Rain to Resource

Stories from the CRD

Sometimes its not easy being green, but it sure is nice!

From Rain to Resource Workshop

October 29, 2010

Making a difference...together

Overview

- Rainwater harvesting and greywater reuse system
- Green roof and living wall features and monitoring data
- Barriers to implementation
- Solutions

Drivers for New Building

Making a difference...together

- Old building – massive earthquake risk
- Phase 1 – design competition for old police building - “green as possible” within approved budget
- Phase 2 - Board directed staff to aim for LEED Gold
- Staff Initiatives
  - Telford’s Tower
  - Jody’s Roof

New CRD Building Phase 1 and Phase 2

Making a difference...together

- Phase 1
  - Extensive green roof
  - Living wall
- Phase 2
  - Rainwater harvesting
  - Grey water reuse
  - Intensive green roof

Water Efficiency Features – both Phases

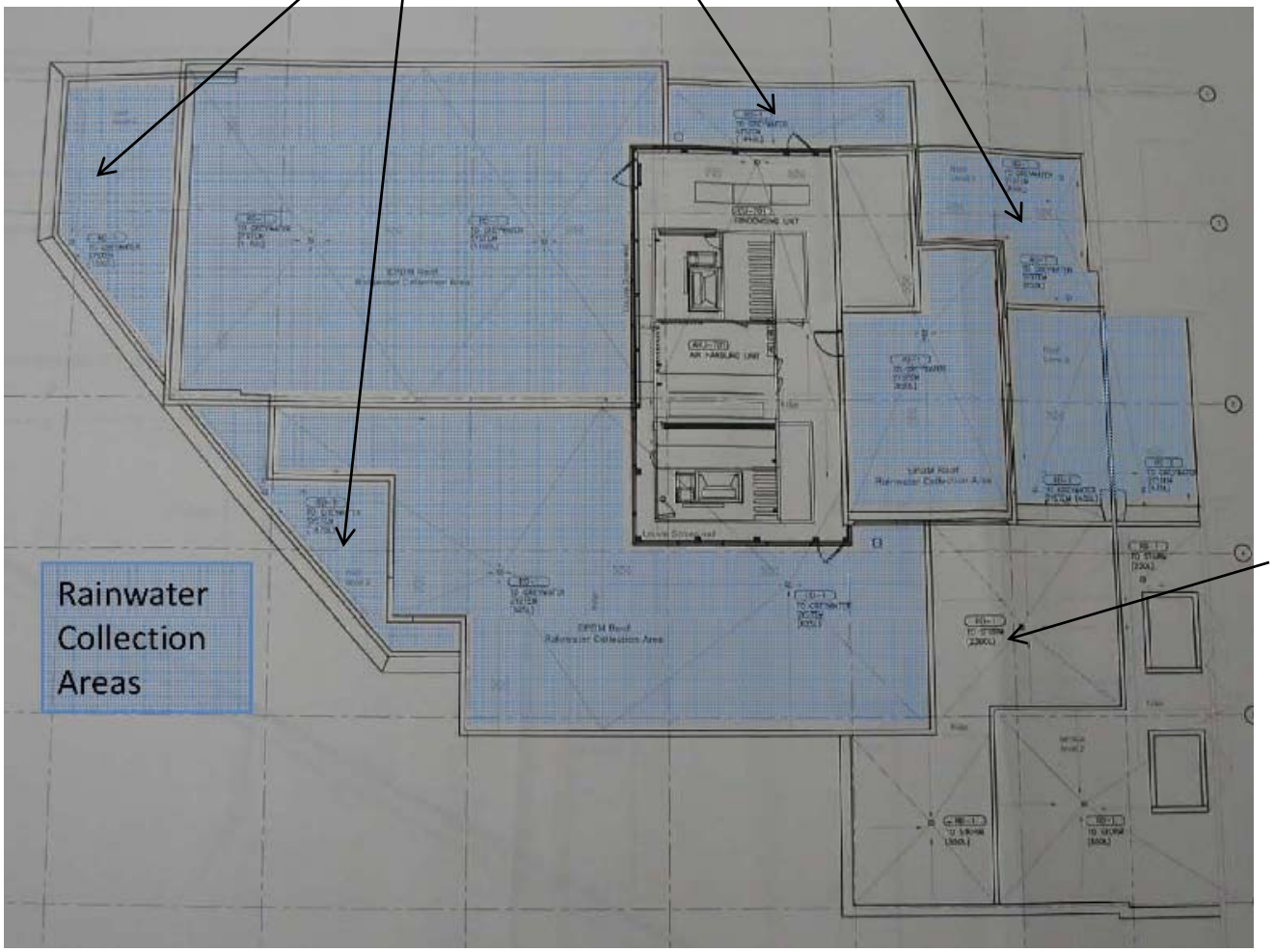
Making a difference...together

- Low flush toilets
- Low-flow showers
- Waterless urinals
- Micro-drip irrigation/no irrigation

Rainwater Harvesting

Making a difference...together

Extensive Green Roof Areas on Phase 2



Intensive Green Roof Areas on Phase 2

Phase 2 Rainwater Harvesting

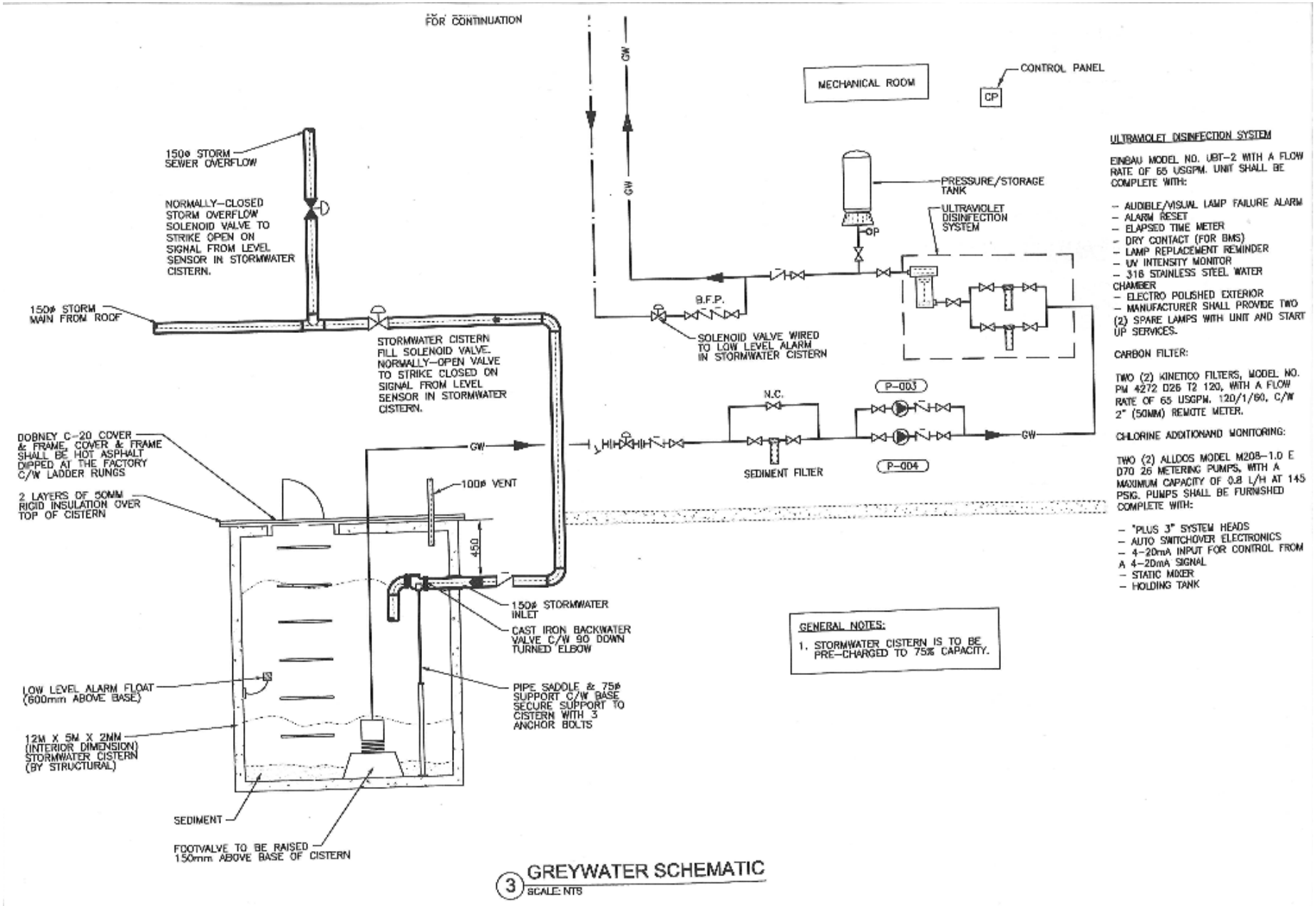
Making a difference...together

Approximately 450 m^2

Rainwater Harvesting

Making a difference...together

- 60,000 L cistern under the parkade (too small)
- Water is reused to flush toilets in Phase 2
- Overflows to storm when full
- Reverts to potable water when empty



ULTRAVIOLET DISINFECTION SYSTEM

EINBAU MODEL NO. UBT-2 WITH A FLOW RATE OF 65 USGPM. UNIT SHALL BE COMPLETE WITH:

- AUDIBLE/VISUAL LAMP FAILURE ALARM
- ALARM RESET
- ELAPSED TIME METER
- DRY CONTACT (FOR BMS)
- LAMP REPLACEMENT REMINDER
- UV INTENSITY MONITOR
- 316 STAINLESS STEEL WATER CHAMBER
- ELECTRO POLISHED EXTERIOR
- MANUFACTURER SHALL PROVIDE TWO (2) SPARE LAMPS WITH UNIT AND START UP SERVICES.

CARBON FILTER:

TWO (2) KINETICO FILTERS, MODEL NO. PM 4272 D26 T2 120, WITH A FLOW RATE OF 65 USGPM. 120/1/60, C/W 2" (50MM) REMOTE METER.

CHLORINE ADDITIONAND MONITORING:

TWO (2) ALLDOS MODEL M208-1.0 E D70 26 METERING PUMPS, WITH A MAXIMUM CAPACITY OF 0.8 L/H AT 145 PSIG. PUMPS SHALL BE FURNISHED COMPLETE WITH:

- "PLUS 3" SYSTEM HEADS
- AUTO SWITCHOVER ELECTRONICS
- 4-20mA INPUT FOR CONTROL FROM A 4-20mA SIGNAL
- STATIC MIXER
- HOLDING TANK

GENERAL NOTES:

1. STORMWATER CISTERN IS TO BE PRE-CHARGED TO 75% CAPACITY.

3 GREYWATER SCHEMATIC

SCALE: NTS

Grey Water Reuse Barriers

Making a difference...together

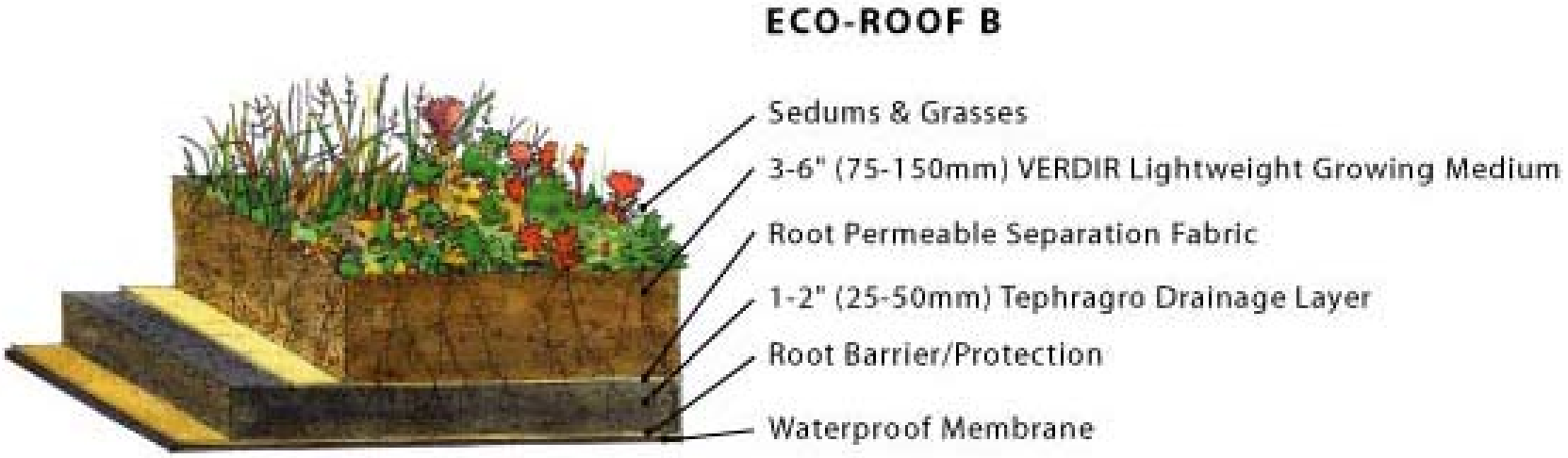
- Building and plumbing code
- Building Inspectors
- Backflow preventers
- Purple pipe system

Grey water reuse

Making a difference...together

- earthquake procedures – signage
- UV treatment and chlorination

Extensive Green Roof



- 6 inches or shallower
- designed to satisfy specific engineering and performance goals

Green Roof Drivers

Making a difference...together

- LEEDs gold certification
- Bird dropping impacting membrane
- Integrated watershed management
- CRD Strategic plan
- Walking the talk!

Green Roof – Barriers to Implementation

Making a difference...together

You want to do what?

- Board Approval
  - 6 staff reports
- Insurance concerns
- Money – UBCM Innovation Gas Tax Funding

Benefits of Green Roofs

Making a difference...together

- Reduce energy costs (insulation, cooling etc)
- Moderation of urban heat island effect
- High water retention
- Protection waterproofing (increases life expectancy of roofing materials)
- Improve air quality (CO_2/O_2 exchange)
- Provide wildlife habitat
- Use of space - aesthetics
- WALK the TALK!


ROOFING
ALPHA
ROOFING

Building Envelope Concerns

Making a difference...together

- Will it leak?
- What will it do to our roof warranty and insurance coverage?
- Material Safety datasheet
- Detec Leak proof system

Concerns - Structural

- 10 psf additional capacity
- Very lightweight system – Xeroflor
- 38mm thick
- Absorbs 25 mm of rainfall when dry
- 9.6 psf fully saturated

Concerns - Windlift

Making a difference...together

Maintenance Concerns

Making a difference...together

- How are we going to get the lawnmower on the roof?
- Roof membrane issues due to bird scat
- Tour of UVic
- 2 yr maintenance contract
- Pre-grown system

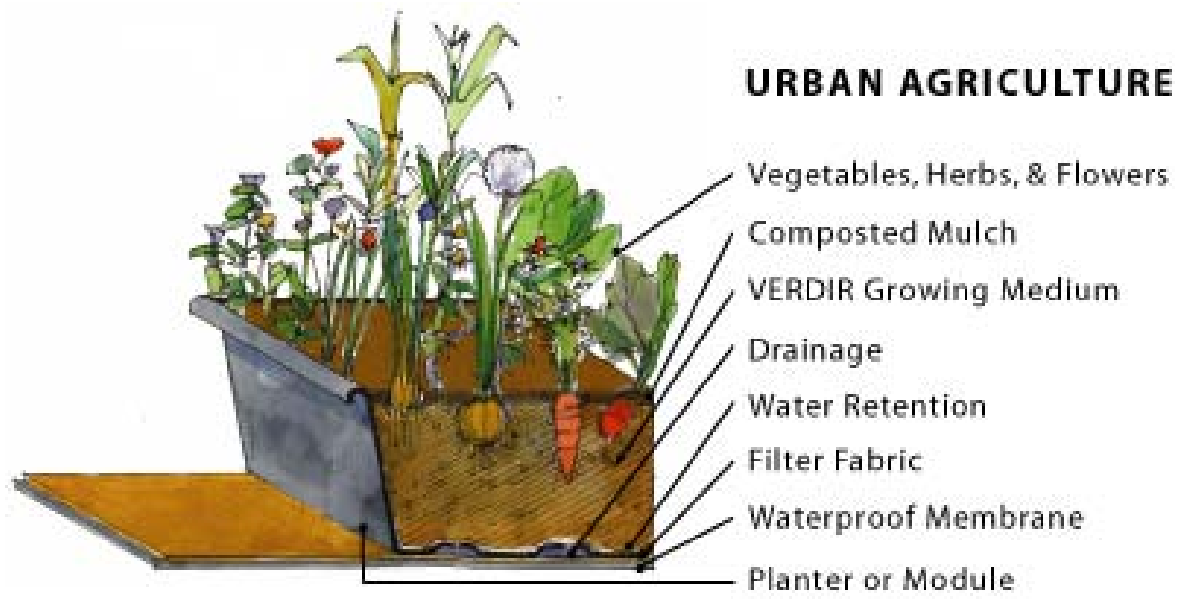

4
PARK
2A

Making a difference...together

Intensive Green Roof

Making a difference...together

- Deeper soils (6-18 inches of growing medium)
- large perennial plants, shrubs and trees
- Urban agriculture



Intensive Green Roof

Making a difference...together

- Higher structural capacity
- larger trees and plantings will be visible from Centennial Square
- staff participated in design workshops to allow for maximum benefit (urban gardening, fruit trees,shade areas, areas for reflection and relaxation)

A nice place for staff

Making a difference...together

Intensive Roof

Making a difference...together

Approximately 150 m^2

Living Wall Location

Making a difference...together

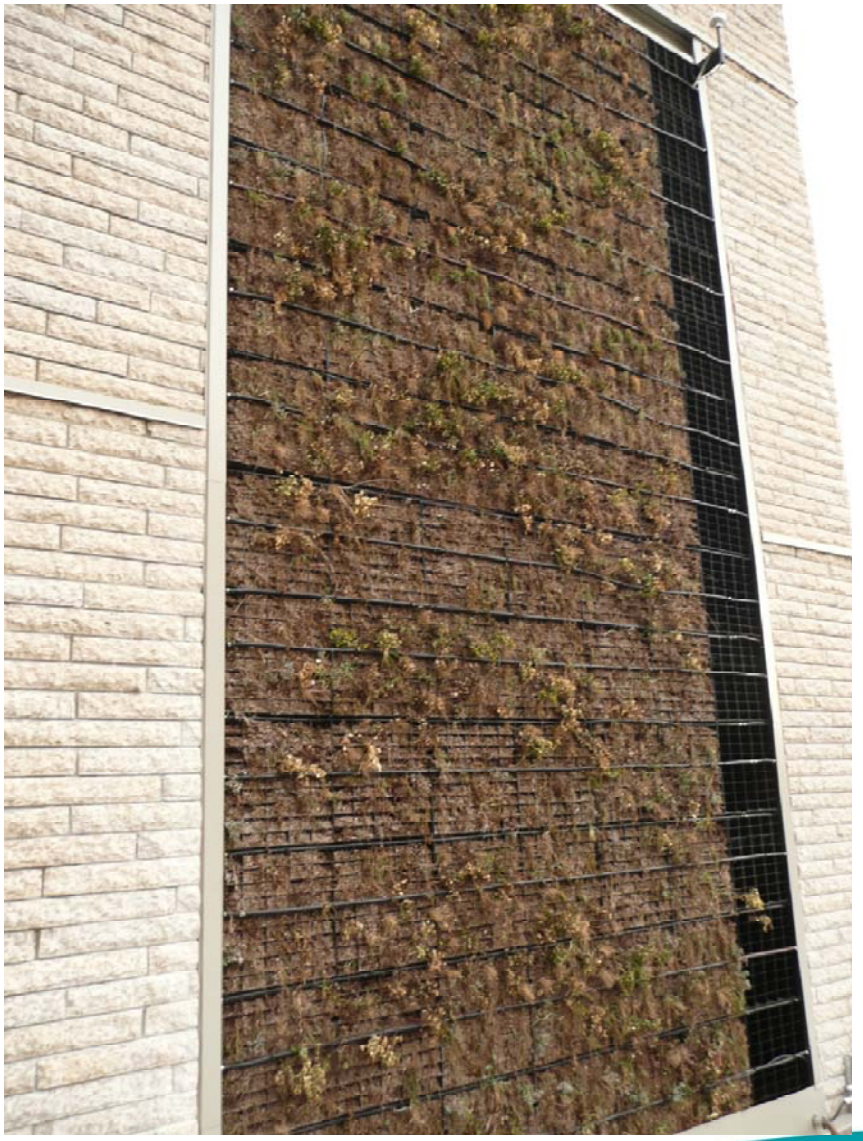
Approximately 26 m^2

Pre-grown system

Living Wall Issues

Making a difference...together

- Removal of cladding
- Irrigation is key
- Connecting moisture sensors to solenoid valves to automatically turn on
- Water balance
- microclimate



Living Wall Maintenance

Making a difference...together

BCIT Monitoring Program

Making a difference...together

Nov 2009 - July 2010

- Retention ~40%
- Runoff delay
  - ~24 min in wet season
  - ~ 2hr in dry season
- Peak runoff flow reduced by 90% and delayed ave. 2 hrs after peak rainfall
- Heat flow predominately out of building in winter, cooling effect in summer
- Overall ave. annual heat flow through roof -1.3 W/m^2
  - RSI 6-8

Questions???

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