

Green Star

Credit Cover Sheet

Round 2

Green Star - Office Interiors v1.1

Inn-3 Environmental Design Initiatives

Points available: 5 Points claimed: 1 CIR or TC Used: N

Round 1 Assessment Comments

No comments.

Compliance with Credit Criteria

The project has invested in a greywater reuse system which collects all greywater produced in the tenancy and uses it to flush toilets. This initiative is not covered in the Potable Water Calculator found in the Green Star - Office Interiors v1.1 rating tool. The project team considers this to be an very worthwhile initiative that should be rewarded, although it is outside of the scope of this tool.

Documents Provided

- [3] Short report explaining the greywater treatment unit and the benefits it provides
- [5] Schematic that demonstrates how the greywater treatment unit functions
- [6] As-built drawing showing the greywater treatment unit
- [7] Sub-contractor confirmation of installation of greywater treatment unit
- [8] EcoPlus greywater treatment unit O&M manual

Discussion

In the GBCA tenancy, considerable risk was assumed in retrofitting the EcoPlus greywater treatment unit into our office. Barriers to approval of this system came from the building owner and the City of Sydney. Once installed and operational, the GBCA had to address a number of operational issues with the system that arose. Currently, the greywater unit is maintained on a regular schedule and performing quite satisfactorily. Greywater is used solely in the dual flush toilets located in male and female restrooms.

The tank was sized to accommodate the amount of greywater the GBCA would produce daily from the hand wash basins, kitchen sink, and dishwashers. This equates to approximately 260 L of water. Total demand for non-potable water was estimated to be 378 L/day. Therefore, the GBCA provides 2/3 of non-potable water demand through treated greywater.

While nominally, this does not represent a large amount of water, the project team decided that greater benefit would be provided by installing a demonstration unit within the GBCA tenancy that

other projects could learn from and potentially include in their own tenancy fitouts. By leading in the uptake of sustainable innovations, the GBCA hopes to fulfil its mission of driving the adoption of green building practices through market-based solutions.

19 February 2009

Greywater Treatment Unit

Summary report written by Joe Karten

One of the most pressing environmental concerns in Australia is the availability of potable water in the near future. Drought has always been commonplace in Australia, but the recent population explosion in the country has put increasing pressure on securing potable water supplies. Because of the importance of the issue of potable water availability, a priority was placed on designing water reuse into the GBCA tenancy.

Through a two-pronged approach of reducing potable water consumption in the first place by specifying water efficient fittings and fixtures and reusing all grey-water for toilet flushing, the GBCA tenancy is minimising its demand on public water provision and treatment infrastructure.

The schematic found later in the credit shows the workings of the system. All water from the five hand wash basins in the male and female bathrooms, the kitchen sink, and the two dishwashers is directed into the EcoPlus Greywater Treatment Unit where a city water connection tops it up and keeps the water flowing. Greywater is only used to flush the four toilets in the office. The unit follows a regular maintenance schedule as outlined below

Weekly Inspection

Visual inspection of grey water tank, test pump fail device on all pumps, add chlorine to grey water tank.

Three Monthly Inspection

Visual inspection of grey water tank, test pump fail device on all pumps, empty grey water tank and flush out, add chlorine to grey water tank.

Six Monthly Inspection

Visual inspection of grey water tank, test pump fail device on all pumps, take sample of water for testing, empty grey water tank and flush out, add chlorine to grey water tank.

Yearly Inspection

Visual inspection of grey water tank, test pump fail device on all pumps, take sample of water for testing, empty grey water tank and flush out, add chlorine to grey water tank, test and commission rpzd, drain out, clean and test pump out units in kitchen and bathrooms.

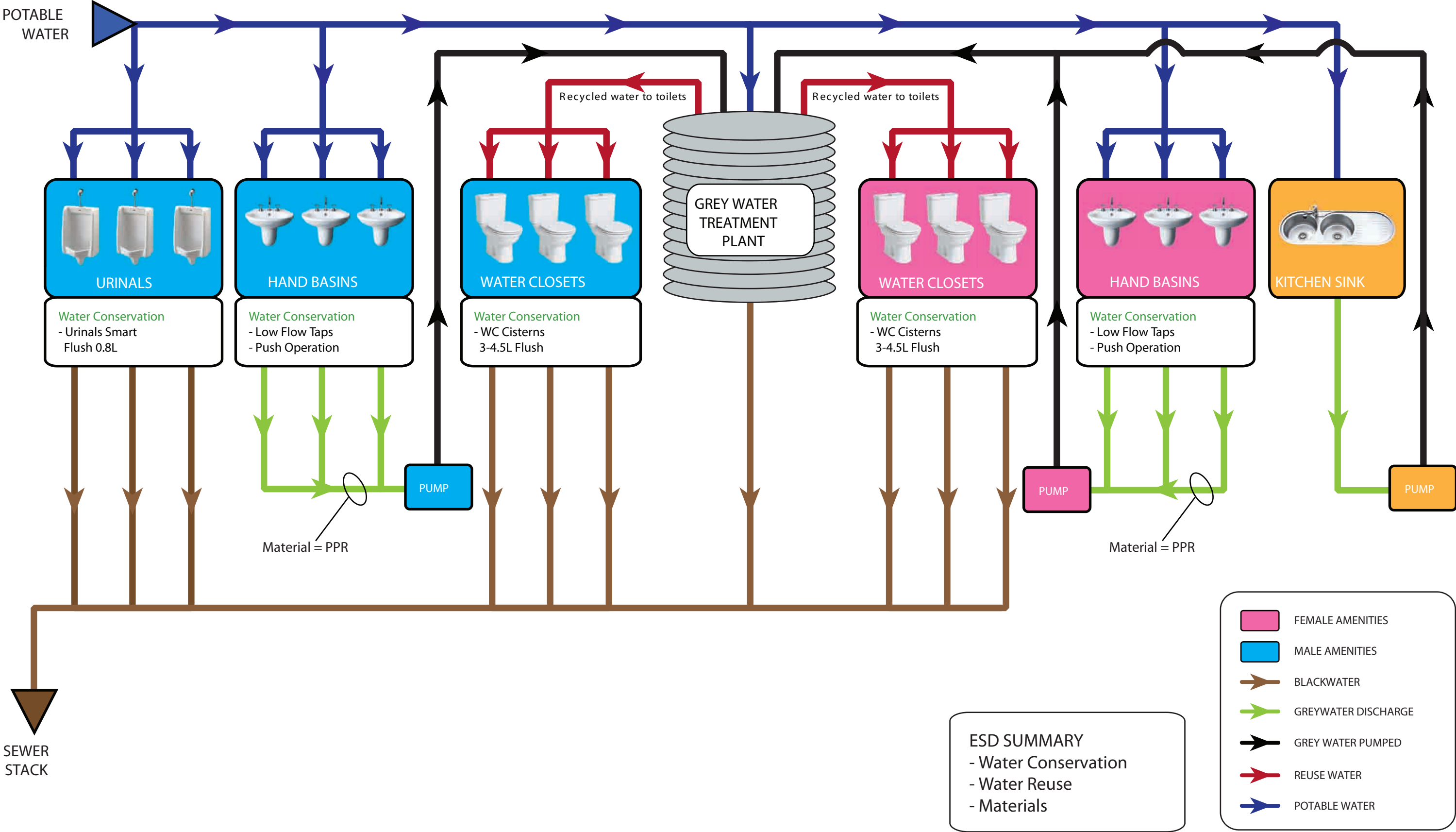
The system ~~as~~ sized for the expected amount of grey~~at~~er that the office ~~would~~ produce each day. The tank has a 400 L volume and can process 2,100 L / day. Potable ~~at~~er demand and Grey~~at~~er demand listed below in Table 1. The GBCA produces approximately 2/3 of toilet flush demand per day. So approximately 260 L of ~~at~~er ~~which would have been potable~~ ~~at~~er is now ~~replaced~~ by grey~~at~~er. Per year, this equates to a savings of 63,700 L of potable ~~at~~er per year (based on a 245 ~~work~~day year).

Total Demand Potable	Total Demand Non-potable	Grey at er Available
260 L/day	378 L/day	260 L/day

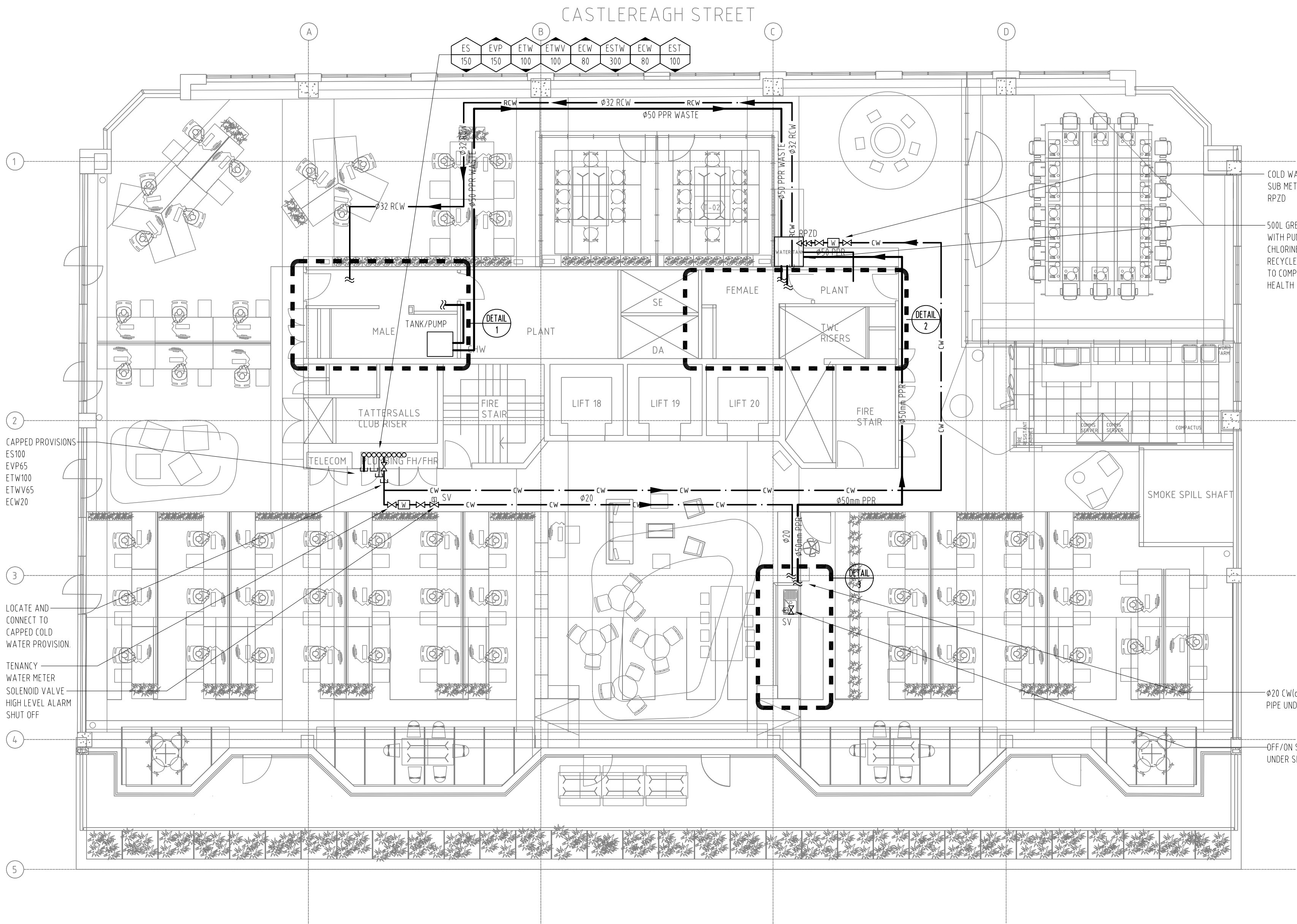
Table 1

The GBCA fitout team expects that this is the first time a tenant has initiated the retrofitting of a grey~~at~~er treatment unit onto their tenancy floor and believes that reward of Innovation for this initiative ~~would~~ further its exposure and encourage other office tenancy projects to target similar ~~at~~er reuse initiatives.

WATER CYCLE AND WATER CONSERVATION



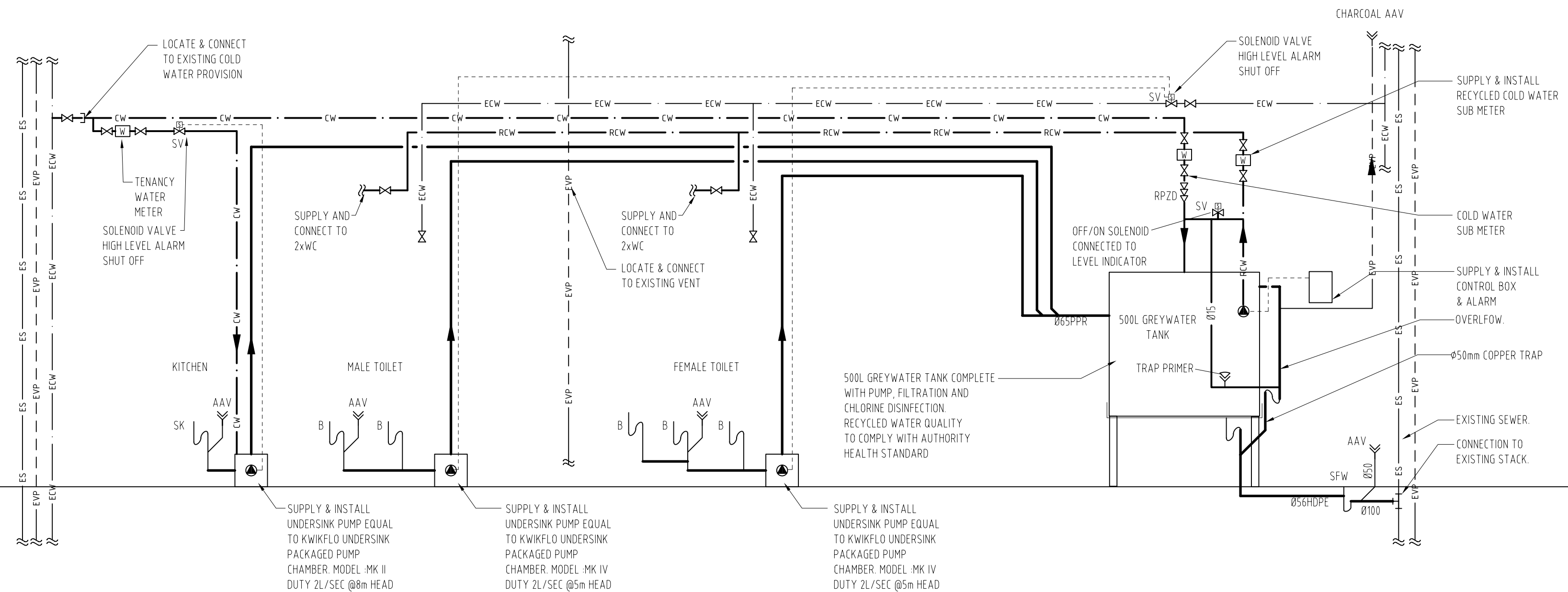
DATE	REV	AMENDMENT	BY	CHKD
13.06.08	AB	ISSUED FOR AS BUILTS	JT	VM



ELIZABETH STREET

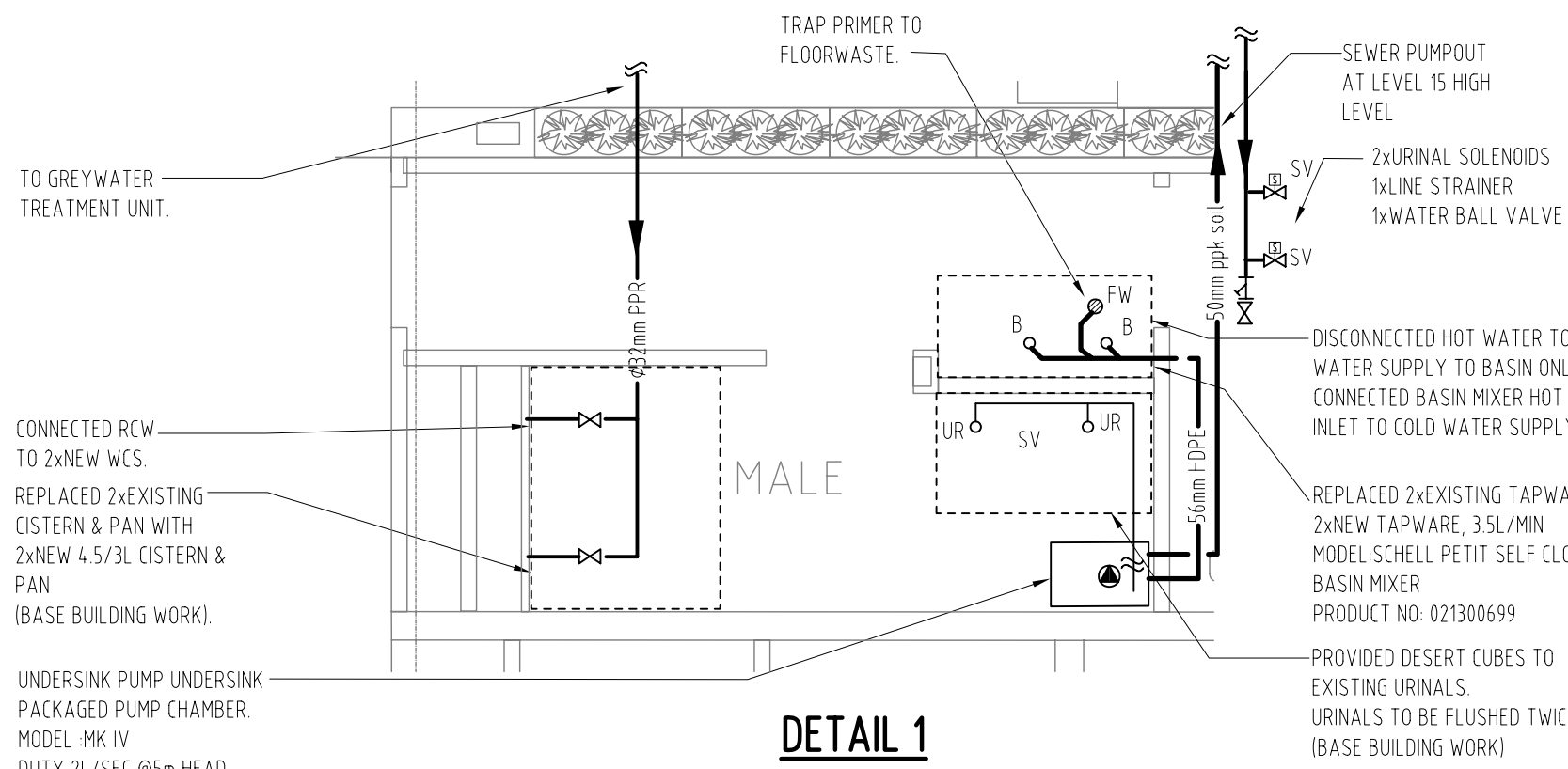
PLAN

1:100



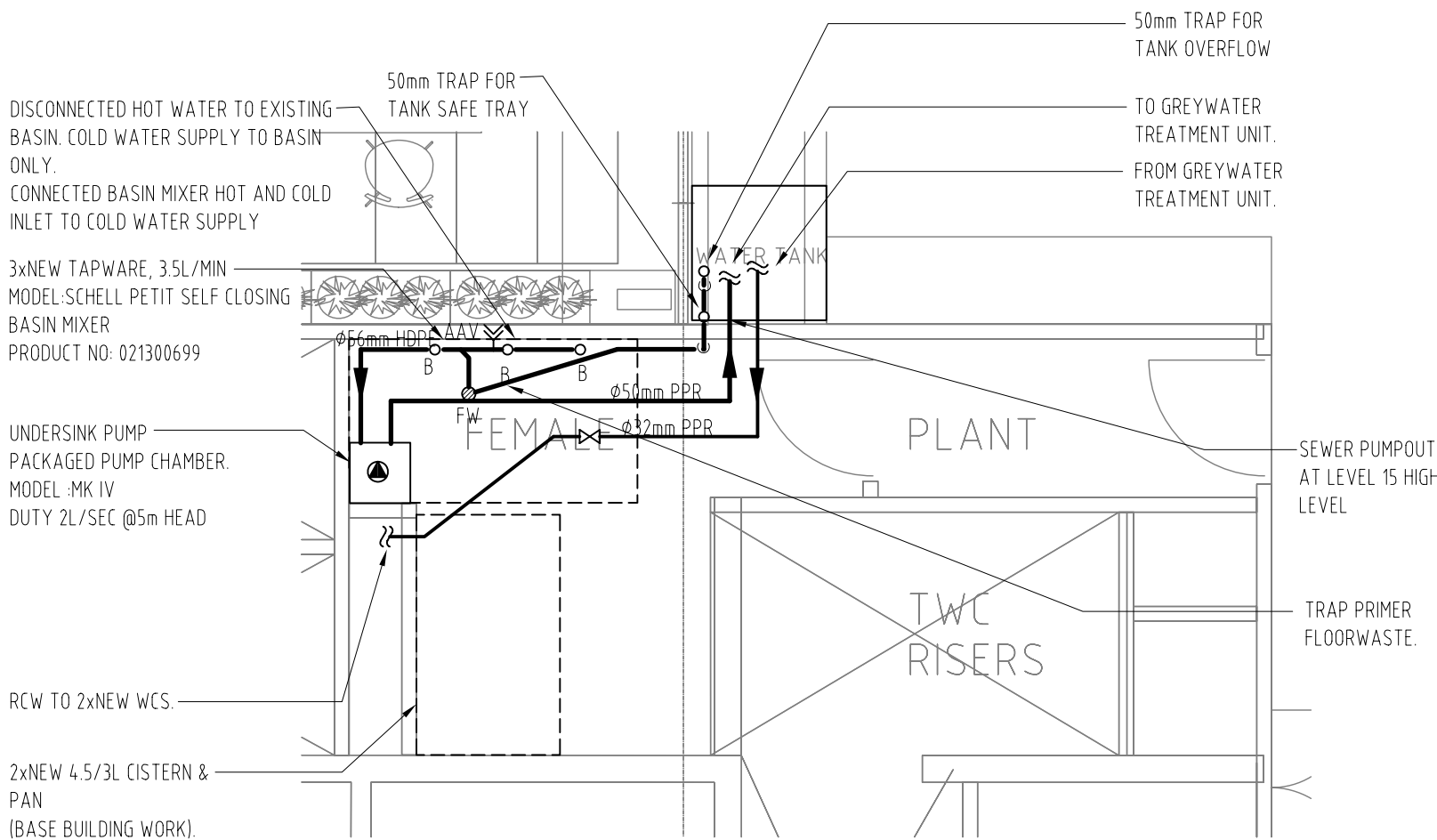
SCHEMATIC

N.T.S



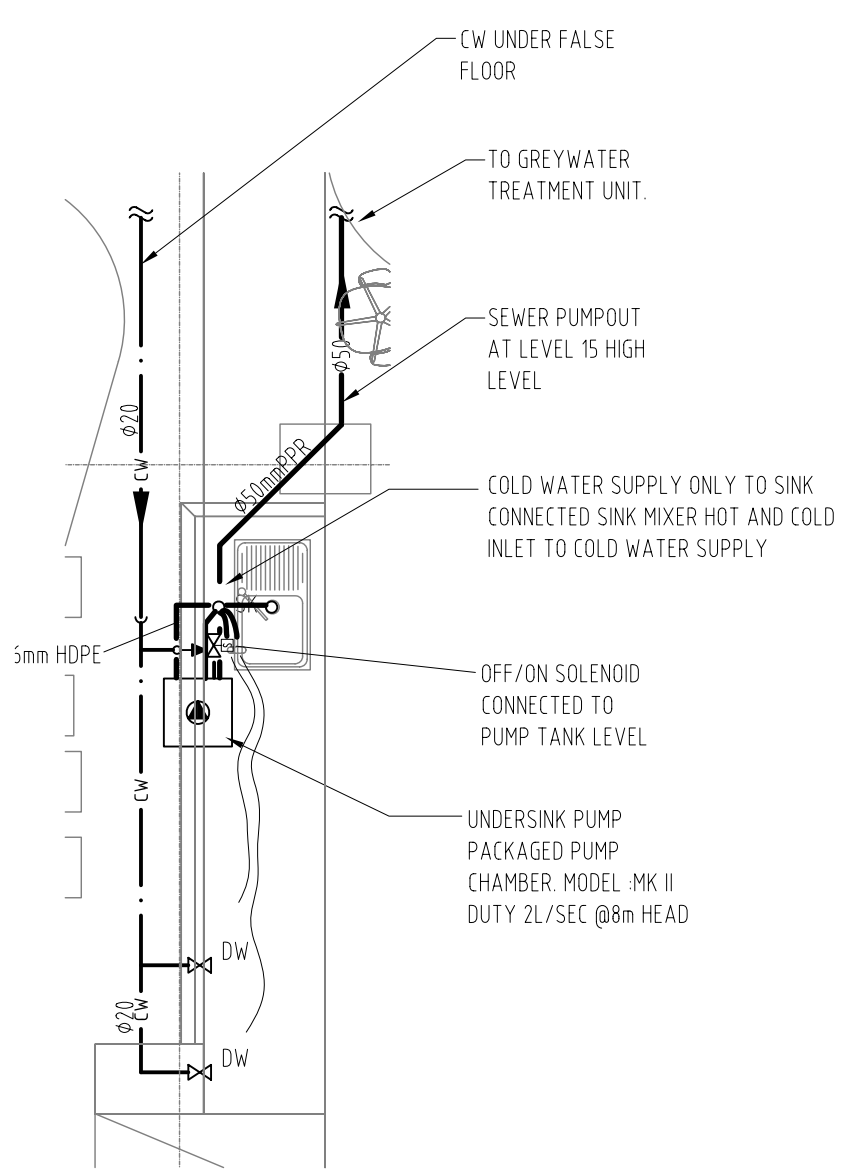
DETAIL 1
MALE AMENITIES

150



DETAIL 2
FEMALE AMENITIES

150



DETAIL 3
KITCHEN

150

LEGEND

- SANITARY DRAINAGE
- VP VENT PIPE
- CW COLD WATER
- HW HOT WATER
- RCW RECYCLED/RECLAIMED COLD WATER
- REDUNDANT SERVICE
- RISER
- DROPPER
- FW FLOORWASTE
- WM WATER METER
- AAV AIR ADMITTANCE VALVE
- TMV THERMOSTATIC MIXING VALVE
- CAPPED OFF
- STOP VALVE
- SOLENOID VALVE
- B BASIN
- SK SINK
- UR URINAL
- WC WATER CLOSET
- DW DISHWASHER
- SFW SEALED FLOORWASTE

PLUMBING CONTRACTORS

6/252-254 WEST STREET
CARLTON NSW 2218
Telephone: 61 2 9747 0033
FAX: 61 2 9567 0044
Email: ns@lincolnescott.com.au

0mm 10 20 30 40 50 60 70mm

REFERENCE COORDINATION DRAWINGS			
DESCRIPTION	DRAWING NO.	REV	CHKD

Lincolne Scott

Consulting Engineers
Adelaide Auckland Bangkok
Brisbane Cairns Honolulu
Melbourne Perth Shanghai
Singapore Sydney

Level 1 41 McLaren Street
PO Box 6245 North Sydney
New South Wales 2060 Australia
Telephone 61 2 9807 0800
Facsimile 61 2 9957 4127
sydney@lincolnescott.com

PROJECT

LEVEL 15
179 ELIZABETH STREET
SYDNEY NSW 2000

CLIENT
GBCA

DATE	13.06.08	DRAWN	JT
SCALE	AS NOTED	CHECKED	VM
SHEET SIZE	A1	APPROVED	AJC
CAD FILE	C:\L15-ELEZABETH\H410.dwg		

TITLE

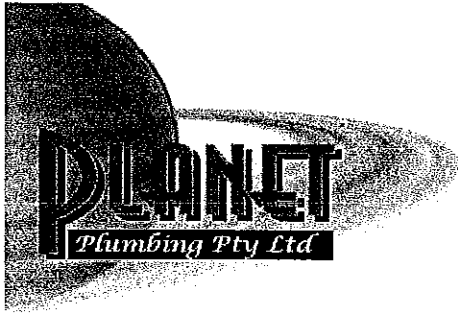
HYDRAULIC SERVICES
179 ELIZABETH STREET

PROJECT NO.
SYD 0703900

DRAWING NO.
H410

REVISION
AB

AS BUILTS



Hydraulic Contractors & Engineers"

Planet Enterprises Aust. Pty Ltd

ABN: 14 092 848 541

6 / 252 – 254 West St

Carlton

NSW 2218

Phone: (02) 9547 0033

Fax: (02) 9547 0044

Web: www.planetplumbing.com.au

Email: nsw@planetplumbing.com.au

2 April 2008

Joe Karten
Green Building Council of Australia
Level 15, 179 Elizabeth Street
Sydney, NSW 2000

Dear Joe,

This letter confirms that Planet Plumbing received and installed the following fixtures and fittings in the restrooms at the GBCA fitout at Level 15, 179 Elizabeth Street in Sydney in accordance with AS 3500, local council requirements, and Lincolne Scott's design and specification.

- 4 Caroma Leda Invisi Suite 4.5/3 Dual Flush Toilets (2 in male restroom, 2 in female restroom)
- 5 Schell Petit Self Closing Mixer and Basin.
- 2 Caroma Cube 0.8L Urinals
- 1 Caroma Liano Sink Mixer
- 1 Clark Advance Kitchen Sink
- 2 Dishwashers
- 1 Grey water tank and associated pumps and plumbing

Should you have any queries regarding this matter, please contact me at 02 9547 0033.

Kind regards,

Vince Molluso
Director
Planet Plumbing

EcoPlus Customer Quotes

"Our experience with your greywater recycling system to date has been excellent. Our guests never know they are using greywater to flush the toilet. Any excess water is reticulated around the garden, trees, etc through 90 metres of plastic ram line. Our unit draws water from two showers, two hand basins as well as two washing machines."
Eco-resort

"We have owned an Ecoplus for over three years now and would not hesitate to recommend the system. The Ecoplus system enables us to water our gardens even during a drought without feeling guilty. Even in a water shortage families need to wash clothes and shower." Householder

"We evaluated numerous options all with a huge footprint and power consumption. The WRG commercial scale greywater system not only provides treated greywater reuse, but also reduces our bore water purification demand by half as well as the costs associated with making that potable." Chemical-free Camping Reserve

"The WRG greywater treatment unit is integrated with an oil separator and is designed to treat the waste recycling depot trucks and tractors chemically free. The ionizer provides chemical-free disinfection rather than chlorine so we are more eco-friendly. Fresh water savings are close to 80% on this site." Government truck wash



Water Recycle Group

Email: sales@waterrecycle.com.au

Website: www.waterrecycle.com.au

"Solutions for the Environment, Business and Community"

Greywater Hotline

1800 333 812

Free Call From Anywhere in Australia

YOUR AUTHORISED MAINTENANCE CONTACT:

EcoPlusTM

Greywater Treatment Units

Operation & Maintenance Manual



Introduction

If you find no real solution to the problem encountered please contact the WRG at:

greywater@waterrecycle.com.au



"The best equipment is only as good as the owner's attention to maintenance." Complete this schedule every time the EcoPlus unit is cleaned, tested or otherwise serviced. This is a priority requirement of the supplier warranty and should be undertaken regardless so the owner is fully aware of the operational status of the greywater treatment unit at all times.

[illegible]

EcoPlus™ System Specifications

EcoPlus Millenium Model (Residential Sites)

- *950 x 750 x 830 mm dimensions*
- *400 L volume*
- *2,100 L / day capacity*
- *Polyethylene moulded materials*
- *Pump 40 psi 12v AC or 240 v AC*
- *50mm inlet & outlet*
- *40 kg dry weight*

EcoPlus Inline Model

- 500 x 2000 x 1000 mm dimensions*
- Same capacity & details as Millenium model*

EcoPlus Square/Quad Model

- 1000 x 1000 x 1000 mm dimensions*
- Same capacity & details as Millenium model*

EcoGrey 15000 Model (Commercial Sites Only)

- 1000 x 1500 x 830 mm dimensions*
- 850 L volume*
- 15,000 L / day capacity*
- Polyethylene moulded materials*
- Pump -0.5-1 L/s 240 v AC*
- 50mm inlet & outlet*
- 90 kg dry weight*

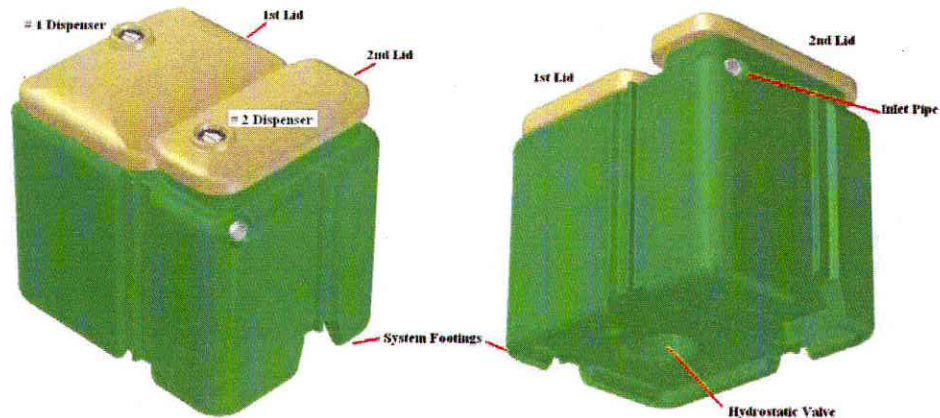
BRIEFLY - THE WHAT HOW AND WHY

Ecoplus greywater units are stand-alone and treat laundry, shower, and basin, spa, bath and pool wastewater. The Millenium model incorporates 4 treatment compartments with 400 litres total storage and a daily treatment capacity of 2,100 litres. Treatment is effected by a patented passive flow through filtration process with full inbuilt disinfection with options for chemical-free ionization.

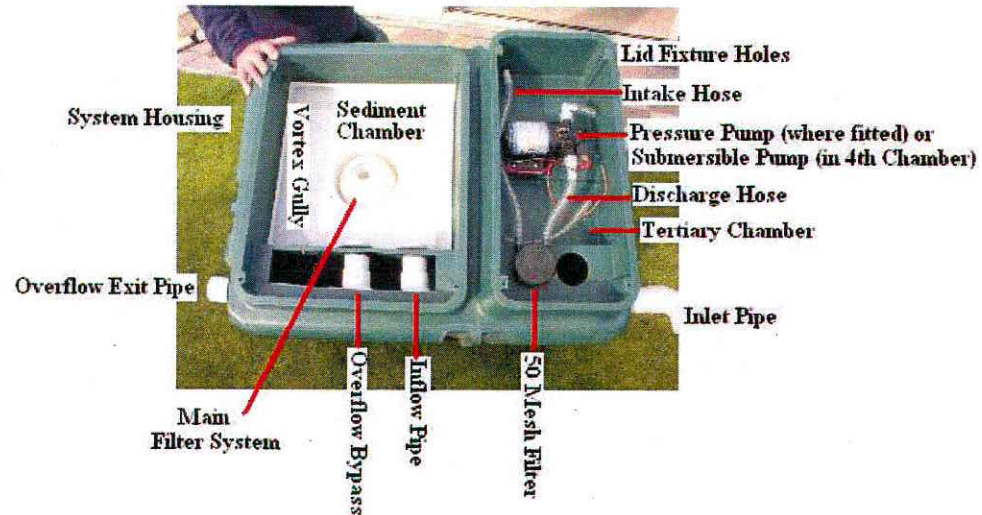
Unlike simple diverters, WRG's greywater treatment units eliminate hazardous and toxic pathogens, remove foam, fibre and solids whilst providing a reuse capability of up to 70% of household wastewater for garden irrigation, car wash, laundry and toilet flush.

EcoPlus™ System Parts Overview

External View



Under The Lids

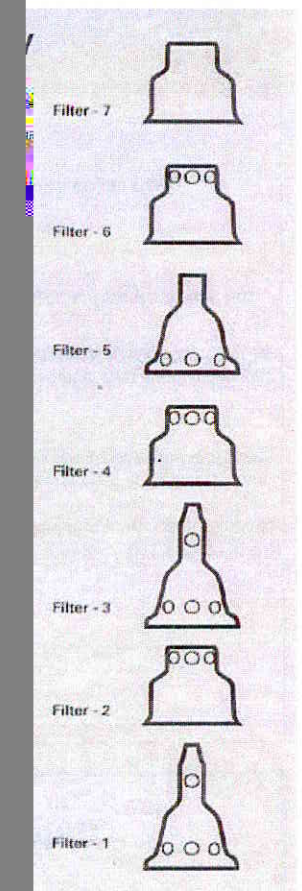


Maintenance Service Record

"The best equipment is only as good as the owner's attention to maintenance."
Complete this schedule every time the EcoPlus unit is cleaned, tested or otherwise serviced. This is a priority requirement of the supplier warranty and should be undertaken regardless so the owner is fully aware of the operational status of the greywater treatment unit at all times.

[illegible]

view



Maintenance & Cleaning

1. WEEKLY MAINTENANCE (Chemical Disinfection Units Only)

Add 1-2 Calcium Hypochlorite tablets once every 1 - 2 weeks into the #1 and # 2 dispensers (ideally 4 tablets should be sufficient)

Caution: When handling Calcium Hypochlorite tablets, care must be taken not to place tablets in direct contact with painted surfaces or other materials as severe bleaching may occur. Do not allow material to splash into eyes or onto clothes. For contact with eyes, rinse with large amounts of running cold water. Keep all chemicals out of reach of children.

2. MONTHLY MAINTENANCE (Pressure Pump Units Only)

If a pressure pump is installed, its pre filter needs to be cleaned once every month. To clean simply unscrew the black filter cap, remove and wash out the mesh filter with hot water and light detergent and replace. Ensure the O Ring seal is securely in place and undamaged when refitting as the pump will suck air and not pump water to the cistern otherwise.

WRG recommends that the pressure pump and wiring be sprayed with a silicon based materials as part of the monthly maintenance.

The EcoPlus Warranty shall be void if the 50 Mesh filter is not in place, for any reason whatsoever. This filter protects the internal workings of the pump. If the filter is damaged during cleaning it is recommended that a new 50 Mesh filter be obtained from your EcoPlus supplier. If the 50 Mesh filter is omitted when reassembling after cleaning and damage occurs to the pump, the Warranty shall be void.

3. 6 MONTHLY MAINTENANCE (All units)

The main filter and Calcium Hypochlorite dispensers require cleaning. Recommended cleaning time is every 6 months.

1. Remove lid from the main filter compartment (large lid) by unscrewing the 4 stainless steel cap screws.
2. Remove filter cones.
3. Unscrew the 4 stainless steel Phillips head screws from the main filter container.
4. Remove filter container.
5. Clean all components with hot detergent water.
6. Remove any dirt or sediment from the bottom of the main filter container.
7. Refit filter container and screw down.
8. Refit filter cones in their correct order. They are numbered from the bottom – place Filter No. 1 in first through to Filter No. 7. Check for the filter number which is stamped onto each one.
9. Ensure the top of No. 7 Filter cone must be level with the 40mm pipe on top of the inner filter.
10. Remove lid from pump chamber and clean out long calcium hypochlorite dispenser making sure the outlet holes near the bottom of the tube are clear.
11. Refit lid and screw down.
12. Place 2 calcium hypochlorite tablets in each dispenser (if this disinfection method is used).

Maintenance & Cleaning

4. ANNUAL MAINTENANCE (All units)

Clean Complete System

1. Change toilet cistern over to mains water supply
2. Unscrew stainless steel cap screws from all lids and remove lids.
3. Remove main filter and filter container.
4. Remove water from the unit by watering your garden.
5. Use a bucket and mop or broom to remove any remaining water and clean any visible lint and sediment
6. (If a garden watering system is not connected, turn off power to transformer. Use an small impeller submersible water pump to remove water from all tanks and discharge to the gully trap. Then follow 5 as above).
7. Clean filter cones, filter container and dispensers.
8. Place 1 Calcium Hypochlorite tablet into the hole in the pump chamber and another into the compartment under the filter container before reassembling the filter components. These will re-commission the EcoPlus unit.
9. Reassemble the filter components as per normal and secure. 9. Replace and secure the unit lids.
10. Place 2 Calcium Hypochlorite tablets in each dispenser.
11. Refill The EcoPlus unit by using your washing machine, shower or bath.
12. Turn off mains supply to toilet cistern. Switch Gate Valve back to toilet cistern supply.

5. GENERAL MAINTENANCE ISSUES

1. As with any appliance, always ensure that all connecting pipes and wiring are clear and undamaged so as to not impede the operation of the EcoPlus unit.
2. Apply occasional visual checks to ensure that garden and building tools have not accidentally damaged the unit whether buried or free standing.
3. Where treated greywater is reused in the toilet cistern, visually observe the recycle greywater quality in the toilet bowl. If significant deterioration in colour is observed and no change in laundry clothes wash dyes are known to be involved, implement 6 monthly maintenance check.
4. If used in commercial environment the filter may be needed to be cleaned more frequently.
5. If the area where the EcoPlus unit is located has an increase in human and pet traffic, consider protective measures for the unit.

