOUNDARIES AS SHOWN ON PLAN, REFER DETAIL.
 - CONSTRUCT STABILISED CONSTRUCTION ENTRANCE TO LOCATION AS DETERMINED BY SUPERINTENDENT/ENGINEER. REFER DETAIL.
 - INSTALL SEDIMENT BASIN AS SHOWN ON PLAN
 - INSTALL SEDIMENT TRAPS AS SHOWN ON PLAN.
- UNDERTAKE SITE DEVELOPMENT WORKS IN ACCORDANCE WITH THE ENGINEERING PLANS. WHERE POSSIBLE, PHASE DEVELOPMENT SO THAT LAND DISTURBANCE IS CONFINED TO AREAS OF WORKABLE SIZE.

EROSION CONTROL

- DURING WINDY WEATHER, LARGE, UNPROTECTED AREAS WILL BE KEPT MOIST (NOT WET) BY SPRINKLING WITH WATER TO KEEP DUST UNDER CONTROL.
- FINAL SITE LANDSCAPING WILL BE UNDERTAKEN AS SOON AS POSSIBLE AND WITHIN 20 WORKING DAYS FROM COMPLETION OF CONSTRUCTION ACTIVITIES.

SEDIMENT CONTROL

- STOCKPILES WILL NOT BE LOCATED WITHIN 2 METRES OF HAZARD AREAS, INCLUDING LIKELY AREAS OF CONCENTRATED OR HIGH VELOCITY FLOWS SUCH AS WATERWAYS. WHERE THEY ARE BETWEEN 2 AND 5 METRES FROM SUCH AREAS, SPECIAL SEDIMENT CONTROL MEASURES SHOULD BE TAKEN TO MINIMISE POSSIBLE POLLUTION TO DOWNSLOPE WATERS, E.G. THROUGH INSTALLATION OF SEDIMENT FENCING.
- ANY SAND USED IN THE CONCRETE CURING PROCESS (SPREAD OVER THE SURFACE) WILL BE REMOVED AS SOON AS POSSIBLE AND WITHIN 10 WORKING DAYS FROM PLACEMENT.
- WATER WILL BE PREVENTED FROM ENTERING THE PERMANENT DRAINAGE SYSTEM UNLESS IT IS RELATIVELY SEDIMENT FREE, I.E. THE CATCHMENT AREA HAS BEEN PERMANENTLY LANDSCAPED AND/OR ANY LIKELY SEDIMENT HAS BEEN FILTERED THROUGH AN APPROVED STRUCTURE.
- TEMPORARY SOIL AND WATER MANAGEMENT STRUCTURES WILL BE REMOVED ONLY AFTER THE LANDS THEY ARE PROTECTING ARE REHABILITATED.

OTHER MATTERS

- ACCEPTABLE RECEPTORS WILL BE PROVIDED FOR CONCRETE AND MORTAR SURRIES, PAINTS, ACID WASHINGS, LIGHT-WEIGHT WASTE MATERIALS AND LITTER.
- ANY EXISTING TREES WHICH FORM PART OF THE FINAL LANDSCAPING PLAN WILL BE PROTECTED FROM CONSTRUCTION ACTIVITIES BY:
 - PROTECTING THEM WITH BARRIER FENCING OR SIMILAR MATERIALS INSTALLED OUTSIDE THE DRIP LINE
 - ENSURING THAT NOTHING IS NAILED TO THEM
 - PROHIBITING PAVING, GRADING, SEDIMENT WASH OR PLACING OF STOCKPILES WITHIN THE DRIP LINE EXCEPT UNDER THE FOLLOWING CONDITIONS.
 - ENCROACHMENT ONLY OCCURS ON ONE SIDE AND NO CLOSER TO THE TRUNK THAN EITHER 1.5 METRES OR HALF THE DISTANCE BETWEEN THE OUTER EDGE OF THE DRIP LINE AND THE TRUNK, WHICH EVER IS THE GREATER
 - A DRAINAGE SYSTEM THAT ALLOWS AIR AND WATER TO CIRCULATE THROUGH THE ROOT ZONE (E.G. A GRAVEL BED) IS PLACED UNDER ALL FILL LAYERS OF MORE THAN 300 MILLIMETRES DEPTH
 - CARE IS TAKEN NOT TO CUT ROOTS UNNECESSARILY NOR TO COMPACT THE SOIL AROUND THEM.

BULK EARTHWORKS NOTES

- REFER SPECIFICATIONS NOTES FOR EARTHWORKS GENERAL REQUIREMENTS.
- STRIP EXISTING TOPSOIL IN CONSULTATION WITH THE GEOTECHNICAL ENGINEER / REPORT. FOR THE PURPOSES OF EARTHWORKS CALCULATIONS A TOPSOIL STRIPPING DEPTH OF 300mm HAS BEEN ASSUMED. GROUND SLAB DEPTH OF 150mm HAS BEEN ASSUMED WHERE REQUIRED.
- NO ALLOWANCE HAS BEEN MADE FOR BULKING FACTORS. NOTE ALL VOLUMES DEPICTED ARE SOLID VOLUMES ONLY AND MAY NOT REFLECT DETAILED EARTHWORKS.
- NO ALLOWANCE HAS BEEN MADE FOR DETAILED EARTHWORKS; ie SERVICE TRENCHING, DETAILED EXCAVATION, FOOTINGS, RETAINING WALLS AND THE LIKE.
- THE CONTRACTOR SHALL USE FINAL SURFACE LEVELS AND TYPICAL PAVEMENT DETAILS FOR ACTUAL EARTHWORKS LEVELS.
- BULK EARTHWORKS ARE BASED ON THE SETDOWN TO UNDERSIDE OF PAVEMENT BUILDUPS AS SPECIFIED FROM FINISHED SURFACE LEVELS.
- SITE STRIPPING VOLUMES HAVE NOT BEEN INCLUDED IN BULK EARTHWORKS CALCULATIONS.

STORMWATER DRAINAGE NOTES

- ON COMPLETION OF STORMWATER INSTALLATION, ALL DISTURBED AREAS MUST BE RESTORED TO ORIGINAL CONDITION, INCLUDING KERBS, FOOTPATHS, CONCRETE AREAS, GRAVEL AND GRASSED AREAS AND ROAD PAVEMENTS, UNLESS DIRECTED OTHERWISE.
- PIPES 300 DIA. AND LARGER TO BE REINFORCED CONCRETE CLASS '3' APPROVED SPIGOT AND SOCKET WITH RUBBER RING JOINTS. U.N.O.
- PIPES UP TO 300 DIA SHALL BE SEWER GRADE uPVC WITH SOLVENT WELDED JOINTS.
- EQUIVALENT STRENGTH VCP OR FRC PIPES MAY BE USED.
- ALL STORMWATER DRAINAGE LINES UNDER PROPOSED BUILDING SLABS TO BE uPVC PRESSURE PIPE GRADE 6. ENSURE ALL VERTICALS AND DOWNPIPES ARE uPVC PRESSURE PIPE, GRADE 6 FOR A MIN OF 3.0m IN HEIGHT.
- PIPES TO BE INSTALLED TO TYPE HS3 (ROAD) HS2 (LOTS) SUPPORT IN ACCORDANCE WITH AS 3725 (2007) IN ALL CASES BACKFILL TRENCH WITH SAND TO 300mm ABOVE PIPE. WHERE PIPE IS UNDER PAVEMENTS BACKFILL REMAINDER OF TRENCH TO UNDERSIDE OF PAVEMENT WITH SAND OR APPROVED GRANULAR MATERIAL COMPACTED IN 150mm LAYERS TO MINIMUM 98% STANDARD MAXIMUM DRY DENSITY IN ACCORDANCE WITH AS 1289 5.2.1. (OR A DENSITY INDEX OF NOT LESS THAN 75)
- ALL INTERNAL WORKS WITHIN PROPERTY BOUNDARIES ARE TO COMPLY WITH THE REQUIREMENTS OF AS 3600 3.1 (2006) AND AS/NZS 3600 3.2 (2010).
- PRECAST PITS MAY BE USED EXTERNAL TO THE BUILDING SUBJECT TO APPROVAL BY STANTEC.
- ENLARGERS, CONNECTIONS AND JUNCTIONS TO BE PREFABRICATED 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.
- CARE IS TO BE TAKEN WITH LEVELS OF STORMWATER LINES. GRADES SHOWN ARE NOT TO BE REDUCED WITHOUT APPROVAL.
- GRATES AND COVERS SHALL CONFORM TO AS 3996.
- ALL INTERNAL PIT DIMENSIONS TO CONFORM TO AS3500.3 TABLE 7.5.2.1
- AT ALL TIMES DURING CONSTRUCTION OF STORMWATER PITS, ADEQUATE SAFETY PROCEDURES SHALL BE TAKEN TO ENSURE AGAINST THE POSSIBILITY OF PERSONNEL FALLING DOWN PITS.
- ALL EXISTING STORMWATER DRAINAGE LINES AND PITS THAT ARE TO REMAIN ARE TO BE INSPECTED AND CLEANED. DURING THIS PROCESS ANY PART OF THE STORMWATER DRAINAGE SYSTEM THAT WARRANTS REPAIR SHALL BE REPORTED TO THE SUPERINTENDENT/ENGINEER FOR FURTHER DIRECTIONS.
- THE CONTRACTOR IS TO ORGANISE AND STAGE CONSTRUCTION WORK AND UNDERTAKE ANY DIVERSION WORKS TO ENSURE THE EXISTING DRAINAGE IS ABLE TO CONVEY ALL STORMWATER FLOWS THAT MAY OCCUR DURING THE PERIOD OF THE CONSTRUCTION WORKS.
- ANY DAMAGE TO THE WORKS DUE TO STORMWATER FLOWS OR FLOODING DURING THE CONSTRUCTION PERIOD IS AT THE CONTRACTOR'S RISK.
- SETOUT POINTS FOR STORMWATER STRUCTURES ARE AS INDICATED IN THE DRAWINGS UNLESS OTHERWISE NOTED.
- ALL PAVED SURFACE LEVELS AND GRADES TO BE COORDINATED WITH GULLY PIT LEVELS TO ENSURE NO UNDRAINED AREAS OCCUR.
- THE SIDES OF ALL PIPE TRENCH EXCAVATIONS DEEPER THAN 1.0m SHALL BE FULLY SUPPORTED AT ALL TIMES AND HAVE APPROPRIATE EDGE PROTECTION.
- ALL NEW PIPES TO BE LAID IN AN UPSTREAM DIRECTION. THE LINE, LEVEL AND LOCATION OF EXISTING SERVICES CROSSING THE LINE OF THE PROPOSED STORMWATER PIPE SHALL BE DETERMINED BY EXCAVATION PRIOR TO THE LAYING OF THE PIPE. IF CONFLICT IS APPARENT, THE ENGINEER SHALL BE NOTIFIED AND INSTRUCTIONS AS TO WHETHER THE EXISTING SERVICE IS TO BE ADJUSTED OR THE PROPOSED PIPE INVERT ALTERED WILL BE ISSUED.
- PIPE BEDDING, HAUNCH AND BACKFILL TO BE AS SHOWN ON THE CIVIL DETAILS DRAWINGS AND THE CIVIL SPECIFICATION.
- SUBSOIL DRAINAGE PIPES TO BE SLOTTED PIPE AND FILTER SOCK CLASS 1000 TO AS2439 PART 1 LAID AT PREFERABLE MINIMUM GRADE 1 IN 100 OR ABSOLUTE MINIMUM 1 IN 200 WHERE LIMITED BY OUTFALL LEVELS.
- STORMWATER STRUCTURES ARE TO BE CONSTRUCTED PERPENDICULAR TO THE INCOMING PIPEWORK UNLESS OTHERWISE NOTED.
- PRECAST COMPONENTS SHALL BE CONNECTED BY MEANS OF EPOXY OR CHEMICAL GROUTED BARS OF THE SAME DIAMETER AND SPACING AS THE SMALLER BARS IN THE RESPECTIVE COMPONENTS.
- PRE-CAST PITS MUST HAVE LIFTING ANCHORS.
- WORKING LOADS ARE THOSE DUE TO FILL MATERIAL AND STANDARD HIGHWAY VEHICLES AS PER AS3725. CONSTRUCTION LOADS HAVE NOT BEEN ALLOWED FOR.
- ALL EXPOSED EDGES ON STORMWATER PITS TO BE ROUNDED TO 5mm RAD. UNO.

Notes		Issue Status	Colour Disclaimer	Client/Project Logo	Client/Project	Title
					SINSW	GENERAL NOTES
					IRRAWANG HIGH SCHOOL	
					RAYMOND TERRACE, NSW 2324	
					File Name: IHS-STNC-XX-XX-DR-C-007001.DWG	
					CPO	
					JMB	
					JMB	
					2022.07.14	
					Dwn.	
					Dign.	
					Chkd.	
					YYYY.MM.DD	
					Project No.	Scale
					IHS-SINSW	-
					Revision	Drawing No.
					c	IHS-STNC-XX-XX-DR-C-007001



Notes

C	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
B	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.28
A	95% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.14

Issued/Revision

By

Appd

YYYY.MM.DD

Issue Status

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IRRAWANG HIGH SCHOOL

RAYMOND TERRACE, NSW 2324

File Name: IHS-STNC-XX-XX-DR-C-055001.DWG

CPO	JMB	JMB	2022.07.14
Dwn.	Dign.	Chkd.	YYYY.MM.DD

Title

DEMOLITION PLAN

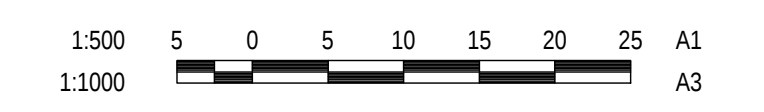
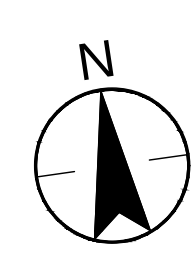
Project No. IHS-SINSW

Revision c

Scale 1:500

Drawing No. IHS-STNC-XX-XX-DR-C-055001

Penins 8/8/2022 7:41:12 PM R:\PROJECTS\CONR P\30130099\PROJECT DOCUMENTATION\DRAWINGS & DESIGN\MSH\SET



Notes

C	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
B	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.28
A	95% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.14

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Client/Project
SINSW

IRRAWANG HIGH SCHOOL

RAYMOND TERRACE, NSW 2324

File Name: IHS-STNC-XX-XX-DR-C-060001.DWG

CPO	JMB	JMB	2022.07.14
Dwn.	Dign.	Chkd.	YYYY.MM.DD

Title
GENERAL ARRANGEMENT PLAN
SITE WIDE

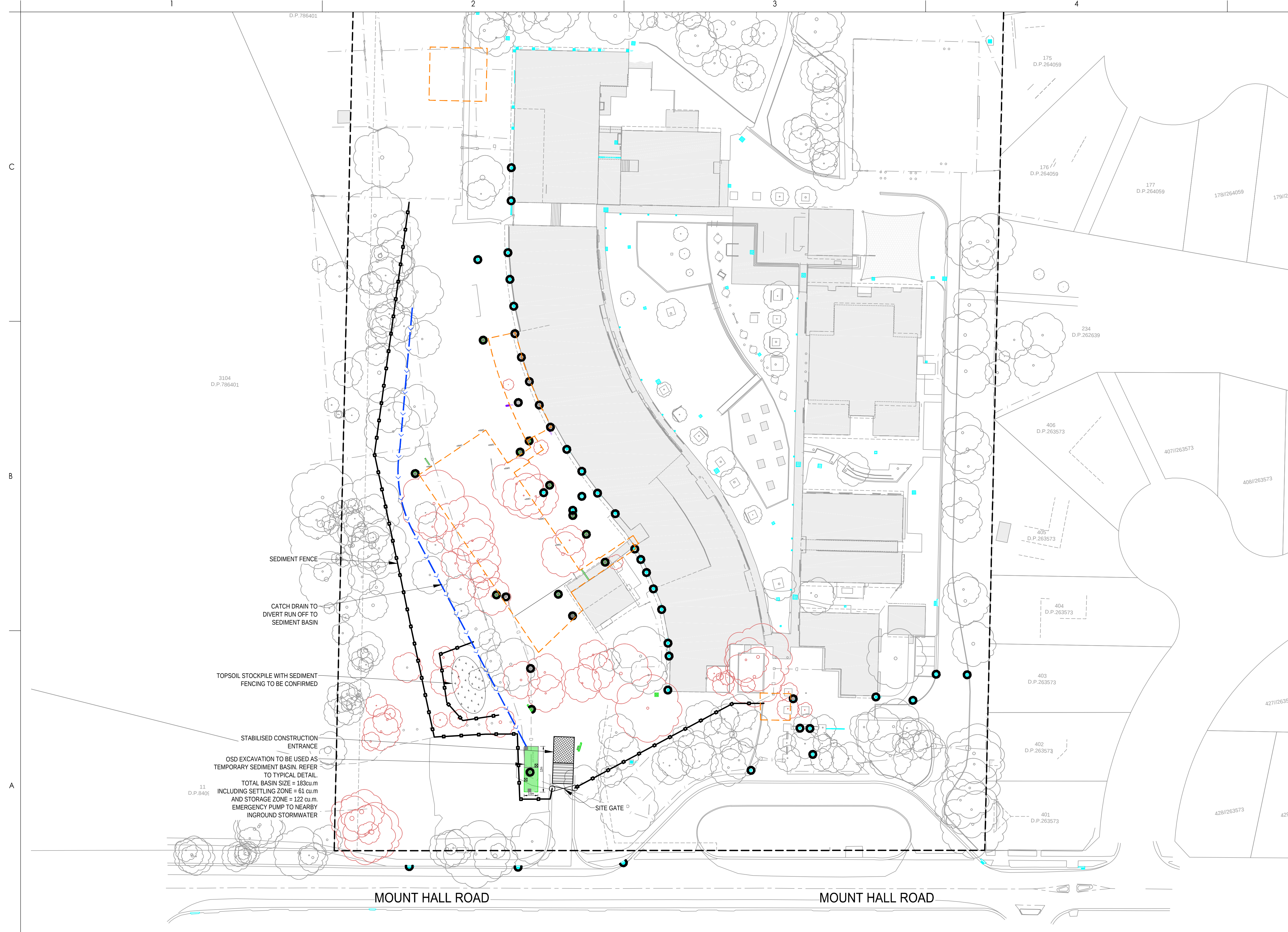
Project No.
IHS-SINSW

Revision
c

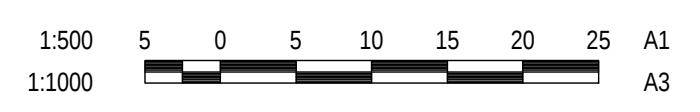
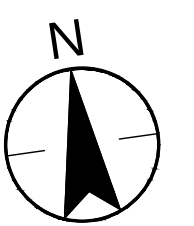
Scale
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Drawing No.
IHS-STNC-XX-XX-DR-C-060001

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LEGEND	
	SITE BOUNDARY
	EXISTING BUILDINGS
	PROPOSED BUILDINGS
	VEHICLE SHAKEDOWN DEVICE
	PROPOSED SILT FENCE
	SITE GATE
	SANDBAG PIT PROTECTION
	SEDIMENT TRAP FOR KERB INLET PITS
	PROPOSED STOCKPILE
	ON SITE DETENTION (OSD) TANK
	PROPOSED JUNCTION PIT
	EXISTING JUNCTION PIT
	PROPOSED GRATED PIT
	EXISTING GRATED PIT
	PROPOSED KERB INLET PIT
	EXISTING KERB INLET PIT
	EXISTING TELSTRA
	EXISTING ELECTRICAL
	EXISTING WATER
	EXISTING GAS
	EXISTING SEWER
	EXISTING TREE TO REMAIN
	EXISTING TREE TO BE REMOVED



Notes

C	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
B	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.28
A	95% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.14

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Issue Status

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Client/Project

SINSW

IRRAWANG HIGH SCHOOL

RAYMOND TERRACE, NSW 2324

File Name: IHS-STNC-XX-XX-DR-C-070001.DWG

CPO	JMB	JMB	2022.07.14
Dwn.	Dign.	Chkd.	YYYY.MM.DD

Title

EROSION AND SEDIMENT CONTROL PLAN

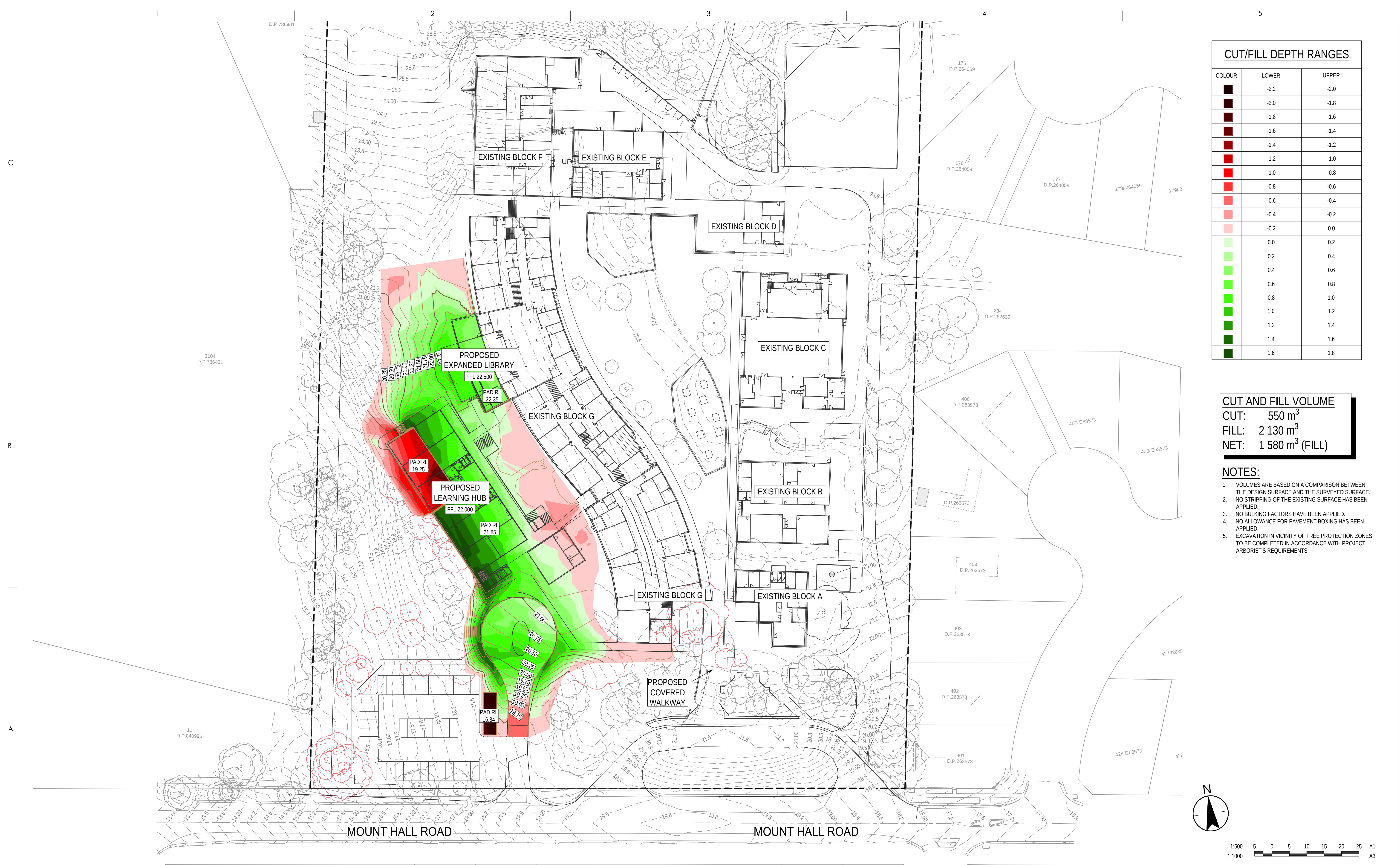
Project No. IHS-SINSW

Scale 1:500

Revision c

Drawing No. IHS-STNC-XX-XX-DR-C-070001

Penrose 8/8/2022 7:01:33 PM B:\PROJECTS\CONTR\30130099\PROJECT DOCUMENTATION\DRAWINGS & DESIGN\A3 SHEET SET



CUT/FILL DEPTH RANGES		
COLOUR	LOWER	UPPER
	-2.2	-2.0
	-2.0	-1.8
	-1.8	-1.6
	-1.6	-1.4
	-1.4	-1.2
	-1.2	-1.0
	-1.0	-0.8
	-0.8	-0.6
	-0.6	-0.4
	-0.4	-0.2
	-0.2	0.0
	0.0	0.2
	0.2	0.4
	0.4	0.6
	0.6	0.8
	0.8	1.0
	1.0	1.2
	1.2	1.4
	1.4	1.6
	1.6	1.8

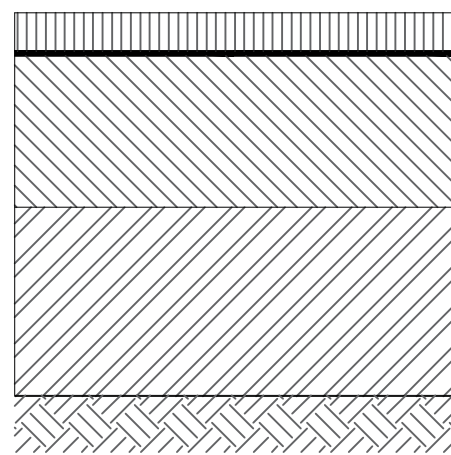
CUT AND FILL VOLUME	
CUT:	550 m ³
FILL:	2 130 m ³
NET:	1 580 m ³ (FILL)

NOTES:

1. VOLUMES ARE BASED ON A COMPARISON BETWEEN THE DESIGN SURFACE AND THE SURVEYED SURFACE.
2. NO STRIPPING OF THE EXISTING SURFACE HAS BEEN APPLIED.
3. NO BULKING FACTORS HAVE BEEN APPLIED.
4. NO ALLOWANCE FOR PAVEMENT BOXING HAS BEEN APPLIED.
5. EXCAVATION IN VICINITY OF TREE PROTECTION ZONES TO BE COMPLETED IN ACCORDANCE WITH PROJECT ARBORIST'S REQUIREMENTS.

[illegible]

C

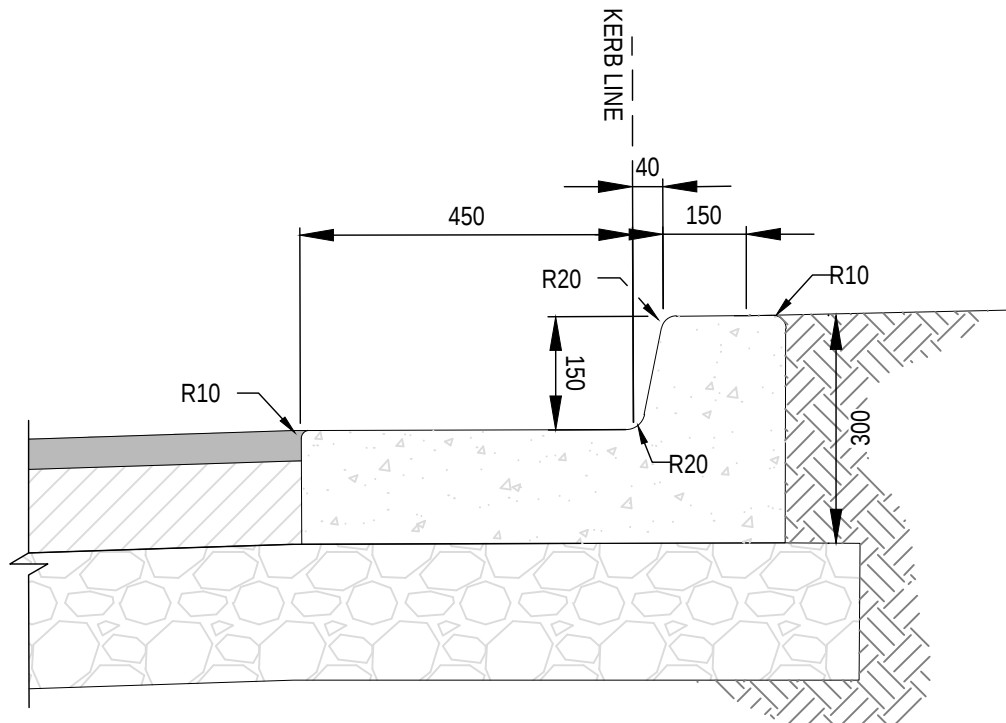


50mm AC10 SURFACING
7mm PRIMER SEAL
200mm THICK BASE.
DGB20 (CBR 80),
98% MODIFIED COMPACTION.

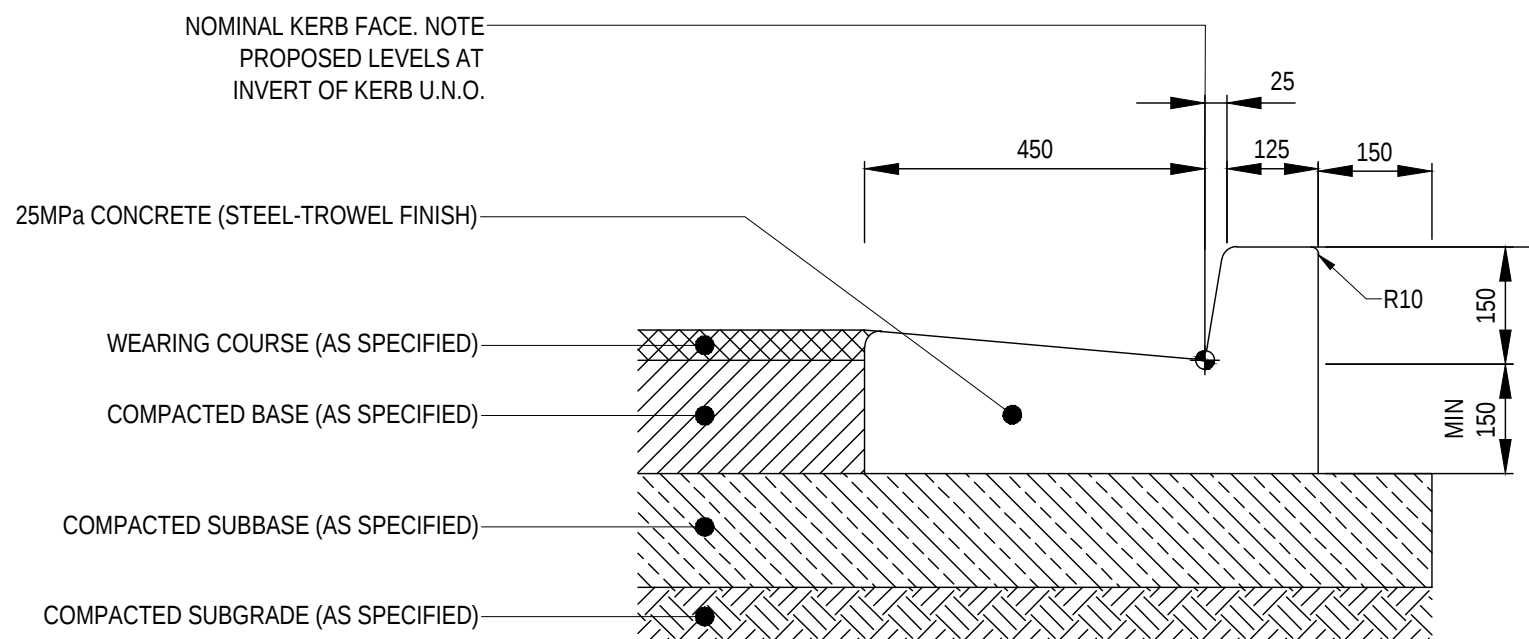
250mm THICK SUB-BASE.
DGS40 (CBR 45),
95% MODIFIED COMPACTION.

COMPACTED SUBGRADE (CBR 3%)

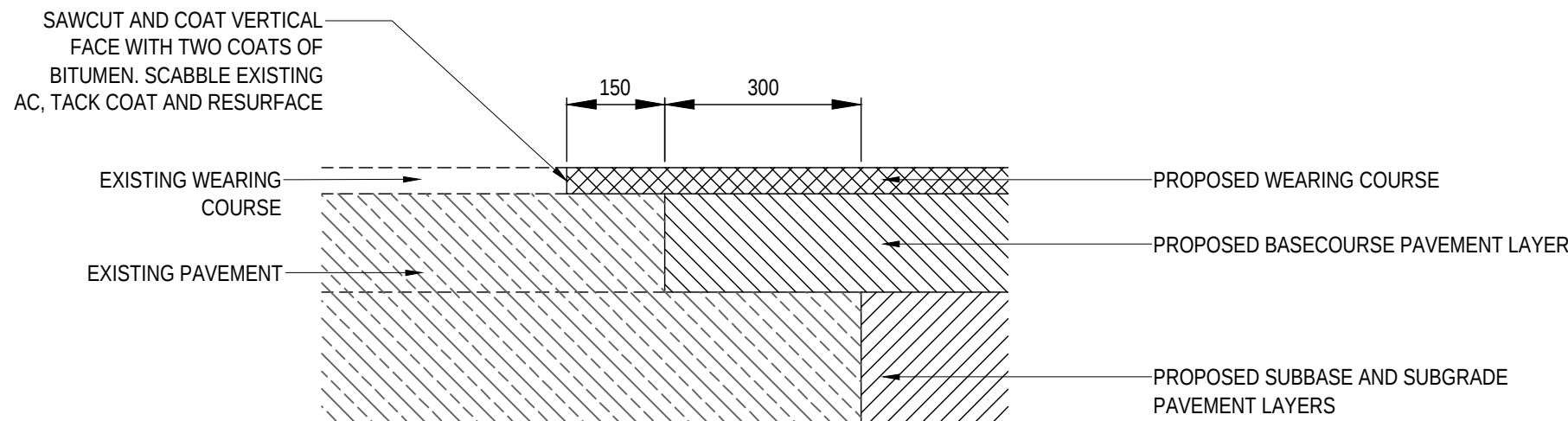
ASPHALT PAVEMENT DETAIL
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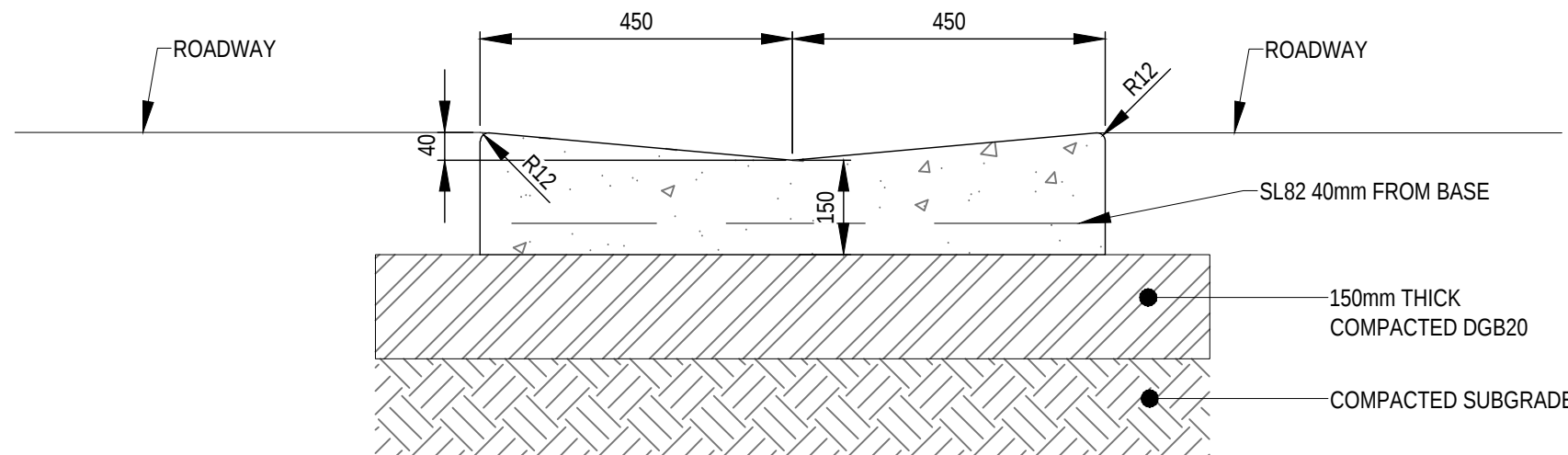
KERB AND TOE (K&T)
(SCALE 1:10)



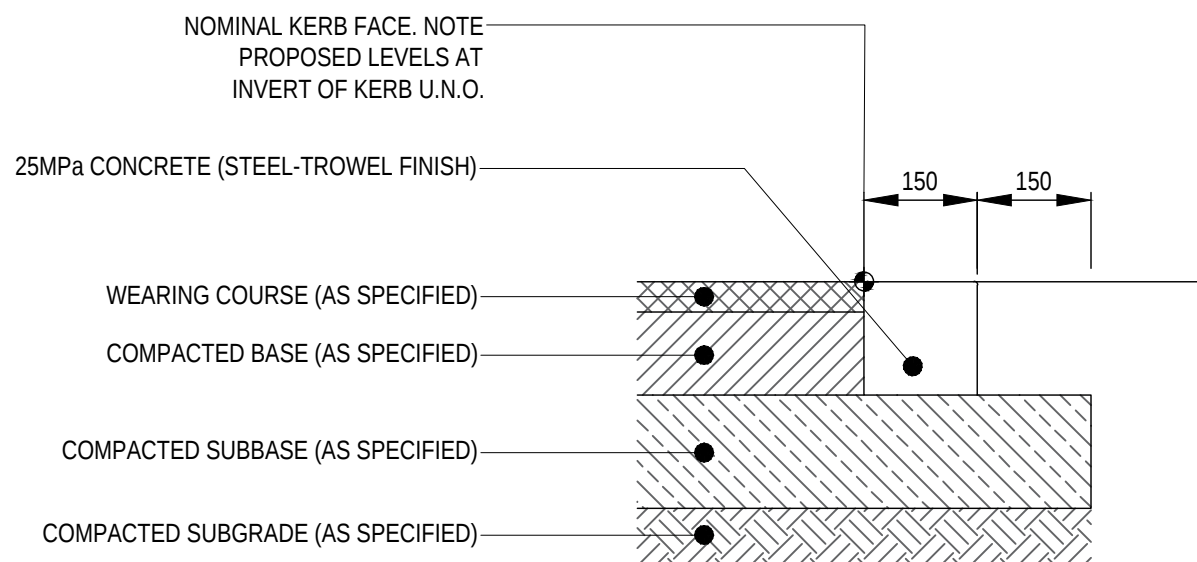
KERB AND GUTTER DETAIL (K+G)
(SCALE 1:10)



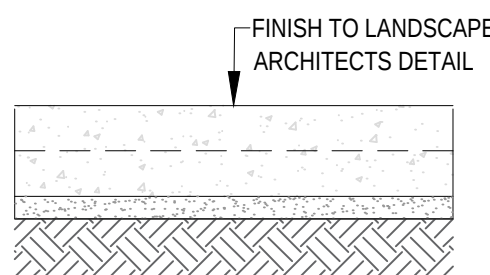
FULL DEPTH PAVEMENT CONNECTION TO EXISTING PAVEMENT
N.T.S



DISH DRAIN (DD)
SCALE 1:10



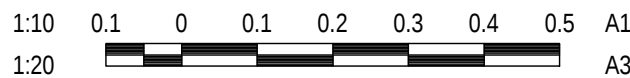
FLUSH KERB DETAIL (FK)
(SCALE 1:10)



120mm CONCRETE 25MPa WITH
SL72 MESH CENTRALLY PLACED
30mm COMPACTED SAND BEDDING
COMPACTED SUBGRADE (CBR 3%)

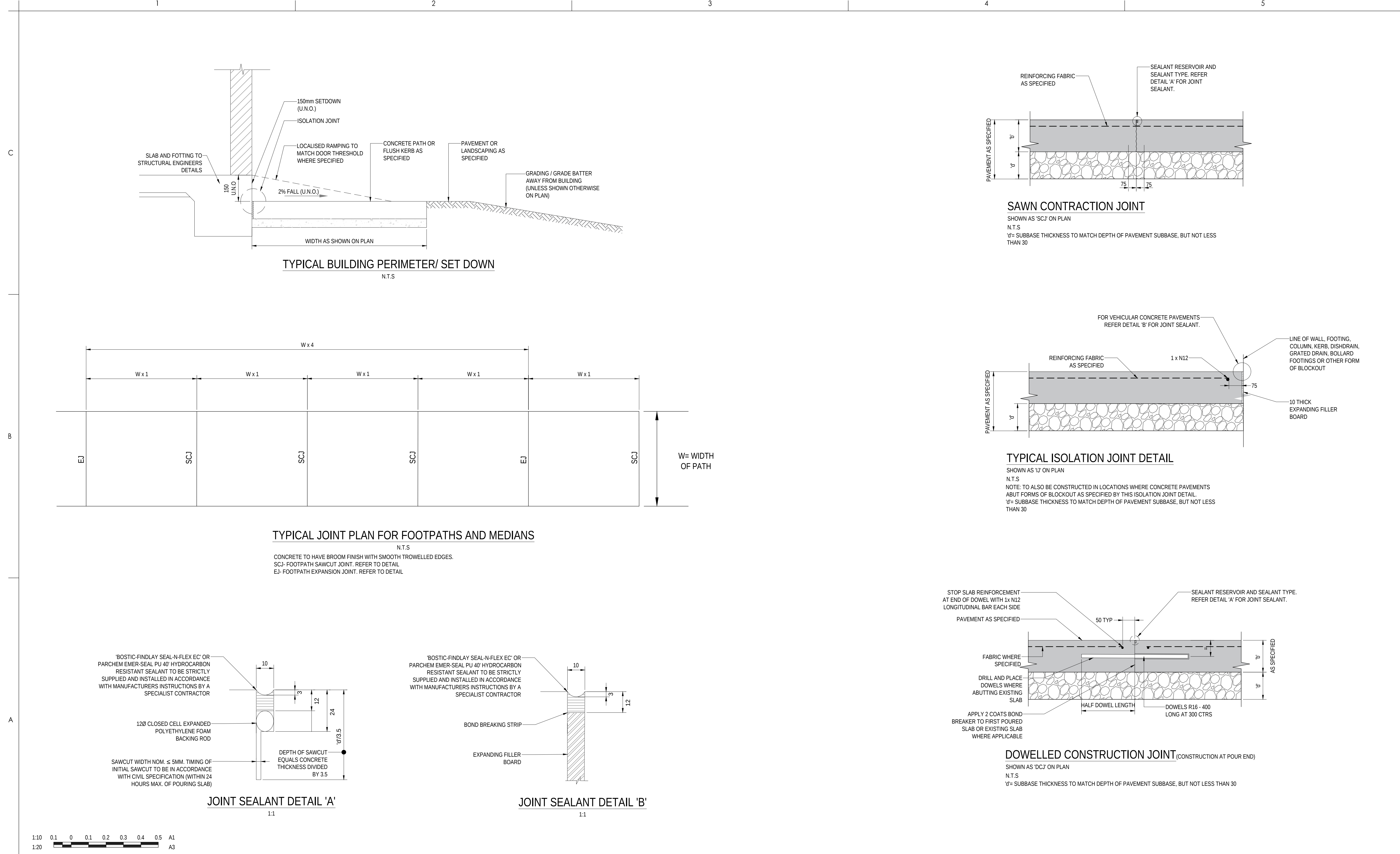
CONCRETE FOOTPATH DETAIL
(SCALE 1:10)

A



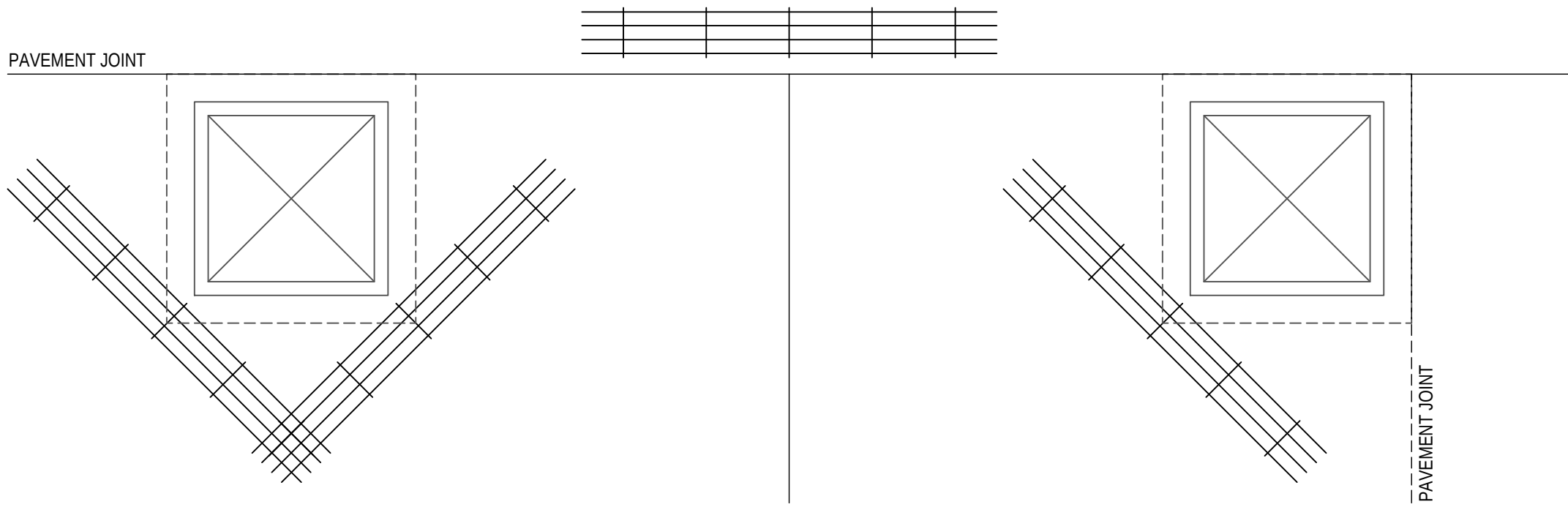
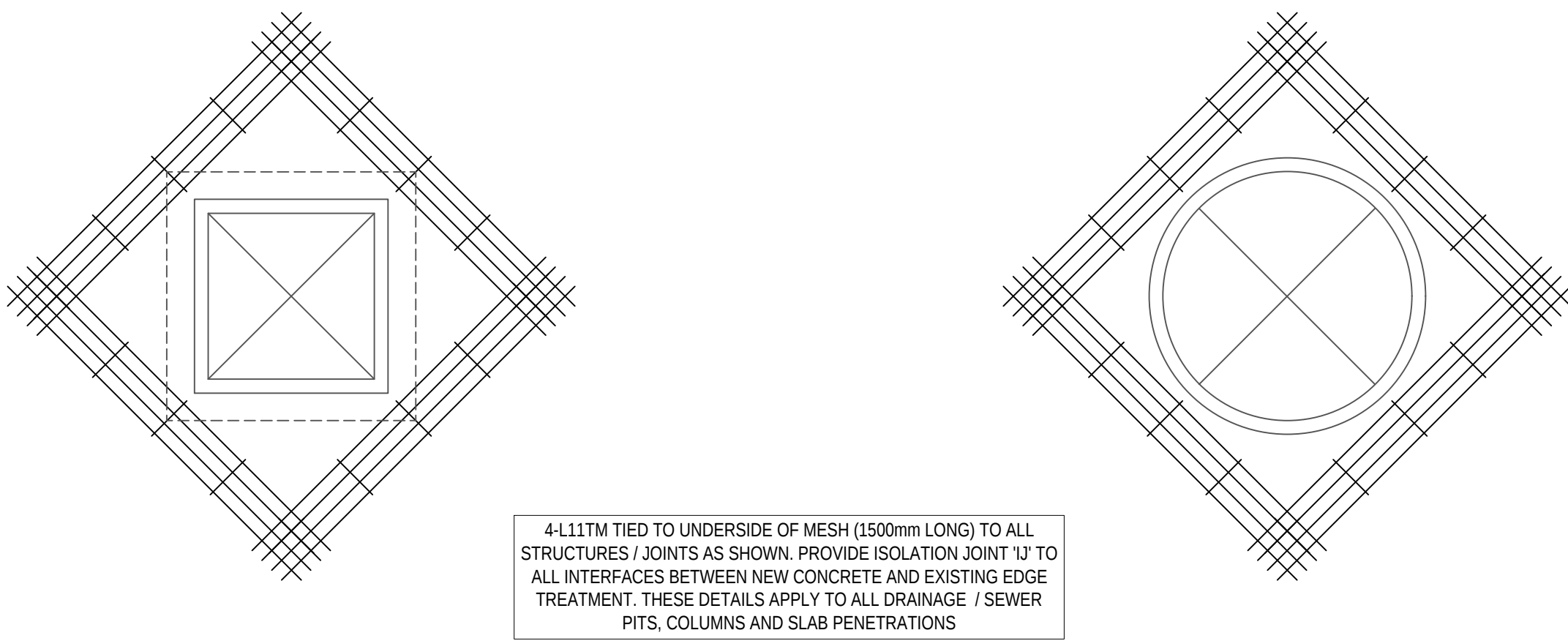
Perkins 8/8/2022 7:00:02 PM I:\PROJECTS\CONCRETE\130099\PROJECT DOCUMENTATION\DRAWINGS & DESIGN\130099.DWG
P:\130099\PROJECT DOCUMENTATION\DRAWINGS & DESIGN\130099.DWG

Notes				Issue Status				Colour Disclaimer				Client/Project Logo				Client/Project				Title			
				PRELIMINARY NOT FOR CONSTRUCTION				Stantec								SINSW				ROADS DETAILS SHEET 1			
				This document is suitable only for the purpose noted above. Use of this document for any other purpose is not permitted.				Stantec Australia Pty. Ltd. Level 6, Building B 207 Pacific Highway St Leonards, NSW 2045 Tel: +61 2 8484 7000				IRRAWANG HIGH SCHOOL				RAYMOND TERRACE, NSW 2324				Project No. IHS-SINSW			
				CPO JMB 2022.08.08 CPO JMB 2022.07.28 CPO JMB 2022.07.14 By Appd YYYY.MM.DD				The Copyrights to all designs and drawings are the property of Stantec. Reproduction or use for any purpose other than that authorised by Stantec is forbidden. The Contractor shall verify and be responsible for all dimensions. DO NOT scale the drawing - any errors or omissions shall be reported to Stantec without delay.				File Name: IHS-STNC-XX-XX-DR-C-406001.DWG				CPO JMB JMB 2022.07.14 Dwn. Dign. Chkd. YYYY.MM.DD				Revision c			
				Issued/Revision				Copyright Reserved				Scale AS SHOWN				Drawing No. IHS-STNC-XX-XX-DR-C-406001							

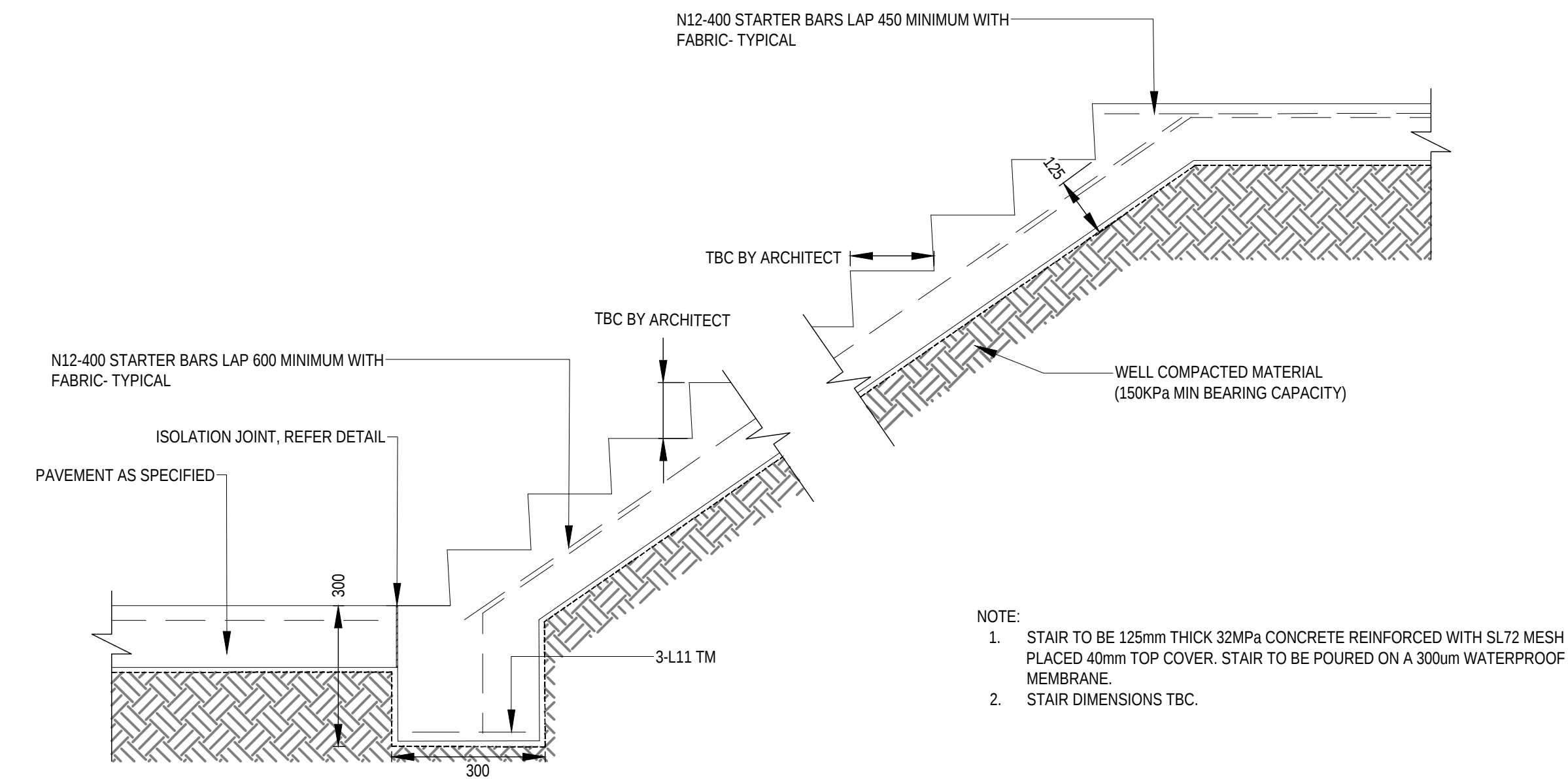


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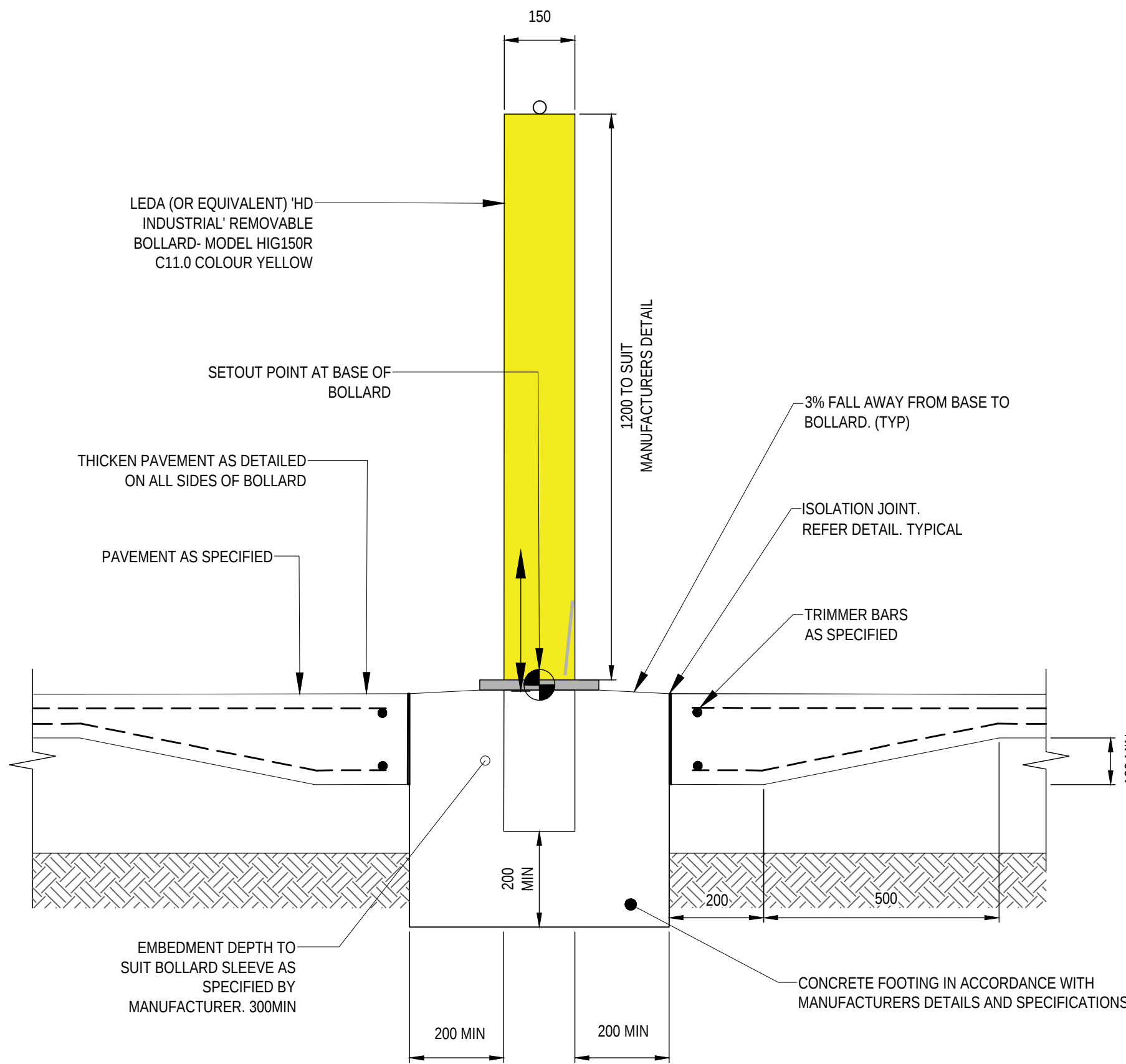
Revised: 8/8/2022 4:59 PM BY: POCOCK, CONNOR
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TRIMMER BAR ARRANGEMENTS
(NOT TO SCALE)

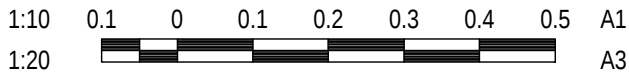


STAIRS ON GRADE
SCALE NTS



REMOVABLE STEEL BOLLARD 'TYPE B1' (CONCRETE PAVEMENT)

- N.T.S
- NOTE:
1. ALL ELEMENTS TO BE GALVANISED
 2. CONTRACTOR TO CONFIRM SERVICES LOCATIONS ON SITE AND ENSURE BOLLARDS DO NOT CONFLICT WITH PROPOSED OR EXISTING SERVICES.
 3. BOLLARD TO BE STRICTLY INSTALLED TO MANUFACTURERS DETAILS AND SPECIFICATIONS



Notes

C	FINAL PHASE 3 ISSUE	CPO	JMB	2022.08.08
B	100% SCHEMATIC DESIGN PROCESS	CPO	JMB	2022.07.28
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SINSW

IRRAWANG HIGH SCHOOL

RAYMOND TERRACE, NSW 2324

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2022.07.14

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YYYY.MM.DD

Title

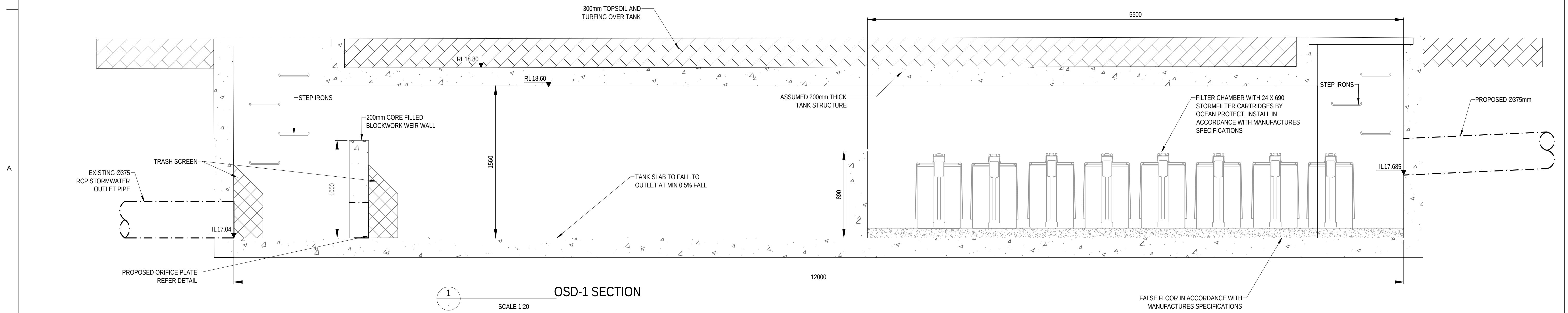
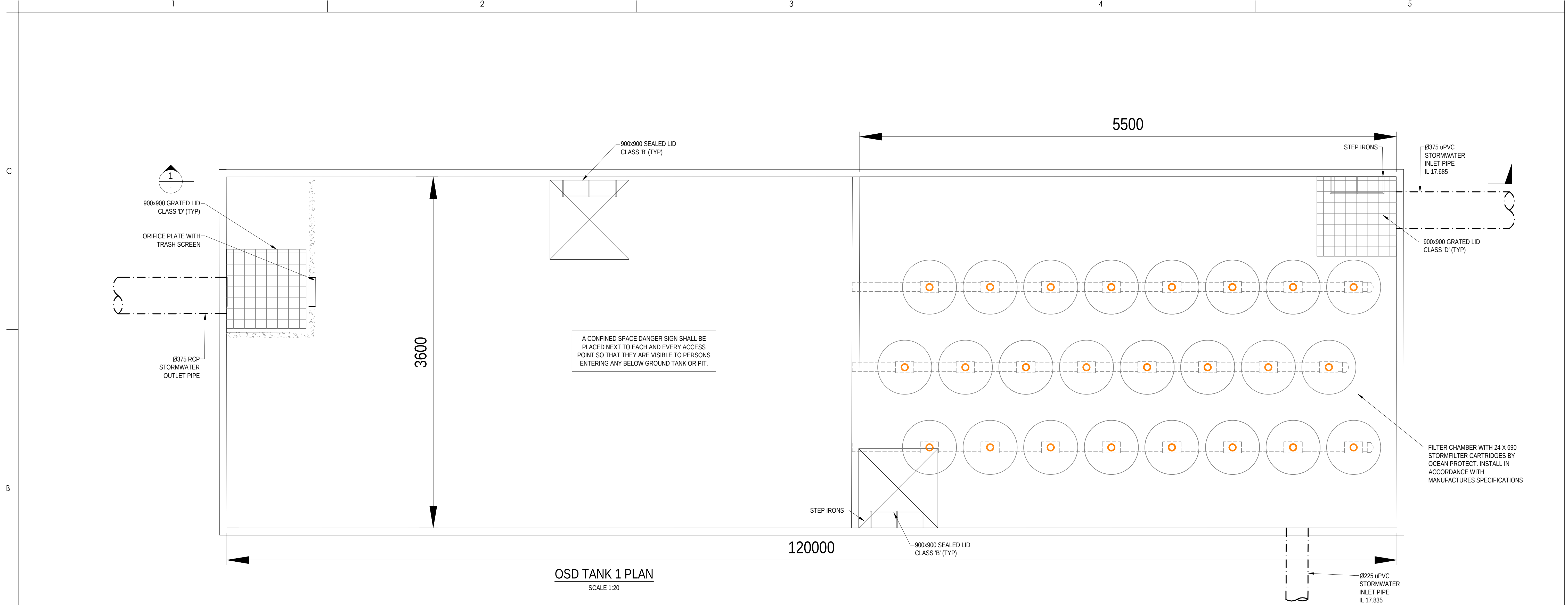
ROADS DETAILS SHEET 3

Project No. IHS-SINSW

Scale AS SHOWN

Revision c

Drawing No. IHS-STNC-XX-XX-DR-C-406003



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Appendix B MUSIC Link Report



MUSIC-*link* Report

Project Details		Company Details	
Project:	Irrawang High School	Company:	Stantec
Report Export Date:	26-Jul-22	Contact:	Lauren Todd
Catchment Name:	80 Mount Hall Rd Raymond Terrace (Rev1)	Address:	Level 6, Building B, 207 Pacific Hwy, St Leonards, New South Wales 2065
Catchment Area:	0.854ha	Phone:	+61 2 8484 7142
Impervious Area*:	83.07%	Email:	Lauren.Todd@stantec.com
Rainfall Station:	WILLIAMTOWN RAAF - Station 061078 - Zone C		
Modelling Time-step:	6 Minutes		
Modelling Period:	1-01-1998 - 31-12-2007 11:54:00 PM		
Mean Annual Rainfall:	1238mm		
Evapotranspiration:	1394mm		
MUSIC Version:	6.3.0		
MUSIC-link data Version:	6.34		
Study Area:	Raymond Terrace		
Scenario:	Default Catchment - Sandy soils		

* takes into account area from all source nodes that link to the chosen reporting node, excluding Import Data Nodes

Treatment Train Effectiveness		Treatment Nodes		Source Nodes	
Node: 90/65/45/90	Reduction	Node Type	Number	Node Type	Number
Flow	0.00107%	Sedimentation Basin Node	1	Urban Source Node	4
TSS	90.1%	GPT Node	1		
TP	76.4%	Generic Node	1		
TN	50.1%				
GP	100%				

Comments

This report was generated to should the compliance of the proposed Stormwater Quality Improvement Devices (SQID's). Further details have been described in the Stormwater Management Report.

Passing Parameters

Node Type	Node Name	Parameter	Min	Max	Actual
GPT	OceanGuard200um Pit Baskets	Hi-flow bypass rate (cum/sec)	None	99	0.26
Receiving	90/65/45/90	% Load Reduction	None	None	0.00107
Receiving	90/65/45/90	GP % Load Reduction	90	None	100
Receiving	90/65/45/90	TN % Load Reduction	45	None	50.1
Receiving	90/65/45/90	TP % Load Reduction	60	None	76.4
Receiving	90/65/45/90	TSS % Load Reduction	90	None	90.1
Sedimentation	SF Chamber (20m)	% Reuse Demand Met	None	None	0
Sedimentation	SF Chamber (20m)	High Flow Bypass Out (ML/yr)	None	None	0
Urban	Driveway/Car Park - 1125m (100% Imp.)	Area Impervious (ha)	None	None	0.113
Urban	Driveway/Car Park - 1125m (100% Imp.)	Area Pervious (ha)	None	None	0
Urban	Driveway/Car Park - 1125m (100% Imp.)	Total Area (ha)	None	None	0.113
Urban	Ground/Landscape - 1437m (50% Imp.)	Area Impervious (ha)	None	None	0.071
Urban	Ground/Landscape - 1437m (50% Imp.)	Area Impervious (ha)	None	None	0.071
Urban	Ground/Landscape - 1437m (50% Imp.)	Area Pervious (ha)	None	None	0.072
Urban	Ground/Landscape - 1437m (50% Imp.)	Area Pervious (ha)	None	None	0.072
Urban	Ground/Landscape - 1437m (50% Imp.)	Total Area (ha)	None	None	0.144
Urban	Ground/Landscape - 1437m (50% Imp.)	Total Area (ha)	None	None	0.144
Urban	Roof - 4530m (100% Imp.)	Area Impervious (ha)	None	None	0.453
Urban	Roof - 4530m (100% Imp.)	Area Pervious (ha)	None	None	0
Urban	Roof - 4530m (100% Imp.)	Total Area (ha)	None	None	0.453

Only certain parameters are reported when they pass validation

Failing Parameters					
Node Type	Node Name	Parameter	Min	Max	Actual
Sedimentation	SF Chamber (20m◆)	Notional Detention Time (hrs)	8	12	0.125
Sedimentation	SF Chamber (20m◆)	Total Nitrogen - k (m/yr)	500	500	1
Sedimentation	SF Chamber (20m◆)	Total Phosphorus - k (m/yr)	6000	6000	1
Sedimentation	SF Chamber (20m◆)	Total Suspended Solids - k (m/yr)	8000	8000	1
Urban	Driveway/Car Park - 1125m◆ (100% Imp.)	Field Capacity (mm)	40	40	80
Urban	Driveway/Car Park - 1125m◆ (100% Imp.)	Groundwater Daily Recharge Rate (%)	90	90	25
Urban	Driveway/Car Park - 1125m◆ (100% Imp.)	Pervious Area Infiltration Capacity coefficient - a	150	150	200
Urban	Driveway/Car Park - 1125m◆ (100% Imp.)	Pervious Area Infiltration Capacity exponent - b	3.5	3.5	1
Urban	Driveway/Car Park - 1125m◆ (100% Imp.)	Pervious Area Soil Initial Storage (% of Capacity)	30	30	25
Urban	Ground/Landscape - 1437m◆ (50% Imp.)	Field Capacity (mm)	40	40	80
Urban	Ground/Landscape - 1437m◆ (50% Imp.)	Field Capacity (mm)	40	40	80
Urban	Ground/Landscape - 1437m◆ (50% Imp.)	Groundwater Daily Recharge Rate (%)	90	90	25
Urban	Ground/Landscape - 1437m◆ (50% Imp.)	Groundwater Daily Recharge Rate (%)	90	90	25
Urban	Ground/Landscape - 1437m◆ (50% Imp.)	Pervious Area Infiltration Capacity coefficient - a	150	150	200
Urban	Ground/Landscape - 1437m◆ (50% Imp.)	Pervious Area Infiltration Capacity coefficient - a	150	150	200
Urban	Ground/Landscape - 1437m◆ (50% Imp.)	Pervious Area Infiltration Capacity exponent - b	3.5	3.5	1
Urban	Ground/Landscape - 1437m◆ (50% Imp.)	Pervious Area Infiltration Capacity exponent - b	3.5	3.5	1
Urban	Roof - 4530m◆ (100% Imp.)	Baseflow Total Nitrogen Mean (log mg/L)	0.11	0.11	0
Urban	Roof - 4530m◆ (100% Imp.)	Baseflow Total Nitrogen Standard Deviation (log mg/L)	0.12	0.12	0
Urban	Roof - 4530m◆ (100% Imp.)	Baseflow Total Phosphorus Mean (log mg/L)	-0.85	-0.85	0
Urban	Roof - 4530m◆ (100% Imp.)	Baseflow Total Phosphorus Standard Deviation (log mg/L)	0.19	0.19	0
Urban	Roof - 4530m◆ (100% Imp.)	Baseflow Total Suspended Solids Mean (log mg/L)	1.2	1.2	0
Urban	Roof - 4530m◆ (100% Imp.)	Baseflow Total Suspended Solids Standard Deviation (log mg/L)	0.17	0.17	0
Urban	Roof - 4530m◆ (100% Imp.)	Field Capacity (mm)	40	40	80
Urban	Roof - 4530m◆ (100% Imp.)	Groundwater Daily Recharge Rate (%)	90	90	25
Urban	Roof - 4530m◆ (100% Imp.)	Impervious Area Rainfall Threshold (mm/day)	1	2	0.3
Urban	Roof - 4530m◆ (100% Imp.)	Pervious Area Infiltration Capacity coefficient - a	150	150	200
Urban	Roof - 4530m◆ (100% Imp.)	Pervious Area Infiltration Capacity exponent - b	3.5	3.5	1
Urban	Roof - 4530m◆ (100% Imp.)	Stormflow Total Phosphorus Mean (log mg/L)	-0.6	-0.6	-0.89
Urban	Roof - 4530m◆ (100% Imp.)	Stormflow Total Suspended Solids Mean (log mg/L)	2.15	2.15	1.3
Only certain parameters are reported when they pass validation					

NOTE: A successful self-validation check of your model does not constitute an approved model by Port Stephens Council
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