

Civil



TaylorThomsonWhitting

STATE SIGNIFICANT DEVELOPMENT, DEVELOPMENT APPLICATION FOR HORNSBY KU-RING-GAI HOSPITAL REDEVELOPMENT STAGE 1 CIVIL ENGINEERING and INTEGRATED WATER MANAGEMENT PLAN

for Health Infrastructure

Issue P4 - 13 November 2012

111379

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1.0 EXECUTIVE SUMMARY

This report addresses the Civil engineering requirements of the Director General's Environmental Assessment Requirements (hereafter DGR's), Section 78A(8A) of the Environmental Planning and Assessment Act, application number SSD 5356, dated 11 July 2012.

As part of the proposed Hornsby Ku-ring-gai Hospital Redevelopment Stage 1, Taylor Thomson Whitting (NSW) Pty Ltd has been engaged by Health Infrastructure to provide advice on Civil aspects of the project.

The DA seeks approval for a new 4 level clinical building plus roof plant level accommodating surgical services (including sterilising services department); Inpatient accommodation and support services. The works are proposed by NSW Health Infrastructure.

This report will assess the relevant DGR's and review civil engineering issues such as stormwater; Onsite Stormwater Detention (hereafter OSD); pollution and litter control; flood impacts; erosion and sediment control; existing service relocation and modifications;.

2.0 INTRODUCTION

The Stage 1 Hornsby Ku-ring-gai Hospital project is located on the Hornsby Ku-ring-gai Hospital campus between the existing Theatre Block, HOPE building, Derby Road and Burdett Street.

This civil engineering and integrated water management plan contains a description of the stormwater system proposed. It also covers civil engineering issues such as pollution control, service relocation and modification, erosion and sediment control during construction, and flood requirements.

2.1 RESPONSE TO DIRECTOR'S GENERAL REQUIREMENTS

No	DGR Key Issues – Civil	Civil Comments
1	General	The study has been carried out with consideration to relevant guidelines and planning documents including: Hornsby Council's planning documents including flood maps and Hornsby Council Development Control Plan and relevant Council documents, Australia Standards, Australian Rainfall & Runoff, Managing Urban Stormwater – Soils & Construction Volume 1 2004 (Landcom), and NSW Floodplain Development Manual (2005)
3	Utilities In consultation with relevant agencies, the EIS shall address the existing capacity and any augmentation requirements of the development for the provision of utilities including staging of infrastructure through the preparation of an Infrastructure Management Plan.	Section 3 provides an overview of the existing site conditions including services. Services will be retained where possible otherwise removal or relocation will be required.
3.5	Utilities Prepare an Integrated Water Management Plan detailing any proposed alternative water supply, proposed end users of potable and non-potable water, demonstration of water sensitive urban design and water conservation measures.	This report comments on water sensitive urban design measures available to the Hornsby's site with respect to captured stormwater.

4.0	Drainage Provide details of the drainage associated with the proposal, including stormwater, drainage infrastructure and OSD, which shall be designed in consultation with Hornsby Shire Council and must avoid any adverse impacts on downstream properties.	Section 4.0 provides an overview of the stormwater management required for the proposed development. OSD with pollution controls will be included in accordance with Hornsby Council requirements. A stormwater concept plan has been provided in Appendix 1.
5.0	Flooding An assessment of any flood risk on site (if relevant) and consideration of any relevant provisions of the NSW Floodplain Development Manual (2005), including the potential effects of climate change, sea level rise and an increase in rainfall intensity.	A flood overview has been provided at section 5.0. The development is not be affected by flooding.
6.0	Sediment, Erosion and Dust controls (Construction and Excavation) Detail measures and procedures to minimise and manage the generation and off-site transmission of sediment, dust and fine particles. Relevant Policies and Guidelines: □ Managing Urban Stormwater – Soils & Construction Volume 1 2004 (Landcom) □ Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (EPA)	An erosion and sedimentation plan has been prepared in accordance with Councils requirements, Landcom's 2004 publication and is provided in Appendix 2.

2.2 The Development Site

The development site is within the existing grounds of the Hornsby Ku-ring-gai Hospital Campus as shown on the layout below. The existing site falls to the east, towards to Derby Road.



3.0 EXISTING CONDITIONS INCLUDING SERVICES

Currently the site is occupied by existing buildings, carparking, access roads and some landscaped open areas. There are existing services which are located within the development site that will need to be identified. **This section addresses key issue number 10 of the Director General's Environmental Assessment Requirements**

3.1 Existing Buildings

There are several buildings will be removed as part of the proposed works. Currently the buildings are of various ages and used as either hospital buildings, residential, or storage. Due to the age of the existing buildings, contaminants such as asbestos are expected to be encountered during demolition.

3.2 Existing Carpark and Roads

There is a concrete carpark off Derby Road which contains some 25 spaces which will be modified or removed to suit the proposed loading dock. Existing access road and drive entry which services building 20 and the rear of the Hope building will be maintained.

The existing asphalt carpark off Burdett Street will be modified to suit the proposed development. This carpark has about 45 spaces.

Existing access ways and paths which located within the proposed development's footprint will be removed.

3.3 Existing Services

There are existing services which transverse the proposed hospital site. These services include, but are not limited to water, sewer, gas, stormwater and telecommunications. A services investigation is being undertaken with the view to ensure that services are modified / relocated / removed as required to suit the proposed works.

A service locator has provided information collected from site investigation.

Whilst attempts have been made to identify all services which will be impacted, there is still the possibility that unknown services are encountered during demolition or construction. This is due to some services being untraceable due their type, not being able identify the service due to depth underground or being located under existing buildings which are yet to be demolished.

3.4 Existing Stormwater

There is an existing OSD tank located within existing Derby Road carpark which connects to Hornsby Council's stormwater system located on Derby Road.

The stormwater from the existing buildings connects into the stormwater on Derby Road via an in-ground stormwater system.

The existing site OSD will be removed, so too will the stormwater drainage from buildings being demolished. The existing connection point on Derby Road will

remain.

3.5 Water Sensitive Urban Design

Stormwater has the potential to be reused onsite provided it is treated to a suitable standard. Reused stormwater can typically be used for flushing toilets, laundry water supply and irrigation of gardens.

The incorporation of water-reuse adds upfront capital and on-going maintenance costs. High level water treatment devices, pumps, storage tanks and additional pipe work add to the capital costs. Maintenance of the supply pipes, treatment devices and pumping system, contributes to maintenance costs.

As there is minimal to none landscaping and laundry facilities, it is unlikely that water reuse will be cost effective.

A wetland to treat stormwater is not considered possible on our site due to site constraints such as limited open space, minimal setback to buildings and proximity to public property. Refer to the pollution and litter control section below for how stormwater contaminants are treated.

Refer to Donnelley Simpson Cleary's report for an Integrated Water Management Plan.

4.0 DRAINAGE

Currently the site is occupied by existing buildings and carparking which have stormwater and onsite stormwater detention. **This section addresses key issue number 14 of the Director General's Environmental Assessment Requirements.**

4.1 Stormwater

The proposed developments stormwater will be picked up and conveyed via pipe to the OSD tank. The OSD tank will discharge to Hornsby Council's existing stormwater system located on Derby Road. The existing stormwater connection with Council's system, pit 10706, will be maintained. It is envisaged that there will be no modifications or upgrades to Hornsby Council's stormwater system.

Existing stormwater that does not require to be removed will be maintained and where required, be connected into the proposed system. All proposed roofs will collect stormwater via gutters and downpipes and be connected to the in-ground system.

Stormwater pipes and pits will be in accordance with AS3500 - National plumbing and drainage code.

A stormwater concept plan is shown in **Appendix 1**.

4.2 Onsite Stormwater Detention

In accordance with Hornsby Council's Onsite Detention Policy and Hornsby Council's Draft DCP, OSD will be required for the development. Correspondence with Council's requirements is shown in **Appendix 2**.

Due to the natural fall of the land to the east, detention tank is proposed to be on the eastern boundary, adjacent Council pit 10706. Initial tank estimates are for a volume of 250m³ with a footprint of about 100m².

The tank is likely to be made as an insitu concrete or precast concrete structure.

As stormwater is being retained and released at pre-development rate in accordance with Council's requirements, there will be no increase in stormwater impact on downstream properties.

4.3 Pollution and Litter Control

Hornsby Council's Draft DCP (Hereafter HDDCP) requires development sites greater than 2000m² meet quality targets prior to stormwater discharge. Table 1 below indicates reduction loads required to be achieved.

Table 1 – Source HDDCP table 1C.1.2(b) Urban Stormwater Quality Targets

<u>Pollutant Type</u>	<u>Performance Target Reduction Loads</u>
Gross Pollutants	90% reduction in the post development mean annual load of total gross pollutants
Total Suspended Solids	80% reduction in the post development mean annual load of total suspended solids.
Total Phosphorous	60% reduction in the post development mean annual load of total phosphorous
Total Nitrogen	45% reduction in the post development mean annual load of total nitrogen

The site stormwater will pass through an Oil and Silt Arrestor (Humeceptor or equivalent) and gross pollutant trash screens. Pits will have litter screens / traps where required. Pollution control measures will clean the stormwater to the level required prior to discharge from site.

The pollution control devices will require on-going maintenance.

5.0 FLOODING

This section addresses key issue number 13 of the Director General's Environmental Assessment Requirements

5.1 Flood Impact

Hornsby Hospital is not located within a flood area as defined by HDDCP, section 1C.3.2 Flooding. There is no obstruction to overland flow paths due to the proposed development.

6.0 EROSION AND SEDIMENT CONTROL

This section addresses key issue number 9 of the Director General's Environmental Assessment Requirements

6.1 Erosion and Sediment Control

A preliminary Soil and Water Management Plan (SWMP) as defined by HDDCP, section 1C.1.2, has been prepared and is included as **Appendix 3**.

During construction erosion and sediment control measures will be put in place to prevent or ensure any site stormwater run-off is cleaned prior to discharge.

It will be required that dust suppression, construction vehicle inspection and cleaning systems are in place. With regular inspections, maintenance and modifications, erosion and sediment control devices will be cleaned out after storm events and adjusted on-site as construction progresses.

Prepared by:
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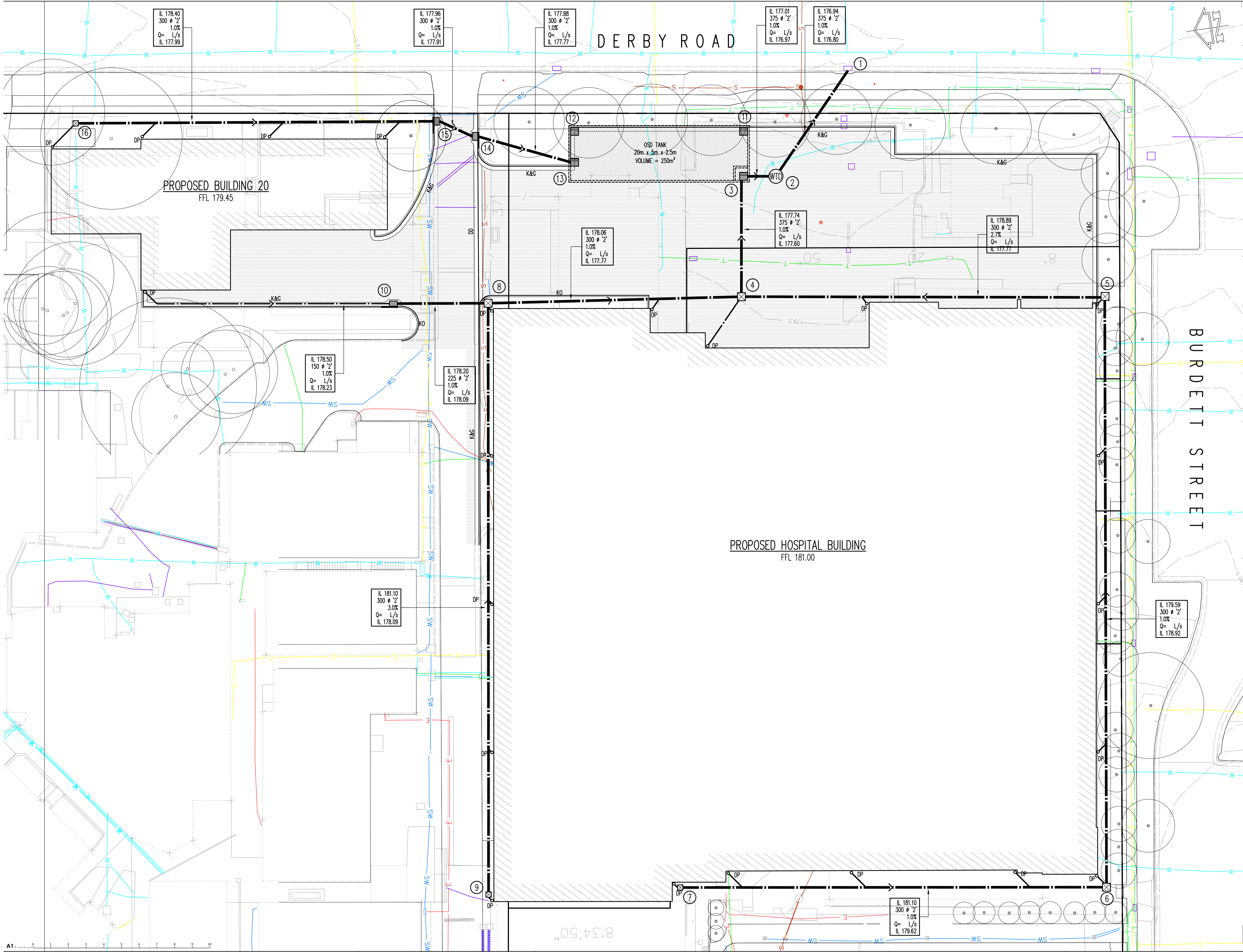
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PAUL YANNOULATOS
Technical Director

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Appendix 1: Stormwater Concept Plan



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THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT NOTES ON DRAWING NO. C001

SITeworks LEGEND

- K&G Kerb and gutter
- KO Kerb only
- DD Dish drain
- Stormwater pit, flow direction and line with invert level upstream
Pipe size and class
Pipe grade
Flow (Litres per second)
Invert level downstream
- Grated drain
Intermediate riser with subsoil drainage line (100 dia)
- Flushing point with subsoil drainage line (100 dia)
- Down pipe

PIT SCHEDULE

Note: Grate size does not necessarily reflect pit size, refer pit type details, shown on detail sheets - **TT-CV-0006**
Final internal pit dimensions are to comply with AS3500.

Type	Description	Cover (Clear Opening)	Number
A	Kerb inlet pit 1800 lintel	450 x 900 Class C galvanised mild steel grate hinged to frame	10,14,15
B	Junction pit	900 x 900 Class C cast iron cover with concrete infill	4,5,6,8
C	Junction pit	600 x 600 Class C cast iron cover with concrete infill	7,9,16
D	OSD Surface inlet pit	900 x 900 Class C galvanised mild steel grate hinged to frame	3,11,12,13
E	WTD	Water treatment device	2
F	Existing pit to remain		1

EXISTING SERVICES LEGEND

- SW Existing stormwater
- S Existing sewer
- T Existing telecommunications
- G Existing gas
- W Existing water supply
- E Existing electrical
- Existing services other/unknown

PRELIMINARY

Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
P2	PRELIMINARY	KH	KA	09.11.12					



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Project
HORNSBY KU-RING-GAI HOSPITAL REDEVELOPMENT

Sheet Subject
SITeworks PLAN

Scale : A1	Drawn	Authorised
1:200	PK	
Job No	Drawing No	Revision
111379	TT-CV-0005	P2
26/07/2012 10:23:51 AM		

Appendix 2: Hornsby Council Correspondence

Kelvin Holey

From: Ahmed Yazdani [AYazdani@Hornsby.nsw.gov.au]
Sent: Thursday, 19 July 2012 8:43 AM
To: Kelvin Holey
Subject: RE: Hornsby Hospital Redevelopment
Attachments: 2596_001.pdf

Categories: 111379

Kelvin,

Although the policy states Q20, as condition of consent we can impose additional condition. The Q20 generally applies to residential development. However, if you want to submit in accordance with the policy statement, we will check. Please see point 1 of the attached document.

Regards

Ahmed Yazdani

Senior Development Engineer | Development Assessment | Hornsby Shire Council
p 02 9847 6688 | m 0438 777 580 | f 02 9847 6599
e ayazdani@hornsby.nsw.gov.au | w hornsby.nsw.gov.au | t twitter.com/HornsbyCouncil

[Click here](#) to sign up to the Bushland Shire eNews, Hornsby Council's monthly eNewsletter.

Council acknowledges the traditional owners of the lands of Hornsby Shire, the Darug and Guringai people.

From: Kelvin Holey [<mailto:Kelvin.Holey@ttw.com.au>]
Sent: Wednesday, 18 July 2012 4:51 PM
To: Ahmed Yazdani
Subject: Hornsby Hospital Redevelopment

Ahmed,

As a follow up to today's phone, please find attached my notes for your comment.

The proposed Hospital development is on the corner of Derby Road and Burdett Street, existing buildings are being replaced with an extension of the Hospital. Location of development shown on the attached plan.

- Onsite stormwater detention is to be provided in accordance with Hornsby Council OSD policy (attached) and that the post development Q20 discharge rate is to be reduce to the predevelopment Q5 rate. Hornsby policy attached to this email.
- OSD is to connect into existing Council pits / pipes located on Derby Road.
- All proposed stormwater drainage including subsoil drainage is to connect to the OSD tank.
- Pollution Control is required to clean stormwater water in accordance with the rates in Hornsby Council's draft DCP 2012
http://www.hornsby.nsw.gov.au/data/assets/pdf_file/0020/38144/HDCP_Part1_General.pdf
- Flood mitigation measures are not required as the property / development is not located within any overland flow path or shown on Hornsby Council Flood maps.

Please do not hesitate to contact me should there be any questions – 02 8437 7272

Regards,
Kelvin Holey

Kelvin Holey

From: Pri Ratnayake [PRatnayake@hornsby.nsw.gov.au]
Sent: Friday, 18 November 2011 10:39 AM
To: Andrew Wallace
Subject: RE: Hornsby Hospital development

Categories: 111379

Hi Andrew,

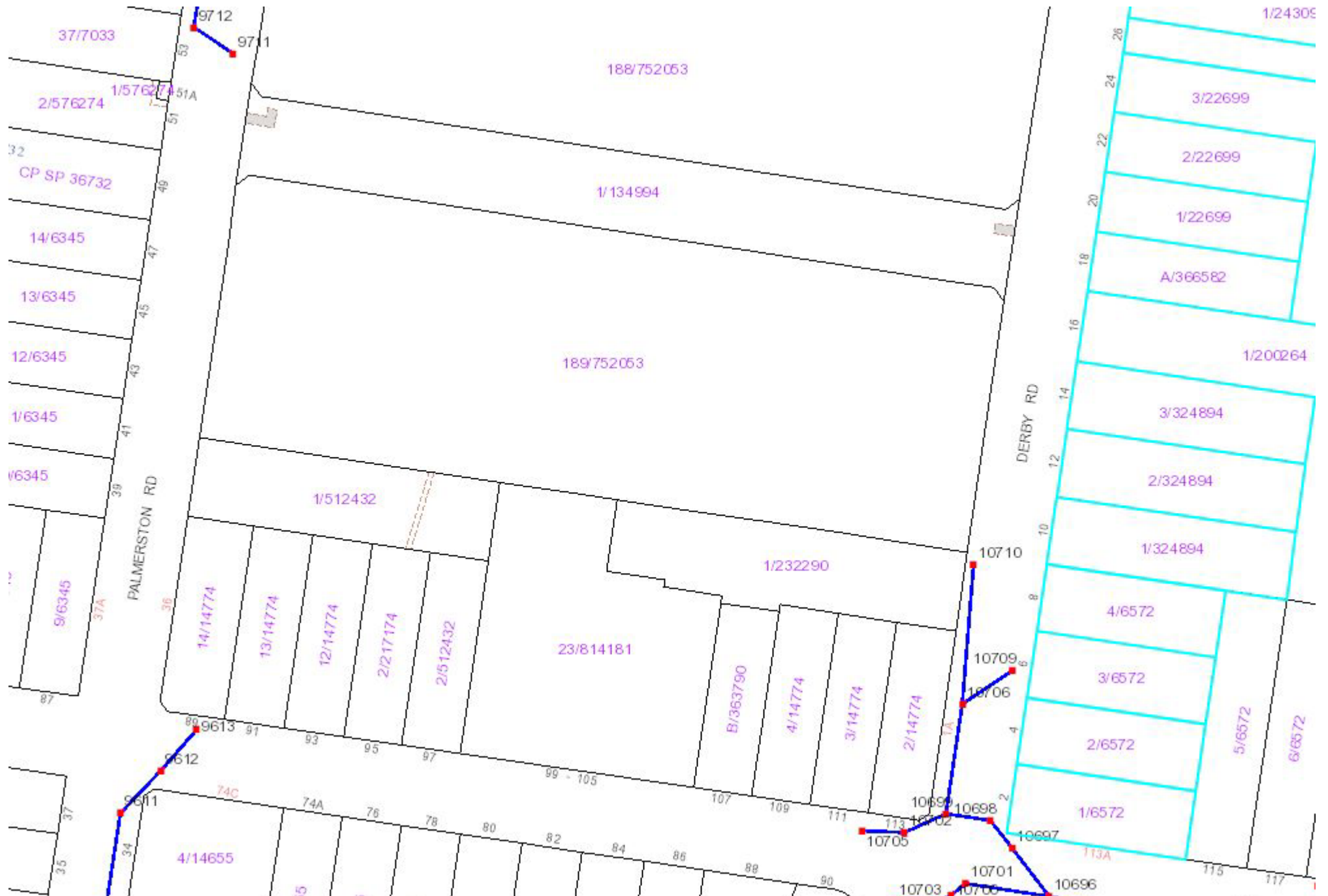
Further to your request, please refer the map below for the Council's drainage assets in the vicinity of Hornsby Hospital. In the map Council's pipes are marked in **Blue** and pit are marked in **Red.squares**. Please note that this information is indicative only, on-site inspection are required to verify the accuracy of the map.

The following comments can be provided in relation to OSD for your consideration. However, this is a planning matter and you are advised to contact Council's planning division on 9847 6853 for further information.

- Calculation for designed storage volume for the proposed On Site Detention system based on Q20 post development discharge rate being reduced to pre-development Q5 flow.
- All stormwater drainage including sub soil drainage is to be connected to the proposed OSD tank.

Thanks

Pri Ratnayake
Investigations Engineer | Hornsby Shire Council
p 02 9847 6699 | f 02 9847 6980
e pratnayke@hornsby.nsw.gov.au | w www.hornsby.nsw.gov.au



From: Andrew Wallace [<mailto:Andrew.Wallace@ttw.com.au>]
Sent: Wednesday, 16 November 2011 12:21 PM
To: Pri Ratnayake
Subject: Hornsby Hospital development

Further to our telephone discussion, please find attached a basic outline of the proposed development area of Hornsby Hospital.

Could you send me plans of the existing council drainage system in the area? The development is towards the southern end of the site, bounded by Derby Road, Burdett St and Palmerston Road.

The proposal is in a very early stage, but as it develops I will be in touch to discuss the drainage. At this stage, I am proposing to design the drainage in accordance with Hornsby Councils OSD policy (attached).

Could you confirm this is acceptable?

Any queries, please contact me.

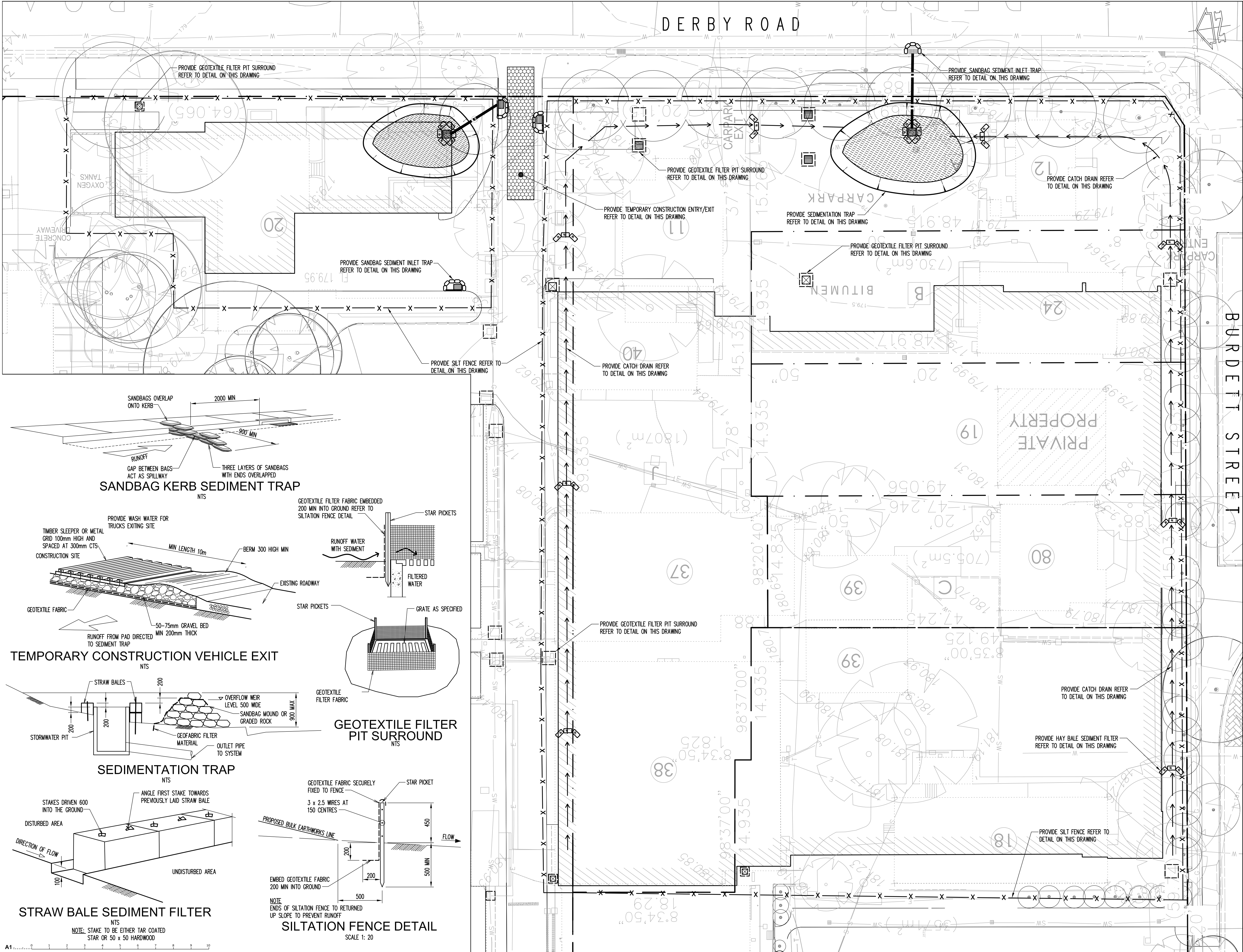
Regards,

Andrew

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Appendix 3: Soil and Water Management Plan



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EROSION AND SEDIMENT CONTROL NOTES

- 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").
- 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 around 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.

EROSION AND SEDIMENT CONTROL LEGEND

- Batter
- Siltation fence
- Stormwater pit with Geotextile filter surround
- Hay bale barriers
- Sandbag sediment trap
- Catch drain
- Overland flow path

PRELIMINARY

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

Rev	Description	Eng	Draft	Date	Rev	Description	Eng	Draft	Date
P1	PRELIMINARY	KH	KA	09.11.12					



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Project
**HORNSBY KU-RING-GAI
HOSPITAL REDEVELOPMENT**

Sheet Subject
**SOIL AND WATER
MANAGEMENT PLAN**

Scale : A1	Drawn	Authorised
1:200, U.N.O	PK	
Job No	Drawing No	Revision
111379	TT-CV-0002	P2
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