

UTS ASRS BUILDING BOOK VAULT & STORAGE BUILDING 15 BROADWAY SYDNEY NSW 2007

Development Assessment Report Statement on Provision of Stormwater Drainage

Issue	Reason	Date	Produced By	Status
A	Issue for Review / Comment	March 2011	D. Nagelschmidt	Superseded
B	Issue for Development Application Submission	March 2011	D. Nagelschmidt	Current

WARREN SMITH & PARTNERS PTY LIMITED
Consulting Hydraulic and Fire Protection Engineers
ACN 002 197 088
ABN 36 300 430 126
1st Floor
123 Clarence Street
SYDNEY NSW 2000

Dirk Nagelschmidt
Senior Hydraulic Services Engineer
Telephone: (02) 9299 1312
Facsimile: (02) 9290 1295
Email: dirk@warrensmith.com.au

UTS ASRS BUILDING – BOOK VAULT & STORAGE BUILDING
15 BROADWAY SYDNEY NSW 2007
STATEMENT ON PROVISION OF STORMWATER DRAINAGE

CONTENTS

- 1.0 GENERAL
- 2.0 DESCRIPTION OF SITE
- 3.0 RAINWATER HARVESTING/RECYCLED WATER SERVICE
- 4.0 SITE STORMWATER DRAINAGE
- 5.0 SEDIMENT & EROSION CONTROL

1.0 GENERAL

This statement herein addresses the provision of a Stormwater Drainage system for the proposed re-development of the site at 15 Broadway, Sydney. Works for the proposed project, consists of the construction of UTS ASRS Building.

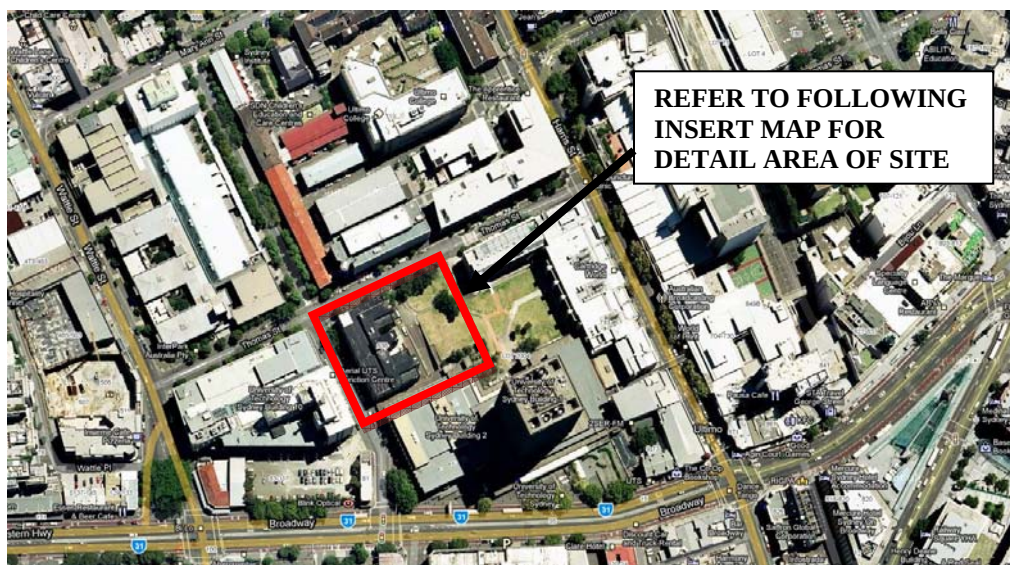


Figure 1.1 Aerial View

UTS ASRS BUILDING – BOOK VAULT & STORAGE BUILDING
15 BROADWAY SYDNEY NSW 2007
STATEMENT ON PROVISION OF STORMWATER DRAINAGE

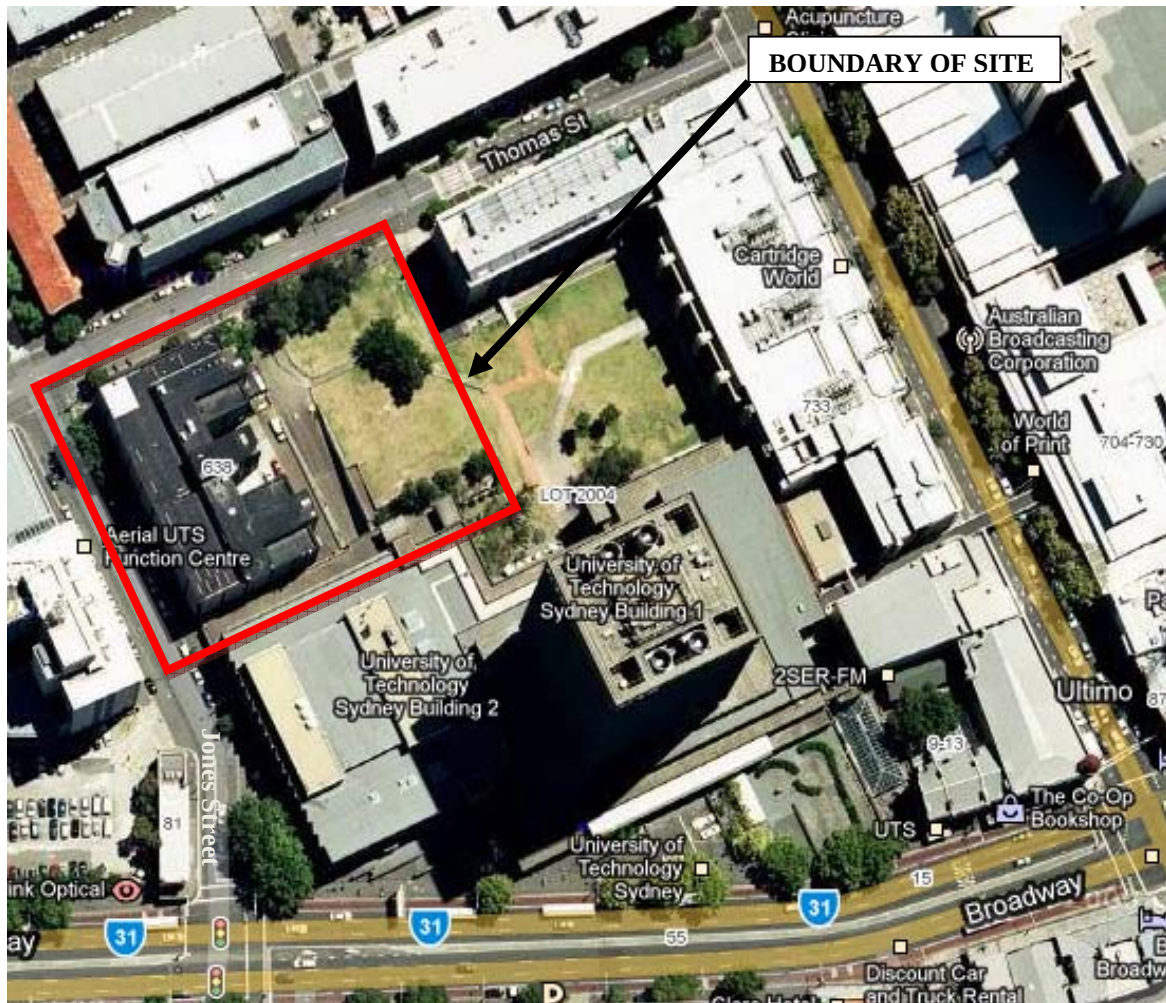


Figure 1.2 Insert Map - Detail Area of Site

2.0 DESCRIPTION OF SITE

The area of proposed site development is located east of Jones Street, and to the south of Thomas Street, adjacent to the intersection of the two streets and includes the site excavation works for the proposed future Thomas Street Building. The total area of the planned site development for the ASRS building only is approximately 2560 m² for which the street frontage at the western boundary on Jones Street is approximately 34 metres. The proposed development area in its pre-existing state consists mainly of pervious surfaces.

3.0 RAINWATER HARVESTING/RECYCLED WATER SERVICE

General

It is proposed that in the future, rainwater reuse will be utilised for WC flushing and landscape irrigation throughout the new Building. Recycled rainwater shall be supplied off a rainwater harvesting tank and filtration system which is to be installed in the near future, as part of the Thomas Street Building project.

UTS ASRS BUILDING – BOOK VAULT & STORAGE BUILDING
15 BROADWAY SYDNEY NSW 2007
STATEMENT ON PROVISION OF STORMWATER DRAINAGE

Initially the WC flushing and landscape irrigation will be supplied from a potable water supply, piped independently from the water supply serving all basins, sinks and showers. This will minimise the amount of modification works required to supply the building with recycled rainwater at a time when the proposed rainwater reuse system described above comes on line.

Materials

- Stormwater drainage connecting to the rainwater reuse tanks (tanks proposed as part of the Thomas Street Building project) will consist of HDPE (High Density Polyethylene) pipework and fittings.
- Rainwater reuse pipework will consist of Class 16 lilac polyethylene pipework and fittings.

Design Standards

The Rainwater Reuse System will be designed and constructed in accordance with AS 3500.3, National Plumbing and Drainage Code Part 3: Stormwater Drainage and The Council of the City of Sydney requirements.

4.0 SITE STORMWATER DRAINAGE

The site stormwater drainage system shall be designed to take into consideration the requirements of City of Sydney council as follows:-

- City of Sydney Council - Stormwater Drainage Connection Information Revision 02, July 2006.

General

The pre-existing site generally consists mainly of pervious surfaces. As the proposed new building is to be constructed entirely underground with a green roof installed above, the total size of impervious area shall not increase. The extent of impervious surfaces should actually decrease due to the existing ramp leading into the basement of building 2 being removed, with the inception of deep soil planting areas to replace the hard standing ramp surface.

New drainage pipework to which rainwater from the site shall be directed to, will temporarily be connected to the Council Stormwater Drainage System within Jones Street. Once programmed construction of the Thomas Street Building has been completed, rainwater harvested from the ASRS Building's green roof shall be diverted to the new rainwater harvesting tank, as described in Section 3.0 above. Overflow from the rainwater harvesting tank shall be directed to the Council Stormwater Drainage System within Jones Street.

UTS propose that the Thomas Street Building will be built concurrently with the ASRS Building.

UTS ASRS BUILDING – BOOK VAULT & STORAGE BUILDING
15 BROADWAY SYDNEY NSW 2007
STATEMENT ON PROVISION OF STORMWATER DRAINAGE

Around the perimeter of the underground basement building, it is proposed for a 2m wide accessible void space be incorporated between the external walls and internal walls where a dish drain would be installed below the inside floor level of the building to ensure that the book vault and storage building is adequately waterproofed.

The dish drain would drain into a perimeter subsoil drainage system via a number of drainage outlets which in turn would drain into a drainage pump out pit complete with two (2) submersible subsoil drainage pumps to pump drainage to the gravity stormwater drainage system. The 2m void would require adequate ventilation so as to prevent the potential build-up of mould and dampness odours.

Both drainage pumps will be wired to the Building Management System to provide early warning of any drainage pump failure and an audible high level alarm will be provided external to the pump out pit which will also be wired to the Building Maintenance System which will give the Building Management early warning of drainage pump failure and high water levels within the pump out pit. Power to the pumps shall be supplied from the building's essential services power supply.

Also, it is extremely important to ensure that an adequate good quality torch applied membrane be applied to the roof of the building to ensure that the building is 100% waterproof.

Continuous drainage cell would then be installed on top of the membrane to allow subsoil drainage to drain away from the roof of the underground building and connect to the subsoil drainage system.

Materials

The Stormwater drainage system will consist of HDPE (High Density Polyethylene) pipework and fittings as required throughout the Building.

Sizing

The stormwater drainage system will be sized for a 1 in 100 year rainfall intensity. Over flow systems will be sized for a rainfall intensity in excess of the 1 in 100 year event.

Design Standards

The Stormwater Drainage System will be designed and constructed in accordance with Australian rainfall and runoff calculated as 270mm per hour for a 5 minute duration storm, AS 3500.3, National Plumbing and Drainage Code Part 3: Stormwater Drainage and The Council of the City of Sydney requirements.

UTS ASRS BUILDING – BOOK VAULT & STORAGE BUILDING
15 BROADWAY SYDNEY NSW 2007
STATEMENT ON PROVISION OF STORMWATER DRAINAGE

5.0 SEDIMENT & EROSION CONTROL

The Contractor for the works is required to provide Erosion and Sedimentation Control in accordance with the following general requirements as provided below:-

- All existing surface pits shall be protected as detailed below and all boundaries where there is potential for runoff to contaminate downstream property (private or public) shall be protected by use of erosion fencing and earth berms.

In addition, the following measures shall be provided:-

SITE PROTECTION MEASURES

It is proposed to provide the following in order to inhibit the movement of sediment off the site during the demolition and construction phases.

Site Access

Construction vehicles leaving the site shall be required to pass over a Temporary Construction Vehicle Entry consisting of a 3m wide 'cattle rack'.

Sediment Control

All exposed earth areas where it may be possible for runoff to transport silt down slope shall be protected with a sediment and erosion control silt fence generally installed along the perimeter of where the site works are to take place.

The fence will be constructed in accordance with details provided by the Department of Conservation and Land Management incorporating geotextile fabric which will not allow suspended particles greater than 50mg/l non filterable solids to pass through, and as such comply with the appropriate provisions of the Clean Waters Act 1970.

The construction of the silt fence will include the following:-

- Geotextile fabric buried to a maximum of 100mm below the surface;
- Overlapping any joins in the fabric;
- Turning up on the ends for a length of 1 metre in order to prevent volumes of suspended solids escaping in a storm event;

UTS ASRS BUILDING – BOOK VAULT & STORAGE BUILDING
15 BROADWAY SYDNEY NSW 2007
STATEMENT ON PROVISION OF STORMWATER DRAINAGE

- Any Council owned road kerb entry and or gully pits will be protected by Atlantis Filter Bales and EcoSock. Additional protection will be provided by inserting Water Clean Filter Cartridges into the gully opening;
- Internal site drainage pits shall be protected by Sediment Traps consisting of Hay Bales.

Temporary Stormwater Pump-Out System (Where required)

Site runoff within the zones of the excavation will be drained into a central holding well within the excavation. Runoff will be allowed to settle out suspended particles and debris and an acceptable water quality of 50mg per L of Non Filtrable Residues (NFR) is required to be achieved prior to discharge by pumping into the authority system.

Once the stormwater has been adequately treated and the quality has been verified on the site, it will be pumped to the Council Stormwater system at a maximum discharge rate of 2 - 4 L/s.

The proposed pumps will be one duty and one standby electro – submersible pumps which shall be mounted on a 300mm high concrete plinth.

The proposed stormwater rising mains to each of the excavation areas will be in the order of 65mm outside diameter polyethylene, PE80B 'BlueLine', Class 12.5.

Dust Control

The following dust control procedures will be adhered to: -

- Loose loads entering or leaving the site will be securely covered by a tarpaulin or like material in accordance with RTA and Council Guidelines.
- Soil transport vehicles will use the single main access to the site.
- There will be no burning of any materials on site.
- Water sprays will be used across the site to suppress dust. The water will be applied either by water sprinklers or water carts across ground surfaces whenever the surface has dried out and has the potential to generate visible levels of dust either by the operation of equipment over the surface or by wind. The watercraft will be equipped with a pump and sprays.
- Spraying water at the rate of not less than three (3) L/s and not less than 700kPa pressure. The area covered will be small enough that surfaces are maintained in a damp condition and large enough that runoff is not generated. The water spray equipment will be kept on site during the construction of the works.

UTS ASRS BUILDING – BOOK VAULT & STORAGE BUILDING
15 BROADWAY SYDNEY NSW 2007
STATEMENT ON PROVISION OF STORMWATER DRAINAGE

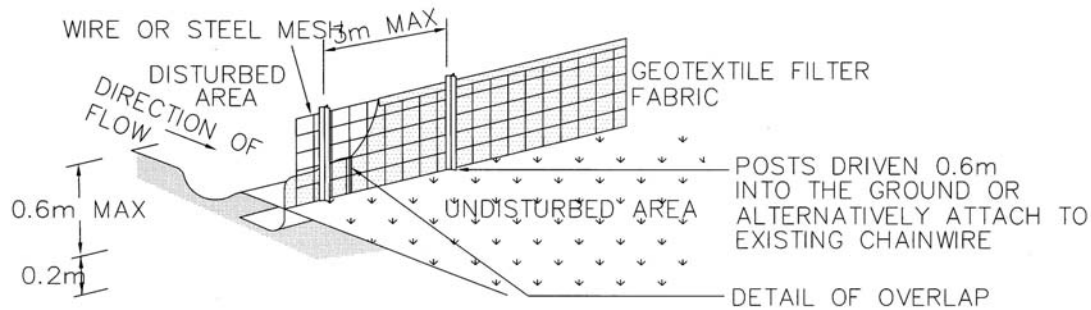
- During excavation all trucks/machinery leaving the site will have their wheels washed and/or agitated prior to travelling on Council Roads.
- Fences will have shade cloth or similar fabric fixed to the inside of the fence.

Maintenance

- It will be the responsibility of the site foreman for the building contractor to ensure sediment and erosion control devices on site are maintained. The devices shall be checked daily and the appropriate maintenance undertaken as necessary.
- Prior to the closing of the site each day, the road shall be swept and materials deposited back onto the site. Under no circumstances shall the road be washed down in order to clean or wash any materials deposited on the street.
- Gutters and roadways will be kept clean regularly to maintain them free of sediment.
- Appropriate covering techniques, such as the use of plastic sheeting will be used to cover excavation faces, stockpiles and any unsealed surfaces;-
 - a) If dust is being generated from a given surface, and water sprays fail:
 - b) If fugitive emissions have the potential to cause the ambient air quality to foul the ambient air quality:
- The area of soils exposed at any one time will be minimised wherever possible by excavating in a localised progressive manner over the site-
- Materials processing equipment suitable comply with regulatory requirements. The protection will include the covering of feed openings with rubber curtains or socks

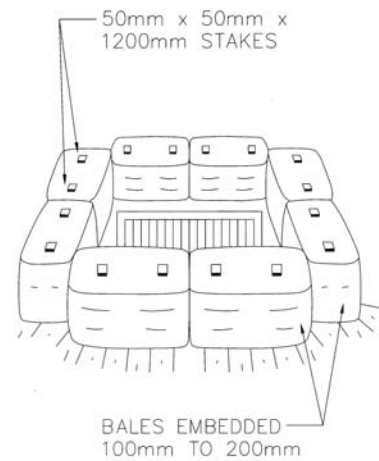
It is considered that by complying with the above, appropriate levels of protection are afforded to the site and the adjacent public roads, footpaths and environment.

UTS ASRS BUILDING – BOOK VAULT & STORAGE BUILDING
15 BROADWAY SYDNEY NSW 2007
STATEMENT ON PROVISION OF STORMWATER DRAINAGE



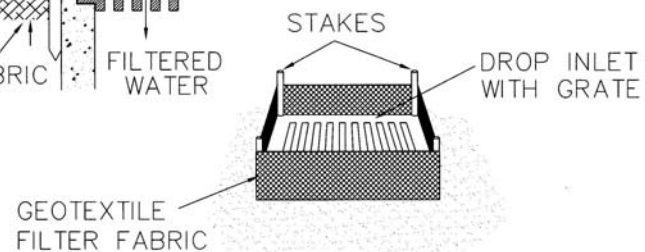
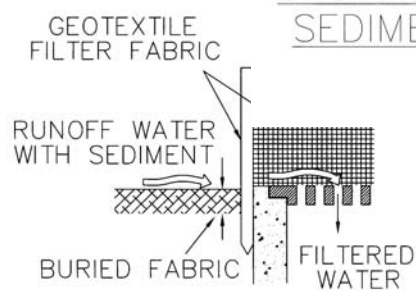
SEDIMENT CONTROL FENCE

NTS



STORMWATER PIT
SEDIMENT TRAP

NTS



GEOTEXTILE FILTER FABRIC DROP INLET
SEDIMENT TRAP

NTS

Atlantis Sediment Control Filter Bales



What are FilterBales?

Water Clean FilterBales are a unique new patented 7 stage sediment filter device developed to substantially reduce the migration of sediment and contaminants into drainage systems while allowing filtered water to easily pass through. FilterBales reduce customers' time and money by providing solutions to comply with environmental and regulatory requirements.

Durable, Dependable, Reusable.

Replacing hay bales and other inadequate attempts to stop sediment run-off, FilterBales are durable and re-useable, effectively stopping your money from "pouring down the drain". They are also lightweight and easy to handle. Replaceable Water Clean Filter Cartridges guarantee peak performance is maintained.



Ask your local FilterBales stockist about replacement frequencies in your area. Cartridges and filter covers should be changed when the infiltration rate decreases. Water Clean FilterBales are suitable for a wide range of sediment and water management situations and can be easily secured in place for long term use. The unique multi-directional filter system allows you to position Water Clean FilterBales in any direction without reducing performance.

Water Clean FilterBales can be fixed to concrete or bitumen surfaces using an epoxy mortar-binder or fixed to earth surfaces using 6-10 mm pegs or stakes. When positioning, the side with the red reflective marker should be facing traffic.

www.atlantiscorp.com.au 

UTS ASRS BUILDING – BOOK VAULT & STORAGE BUILDING
15 BROADWAY SYDNEY NSW 2007
STATEMENT ON PROVISION OF STORMWATER DRAINAGE

1. **FilterBales frames** are a perforated plastic structure made from recycled wheelie bins, battery cases, milk bottles etc.
2. **Filter medium** (bio engineered soil media) used in the filter cartridges is made from a special blend of recycled organic (RO) materials from kerbside and vegetation drop off centres. The RO hosts enhanced naturally occurring micro-organisms. The blend also contains natural minerals to capture nutrients. The filter medium is as safe as normal soil.
3. **FilterBales** have a seven (7) stage filtration system:
 1. In through the filter bag
 2. Through the perforated plastic structure wall
 3. In through the filter cartridge bag
 4. Through the bio engineered filter medium
 5. Out through the filter cartridge bag
 6. Out through the perforated plastic structure wall
 7. Out through the filter bag
4. **The filter bag** is made from 300-micron (one third of a millimetre) pore size geotextile. This is the first stage that filters much of the sediment and other suspended solids from the run-off water. The geotextile is designed to stop sediment and reduce clogging but allow water to pass through easily. The filter cartridge bags are made from a similar geotextile.
5. **FilterBales** work effectively up to "a one-in-one-year 48 hours, 100 mm "storm events". This is the largest storm event experienced since the commercialisation of FilterBales. Having handled this easily, Filter Bales are considered capable of handling much greater "storm events". During these storm events FilterBales were used inside gully pits in one application and on the ground surrounding the gully pit in another application.
6. **EcoSocks** are made from a similar geotextile to the filter cartridge bags and contain the same bio engineered soil media as the FilterBales. They appear able to stand up to as much wear and tear as a sandbag.
7. **FilterBales** are much lighter (at around 15 kgs dry weight) than hay bales. This reduces exposure to Occupational Health and Safety problems

Product Range

Item No.	Description	
HFB001	High FilterBale , suitable for high flow situations and higher retention time applications. Contains two standard size WaterClean Filter Cartridges in upright formation to treat contaminated waters. (605mm x 485mm x 460mm)	
LFB002	Low FilterBale , suitable for low flow situations and kerb & gutter applications. Multi-directional module containing two standard size WaterClean Filter Cartridges. (605mm x 485mm x 220mm)	
ESF004	Directional EcoSock , can be used in conjunction with FilterBales to direct water. Will also provide some sediment filtration from seepage through bio-remediating media contained within the EcoSock (1135mm x 160mm x 30mm)	

Accessories

Item No.	Description	
FCR004	WaterClean Filter Cartridges contain a unique blend of fixating and bio-remediating products that treat common pollutants. To achieve maximum performance, each FilterBale uses two WaterClean Filter Cartridges. (440mm x 400mm x 100mm)	
HBC005 (High bale)	Replaceable FilterBale covers , made from specially designed geotextile. FilterBale covers have a standard aperture of 300 microns.	
HBC006 (Low bale)	Replaceable FilterBale covers , made from specially designed geotextile. FilterBale covers have a standard aperture of 300 microns.	

Atlantis Water Management Rebirth Pty Ltd trading as Atlantis Water Management

Suite 402/781 Pacific Highway Chatswood NSW, 2067 Australia
Phone • + 61 2 9419 6000 **Fax** • + 61 2 9419 6710
Email • info@atlantiscorp.com.au **Web Site** • www.atlantiscorp.com.au



V3-20/06/01