

Civil Design Report

NSW Rugby League Centre of Excellence

Prepared for APP / 9 September 2016

161358

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1.0 Executive Summary

Taylor Thomson Whitting (NSW) has been engaged by NSW Rugby League to design the proposed NSW Rugby League Centre of Excellence located on Dawn Fraser Avenue, Homebush. This report does not cover the recently approved rugby league field.

This report covers the civil aspects relevant to the site and based on information known at the time of report production.

This report has taken into consideration the requirements specified in Stormwater Management and Water Sensitive Urban Design Policy (POL13/04).

2.0 Existing Site

2.1 Existing Site

The site is located on Dawn Fraser Avenue, in front of the Sydney Olympic Park Athletic Centre and opposite ANZ Stadium. A pedestrian tunnel under Dawn Fraser Avenue to ANZ Stadium is within the building footprint.

Located adjacent to the site, and towards Olympic Boulevard, is an open grassed depression, which is soon to be modified to accommodate the rugby league field.

The development site falls from the edge of the athletics centre towards Dawn Fraser Avenue with predominately grassed ground covering and sparse native trees.

Refer to **figure 1** for site location.



Figure 1 - Existing Site

2.2 Existing Services

The site is constrained by existing services. Stormwater, sewer, irrigation and electricity cross within the proposed building footprint.

Stormwater from the Sydney Olympic Park Athletic Centre traverses through the site and connects with the stormwater that is located within the proposed rugby league field. A diversion of the stormwater pipe around the building is likely to be required.

There is a sewer line that traverses the site that is likely to need relocating. This will require approval from Sydney Water and the engagement of a Water Services Coordinator.

Other services will be removed or relocated as required.

3.0 Proposed Works

The development involves clearing the site, earthworks and foundation works for the construction of a two/three level building with a loading dock and parking. Stormwater calculations have been based on a site around is 2700m².

3.1 Erosion and Sediment Control

During construction and while the site is disturbed, erosion prevention and sediment control measures will be required. Erosion prevention generally involves managing stormwater by diverting overland flow around construction areas as well as collecting stormwater within the construction zone and directing to sediment control devices. Devices likely to be incorporated are: silt removal like fences, hay bales, and grass lined swales; water flow dissipation and discharge control devices such as sand bags, pollution mattresses, and basins.

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

Refer to **Appendix A** for the proposed Erosion and Sediment Control Plan.

Erosion and sediment control is provided in accordance with SOPA's Stormwater Management and Water Sensitive Urban Design Policy.

3.2 Onsite Stormwater Detention

The site is removing permeable surfaces and being replaced with hardstand leading to faster stormwater runoff. As a consequence, Onsite Stormwater Detention (OSD) is required to attenuate stormwater flows.

The OSD design proposes to attenuate the **Post Development** storm flow for 5 Year ARI and up to the 100 Year ARI down to the **Pre Development** flow rate for the 5 Year ARI

A preliminary DRAINS analysis indicates that the site in the Pre Development state, for the 5 Year ARI storm event produces runoff at a rate of 84L/s.

As a consequence, an approximate OSD volume of 70m³ is required to reduce Post Development flows to the Pre Development flow rate.

Refer to **Appendix B** for the Stormwater Concept Plan which includes OSD.

OSD is provided as per the requirements specified in SOPA's Stormwater Management and Water Sensitive Urban Design Policy

3.3 Flooding

No flooding constraints were identified for this site. The site is positioned well away from creeks and receiving water bodies so any impact from sea level rise is not expected. The proposed stormwater pipe system within the site will cater for a 50% increase in rainfall intensities for the 5% AEP.

3.4 Water Sensitive Urban Design (WSUD)

Water Sensitive Urban Design includes water reuse, pollutant removal via natural systems, and the minimisation of hard structures to control stormwater and improve aesthetic and recreational appeal.

As the site has limited open space as part of the proposed works no WSUD natural systems are proposed.

3.5 Proposed Stormwater Quality

Prior to discharge, stormwater is required to be cleaned to meet SOPA requirements. Due to site constraints, Water Sensitive Urban Design practices will not be accommodated. As a consequence pollutant removal devices will be designed to remove gross pollutants, suspended solids, reduce nutrient runoff including nitrogen and phosphorous.

Pollutant removal devices will require at least a yearly inspection and maintenance.

Stormwater pollutant removal will be provided as per the requirements specified in SOPA's Stormwater Management and Water Sensitive Urban Design Policy.

Water removal rates are as per the following:

- **All development must as a minimum meet the following baseline water quality targets:**
 - **45% reduction in the mean annual load of Total Nitrogen***
 - **65% reduction in the mean annual load of Total Phosphorus***
 - **85% reduction in the mean annual load of Total Suspended Solids***
 - **90% reduction in the mean annual load of hydrocarbons[#]**
 - **95% reduction in the mean annual load of gross pollutants[#]**

3.6 Overland flow

It is proposed that in the event that the piped stormwater system fails due to blockage or other obstructions the stormwater will be required to be conveyed as overland flow. The overland flow is to be directed away from building entries towards the Dawn Fraser Avenue and the proposed rugby league field.

At the boundary to the Sydney Olympic Park Athletic Centre the proposed building will sit lower. Any water falling on the boundary wall will be caught between the wall and building, where water will be collected in a spoon drain and conveyed to pits. If the pits block the spoon drain will discharge onto the proposed loading dock or out towards the proposed rugby league field.

3.7 Vehicular Pavements

A carpark and loading dock will be located on the western side of the proposed building. The carpark is proposed to accommodate 10 vehicles, include a driveway and travel aisle.

A loading dock is proposed for service vehicles and ambulances.

Assuming a 3% CBR a typical flexible pavement would include:

40mm thick asphalt on

120mm thick densely graded base on

220mm thick densely graded subbase on proof rolled subgrade.

A corresponding concrete pavement option would be:

170mm thick 32MPa concrete on

100mm thick densely graded base on proof rolled subgrade

3.8 Vehicle Turning

The carpark is to be designed in accordance with AS2890.1 for off street spaces. With accessible spaces required to be in compliance with AS2890.6.

No vehicle access to the Sydney Olympic Park Athletic Centre is proposed from the Rugby League Centre of Excellence.

It is expected that fire emergency vehicles will access the site from Dawn Fraser Avenue only. The traffic engineer will review all turning manoeuvres.

3.9 Retaining Walls

It is expected that the existing wall to the Sydney Olympic Park Athletic Centre will be modified to the proposed development. This wall is likely to be reconstructed from blockwork or off-form concrete.

Minor walls for planting or to suit steps or ramps may be proposed, up to around 1m in height.

Prepared by
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(NSW) PTY LTD**



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Civil Associate

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Authorised By
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PAUL YANNOULATOS
Technical Director

Appendix A

Erosion and Sediment Control Plan

EROSION AND SEDIMENT CONTROL NOTES

- All work shall be generally carried out in accordance with:
 - Local authority requirements,
 - EPA - Pollution control manual for urban stormwater,
 - LANDCOM NSW - Managing Urban Stormwater: Soils and Construction ("Blue Book").
- Erosion and sediment control drawings and notes are provided for the whole of the works. Should the Contractor stage these works 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.
- Maintain all erosion and sediment control devices to the satisfaction of the superintendent and the local authority.
- When stormwater pits are constructed prevent site runoff entering the pits unless silt fences are erected around pits.
- Minimise the area of site being disturbed at any one time.
- Protect all stockpiles of materials from scour and erosion. Do not stockpile loose material in roadways, near drainage pits or in watercourses.
- All soil and water control measures are to be put back in place at the end of each working day, and modified to best suit site conditions.
- Control water from upstream of the site such that it does not enter the disturbed site.
- All construction vehicles shall enter and exit the site via the temporary construction entry/exit.
- All vehicles leaving the site shall be cleaned and inspected before leaving.
- Maintain all stormwater pipes and pits clear of debris and sediment. Inspect stormwater system and clean out after each storm event.
- Clean out all erosion and sediment control devices after each storm event.

Sequence Of Works

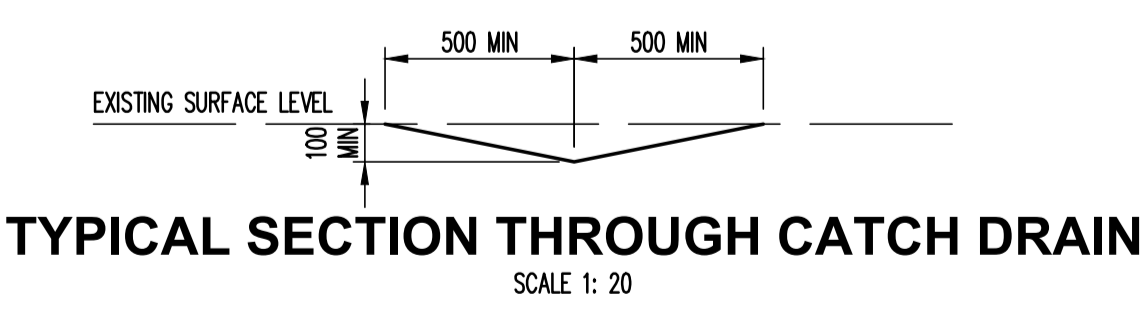
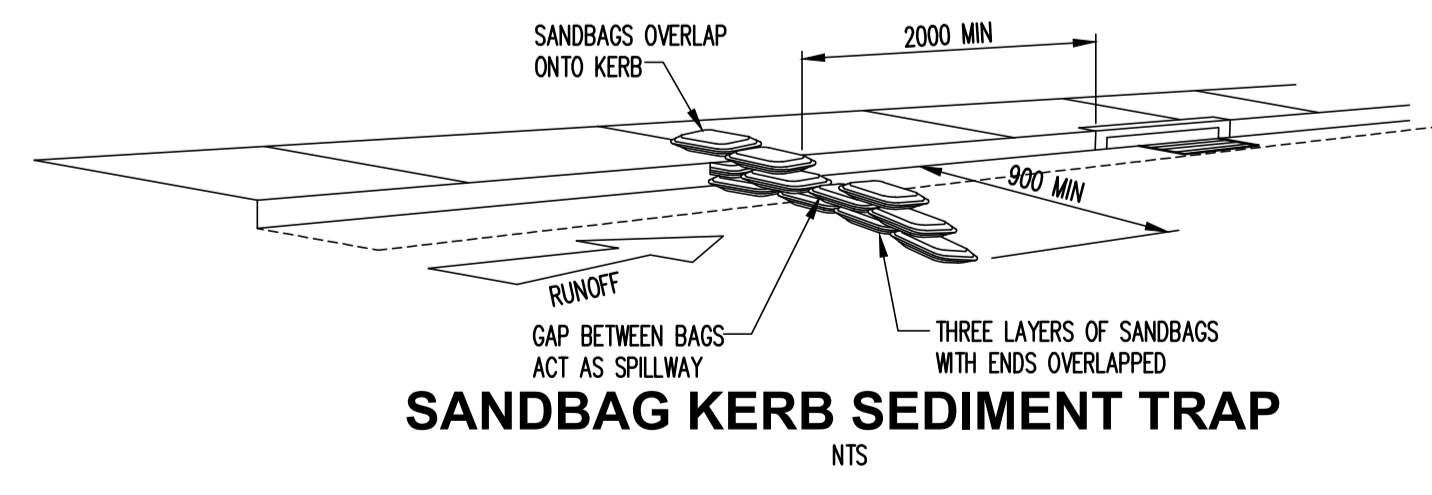
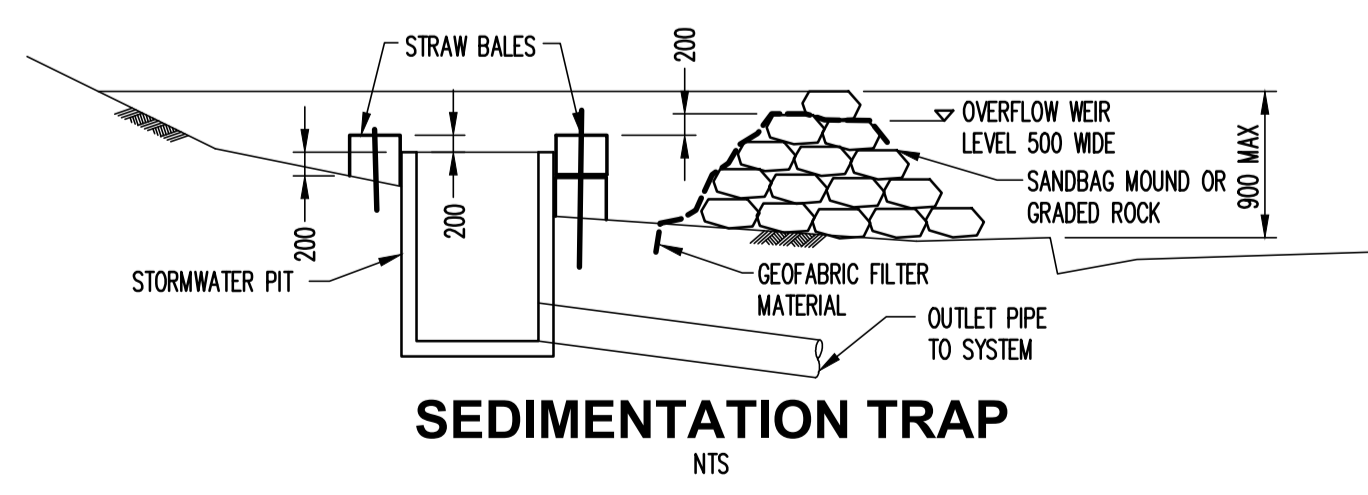
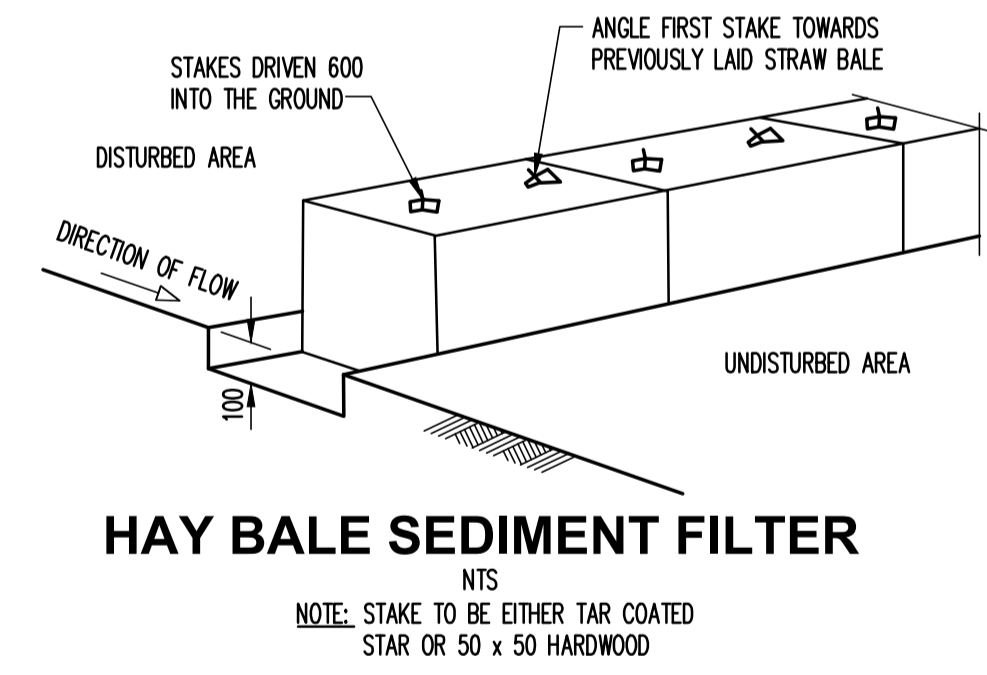
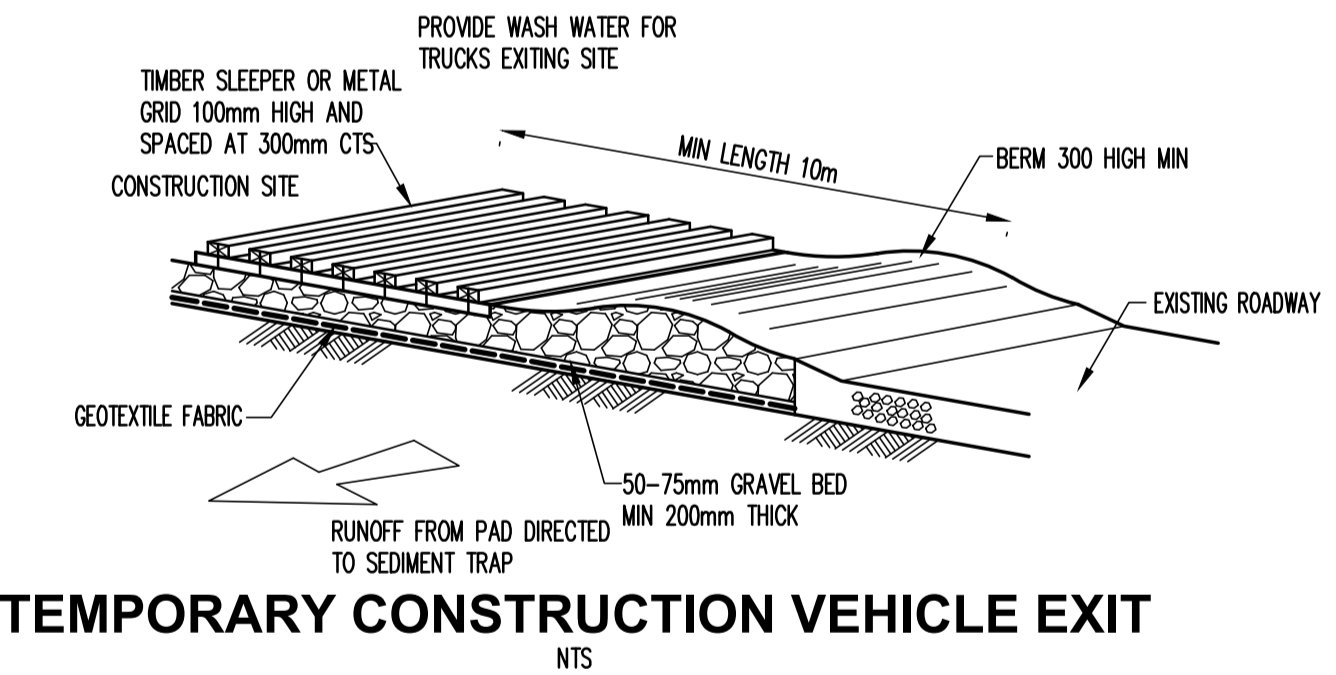
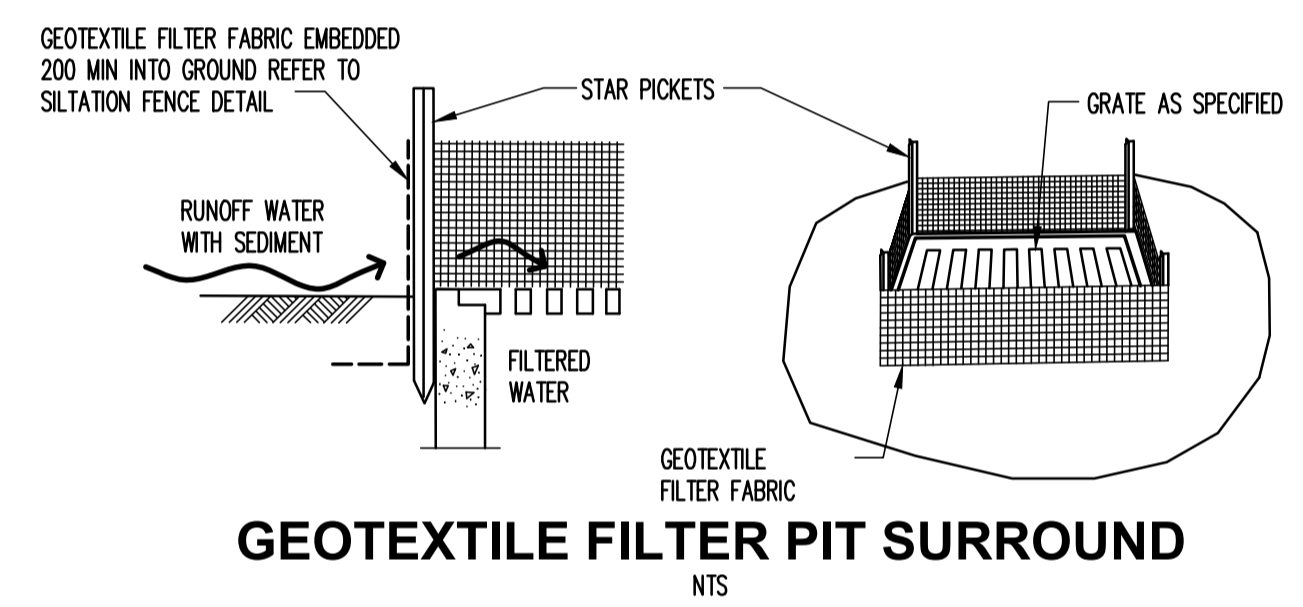
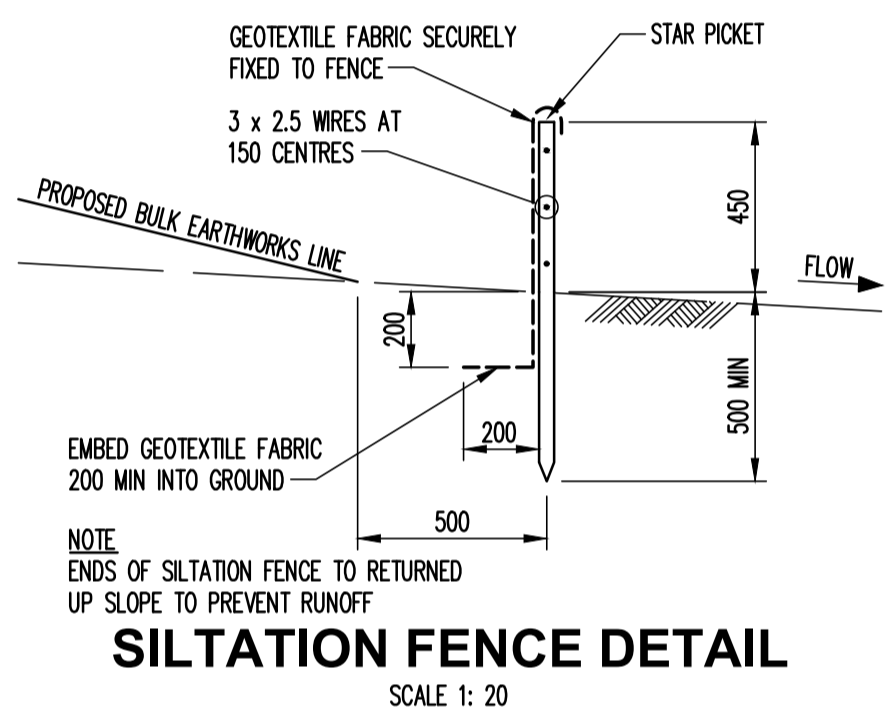
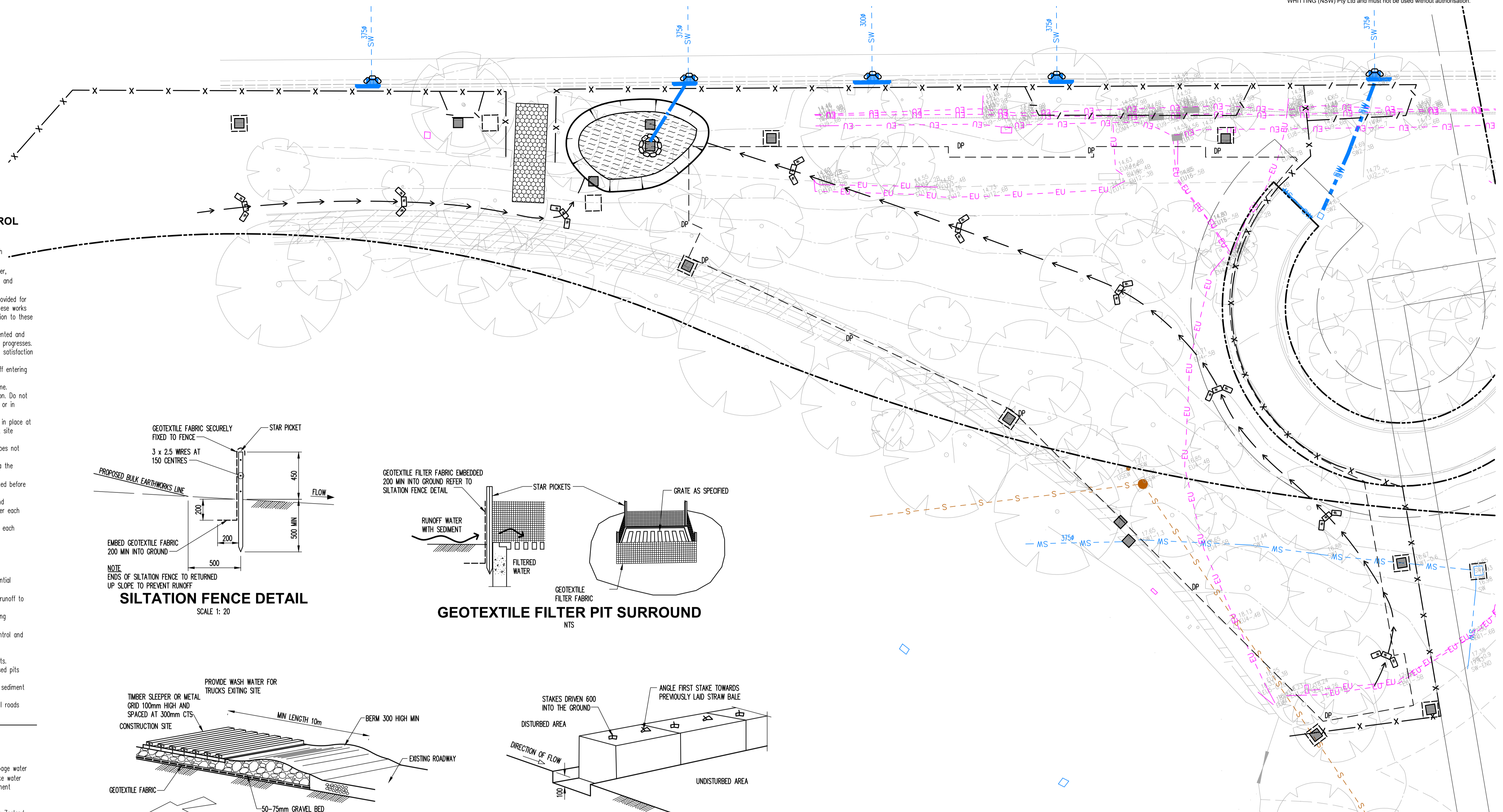
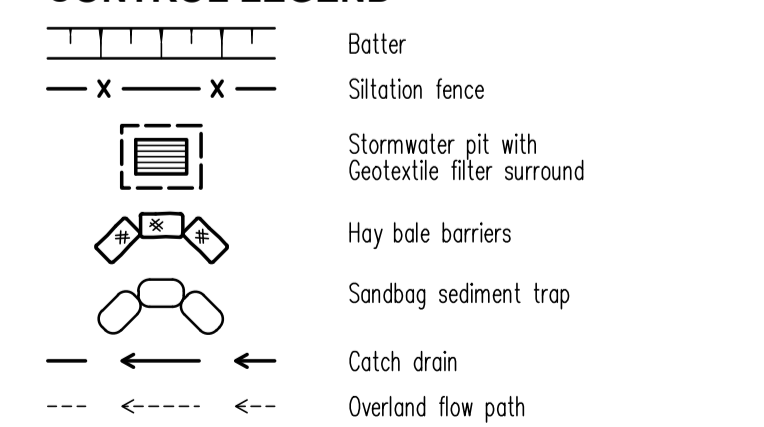
- Prior to commencement of excavation the following soil management devices must be installed.
 - Construct silt fences below the site and across all potential runoff sites.
 - Construct temporary construction entry/exit and divert runoff to suitable control systems.
 - Construct measures to divert upstream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

WATER QUALITY TESTING REQUIREMENTS

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

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



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P2	ISSUE FOR APPROVAL	KH	PW	26.08.16										
P1	PRELIMINARY	KH	PW	19.08.16										

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NSW RUGBY LEAGUE - CENTRE OF EXCELLENCE, SYDNEY OLYMPIC PARK

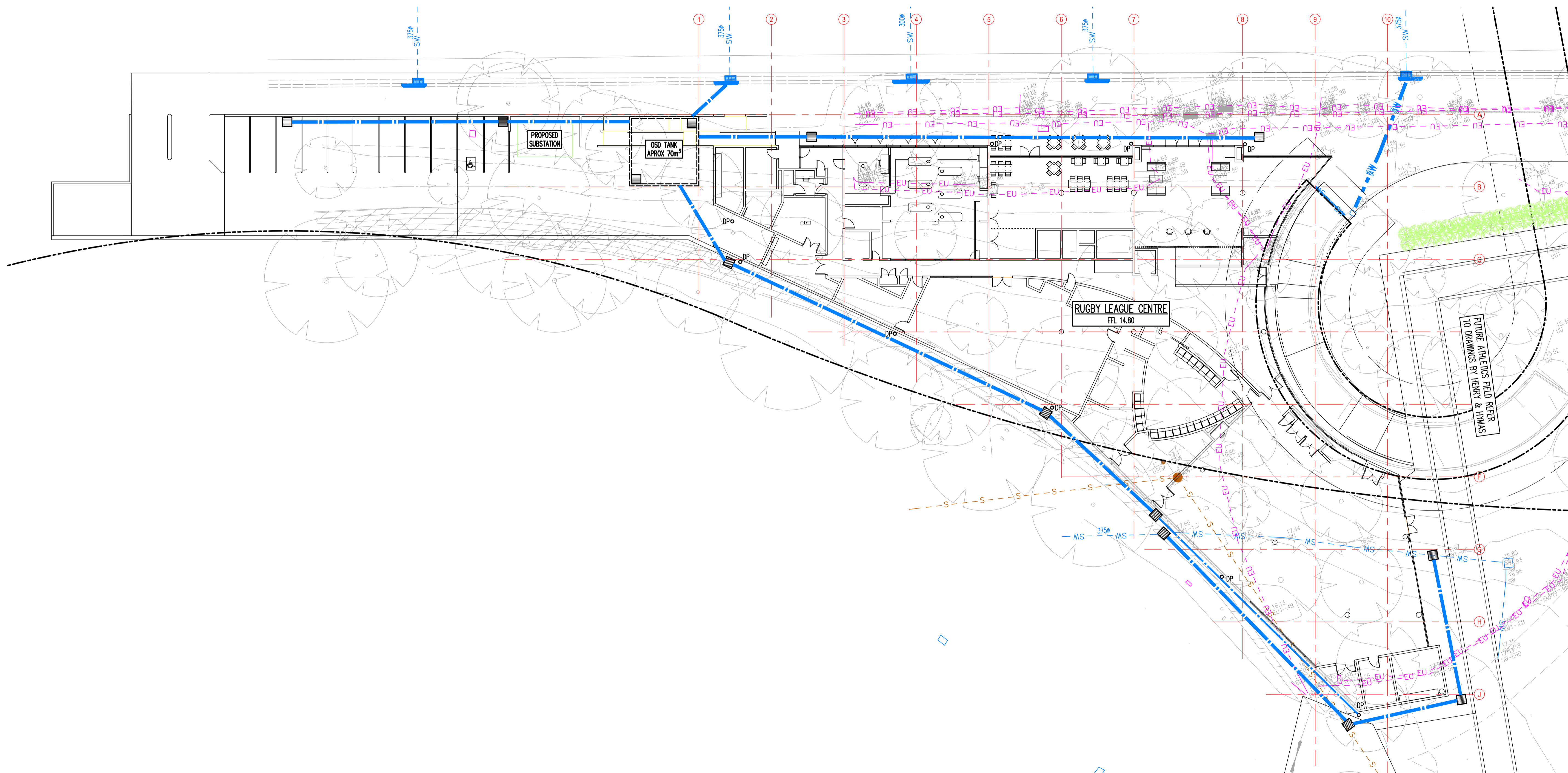
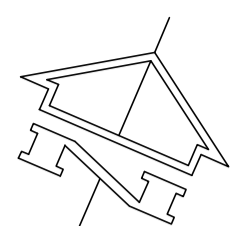
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EROSION AND SEDIMENT CONTROL PLAN

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Job No: 161358
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Appendix B

Stormwater Concept Plan

STORMWATER DESIGN CRITERIA	
SITE AREA: 2,770m ²	
PRE DEVELOPMENT IMPERVIOUS AREA: 250m ²	
POST DEVELOPMENT IMPERVIOUS AREA: 2,330m ²	
OSD REQUIRED TO ATTENUATE POST DEVELOPMENT FLOW, FOR ALL STORMS UP TO 100 YEAR ARI, TO BE EQUAL TO OR LESS THAN THE PRE DEVELOPMENT 5 YEAR ARI.	
5 YEAR ARI = 84L/s	
APPROX OSD VOLUME = 70m ³	
WATER QUALITY CRITERIA	
Pollutant	Target Rate
Total Suspended Solids (TSS)	85%
Total Phosphorous (P)	65%
Total Nitrogen (N)	45%
Gross Pollutants	95%
Oils and Hydrocarbon	90%



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Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
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Sheet Subject
STORMWATER CONCEPT PLAN

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Job No 161358	Drawing No SKC02	Revision P2
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Appendix C

ADP WATER SERVICES

4.0

The hydraulic consultant ADP has advised the following:

4.1 Stormwater Reuse

The site is located within Sydney Olympic Park's water reuse reticulation precinct requiring no reuse of captured stormwater. As a consequence no rainwater reuse for the proposed building is proposed.

Building water demand, based on Maximum Demand 300 People/ Day

- WC/ Urinal- 3500L
 - Irrigation- 500L
- Total- 4kL / Day

Please note provision does not allow for Playing Field Irrigation.

4.2 Water

There is an existing 300mm Recycled Water main along Dawn Fraser Ave, We Propose to the connect to the main.

It is intended to supply the Below:

- Fire Hydrants throughout the site
- WC and Urinal Flushing
- Irrigation to landscaped areas
- Hose Taps to Wash Down Hard surface areas

The estimated water savings based on the maximum demand for 300 people per day is 4000 L/Day.

There is no planned Rainwater tank to the site.

The Sewer is planned to drain to the existing 225 VCP Authority Sewer- There will be no Sewer Mining to the site.