Civil Engineering Report

Sydney Olympic Park new high school

Prepared for Roberts Co / 30 August 2021

SOPHS-TTW-CV-L0-00100

Job#211266

Taylor Thomson Whitting (NSW) Pty Ltd (ACN 113 578 377)
as trustee for the Taylor Thomson Whitting NSW Trust
(ABN 59 514 956 558) I Consulting Engineers
Level 6, 73 Miller Street, North Sydney NSW 2060

Your Partner in Engineering

Contents

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1.0 Introduction

This report has been prepared to support a State Significant Development Application (SSDA) (SSD-11802230) for the proposed development of Sydney Olympic Park New High School to be submitted to the Department of Planning, Industry and Environment (DPIE).

This report addresses general requirements as identified in the Planning Secretary's Environment Assessment Requirements (SEARs) and more specific requirements as set out by Council.

1.1 Proposal

The proposed development is for the construction of a school whereby the project is known as Sydney Olympic Park new high school. The school is to be developed in two stages. The SSD application will seek consent for both Stage One and Stage Two. While Stage Two is submitted as part of this proposal, construction is subject to approval of additional funding.

Stage One will provide for a Stream 5 high school, catering for up to 850 students. Stage Two will bring the school up to a stream 9 school capability catering up to 1,530 students.

The design features a six storey building. To the north of the site, a hall building (for sports and performance) is proposed.

The play space required to meet the need of students for Stage One can be generally accommodated onsite, within the 9,511sqm available. Additional play space may be required to accommodate the increased student numbers anticipated during Stage 2. The proposed adjoining play space comprises an area of around 8,800sqm, and will be subject to a Joint Use Arrangement and available for public use outside school hours. The future Wentworth Point Peninsula Park will result in an open space area of approximately 4ha.

The remainder of the peninsula (Tf NSW land) is under review and will be subject to a separate approval process. Redevelopment of this land will include the new access road proposed off Burroway Road along the eastern boundary of the subject site and is proposed to include car parking, drop-off zones and delivery zones.

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1.2 Site Description

The proposed development is located within the peninsula of Wentworth Point at 7-11 Burroway Road, Wentworth Park across parts of three lots; Lot 202 DP1216628, Lot 203 DP1216628 and Lot 204 DP1216628. The site forms part of the Wentworth Point Planned Precinct, which was rezoned in 2014 for the purposes of high density residential, public recreation, school and business purposes.

The site is approximately 9,511sqm in area, with a frontage of approximately 91m to Burroway Road. It currently contains vacant land, which is cleared of all past development, and almost entirely cleared of native vegetation.

The surrounding area is generally characterised by high rise residential and mixed-use developments. The site is directly adjacent to the Wentworth Point Peninsula Park and immediately east of Wentworth Point Public School.

Figure 1 Site Aerial Map
Source: Mecone

1.3 Secretary's Environmental Assessment Requirements

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Under application number SSD-11802230, we have been provided the Secretary's Environmental Assessment Requirements (SEARs) issued on the 19th of July 2021. This report provides response (in part or full where relevant) to the following SEARs:

	SEARs Requirement:	**Addressed in section:**
6	**Ecologically Sustainable Development (ESD)**	
	Identify proposed measures to minimise consumption of resources, water (including water sensitive urban design) and energy	Section 3.3.2, Section 4
	Identify how the future development would be designed to consider and reflect national best practice sustainable building principles to improve environmental performance and reduce ecological impact. This should be based on a materiality assessment and include waste reduction design measures, future proofing, use of sustainable and low-carbon materials, energy and water efficient design (including water sensitive urban design) and technology and use of renewable energy.	Section 3.3.2, Section 4
	Provide an Integrated Water Management Plan detailing any proposed alternative water supplies, proposed end uses of potable and non-potable water, and water sensitive urban design.	Section 3.3.2, Section 4
14	**Stormwater Drainage**	
	Provide a preliminary stormwater management plan for the development that: • is prepared by a suitably qualified person in consultation with Council and any other relevant drainage authority. • details the proposed drainage design for the site including on-site detention facilities, water quality measures and the nominated discharge point. • demonstrates compliance with Council or other drainage authority requirements.	Section 3.1.2, Section 3.2.2, Section 3.3.2, Appendix A
	Provide stormwater plans detailing the proposed methods of drainage without impacting on the downstream properties.	Section 3.1.2, Section 3.2.2, Appendix A
	Where drainage infrastructure works are required that would be handed over to Council, provide full hydraulic details and detailed plans and specifications of proposed works that have been prepared in consultation with Council and comply with Council's relevant standards.	N/A
15	**Flooding**	
	Identify any flood risk on-site in consultation with Council and having regard to the most recent flood studies for the development area and the potential effects of climate change, sea level rise and an increase in rainfall intensity.	Section 4
	Assess the impacts of the development, including any changes to flood risk on-site or off-site, and detail design solutions to mitigate flood risk where required.	Section 4
16	**Soil and Water**	
	Provide details of measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles.	Section 3.4

1.4 Relevant Documents

The site lies within the amalgamated Parramatta City Council LGA and a development control plan (DCP) has been created for the Wentworth Point Precinct which applies to this site. This DCP created in 2014 refers to the Auburn Development Control Plan (DCP) 2010 which also provides guidance on development controls. Further, the Department of Education's 'Education Facilities – Standards and Guidelines' applies to the proposed high school development. All three documents have been reviewed in preparation of this report. Where applicable, the more stringent requirements have been met by the development.

The following documents have been used in preparing this document:

- Australian Rainfall and Runoff 2019
- AS3500.3 Plumbing and Drainage: Stormwater Drainage

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- Managing Urban Stormwater – Soils and Construction 'Blue Book', Volume 1, 4th Edition, Landcom
- Wentworth Point Development Control Plan 2014
- Auburn Council Development Control Plan 2010
- Department of Education's Educational Facilities – Standards and Guidelines
- Lower Parramatta River Floodplain Risk Management Study and Plan 2005, SKM

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2.0 Site Context

2.1 Existing Structures

The site was previously developed however most permanent existing structures have now been removed. There is significant concrete pavement remaining on site and sections of brick wall along the perimeter.

2.2 Existing Services

There are several in-ground services that have been identified on the detailed survey prepared by LTS Lockley dated 21/04/21.

Electrical, water and communication services are shown along the west of the site through the proposed development area. The electrical services are contained within two easements.

There are also electrical and communications reticulation services from Burroway Road into the site.

2.3 Existing Stormwater

Review of the detailed survey prepared by LTS Lockley shows existing stormwater infrastructure in Burroway Road. There are 2 kerb inlet pits along the frontage of the site connected by a 375mm diameter pipe. This pipe crosses Burroway Road and connects to a 750mm diameter pipe which continues east along Burroway Road and discharges to the Parramatta River.

Internal to the site, there are existing stormwater pits and pipes however they are not shown to be connected. It is not clear where the site's existing stormwater connection point is.

There is existing kerb and gutter for the entire frontage in Burroway Road however it is disjointed where the road transitions from approximately 12m wide bitumen to 14m wide concrete road.

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3.0 Civil Engineering

3.1 Stormwater Drainage

3.1.1 Statutory Requirements

The development stormwater drainage design is subject to requirements stated in the Educational Facilities – Standards & Guidelines (EFSG) from the NSW Department of Education. These guidelines require stormwater to be managed through a minor/major drainage system. The inground drainage pits and pipe infrastructure must have capacity to cater for storm events up to the 20 year ARI storm event. Designated overland flow paths must cater for flows resulting from storm events greater than this up to the 100 year ARI storm event, or where blockages may occur.

For Council's stormwater network, the Wentworth Point Precinct DCP and Auburn Council DCP provide guidance on the drainage design requirements. As per the EFSG, inground pits and pipe must cater for flows up to the 20 year ARI storm event and overland flows paths up to the 100 year ARI storm event.

3.1.2 Proposed Strategy

In accordance with the EFSG, the development inground pits and pipe have been designed to cater for the minor storm event (20 year ARI storm). This includes a network of surface inlet pits, and pipes sized accordingly. Roof drainage has not been documented at this stage however it is proposed that downpipes will discharge to drainage outlets in the ground as required by the EFSG and then connect to the nearest stormwater pit.

Similarly, overland flow paths have been designed within the site to allow for the major storm event (100 year ARI storm) in accordance with the EFSG. The overland flow path through the site has been designed to direct overland flow towards Burroway Road.

The site is proposed to discharge all stormwater to Council's stormwater network in Burroway Road. There is an existing kerb inlet pit at the frontage of the site that the development will connect to. This has an outgoing pipe size of 375mm.

Council's stormwater network has been assessed for capacity to cater for the flows anticipated from the development in DRAINS software. A catchment size of 9,511sq.m was assumed with 95% impervious and 5% pervious areas. The assessment determined that the downstream drainage network would have capacity to cater for storms up to the 5 year ARI storm event. For storms above the 5 year and up to the 20 year ARI storm event, there would be significant overflows in Burroway Road. As such, detention of stormwater or upgrade of Council's downstream stormwater network would be necessary to conform with Council's requirement for the minor storm event. Given the scope of works to upgrade Council's drainage network, it was determined that on site detention would be more feasible. This is discussed in more detail in Section 3.2.

The DRAINS model was also run to assess impacts in the major storm event (100 year ARI). In the major event, overland flows are directed east along Burroway Road. There is an increase in overland flows attributed to the development, however flows are contained within the road reserve and depth x velocity values are between 0.10 and 0.13. As such, this is considered safe and in accordance with Council's requirements.

There are no proposed stormwater works that will be handed over to Council.

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3.2 Stormwater Quantity

3.2.1 Statutory Requirements

Auburn Council's DCP provides guidance to the on site detention (OSD) requirements for the site. Section 5.1 D1 of the Stormwater Management chapter of the DCP stipulates that OSD shall be required for all proposed development, re-development or new land subdivisions. However, it also stipulates that land located within Zone 8 as nominated on Figure 1 of the document is exempt from providing OSD. As such and per Figure 2 of this document, there is no OSD requirement for the site in this regard. However as mentioned in Section 3.1.2, the proposed development will impact downstream properties by increasing overland flows in Burroway Road in the minor storm event. As such, the development would need to provide on site detention in order to maintain the current downstream drainage regime.

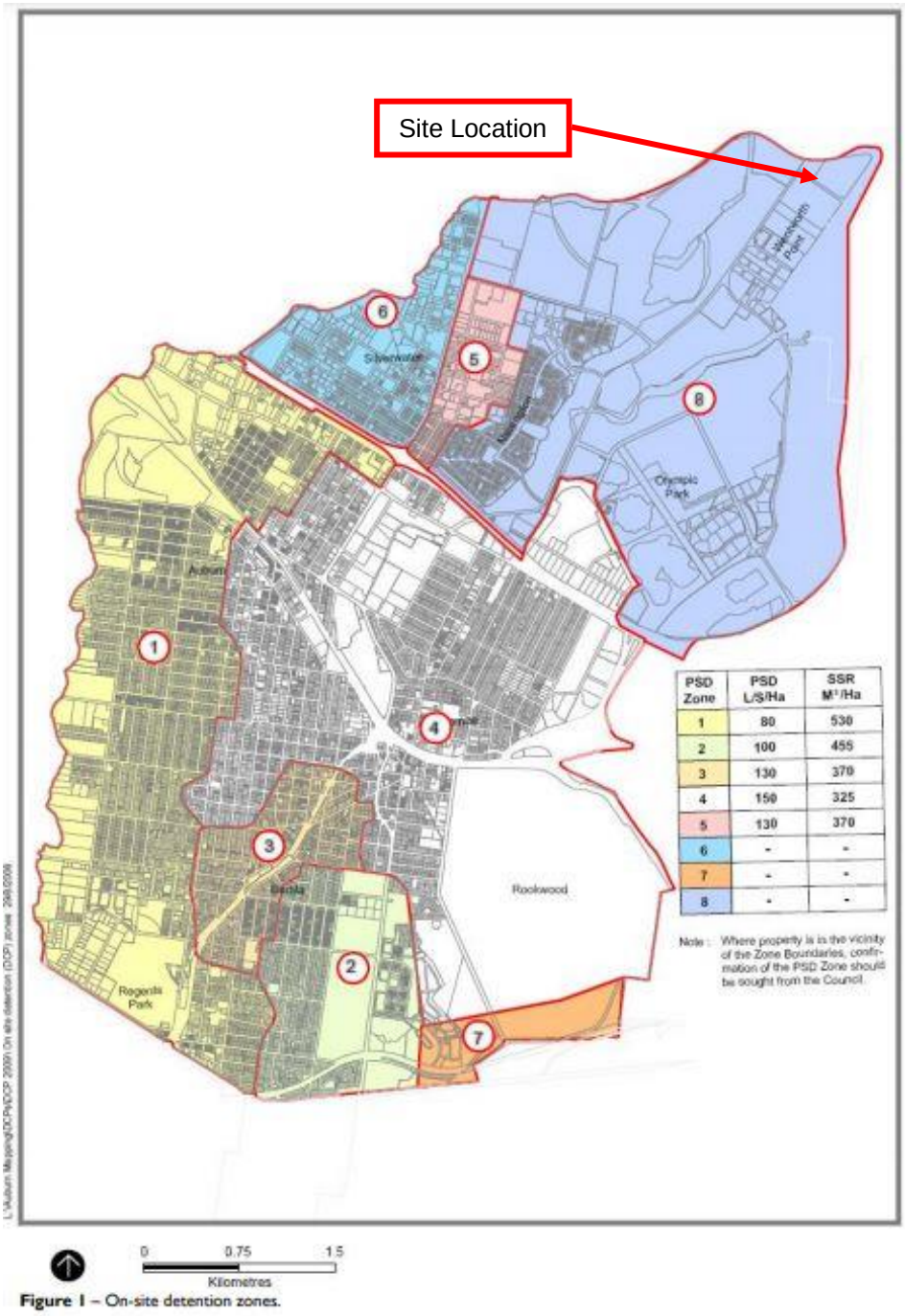

Figure 1 Excerpt from Auburn DCP 2010 - On-site detention zones

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3.2.2 Proposed Strategy

On site detention is proposed to manage stormwater discharge from the site for storm events up to and including the minor storm event (20 year ARI). This will mitigate impacts on the downstream drainage network as well as assist in achieving the Green Star requirements for the development.

The proposed detention tank was modelled in DRAINS software and included in the model of the wider Council drainage network. The detention volume and discharge rate from the site was assessed against having a non-worsening scenario on the downstream properties and drainage network. As such, it was determined that a discharge rate of 70L/s and detention volume of 300kL would satisfy the 20 year ARI storm event.

The proposed OSD tank will be located underground at the downstream end of the site close to the connection point to Council's stormwater network. This is documented on the engineering plans included in **Appendix A**.

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3.3 Stormwater Quality

3.3.1 Statutory Requirements

The proposed development is subject to water quality requirements as detailed in the Wentworth Point Precinct DCP. The DCP stipulates the following targets for removal of pollutants in stormwater discharge:

- 90% reduction in the post-development average annual gross pollutant load
- 85% reduction in the post-development average annual total suspended solids (TSS) load
- 65% reduction in the post-development average annual total phosphorus (TP) load
- 45% reduction in the post-development average annual total nitrogen (TN) load

3.3.2 Proposed Strategy

A treatment train is proposed to meet the pollutant reduction targets consisting of a combination of Water Sensitive Urban Design (WSUD) practices and proprietary products.

The treatment train proposed for the site consists of a 30kL rainwater tank for rainwater capture and reuse, OceanProtect OceanGuard pit litter baskets and OceanProtect Stormfilter cartridges prior to discharge from the site.

The proposed treatment train was modelled using the Model for Urban Stormwater Improvement Conceptualisation (MUSIC) software. Refer to Figure 3 for the MUSIC model schematic layout.

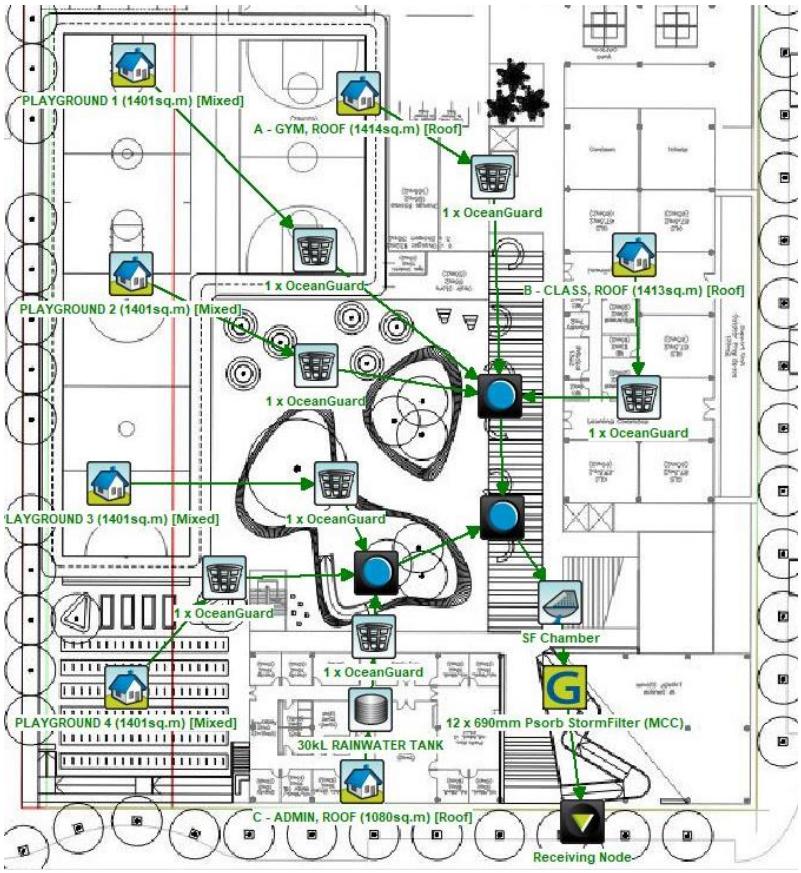

Figure 2 MUSIC model schematic layout

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The modelled MUSIC results are summarised in the table below.

Table 1 MUSIC Modelling Results

Pollutant	Target Reduction Rate	Achieved Reduction Rate
Gross Pollutants	90%	100%
Total Suspended Solids (TSS)	85%	89.1%
Total Phosphorus (TP)	65%	65.4%
Total Nitrogen (TN)	45%	48.4%

As demonstrated, the proposed treatment train achieves the target pollutant removal rates specified. Twelve 690mm PSorb Stormfilter cartridges were required to meet the targets along with litter baskets in all surface inlet pits. It was assumed that rainwater was utilised for landscape irrigation only. This provided a reduction in potable water usage of approximately 365kL annually assuming a landscape area of approximately 500sq.m.

It is proposed to locate the Psorb Stormfilter cartridges within the OSD tank. This is documented on the engineering plans included in **Appendix A**.

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3.4 Erosion and Sediment Control

3.4.1 Proposed Strategies

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 in Table 2. These measures are in accordance with the Managing Urban Stormwater – Soils and Construction 'Blue Book' guidelines prepared by Landcom.

Table 2 Temporary and Permanent Strategies

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	Permanent strategies generally refer to the installation of a number of permanent treatment measures to remove gross pollutants, total suspended solids, and phosphorus/nitrogen nutrients effectively in order to maintain stormwater quality discharged from the site. For the permanent water quantity and quality measures, refer to Section 3.2.2 and Section 3.3.2 of this report.

3.4.2 Proposed Measures

A Sediment and Erosion Control Plan is attached to this report in **Appendix A**.

3.4.3 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.

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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 Sedimentation 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.

3.4.4 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:

Table 3 Limitations to Access

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.

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4.0 Integrated Water Management Plan

4.1 Potable Water Consumption

Reducing potable water demand can be achieved by providing rainwater harvesting and reuse. Rainwater harvesting is designed to provide an alternative source for non-potable water uses for the school. It conserves potable water and reduces the daily water demand. Rainwater reuse can reduce the volume of stormwater leaving the site which is beneficial for water quantity control and puts less pressure on the local drainage system.

Rainwater will be collected via gutters and downpipes from the nominated building and sent to the rainwater tank. A rainwater tank with 30kL of volume is proposed for the development. The captured rainwater can then be used for landscape irrigation systems without additional treatment.

Further reduction in potable water use can be sought through water efficient landscaping, plumbing fittings and appliances. This is covered in more detail in the Project Sustainability Design Response prepared by Stantec.

4.2 Water Sensitive Urban Design

The WSUD strategy has been developed based on current best practice, taking guidance from the Wentworth Point Precinct DCP as mentioned in Section 3.3.

The following schemes have been implemented for the integrated water management plan:

- Reduce potable water demand through rainwater harvesting and reuse.
- Matching the natural water runoff regime as closely as possible by providing OSD for stormwater runoff control, providing GPT and vegetation swales in multiple locations for stormwater quality control.

To comply with council's WSUD Guidelines, the following WSUD features have been added to the integrated water management plan:

- Pollutant filter baskets are proposed in all surface inlet pits to remove gross pollutants, suspended solids and phosphorus/nitrogen nutrients. This will provide primary treatment of runoff from hardstand areas.
- Stormfilter cartridges are proposed to filter flow from hardstand areas and removes gross pollutants, sediment particles and nutrients. The stormfilter cartridges will be located within the OSD tank just prior to discharge to ensure capture of majority of the site catchment.
- Rainwater harvesting and reuse is proposed and will effectively reduce pollutant loads in stormwater runoff by retaining them on site, as well as reducing the overall volume of stormwater runoff.

Vegetated swales were considered for the proposed development however due to the site constraints and underlying material; the site was deemed not suitable for such WSUD measures.

The principles of the proposed WSUD approach are in accordance with the recommendations of the Wentworth Point Precinct guidelines and pollution reduction targets are addressed in more detail in Section 3.3.2.

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5.0 Flooding

A flood enquiry has been lodged with Parramatta City Council to obtain the flood planning level relevant to the site, however no response has been received at the time of writing of this report.

A comprehensive flood study and assessment has been completed by Sinclair Knight Merz (SKM) on behalf of Parramatta City Council for the lower Parramatta Catchment and is summarised in the Lower Parramatta River Flood Risk Management Study and Plan (2005). This document is publicly available and has been used to determine the site flood conditions and flood levels.

Design flood levels obtained from this study for the 5% AEP, 1% AEP and Probable Maximum Flood (PMF) events corresponding to the development area are specified in Table 4.

Table 4 Design Flood Levels - Extract from Lower Parramatta River Study and Plan (2005), Appendix B

Flood Event	**20% AEP**	**5% AEP**	**2% AEP**	**1% AEP**	**PMF**
Design Flood Level (mAHD)	1.27	1.34	1.39	1.42	2.42

The Wentworth Point Precinct DCP refers to the Auburn DCP in regard to the flood planning requirements for the site. Auburn's DCP classifies the proposed development as a commercial facility. As such, the habitable floor level is required to meet the 1% AEP flood level plus freeboard, being 500mm. In this case, the flood planning level is 1.92m AHD.

The minimum Finished Floor Level (FFL) for the proposed buildings are at RL 4.0m AHD which is above the 1% AEP flood level plus freeboard of 1.92m AHD. The proposed FFL is also above the PMF level nominated in the SKM report (2.42m AHD).

The CSIRO and Bureau of Meteorology's Climate Change in Australia – Projections for Australia's NRM Regions report prepared in 2015 nominates a rise in sea level of 0.84m under the most extreme relative concentration pathway (RCP8.5) in the year 2090. Considering this sea level rise and the PMF level obtained from the SKM report gives a worst case flood level of 3.26m AHD. This is below the proposed development FFL and as such, the proposed development would have protection to the 1% AEP flood level, PMF level whilst considering climate change.

The proposed minimum finished floor level of 4.0m AHD will match the existing adjacent primary school floor level and therefore reduce the potential risk of flooding or potential inundation as a result of large storm events or future sea level rise. In such an event, internal evacuation and shelter-in-place strategies are available.

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6.0 Conclusion

This report provides a summary of the proposed concept civil engineering and stormwater management for the proposed Sydney Olympic Park High School development. Stormwater is proposed to comply with the relevant statutory requirements including those set out by Council and the Department of Education. This includes provision of on site detention, stormwater quality treatment and sediment and erosion control. The proposed development is located above current and anticipated flood levels and as such, is not impacted by flooding.

Concept engineering plans for the development have been prepared and are attached in **Appendix A**.

Prepared by
TAYLOR THOMSON WHITTING (NSW) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING NSW TRUST

STEPHEN FOK
Civil Engineer

Authorised By
TAYLOR THOMSON WHITTING (NSW) PTY LTD
in its capacity as trustee for the
TAYLOR THOMSON WHITTING NSW TRUST

NEMESIO BIASON JR.
Associate Director

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Appendix A

Civil Engineering Plans

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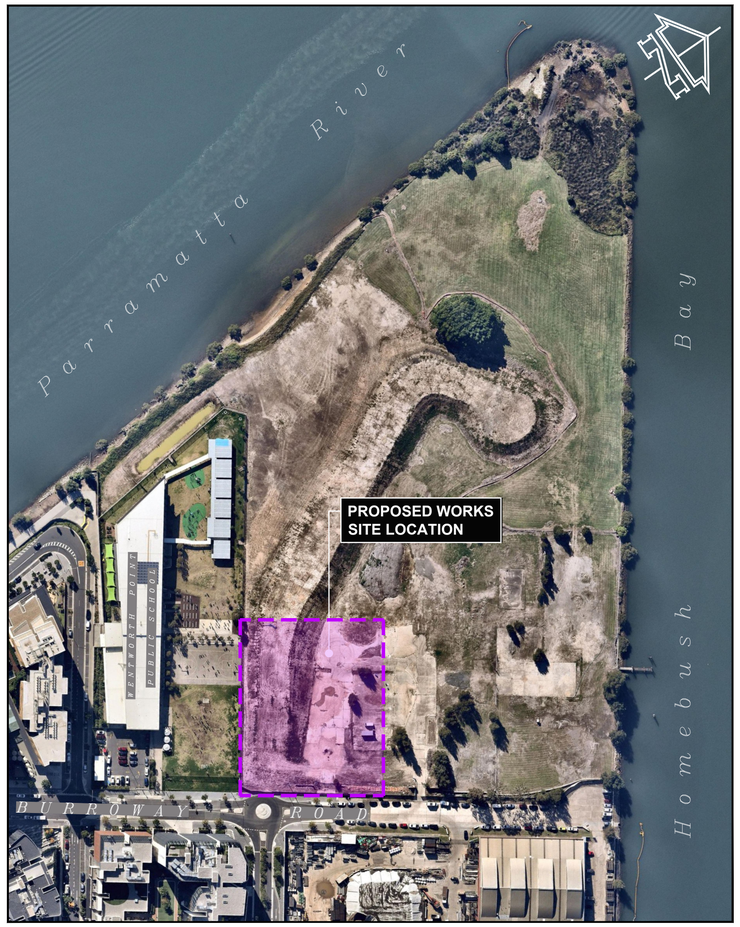
SYDNEY OLYMPIC PARK HIGH SCHOOL (SOPHS)

CIVIL WORKS



LOCALITY PLAN
NOT TO SCALE

DRAWING SCHEDULE

DRAWING NUMBER	DRAWING NAME
SOPHS-TTW-CV-L0-00000	COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE
SOPHS-TTW-CV-L0-00001	GENERAL NOTES AND LEGENDS
SOPHS-TTW-CV-L0-00002	OVERALL SITE PLAN
SOPHS-TTW-CV-L0-00003	SEDIMENT AND EROSION CONTROL PLAN AND DETAILS
SOPHS-TTW-CV-L0-00010	STORMWATER CATCHMENT PLAN
SOPHS-TTW-CV-L0-00030	SITEWORKS AND STORMWATER MANAGEMENT PLAN
SOPHS-TTW-CV-L0-00040	CIVIL DETAILS, SHEET 1
SOPHS-TTW-CV-L0-00041	CIVIL DETAILS, SHEET 2

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ISSUE FOR SSDA

REV	DESCRIPTION	CHK	DR	DATE
04	ISSUED FOR SSDA	SF	WW	30.08.21
03	ISSUED FOR SSDA	SF	WW	25.08.21
02	ISSUED FOR DA	SF	WW	18.08.21
01	ISSUED FOR COMMENTS	SF	LA	16.08.21

ARCHITECT:
WOODS BAGOT
LEVEL 2
60 CARRINGTON STREET
SYDNEY NSW 2000
PO BOX N19
GROSVENOR PLACE NSW 1220

ENGINEER:
TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

PROJECT:
SYDNEY OLYMPIC PARK HIGH SCHOOL (SOPHS)
7-9 BURROWAY ROAD,
WENTWORTH POINT NSW 2127

DRAWING NAME:
COVER SHEET, LOCALITY PLAN AND DRAWING SCHEDULE

TTW JOB No: 211266

SCALE : A1 N/A
DRAWN BY LA
AUTHORISED BY SB
DRAWING No SOPHS-TTW-CV-L0-00000
REVISION 04
Plot File Created: Aug 30, 2021 - 12:09pm

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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 Engineer.
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 footprint.
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

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

Consultant	Dwg Title	Dwg No	Rev	Date
LTS	PLAN OF DETAIL	51086001DT	C	21/04/21
URBIS	GROUND FLOOR CONCEPT PLAN	L001	A	12/08/21
URBIS	LANDSCAPE BASE			16/08/21

SURVEY AND SERVICES INFORMATION

SURVEY

Origin of levels : SSM 99411 R.L. 2.094m
Datum of levels : A.H.D.
Coordinate system : MGA (GDA 2020)
Survey prepared by : LTS
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 whatsoever.

UNDERGROUND SERVICES - WARNING

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

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

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

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

The contractor is to get approval from the relevant state survey department, to remove/adjust any survey mark. This includes but is not limited to; State Survey Marks (SSM), Permanent Marks (PM), cadastral reference marks or any other survey mark which is to be removed or adjusted in any way.
Taylor Thomson Whitting plans do not indicate the presence of any survey mark. The contractor is to undertake their own search.

BOUNDARY AND EASEMENT NOTE

The property boundary and easement locations shown on Taylor Thomson Whitting drawing's have been based from information received from : **LTS dated Feb 2021**
801 Pacific Highway, Gordon, NSW 2072
P: 1300 587 000

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

SAFETY IN DESIGN

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

EXISTING SERVICES

Contractor to be aware existing services are located within the site. Location of all services to be verified by the Contractor prior to commencing works. Contractor to confirm with relevant authority regarding measures to be taken to ensure services are protected or procedures are in place to 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. All excavations to be fenced off and batters adequately supported to approval of Geotechnical Engineer.

GROUND CONDITIONS

Contractor to be aware of the site geotechnical conditions. Refer to geotechnical report by DOUGLAS PARTNERS 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 GREENCAP for details.

CONFINED SPACES

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

MANUAL HANDLING

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

WATER POLLUTION

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

SITE ACCESS/EGRESS

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

VEHICLE MOVEMENT

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

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 5.1.1

STORMWATER DRAINAGE NOTES

1 Stormwater Design Criteria :
(A) Average exceedance probability –
1% AEP for roof drainage to first external pit
5% AEP for paved and landscaped areas
(B) Rainfall intensities –
Time of concentration: 5 minutes
1% AEP = 227.0 mm/hr
5% AEP = 176.0 mm/hr
(C) Rainfall losses –
Impervious areas: IL = 1.5 mm , CL = 0 mm/hr
Pervious areas: IL = 33 mm , CL =0.72mm/hr

2. Pipes 300 dia and larger to be reinforced concrete Class " 2 " approved spigot and socket with rubber ring joints U.N.O.
3. 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.
5. Precast pits may be used external to the building subject to approval by Engineer
6. Enlargers, connections and junctions to be manufactured fittings where pipes are less than 300 dia.
7. 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.
11. All stormwater pipes to be 150 dia at 1.0% min fall U.N.O.
12. Subsoil drains to be slotted flexible uPVC U.N.O.
13. Adopt invert levels for pipe installation (grades shown are only nominal).

CONCRETE NOTES

EXPOSURE CLASSIFICATION : External : B2

CONCRETE

Place concrete of the following characteristic compressive strength f'c as defined in AS 1379.

Location	AS 1379 f'c MPa at 28 days	Specified Slump	Nominal Agg. Size
Kerbs	S20	80	20
Retaining wall footing	S40	80	20

1. Use Type 'GP' cement, unless otherwise specified.
2. All concrete shall be subject to project assessment and testing to AS 1379.
3. Consolidate by mechanical vibration. Cure all concrete surfaces as directed in the Specification.
4. For all falls in slab, drip grooves, reglets, chamfers etc. refer to Architects drawings and specifications.
5. Unless shown on the drawings, the location of all construction joints shall be submitted to Engineer for review.
6. No holes or chases shall be made in the slab without the approval of the Engineer.
7. Conduits and pipes are to be fixed to the underside of the top reinforcement layer.
8. Slurry used to lubricate concrete pump lines is not to be used in any structural members.
9. All slabs cast on ground require sand blinding with a Concrete Underlay

FORMWORK

1. The design, certification, construction and performance of the formwork, falsework and backpropping shall be the responsibility of the contractor. Proposed method of installation and removal of formwork is to be submitted to the superintendent for comment prior to work being carried out.

FILENAME: Z:\Jobs\211\211266\Civil_SOPHS-TTW-CV-L0-00001.dwg – USER: stephenlok – Plot File Created: Aug 30, 2021 – 12:07pm

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ISSUE FOR SSDA

REV	DESCRIPTION	CHK	DR	DATE
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03	ISSUED FOR SSDA	SF	WW	25.08.21
02	ISSUED FOR DA	SF	WW	18.08.21
01	ISSUED FOR COMMENTS	SF	LA	16.08.21

REV DESCRIPTION CHK DR DATE | REV DESCRIPTION CHK DR DATE

ARCHITECT:
WOODS BAGOT
LEVEL 2
60 CARRINGTON STREET
SYDNEY NSW 2000
PO BOX N19
GROSVENOR PLACE NSW 1220

ENGINEER:
TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

PROJECT:
SYDNEY OLYMPIC PARK HIGH SCHOOL (SOPHS)
7-9 BURROWAY ROAD,
WENTWORTH POINT NSW 2127

DRAWING NAME:
GENERAL NOTES AND LEGENDS

TTW JOB No: 211266

SCALE : A1 N/A | DRAWN BY LA | AUTHORISED BY SB
DRAWING No SOPHS-TTW-CV-L0-00001 | REVISION 04
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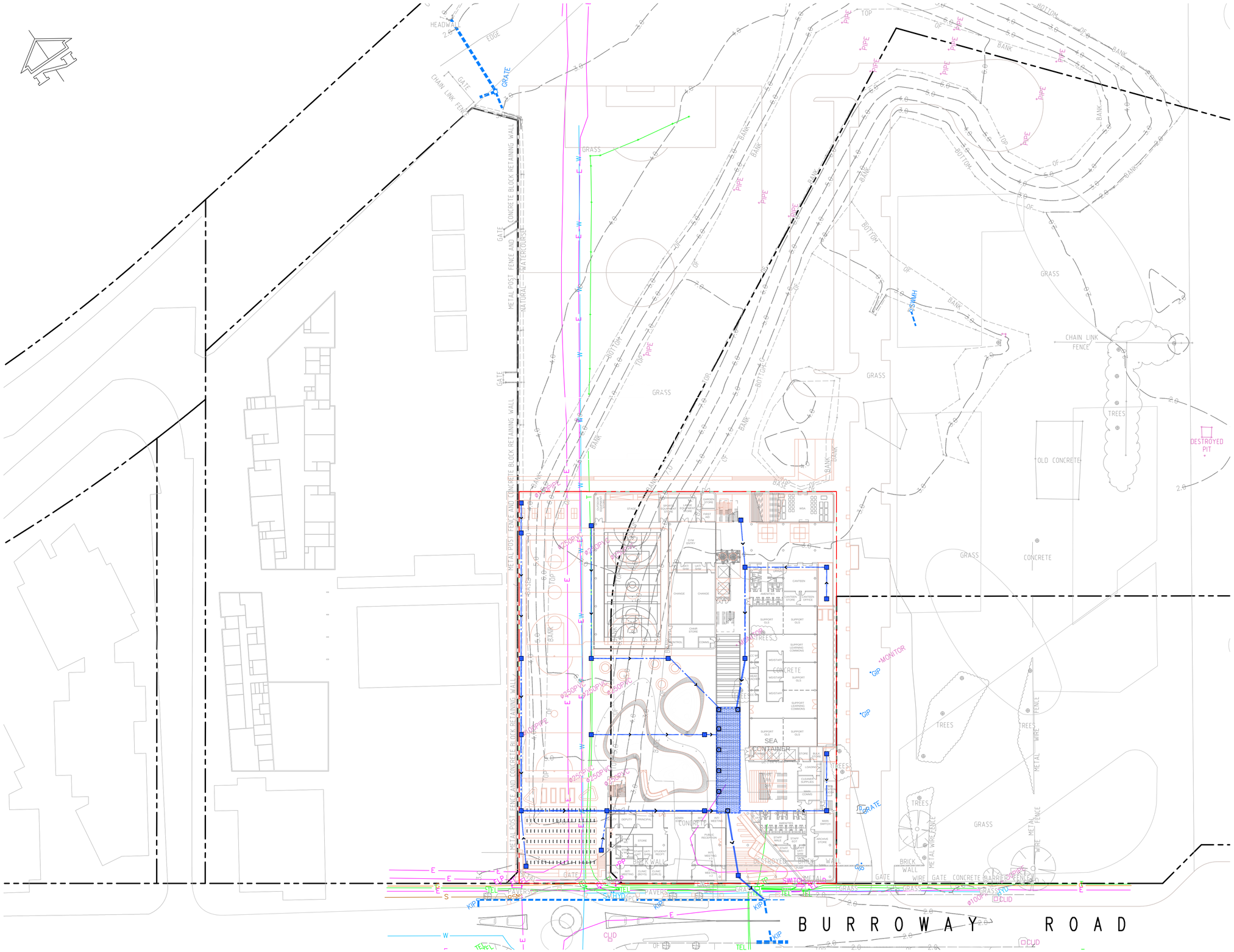

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01	ISSUED FOR COMMENTS	SF	LA	16.08.21

REV DESCRIPTION CHK DR DATE | REV DESCRIPTION CHK DR DATE | REV DESCRIPTION CHK DR DATE

ARCHITECT:
WOODS BAGOT
LEVEL 2
60 CARRINGTON STREET
SYDNEY NSW 2000
PO BOX N19
GROSVENOR PLACE NSW 1220

ENGINEER:
TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

PROJECT:
SYDNEY OLYMPIC PARK HIGH SCHOOL (SOPHS)
7-9 BURROWAY ROAD,
WENTWORTH POINT NSW 2127

DRAWING NAME:
OVERALL SITE PLAN

TTW JOB No: 211266

SCALE : A1: 1:500
DRAWN BY: LA
AUTHORISED BY: SB
DRAWING No: SOPHS-TTW-CV-L0-00002
REVISION: 04
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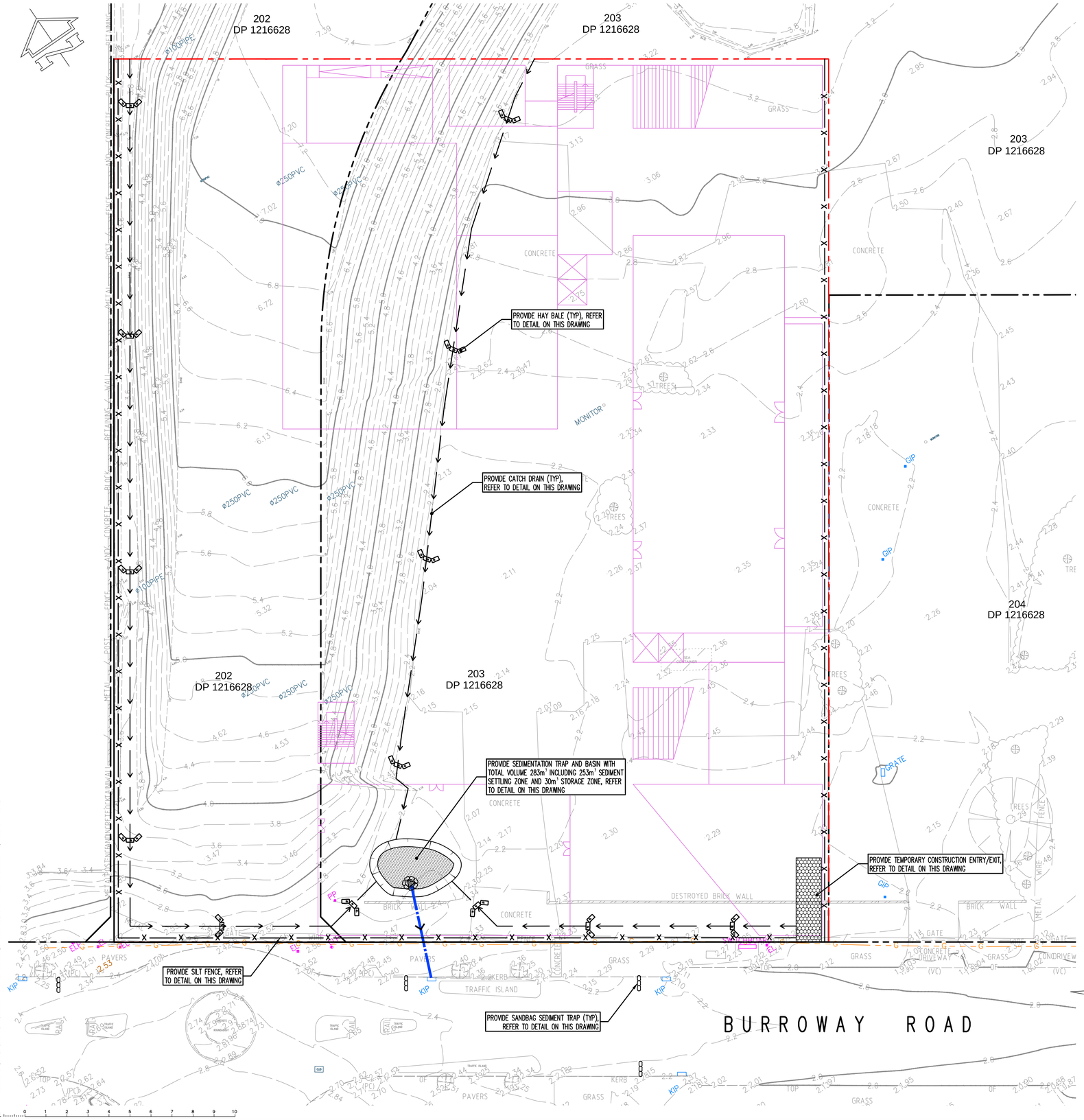
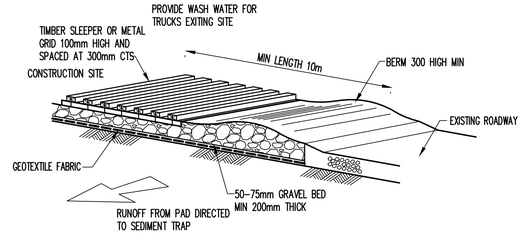
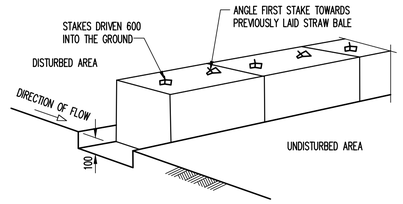




TEMPORARY CONSTRUCTION VEHICLE EXIT

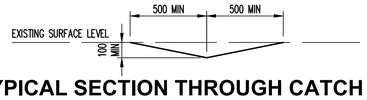
NTS



HAY BALE SEDIMENT FILTER

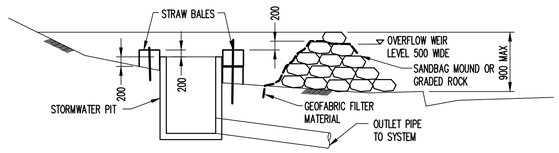
NTS

NOTE: STAKE TO BE EITHER TAR COATED STAR OR 50 x 50 HARDWOOD



TYPICAL SECTION THROUGH CATCH DRAIN

SCALE 1: 20



SEDIMENTATION TRAP

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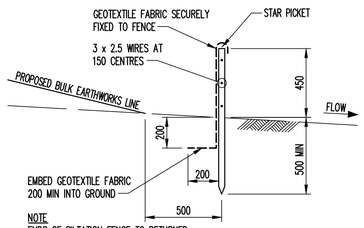
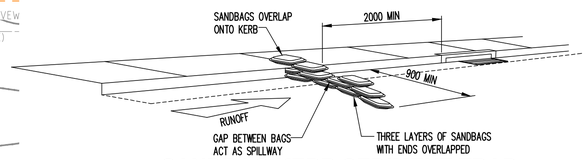


NOTE
ENDS OF SILTATION FENCE TO RETURNED UP SLOPE TO PREVENT RUNOFF

SILTATION FENCE DETAIL

SCALE 1: 20



SANDBAG KERB SEDIMENT TRAP

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EROSION AND SEDIMENT CONTROL NOTES

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 Construction ("Blue Book").
2. Erosion and sediment control drawings and notes are provided for the whole of the works. Should the Contractor stage these works then the design may be required to be modified. Variation to these details may require approval by the relevant authorities.
   The erosion and sediment control plan shall be implemented and adapted to meet the varying situations as work on site progresses.
3. Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
4. When stormwater pits are constructed prevent site runoff entering the pits unless 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 conditions.
8. Control water from upstream of the site such that it does not enter the disturbed site.
9. All construction vehicles shall enter and exit the site via the temporary construction entry/exit.
10. All vehicles leaving the site shall be cleaned and inspected before leaving.
11. Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
12. Clean out all erosion and sediment control devices after each storm event.

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 runoff sites.
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 overflow.
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.

EROSION AND SEDIMENT CONTROL LEGEND

— x — x —	Siltation fence
— ← ←	Catch drain
	Hay bale barriers
	Sandbag sediment trap

0 2.5 5 7.5 10 12.5 15 17.5 20m

1:250 A1 1:500 A3

ISSUE FOR SSDA

FILENAME: Z:\jobs\211\211266\civil\ SOPHS-TTW-CV-L0-00003.dwg – USER: stephenlok – Plot File Created: Aug 30, 2021 – 12:05pm

A1

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02	ISSUED FOR DA	SF	WW	18.08.21
01	ISSUED FOR COMMENTS	SF	LA	16.08.21

ARCHITECT:
WOODS BAGOT
LEVEL 2
60 CARRINGTON STREET
SYDNEY NSW 2000
PO BOX N19
GROSVENOR PLACE NSW 1220

ENGINEER:
TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

PROJECT:
SYDNEY OLYMPIC PARK HIGH SCHOOL (SOPHS)
7-9 BURROWAY ROAD,
WENTWORTH POINT NSW 2127

DRAWING NAME:
SEDIMENT AND EROSION CONTROL PLAN AND DETAILS

TTW JOB No: 211266

SCALE : A1 — AS NOTED
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AUTHORISED BY — SB
DRAWING No — SOPHS-TTW-CV-L0-00003
REVISION — 04
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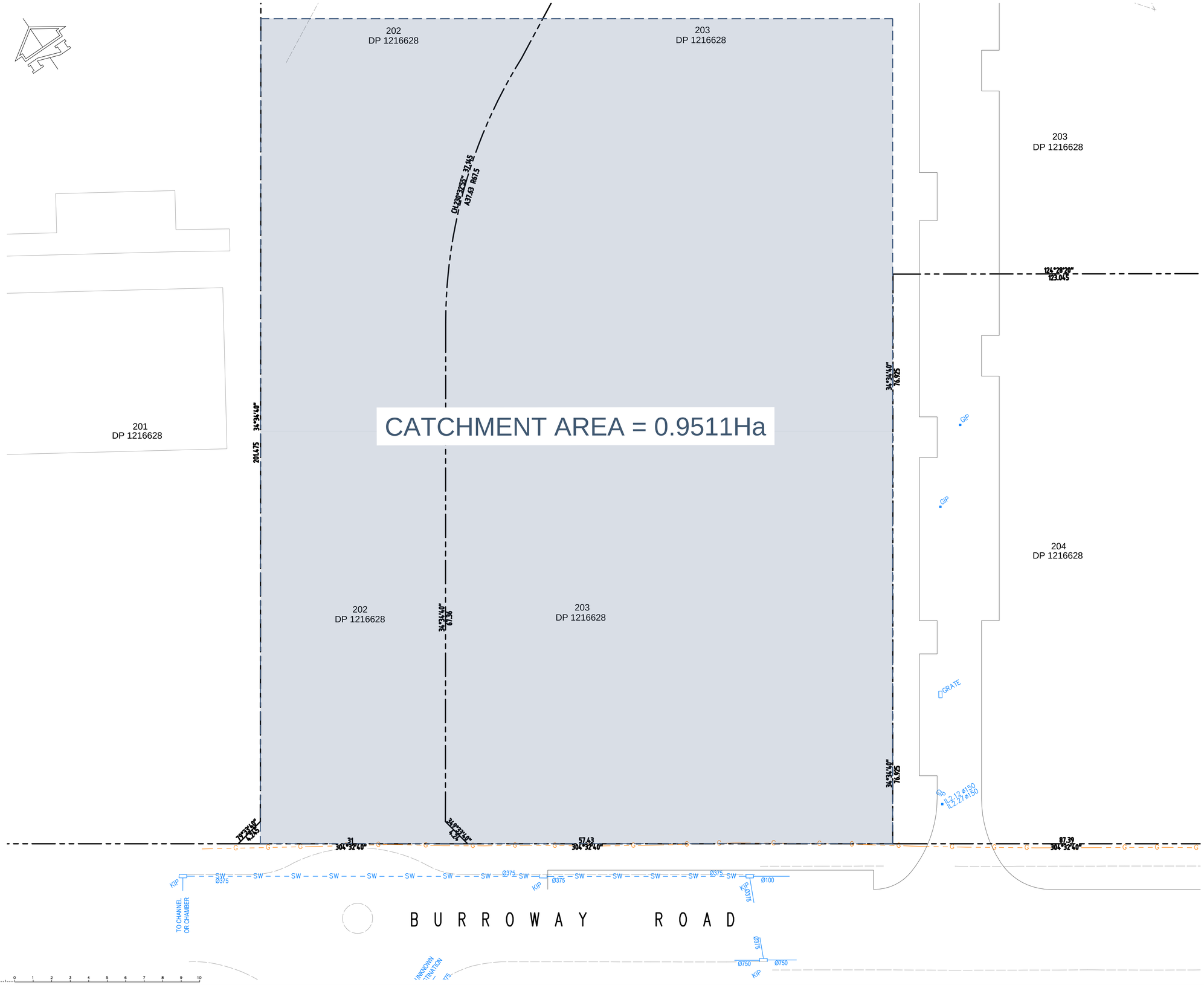

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WOODS BAGOT
LEVEL 2
60 CARRINGTON STREET
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ENGINEER:
TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

PROJECT:
SYDNEY OLYMPIC PARK HIGH SCHOOL (SOPHS)
7-9 BURROWAY ROAD,
WENTWORTH POINT NSW 2127

DRAWING NAME:
STORMWATER CATCHMENT PLAN

TTW JOB No: 211266

SCALE : A1: 1:250
DRAWN BY: LA
AUTHORISED BY: SB
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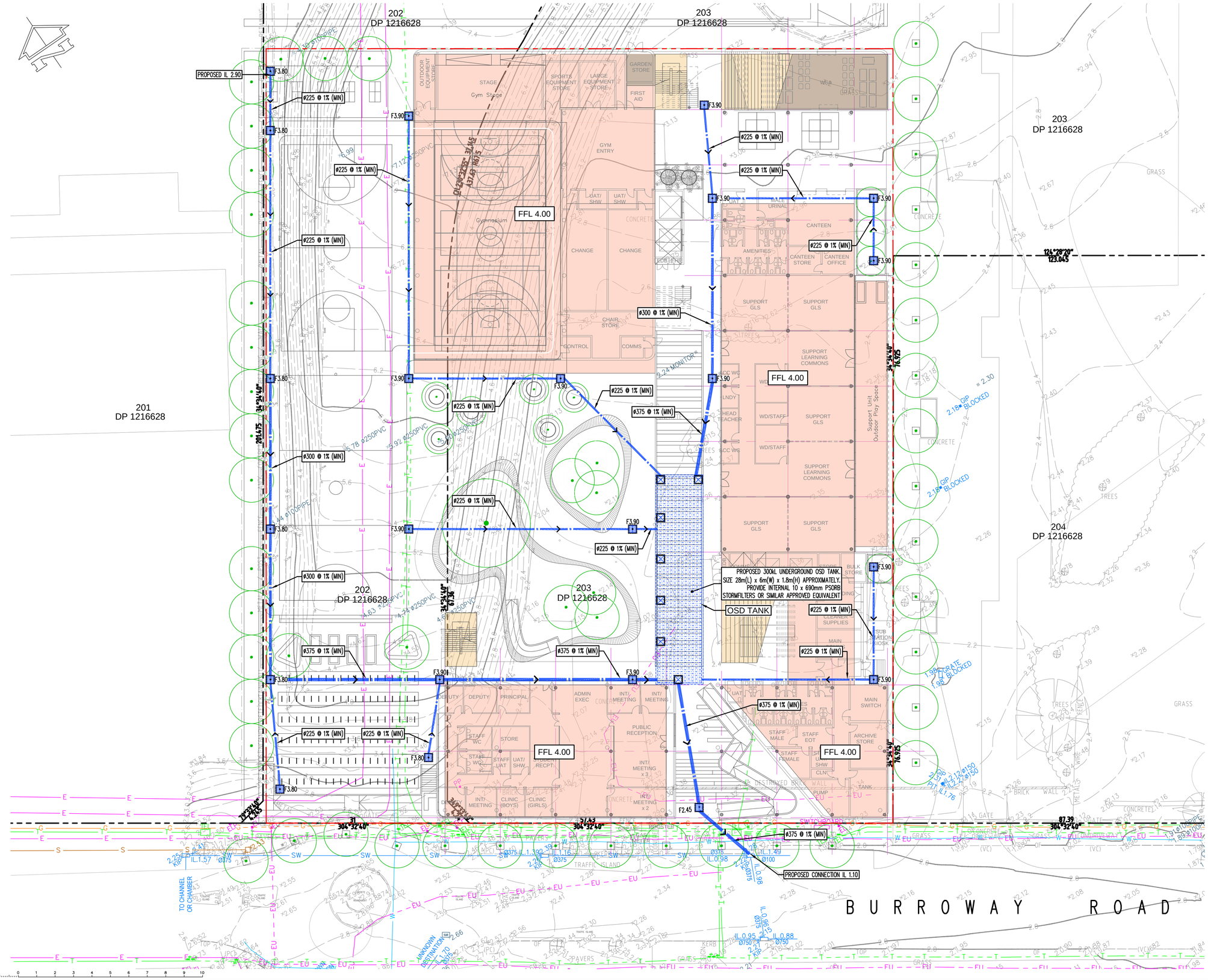

GENERAL LEGEND

- PROPERTY BOUNDARY
- SITE BOUNDARY
- F3.80 — PROPOSED FINISHED SURFACE LEVEL
- PROPOSED STORMWATER PIT, PIPE & FLOW DIRECTION

EXISTING SEVICES LEGEND

- S — SEWER
- W — WATER
- E — ELECTRICITY
- T — COMMUNICATIONS
- G — GAS
- SW — STORMWATER

PIT SCHEDULE

Note:
Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheet **COPHS-CV-TTW-L2-00040**. Find internal pit dimensions are to comply with AS3500.

Type	Description	Cover (Clear Opening)	Number
A	Surface inlet pit	900 x 900 Class B stainless steel heel proof grate	–
B	OSD access lid	900 x 900 Class B gatic lid with infill to suit landscape detail	–

NOTE:
ALL GRATED STORMWATER INLET PITS TO HAVE OCEANGUARD FILTER BASKET OR APPROVED EQUIVALENT

0 2.5 5 7.5 10 12.5 15 17.5 20m
1:250 A1 1:500 A3

ISSUE FOR SSDA

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WOODS BAGOT
LEVEL 2
60 CARRINGTON STREET
SYDNEY NSW 2000
PO BOX N19
GROSVENOR PLACE NSW 1220

ENGINEER:
TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

PROJECT:
SYDNEY OLYMPIC PARK HIGH SCHOOL (SOPHS)
7-9 BURROWAY ROAD,
WENTWORTH POINT NSW 2127

DRAWING NAME:
SITEWORKS AND STORMWATER MANAGEMENT PLAN

TTW JOB No: 211266

SCALE : A1 1:250
DRAWN BY LA
AUTHORISED BY SB
DRAWING No SOPHS-TTW-CV-L0-00030
REVISION 04
Plot File Created: Aug 30, 2021 - 12:03pm

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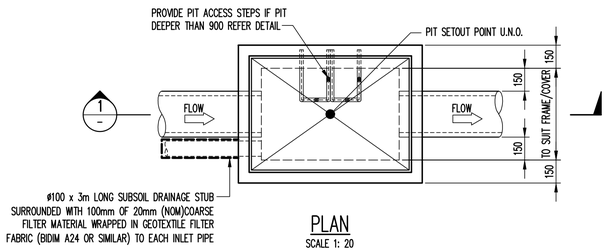
NOTE:IF REINFORCING FABRIC IS TO BE USED
REFER TO WALL AND CORNER DETAILS



PLAN
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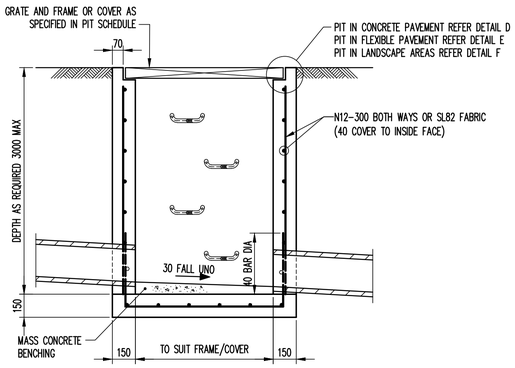

SECTION 1
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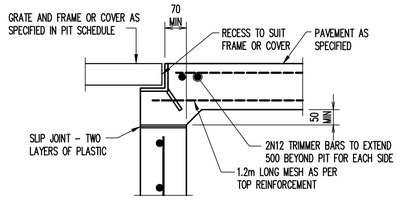
PIT TYPE A



DETAIL D
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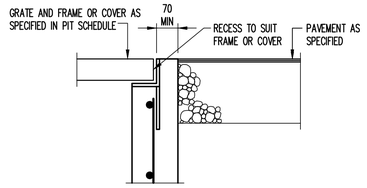

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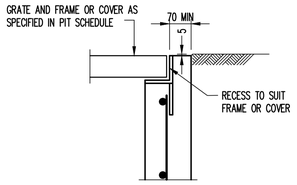

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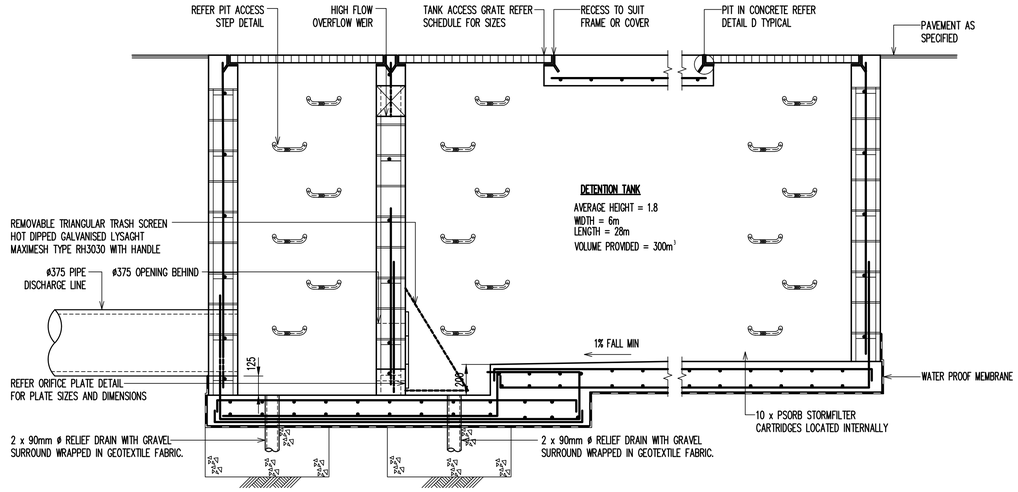

SECTION THROUGH DETENTION TANK
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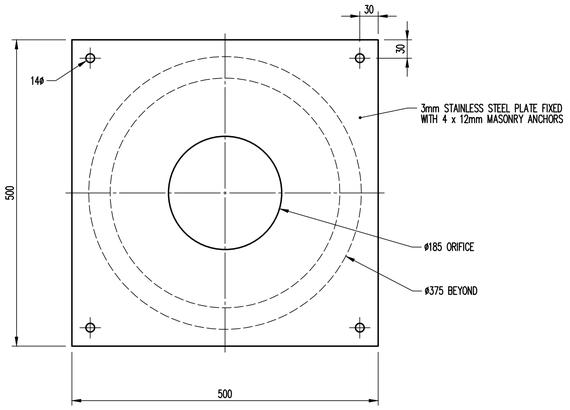

ORIFICE PLATE DETAIL
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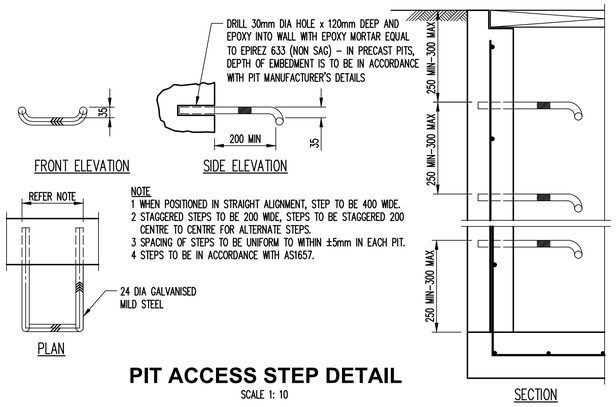

NOTE
1 WHEN POSITIONED IN STRAIGHT ALIGNMENT, STEP TO BE 400 WIDE.
2 STAGGERED STEPS TO BE 200 WIDE, STEPS TO BE STAGGERED 200 CENTRE TO CENTRE FOR ALTERNATE STEPS.
3 SPACING OF STEPS TO BE UNIFORM TO WITHIN ±5mm IN EACH PIT.
4 STEPS TO BE IN ACCORDANCE WITH AS1657.

PIT ACCESS STEP DETAIL
SCALE 1: 10

0 0.2 0.4 0.6 0.8 1 1.2 1.4 1.6m
1:20 A1 1:40 A3

0 0.1 0.2 0.3 0.4 0.5 0.6 0.7 0.8m
1:10 A1 1:20 A3

ISSUE FOR SSDA

FILENAME: Z:\jobs\211\211266\plot_SOPHS-TTW-CV-L0-00040.dwg - USER: stephenlok - Plot File Created: Aug 30, 2021 - 12:02pm

A1 0 1 2 3 4 5 6 7 8 9 10

REV	DESCRIPTION	CHK DR	DATE
04	ISSUED FOR SSDA	SF WW	30.08.21
03	ISSUED FOR SSDA	SF WW	25.08.21
02	ISSUED FOR DA	SF WW	18.08.21
01	ISSUED FOR COMMENTS	SF LA	16.08.21

ARCHITECT:
WOODS BAGOT
LEVEL 2
60 CARRINGTON STREET
SYDNEY NSW 2000
PO BOX N19
GROSVENOR PLACE NSW 1220

ENGINEER:
TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

PROJECT:
SYDNEY OLYMPIC PARK HIGH SCHOOL (SOPHS)
7-9 BURROWAY ROAD,
WENTWORTH POINT NSW 2127

DRAWING NAME:
CIVIL DETAILS, SHEET 1

TTW JOB No: 211266

SCALE : A1: AS SHOWN
DRAWN BY: LA
AUTHORISED BY: SB
DRAWING No: SOPHS-TTW-CV-L0-00040
REVISION: 04
Plot File Created: Aug 30, 2021 - 12:02pm

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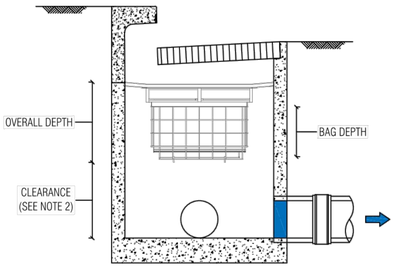
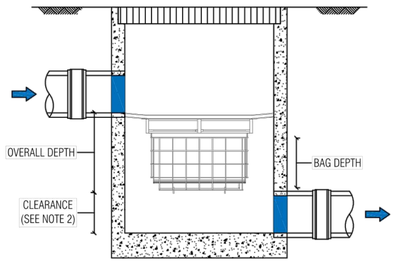
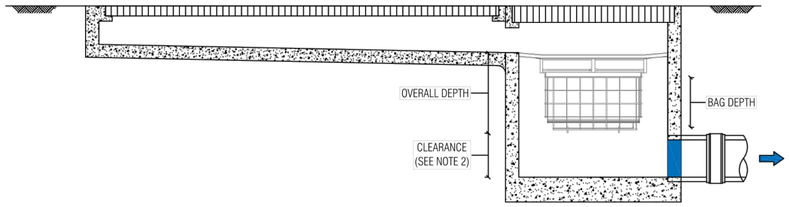


SURFACE FLOW CONFIGURATION



PIPE FLOW CONFIGURATION

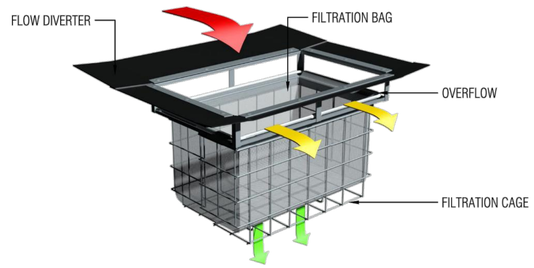


GRATED STRIP DRAIN CONFIGURATION

PLAN ID	MAXIMUM PIT PLAN DIMENSIONS
S	450mm x 450mm
M	600mm x 600mm
L	900mm x 900mm
XL	1200mm x 1200mm

DEPTH ID	BAG DEPTH	OVERALL DEPTH
1	170	270
2	300	450
3	600	700

		DEPTH ID		
		1	2	3
PLAN ID	S	■		
	M	■	■	
	L	■	■	■
	XL	■	■	■



GENERAL NOTES

1. THE MINIMUM CLEARANCE DEPENDS ON THE CONFIGURATION (SEE NOTE 2) AND THE LOCAL COUNCIL REQUIREMENTS.
2. CLEARANCE FOR ANY PIT WITHOUT AN INLET PIPE (ONLY USED FOR SURFACE FLOW) CAN BE AS LOW AS 50mm. FOR OTHER PITS, THE RECOMMENDED CLEARANCE SHOULD BE GREATER OR EQUAL TO THE PIPE OBVERT SO AS NOT TO INHIBIT HYDRAULIC CAPACITY.
3. OCEAN PROTECT PROVIDES TWO FILTRATION BAG TYPES:- 200 MICRON BAGS FOR HIGHER WATER QUALITY FILTERING AND A COARSE BAG FOR TARGETING GROSS POLLUTANTS.
4. DRAWINGS NOT TO SCALE.

LAST MODIFIED: 18-03-19

OCEAN PROTECT

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SPECIFICATION DRAWING

FILENAME: Z:\jobs\211\211266\civil_SOPHS-TTW-CV-L0-00041.dwg - USER: stephenlok - Plot File Created: Aug 30, 2021 - 12:11pm

A1 0 1 2 3 4 5 6 7 8 9 10

ISSUE FOR SSDA

REV	DESCRIPTION	CHK	DR	DATE
04	ISSUED FOR SSDA	SF	WW	30.08.21
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01	ISSUED FOR COMMENTS	SF	LA	16.08.21

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PROJECT:
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7-9 BURROWAY ROAD,
WENTWORTH POINT NSW 2127

DRAWING NAME:
CIVIL DETAILS, SHEET 2

TTW JOB No: 211266

SCALE : A1: NTS
DRAWN BY: LA
AUTHORISED BY: SB
DRAWING No: SOPHS-TTW-CV-L0-00041
REVISION: 04
Plot File Created: Aug 30, 2021 - 12:11pm

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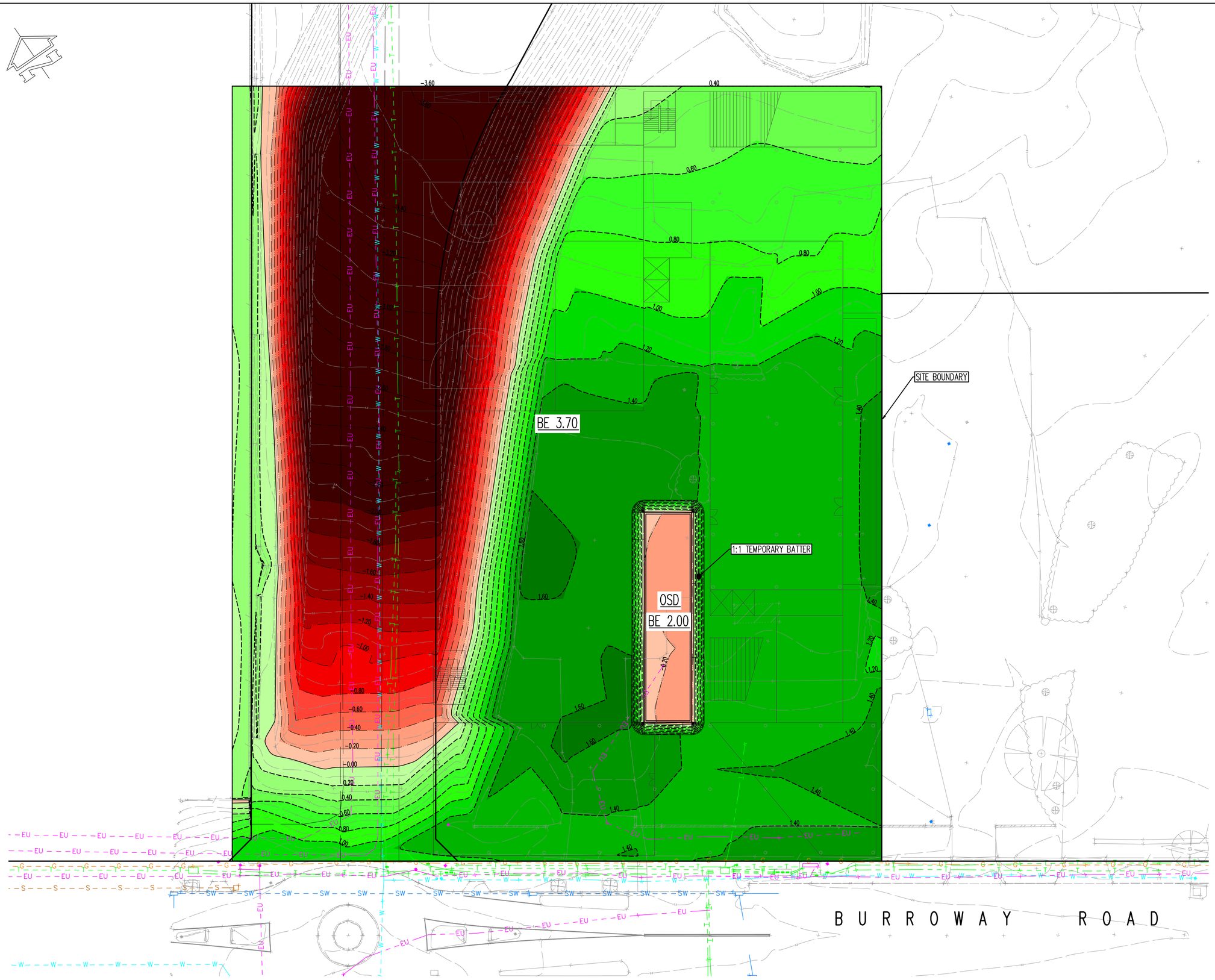

BULK EARTHWORKS CUT AND FILL				
Lower_value		Upper_value	Colour	
-5	to	-2	m	
-2	to	-1.8	m	
-1.8	to	-1.6	m	
-1.6	to	-1.4	m	
-1.4	to	-1.2	m	
-1.2	to	-1	m	
-1	to	-.8	m	
-.8	to	-.6	m	
-.6	to	-.4	m	
-.4	to	-.2	m	
-.2	to	0.00	m	
0.000	to	0.2	m	
0.2	to	.4	m	
.4	to	.6	m	
.6	to	.8	m	
.8	to	1	m	
1	to	1.2	m	
1.2	to	1.4	m	
1.4	to	1.6	m	
1.6	to	1.8	m	
1.8	to	2	m	
2	to	5	m	

BULK EARTHWORKS VOLUME

Total Cut :	-5600
Total Fill :	6346
Total Balance :	746

BULK EARTHWORKS LEGEND

	Batter
-1.40	Bulk earthworks depth contour (cut)
+2.00	Bulk earthworks depth contour (fill)
B22.00	Bulk earthworks contour level
BE 22.00	Bulk earthworks platform level

0 2.5 5 7.5 10 12.5 15 17.5 20m

1:250 A1 1:500 A3

ISSUE FOR SSDA

FILENAME: Z:\jobs\21\211266\civil_SOPHS-TTW-CV-L0-00050.dwg - USER: stephenlok - Plot File Created: Aug 30, 2021 - 11:58am

A1 0 1 2 3 4 5 6 7 8 9 10

REV	DESCRIPTION	CHK	DR	DATE
02	ISSUED FOR SSDA	NB	JH	30.08.21
01	ISSUED FOR SSDA	NB	JH	26.08.21

ARCHITECT:
WOODS BAGOT
LEVEL 2
60 CARRINGTON STREET
SYDNEY NSW 2000
PO BOX N19
GROSVENOR PLACE NSW 1220

ENGINEER:
TTW Structural Civil Traffic Façade
612 9439 7288 | Level 6, 73 Miller Street, North Sydney, NSW 2060

PROJECT:
SYDNEY OLYMPIC PARK HIGH SCHOOL (SOPHS)
7-9 BURROWAY ROAD,
WENTWORTH POINT NSW 2127

DRAWING NAME:
BULK EARTHWORKS PLAN (CUT AND FILL)

TTW JOB No: 211266

SCALE : A1: 1:250
DRAWN BY: LA
AUTHORISED BY: SB
DRAWING No: SOPHS-TTW-CV-L0-00050
REVISION: 02
Plot File Created: Aug 30, 2021 - 11:58am