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Stormwater and Sensitive Urban Design Report for DA Submission Sydney Olympic Park Private Hospital PTW Architects

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Contents

Section Page

1. Stormwater 1
2. Sewer 1
3. Water 1
4. Gas 2
5. Water sensitive urban design 2
   - 5.1 Bioretention planter box 2
   - 5.2 Permeable pavements 3
   - 5.3 Rainwater tanks 3
   - 5.3.1 Site specific considerations 3
   - 5.4 Gross pollutant traps (GPT) 4

Appendix A
Sedimentation and erosion control plan

Appendix B
Site services diversion and stormwater concept plan

Appendix C
Existing stormwater catchment layout

1. Stormwater

The site consists of an asphalt car park and landscaped plating areas. The impervious surface area is approximately 46% of the total site area. A concrete dish drain and a series of grated inlet pits collect the surface water run-off. The grated pits are collected by an underground pipped drainage system and are discharged via a 375Φ pipe to a stormwater pit on Olympic Boulevard.

Catchment areas external to the site discharge through this piped drainage system. Run-off from these external areas should be allowed for in the proposed development. The following table is a summary of the existing catchment areas and should be read in conjunction with the existing stormwater layout included in this report.

Existing catchment area information									
No.	AREA (m^2)			Area (%)		Pit			
	Total	Imperv.	Perv.	Imperv.	Perv.	No.	RL	IL	Depth
2	2430	1250	1180	51%	49%	A02	111.85	110.05	1.8
3	485	370	115	76%	24%	A03	111.92	110.58	1.34
4	530	400	130	75%	25%	A04	112.09	110.66	1.43
5	680	270	410	40%	60%	A05	112.17	110.90	1.27
6	430	120	310	28%	72%	A06	112.25	111.10	1.15
7	870	470	400	54%	46%	A07	112.40	111.13	1.27
8	360	60	300	17%	83%	A08	112.28	111.02	1.26
Total	5785	2940	2845	51%	49%				

The existing downstream drainage system has adequate capacity for the proposed development.

The site is located within Auburn Council however SOPA is the consent authority for the stormwater drainage system. On-site detention in not a requirement of SOPA however they have indicated that any new development be sensitive to ESD principles. (Refer to Section 5 – Water Sensitive Urban Design)

2. Sewer

A sewer drainage system servicing the amenities at the western end of the parking structure is located within the proposed site area and diversions will be required prior to construction commencing. The site services concept drawing indicates the likely diversion routes. However the drawing shall be considered as conceptual only and shall be superceeded during the design phase by an appropriate Sydney Water Corporation (SWC) compliant diversion drawing document.The existing sewer system has adequate capacity for the proposed development.

3. Water

Potable and recycled water mains are located in the footpath reserve areas at the northern and western sides of the site in Sarah Durack Avenue and Olympic Boulevard.

4. Gas

Existing natural gas mains are located in the footpath reserve area at the northern end of the site in Sarah Durack Avenue.

5. Water sensitive urban design

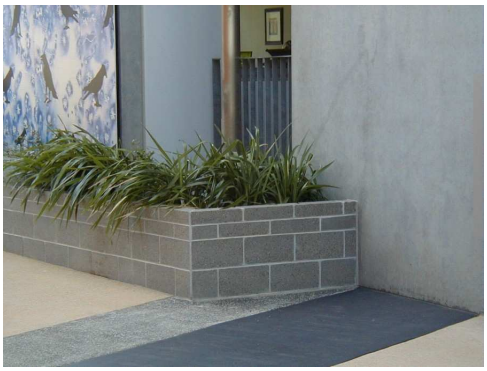
Water sensitive urban design (WSUD) aims to minimise the impact urbanisation has on the natural water cycle. Stormwater management is a subset of WSUD with flood control and water quality objectives.
The purpose of WSUD is to:

- reduce and retard the volume of stormwater runoff
- reduce the pollutant loadings in stormwater runoff to the required performance objectives
- integrate stormwater management into the landscape

There is a variety of alternatives available for incorporating WSUD into a building project. However due to the nature of the site and it's relatively small associated catchment, only certain site specific and site suitable WSUD principles have been considered and they are listed below;

- bioretention planter boxes
- permeable pavements
- rainwater tanks

5.1 Bioretention planter box



Planter boxes otherwise known as small bio-retention basins, are specifically designed to integrate gardens into the stormwater management systems of the site. Bioretention systems treat stormwater by percolation through a vegetated soil media (typically sandy loam). A planter box can create a nice aesthetic for a building, and can combine with a contemporary sculpture that conveys water from a downpipe to the box to add an architectural value. This type of system would be proposed at the Level 1 landscaped terrace area.

5.2 Permeable pavements

Permeable pavements promote infiltration of stormwater runoff to either the soil below or to a sub-soil cell drainage system which is then conveyed to the general gravity stormwater system.

The structure of permeable pavements is relatively simple. They consist of the pavers, laid with a gap in between each paver, on a sand or fine gravel base with a layer of geotextile fabric between the base and a sub base of coarse aggregate or drainage cell where situated on an elevated slab. Pervious concrete and pervious gravel can also be considered a form of permeable pavements.

There are 2 main advantages of permeable pavements over traditional pavements; improved water quality through filtering, interception and biological treatment and flow attenuation through infiltration increasing run off lag times and therefore reducing peak run off flow rates.

The concept of permeable pavements is enticing, but careful design is required if the pavement requires vehicular traffic. Also, installation of permeable pavements alone will not meet the best practice targets for pollutant reductions as specified in the *Urban Stormwater: Best Practice Environmental Management Guidelines* (Victorian Stormwater Committee, 1999)

5.3 Rainwater tanks

Rainwater tanks are used for harvesting stormwater for reuse. They capture stormwater runoff, primarily from roof tops, and store it for reuse. Applications of reuse include garden watering and toilet flushing and cooling tower water make-up. This will effectively reduce the demand on reticulated potable water, while reducing the volume of stormwater runoff and the pollutants associated with the runoff.

5.3.1 Site specific considerations

Rainwater tank(s) would be positioned above the ground to ensure the tanks overflow to naturally gravitate to the stormwater system. Tanks located below grade require the overflow to be pumped back up to the gravity system. This is not an energy efficient design practise as the incorporation of pumps increases the sites ongoing power usages (which can be quite significant as the overflow duty is equivalent to the catchment inflow) and therefore contradicts energy sustainable development philosophies. Due to the configuration of the building and it's limited ground floor space, the rainwater tanks would need to be positioned within the roof plant area and would be served by the plant roof catchments. Our site specific parameters indicate two available plant roof catchment areas totalling approximately 900m2. Based on the highest monthly average rainfall (March) of 131mm, this would indicate that a tank capacity of up to 118m3 could be utilised depending on available space.

5.4 Gross pollutant traps (GPT)

Gross pollutant traps (GPT) are used as a primary treatment measure to remove litter, debris and coarse sediments.
GPT's are advantageous in that they can be located underground in the form of a large drainage pit. They do, however, only remove a small portion of total phosphorous and total nitrogen from the runoff, only that which is attached to the coarse sediments being retained in the trap.

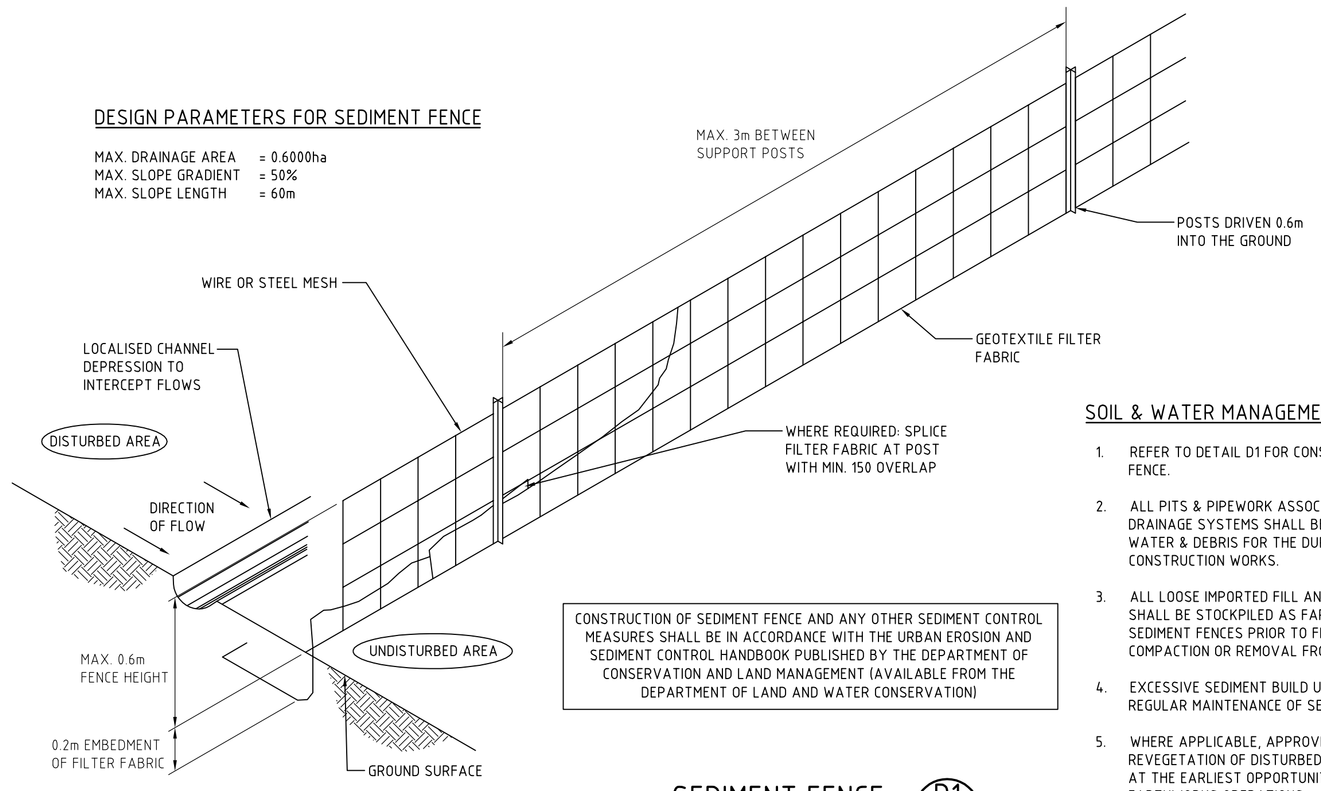
GPT's require regular manual maintenance to clean out the litter and debris, but are an ideal treatment for removal of unsightly gross pollutants as they have a very small footprint. Due to the configuration and the relatively clean nature of the proposed site, it is unsure whether GPT's will be useful. This will be reviewed further in the design development phase.

Appendix A

Sedimentation and erosion control plan

DESIGN PARAMETERS FOR SEDIMENT FENCE

MAX. DRAINAGE AREA = 0.6000ha
MAX. SLOPE GRADIENT = 50%
MAX. SLOPE LENGTH = 60m

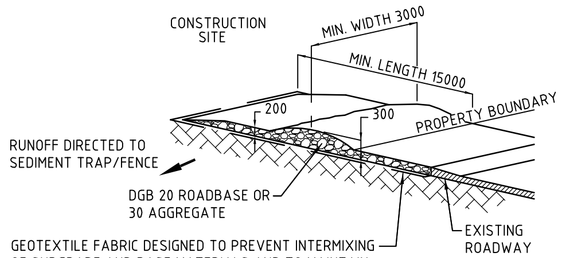


CONSTRUCTION OF SEDIMENT FENCE AND ANY OTHER SEDIMENT CONTROL MEASURES SHALL BE IN ACCORDANCE WITH THE URBAN EROSION AND SEDIMENT CONTROL HANDBOOK PUBLISHED BY THE DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT (AVAILABLE FROM THE DEPARTMENT OF LAND AND WATER CONSERVATION)

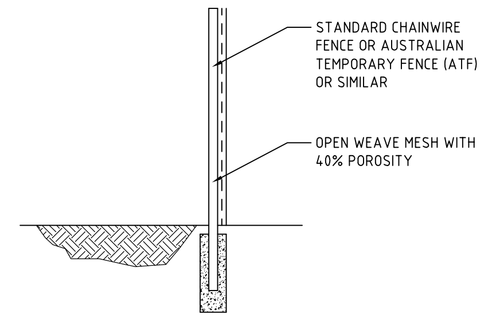
SOIL & WATER MANAGEMENT NOTES

1. REFER TO DETAIL D1 FOR CONSTRUCTION OF SEDIMENT FENCE.
2. ALL PITS & PIPEWORK ASSOCIATED WITH PROPOSED DRAINAGE SYSTEMS SHALL BE KEPT FREE OF SOIL, WATER & DEBRIS FOR THE DURATION OF THE CONSTRUCTION WORKS.
3. ALL LOOSE IMPORTED FILL AND EXCAVATED MATERIAL SHALL BE STOCKPILED AS FAR AS POSSIBLE FROM SEDIMENT FENCES PRIOR TO FINAL PLACEMENT, COMPACTION OR REMOVAL FROM SITE.
4. EXCESSIVE SEDIMENT BUILD UP SHALL BE AVOIDED BY REGULAR MAINTENANCE OF SEDIMENT FENCES.
5. WHERE APPLICABLE, APPROVED LANDSCAPING & REVEGETATION OF DISTURBED AREAS SHALL COMMENCE AT THE EARLIEST OPPORTUNITY AFTER COMPLETION OF EARTHWORKS OPERATIONS.

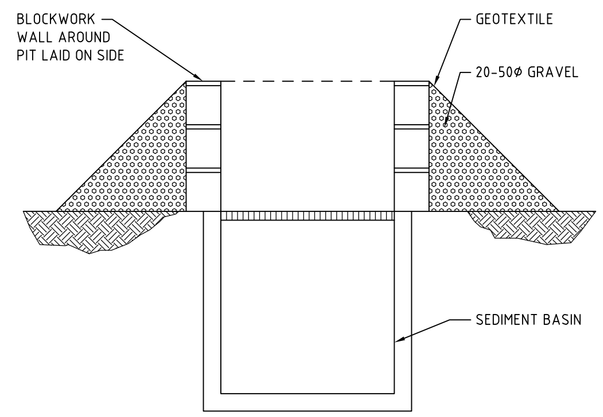
SEDIMENT FENCE D1
NTS -



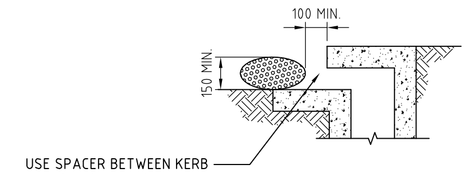
STABILISED SITE ACCESS DETAIL D2
NTS -



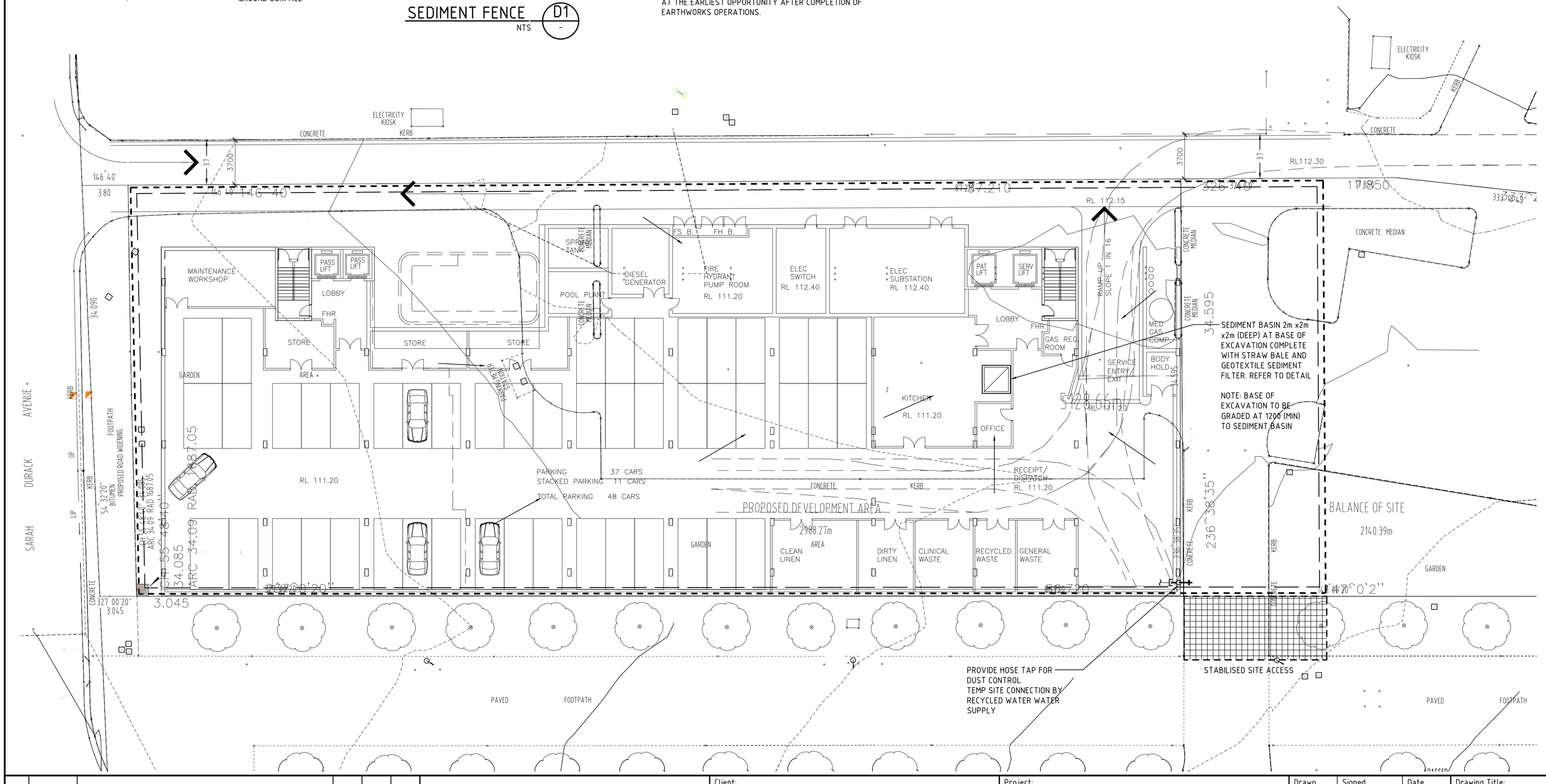
WIND FENCE D3
NTS -

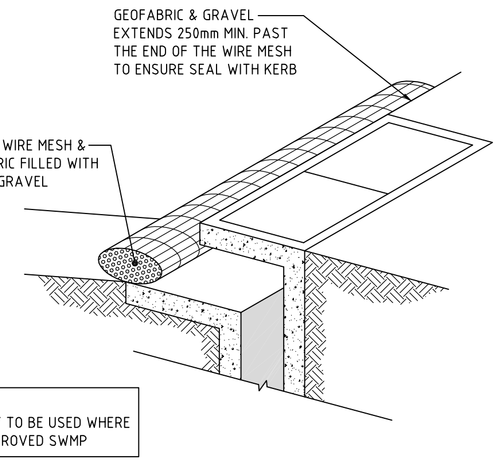


SEDIMENT BASIN OUTLET CONTROL D4
NTS -



PLAN VIEW





NOTE:
THIS PRACTICE ONLY TO BE USED WHERE SPECIFIED IN AN APPROVED SWMP

GRAVEL SOCK INLET FILTER D5
NTS -

NOTES:

1. EROSION AND SEDIMENT CONTROLS TO BE PLACED ACCORDING TO CONSTRUCTION PHASING.
2. EROSION AND SEDIMENT CONTROL DEVICES TO BE IN ACCORDANCE WITH "MANAGING URBAN STORM WATER-SOILS & CONSTRUCTION" (1998-BLUE BOOK), AUBURN COUNCIL, STORMWATER DRAINAGE DESIGN GUIDELINES AND & SOPA REQUIREMENTS.
3. SEDIMENT, WIND & CONSTRUCTION FENCE CAN BE COMBINED.
4. THE CONTRACTOR SHALL TAKE ALL NECESSARY STEPS TO PROTECT THE ENVIRONMENT AND IN PARTICULAR CONTROL EROSION, SEDIMENTATION AND POLLUTION DURING CONSTRUCTION IN ACCORDANCE WITH THE REQUIREMENTS OF THE EPA, DLWC, SOPA, COUNCIL AND EROSION AND SEDIMENT CONTROL PLAN.
5. AFTER RAINFALL RETAINED WATER SHALL BE FLOCCULATED WITH ALUM AT A RATE OF 1.5-3kg/100m³ & WATER DISCHARGED TO THE STORMWATER SYSTEM. SUSPENDED SOLIDS IN THE DISCHARGE WATER SHALL NOT EXCEED 50mg/L.

LEGEND

- - - - WIND FENCE
—— —— SEDIMENT FENCE

PRELIMINARY
NOT FOR CONSTRUCTION

Rev.	Date	Revision Details	Drn	Ver.	App.
02	11.07.07	ISSUED FOR REVIEW BY DEPT. OF PLANING	VB	MML	GJN
01	21.06.07	PRELIMINARY DA ISSUE	MEF		

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Project:
SYDNEY OLYMPIC PARK
PRIVATE HOSPITAL

Drawn MEF	Signed	Date
Designed MML	Signed	Date
Verified MML	Signed	Date
Approved GJN	Signed	Date

Drawing Title:
HYDRAULIC SERVICES
EROSION AND SEDIMENT CONTROL
PLAN AND DETAILS

Project No. 8429
Scale 1:200 U.N.O.
Sheet Size A1
Drawing No. SKH001
Rev. 02

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Appendix B

Site services diversion and stormwater concept plan

NOTES:

SEWER MAIN DIVERSION SHOWN AS CONCEPTUAL ONLY
FINAL DIVERSION DESIGN AND CONSTRUCTION SHALL BE
UNDERTAKEN BY QUALIFIED SYDNEY WATER COOPERATION
ACCREDITED MAJOR WORKS CONTRACTOR.

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Project: SYDNEY OLYMPIC PARK PRIVATE HOSPITAL

Role	Name	Signed	Date
Drawn	MEF	Signed	Date
Designed	MML	Signed	Date
Verified	MML	Signed	Date
Approved	GJN	Signed	Date

Drawing Title: HYDRAULIC SERVICES SITE PLAN SEWER AND STORMWATER DIVERSION DIAGRAM

PRELIMINARY
NOT FOR CONSTRUCTION

Project No. 8429
Scale 1:200
Sheet Size A1
Drawing No. SKH002
Rev. 02

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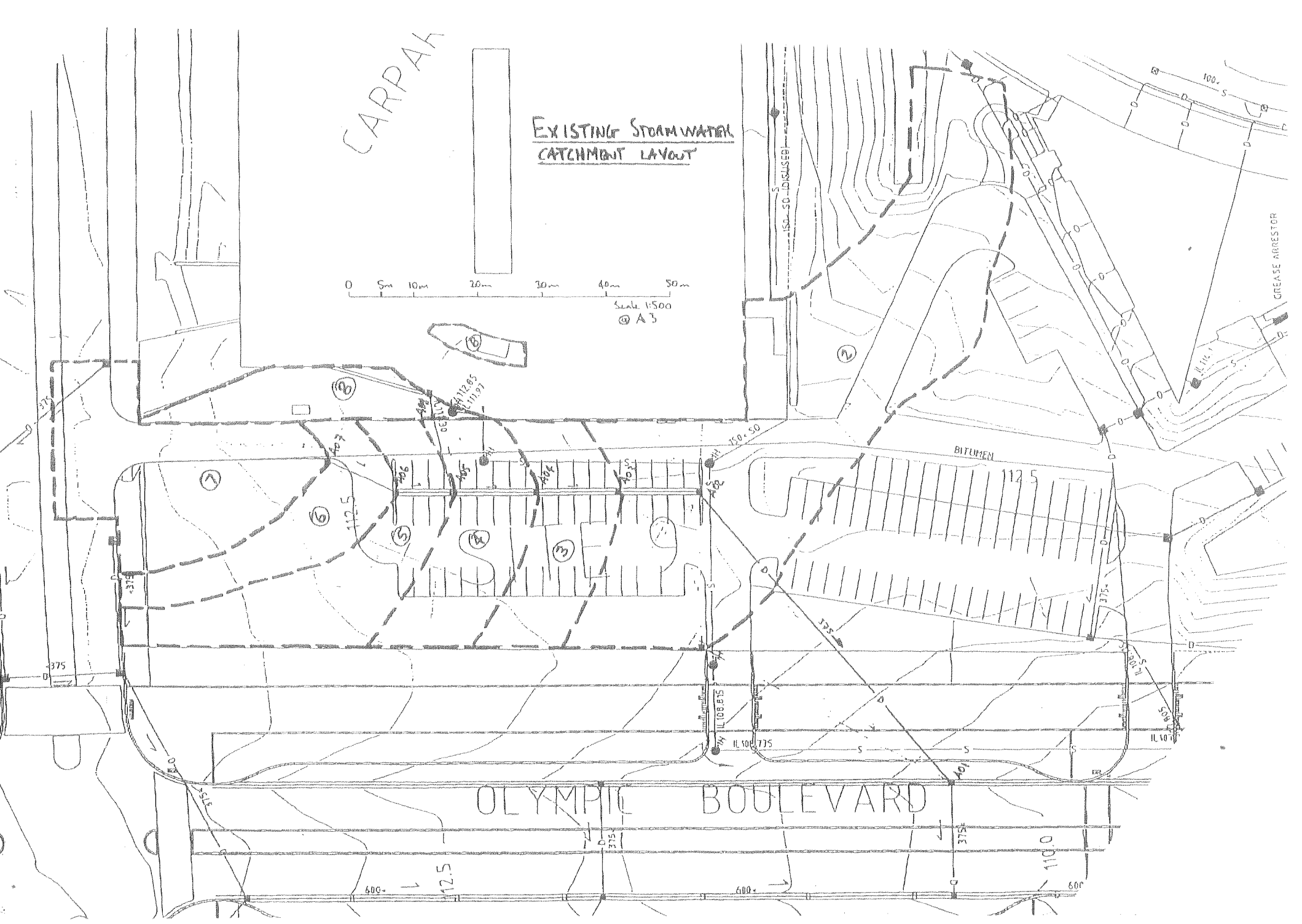
Appendix C

Existing stormwater catchment layout


EXISTING STORMWATER
CATCHMENT LAYOUT
0 5m 10m 20m 30m 40m 50m
Scale 1:500
@ A3
CARPARK
OLYMPIC BOULEVARD
BITUMEN
GREASE ARRESTOR
112.5
110.0
600
375