Warren Smith & Partners Pty Ltd

BANCOR

6-16 ATCHISON STREET
ST LEONARDS, NSW

Development Assessment Report
Statement on Provision of Hydraulic & Fire Services

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A	Issue for Review / Comment	November 2009	D. Nagelschmidt	Superseded
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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

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1.0 GENERAL

This statement herein addresses the provision of Hydraulic & Fire Services systems for the proposed re-development of the site at 6-16 Atchison Street, St Leonards. Works for the proposed project, consists of demolition of the existing buildings located on the site, followed by the construction of a new twenty nine level apartment building.

Figure 1.1 Aerial View

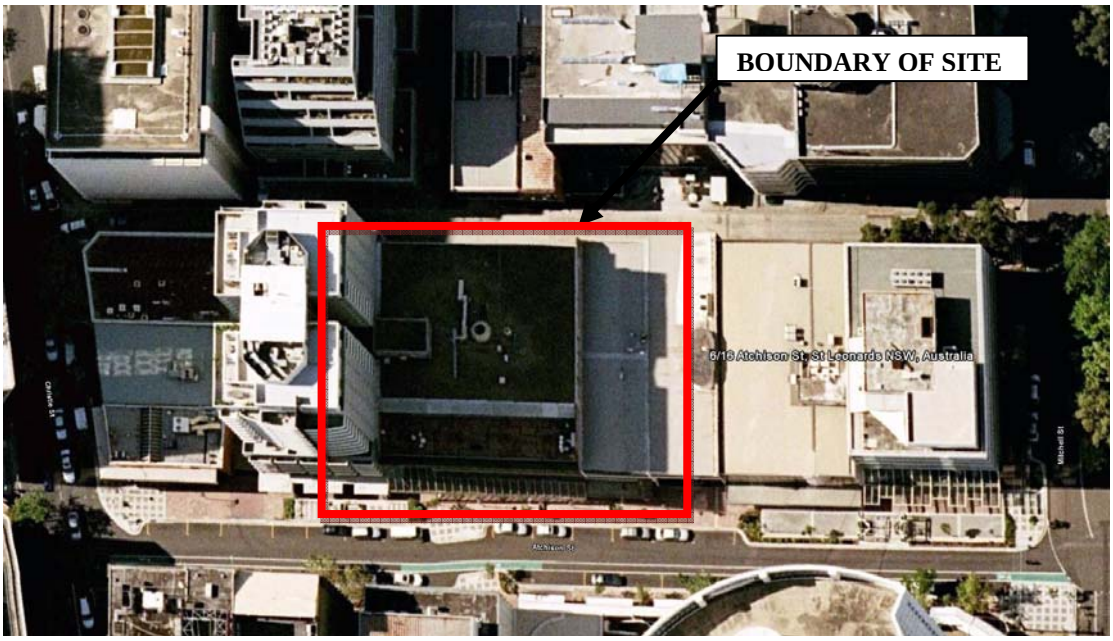


Figure 1.2 Insert Map - Detail Area of Site

2.0 DESCRIPTION OF SITE

The area of proposed site is located between Atchison Street and Atchison Lane, approximately 50m east of the intersection at Christie Street. The total area of site of the planned development is 1740.6 m^2. The street frontage at the southern boundary on Atchison Street is approximately 50 metres, whilst the northern boundary has a frontage to Atchison Lane, also of approximately 50 metres. The entire proposed development area in its pre-existing state consists of impervious surfaces.

3.0 EXISTING HYDRAULIC SITE SERVICES

Presently connected to the authority mains, and serving the current three separate site allotments, and buildings contained upon, are a number of existing services. These include sewer drainage, stormwater drainage, hot & cold water supplies and a gas supply services. Where these mains services connections cannot be re-utilised, they will be required to be capped off at the distribution mains in accordance with the relevant authority requirements.

It is envisaged that due to the increase in the site occupation levels as a result of the development, new connections from the authorities mains would be required in nearly all instances to cope with the additional usage demand for the development.

Preliminary investigation and enquiries have established that all Authority services mains infrastructure, where connection is required have ample capacity to cater for the additional load of the site re-development.

4.0 POTABLE COLD WATER SERVICE

All existing water service pipework supplying the current site allotments are to be made redundant and removed, with incoming services capped off at the Authority 'Sydney Water' water main.

Separate water meters, owned by Sydney Water will be provided to the cold water service for supply to the serviced apartments, the Ground floor commercial tenancy and for each residential apartment, as well as an additional separate water meter for supplying 'common' areas of the residential portion of the development. These water meters shall be fitted with a pulse output connection for remote data logging for authority customer billing, and linked to the BMS system for client consumption monitoring purposes.

Areas considered a cross contamination risk will be fitted with a zone backflow prevention device as required by the relevant Authorities.

To reduce water consumption, water efficiency tapware shall be installed to showers, basins and sinks, dual flush 6/3 litre WC cisterns, and devices such as flow control valves will be used.

5.0 POTABLE HOT WATER SERVICE

Hot water will be generated from two (2) separate centralised hot water generation plants, one located at roof level to supply hot water to the residential apartments, and the second located at basement level to supply the serviced apartments and the retail tenancy and lower floor common area amenities.

The hot water systems are to be supplied from the potable cold water service and will incorporate a flow and return type system with circulation pumps to maintain system temperature.

Hot water for supply to the serviced apartments, retail tenancy, and common amenities will be generated via a centralised hot water system consisting of four gas fired (4) mains pressure storage heaters, installed in an equa-flow arrangement at Basement Level 1.

For the residential apartments, it is proposed that a solar preheating plant be incorporated into the design to provide approximately 50% of the total daily demand during the most solar efficient summer month of December. A direct fired gas booster hot water system is required for periods of poor or no solar gain. It is necessary for the booster system to provide 100% of the hot water needs of the project.
The gas fired hot water booster system will be located at open roof level within a screened enclosure, along three (3) buffer storage vessels and a total of eighteen (18) solar preheat tanks. It is proposed that three (3) arrays of twenty four (24) solar panels (in each array) be installed on the roof of the level 33 penthouse apartments.

To reduce water consumption, water efficiency tapware shall be installed to showers, basins and sinks and devices such as flow control valves will be used.

6.0 RAINWATER HARVESTING/RECYCLED WATER SERVICE

It is proposed that a recycled water system be incorporated in which rainwater from the roofs will be collected and stored within a 100,000 litre bulk storage tank.

Rainwater will be filtered and then stored in a 'Day' storage tank for the primary use of supply to irrigation systems. Other possible uses for recycled water for future consideration could include for toilet cistern flushing, but due to the limited harvest catchment this is highly unlikely to be feasible.

A tank infill float valve, connected to the potable cold water supply, will top up the tank during times of limited rainfall.

7.0 FIRE HOSE REEL SERVICE

The fire hose reel service will be extended from the metered domestic potable cold water service, to provide protection to satisfy the current Australian Standard AS 2441-2005 requirements for performance and coverage to the new development and to satisfy the requirements of the BCA – Clause E1.4.

Fire Hose Reels shall be located within 4m of selected fire stairs and fire exits. All fire hose reels provide 36m coverage plus 4m hose spray and their distribution provides for coverage to all parts of the floors on an open plan arrangement.

8.0 FIRE PROTECTION SYSTEMS

A fire protection system will be installed to the proposed new development to provide a number of measured and various types of protection, as described in the following paragraphs.

Summary Description of Fire Services

The fire services shall comprise of the following:

- Combined Fire Sprinkler /Hydrant System
- Fire Detection and Alarm system
- Sound System and Intercom System for Emergency purposes
- Fire Hose Reel Service
- Portable Fire Extinguishers

Combined Fire Sprinkler / Hydrant System Description

The fire hydrant and sprinkler system is designed as a combined system as per AS 2118.6 – 1995.

- Feed pipe risers to ring zones: 150mm diameter
- Combined System Ring zone pipes: 150mm diameter
- Valve requirements as per AS 2118.6 and AS/NZS 3500.1
- Tank requirements as per AS 2118.6, AS 2118.1 and AS/NZS 3500.1
- Hydrant locations as per AS 2419.1 and the BCA
- Fire Hose Reel Locations as per AS 2441 and the BCA

Connection to Authority Infrastructure

Connection to the authority infrastructure shall comply with AS2118.1 and AS/NZS 3500.1

Grade of Water Supply

A grade one water supply to the project as required by the BCA, relevant codes and standards has been documented via:

- The primary supply shall be provided by a 150mm connection to 200mm diameter Sydney Water watermain in Atchison Street. The primary supply shall be boosted by an electric multistage booster pump which feeds each pressure stage of the system.
- The secondary supply is provided by an on site water storage requirements (tank) as per AS 2118.1, AS 2118.6 and AS 2419.1.

Authority Infrastructure Protection

The Authority infrastructure will be protected from backflow contamination via the installation of a testable double check valve with metered by-pass assembly, installed at the boundary providing containment protection before any connection points are made, in accordance with the requirements of Sydney Water Corporation.

Fire Brigade Booster Assembly

Feed hydrants and separate booster inlets shall be provided in a cupboard adjacent facing Atchison St.

Fire System Pump Sets

The following fire pump sets shall be provided:-

- 2 Stage Multistage electric pump to boost the primary water supply from Atchison Street.
- 2 Stage Multistage diesel pump to boost the secondary water supply (tank).
- 2 Stage Multistage diesel Intermediate Fire Brigade relay pump
- Automatic jockey pump to boost each ring main.
- Fire Pumps shall comply with AS 2941-2008.
- All fire pumps shall be monitored at the Fire Indicator Panel.
- The intermediate Fire Brigade relay pumps shall be provided with remote stop/start switches in the Fire Control Panel.

Electric Signals to the FIP

- In the event of a fire the sprinkler head is activated, a flow switch is activated and shall initiate a fire trip to the F.I.P.
- The flow switch is also monitored at FIP for a “fault” condition
- The flow switch fire trip FIP shall alert the Fire Brigade and activates the Sound and Intercom System for Emergency Purposes
- The pumps are only shown at the FIP as to which pump is running. The pumps are not to alert the Fire Brigade
- All monitored valves are connected to the FIP as per AS 2118.1 and AS 2419.1
- A manual switch adjacent to the FIP is required for each intermediate relay pump.

Fire Hose Reels

Refer to previous Clause 7.0 – Fire Hose Reel service.

Tank Configuration

- The tank shall have a capacity of 60 minutes as required by AS 2118.1 for the sprinkler component and a 25,000 litre component for the Fire Hydrant component.

Zone Pressure Protection

- AS 2419.1 2005: 700 kPa minimum – 1200 kPa maximum

Each pressure stage on the cascade system shall be configured to ensure the requirements of AS 2118.1 and AS 2419.1 are not exceeded. The zones are calculated so that the maximum pressure in any zone is 1200 kPa at the most advantaged hydrant outlet and 700 kPa at the most disadvantaged hydrant outlet.

Services Connection at Each Floor

- Fire hydrant landing valves as per the requirements of AS 2419.1 (both sides of the zone ring)
- Fire sprinkler have a separate connection as per AS 2118.1 and AS 2118.6 (one side of the zone ring)

Materials and Values

All materials in the system have been selected to withstand the pressure requirements of the system and the associated code requirements for the installation of the fire services

Sprinkler Heads

The following types of heads shall be used:-

Location	Sprinkler Head Type	Temp. Rating °C	Size	Colour	Escutcheon Plate	Colour
Carpark Plantrooms Service Areas	Pendant Upright	68 Fast Response	15	Brass	-	-
Concealed Spaces	Pendant Upright	68 Fast Response	10	Brass	-	-
Retail False Ceilings	Type A	68 Fast Response	15	White	Two piece semi-recessed	White
Lift Shafts – Apex and Base	Pendant / Sidewall	141	15	Brass	-	-
External Sprinklers	Pendant Sidewall Facing Glass	93 Fast Response	15	Chrome	Stainless Steel Cowl / Water Shield	-
Residential Sprinklers	Pendant / Sidewall	68 Fast Response	15	White	Two piece semi-recessed	White
All sprinkler heads to be glass bulb type unless notified otherwise.						

Fire Detection and Alarm System

An addressable analogue Fire Detection and Alarm System shall be provided as required by the BCA, referenced Standards and the Fire Engineered Solution. The Fire Indication Panel and Fire Fan Control Panels shall be located in the Fire Control Room located at Ground Level adjacent to the main building foyer.

Smoke detectors shall be provided throughout the building in accordance with requirements of AS1661.1 – 1998 Part 4 and E2.2 of the BCA.

Smoke detection will not be provided to carparks, ceiling voids and inside fire stairs unless otherwise required by AS 1668.1 – 1998.

The Fire Detection and Alarm System will interface with the following:-

- Monitoring of isolation valves, fire pump and flow switches.
- Remote test of flow switch, solenoid valves via the Fire Indication Panel.
- AS 1668.1 – 1998 interface at Mechanical Control Centres for the control and indication where required of the Smoke Control System.
- Initiation of the Sound System and Intercom System for emergency purposes.
- Gas Detector monitoring.
- Fire trips to fire curtains.

Sound System and Intercom System for Emergency Purpose

A Sound System and Intercom System for emergency purposes will be provided throughout the building in accordance with E4.9 of the BCA and AS 1670.4 – 2004.

The Master Emergency Control Panel shall be located in the Ground Floor Fire Control Room adjacent to the Fire Indication Panel.

Warden Phones will be provided in a Fire Hose Reel cupboard on each Commercial floor and in the Safe haven adjacent to the Goods Lift and Emergency Initiating Devices.

Speakers will be provided throughout the building. Generally 100mm white ceiling speakers will be provided to Commercial levels and horn speakers throughout the carpark and Plantroom areas.

Portable Fire Extinguishers

Portable fire extinguishers and fire blankets are to be provided in accordance with Table E1.6 of the BCA.

9.0 NATURAL GAS SERVICE

All redundant gas pipework within the site boundary will be removed and the incoming supply replaced with a new connection of adequate capacity to serve the new development.

A boundary regulator will be provided within a designated room at Basement Level 1 from where the gas pressure will be lowered to 7 kPa for distribution throughout the development. Gas appliances to be served will include the centralised hot water plant, mechanical equipment requiring supply and to cooking equipment within the café and any other service areas as required.

Separate gas meters, owned by 'Jemena' will be provided to the gas supply to each residential apartment, one (1) gas meter to the hot water plant serving all of the serviced apartments, one (1) gas meter to the hot water plant serving all of the residential apartments, one (1) gas meter to the mechanical heating boiler plant, a meter for the Ground Floor retail tenancy, as well as an additional separate gas meter for supplying 'common' areas of the development. These water meters shall be fitted with a pulse output connection for remote data logging for authority customer billing, and linked to the BMS system for client consumption monitoring purposes.

10.0 SEWER DRAINAGE & SANITARY PLUMBING

The existing sewer connections draining the present site allotments currently connect to the 'Sydney Water' sewer main located within Atchison Lane.

All redundant sewer connections shall be capped off at the existing junction to Sydney Water's sewer main. A new connection will be provided to serve the site, as the current connections will be inadequate in size to cope with the additional load that is projected to discharge from the site.

The new Sewer Drainage & Sanitary Plumbing system shall be designed and installed to satisfy the current Australian Standards AS/NZS 3500-2003 for Plumbing & Drainage and AS/NZS 3500.2-2003 for Sanitary Plumbing & Drainage.

11.0 SITE STORMWATER DRAINAGE

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

- North Sydney Council - Development Control Plan – 2002
- North Sydney Council - Performance Guide for Engineering Design & Construction – July 2005

The pre-existing site where the works are to take place has a total site area of approximately 1741.4 $m^{2,}$ with which generally all consists of impervious surfaces. Therefore, the total size of impervious area shall not increase but should actually decrease with the inception of deep soil planting areas.

Presently the site allotments drained to the Council's Stormwater Drainage System in Atchison Lane at the rear of the site.

New pipework connections will be provided to the Council Stormwater Drainage System within Atchison Lane, to which surface water drainage from the site shall be directed to, along with overflow from the rainwater harvesting tank, which collects rainwater from the new roofed structures.

12.0 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;
- 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

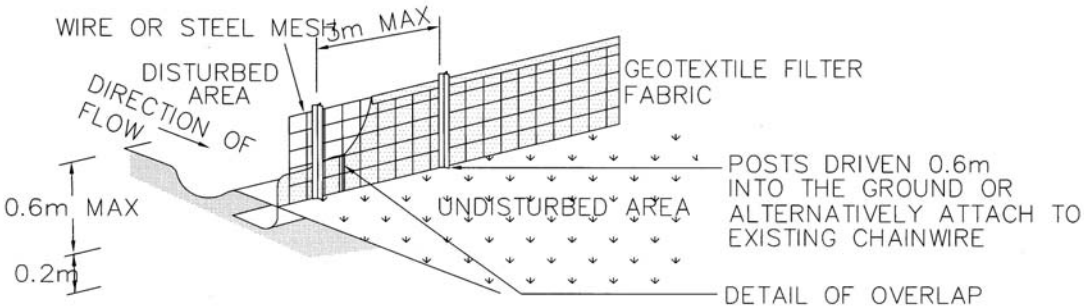
The following dust control procedures will be adhered to: -

- 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.
- 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

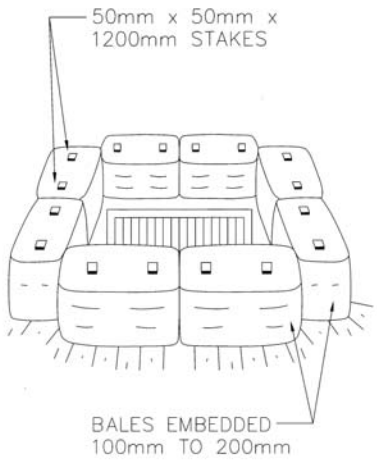
- It will be the responsibility of the site foreman for the building contractor to ensure sediment and erosion control devices on site are maintained. The devices shall be checked daily and the appropriate maintenance undertaken as necessary.
- Prior to the closing of the site each day, the road shall 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 as 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.



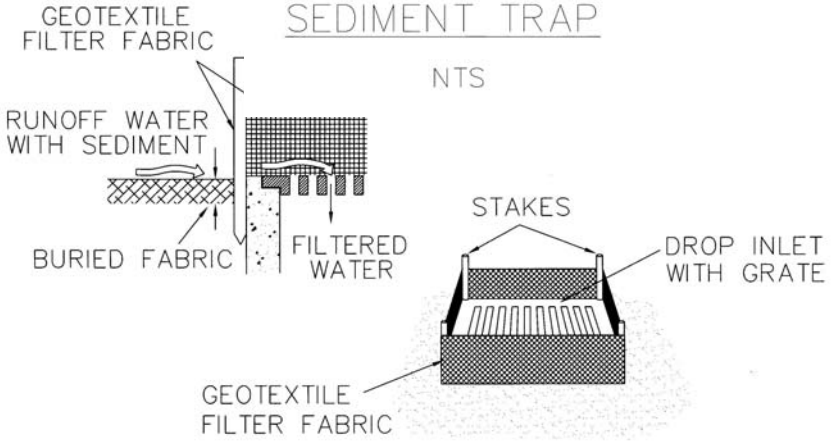
SEDIMENT CONTROL FENCE

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 witht 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

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

Atlantis Water Management

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