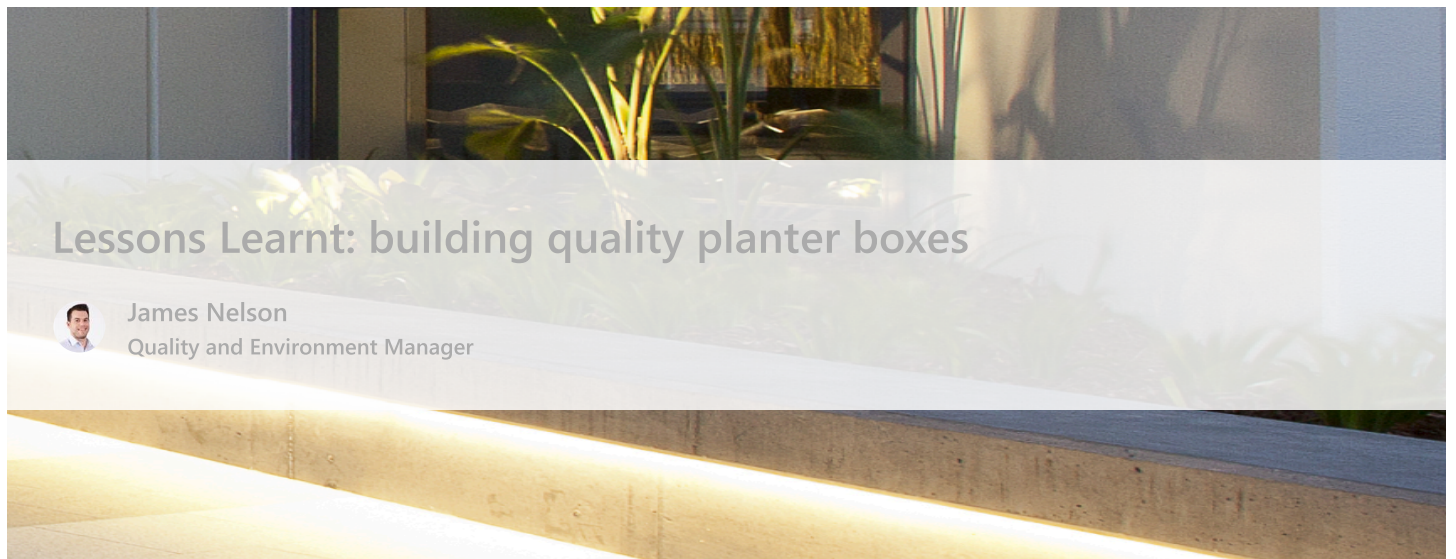




Lessons Learnt: building quality planter boxes



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Detailed Description of Incident/Issue:

Over the years we've encountered a number of issues with planter boxes, most recently with the Pullman Ibis Conference Centre at the Brisbane Airport (2016) and as far back as Admiralty II (1995) and Dundrenan (2001). Planter design and their contents have to be carefully considered.

A key risk to be aware of is roots from plants and trees growing through and damaging the membrane.





Protect the membrane

Overlapping layers of well-taped **protective board** (such as corflute) will assist in protecting the membrane. Over the top of the protective layer should be a drainage cell protected by geo-fabric, up the floors and walls.

This is consistent with AS 4654.2 "Waterproof Membranes For Above Ground Use", **Figure 2.17 extracted below** (slightly modified to show additional protective board along the bottom of the planter, additional drainage cell up the wall, and a lower exterior wall).

Avoid invasive root structures and trees that exceed 1m mature height

Planting should be discussed with the landscape architect to discuss the risk of **root-growth**.

- **AVOID** species with invasive root structures, such as **ferns, palms** and similar root-matted plants. Other species to avoid include **Golden Cane, Philodendron, and Rhododendron**.
- **TREES** that exceed 1m mature height should be discussed.

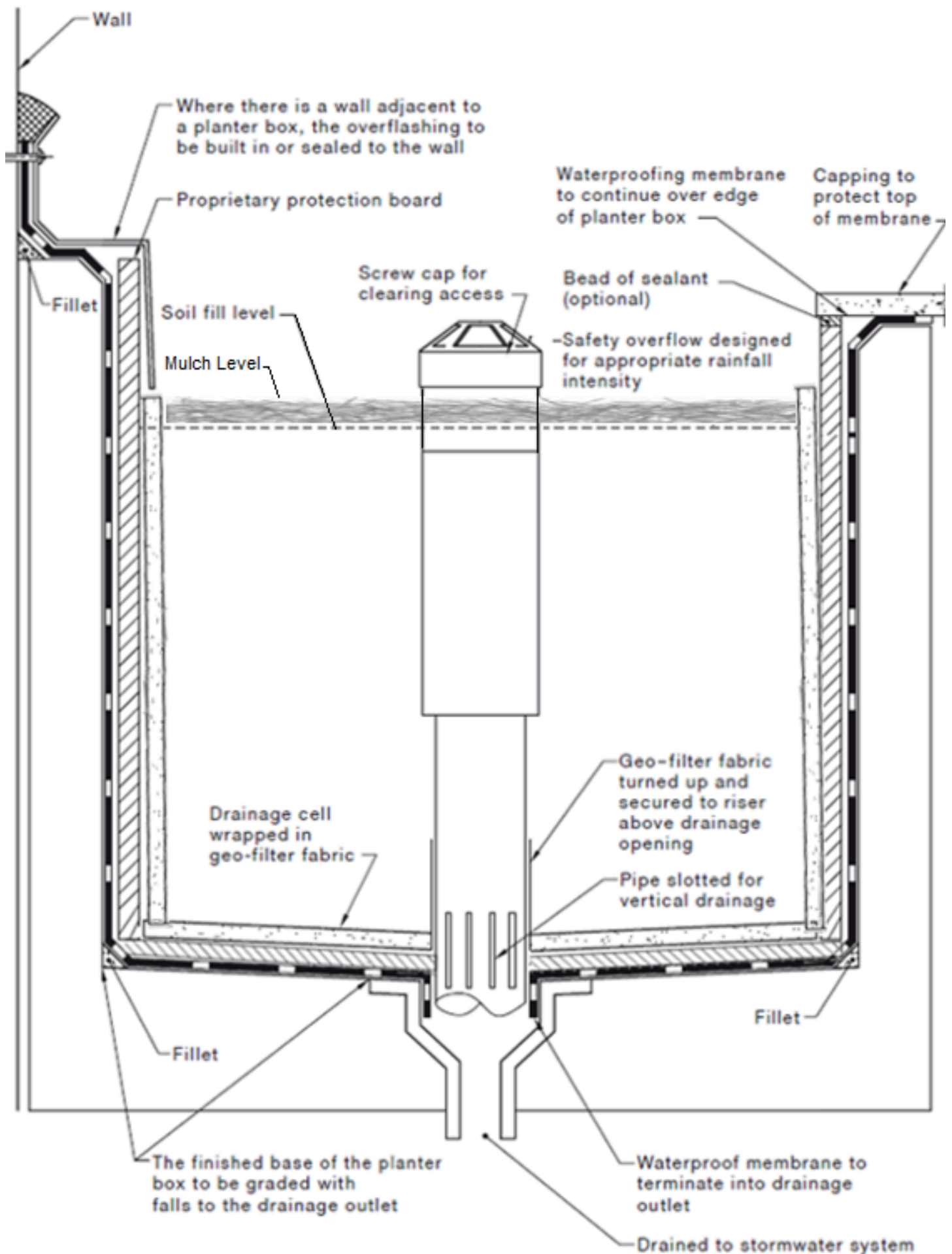


FIGURE 2.17 TYPICAL PLANTER BOX CONSTRUCTION

Construct planter boxes like external bathtubs

Planter boxes act like external bathtubs, and must be constructed as such, four-sided, self-contained and integrally constructed.

Slab base must drain to a cast-in cast iron floor drain

The structural slab base of the planter will be graded with strong falls, draining to a cast-in cast iron floor drain.

Planter boxes adjacent to internal areas must be separated with a waterproofed secondary cavity wall

Planter boxes constructed adjacent to internal areas must be separated with a waterproofed secondary cavity wall between the planter and wall of the building, with a flashing over the cavity sealed/chased into the inner wall and turning down into the planter box. Horizontal pour breaks or movement joints must not be designed in the floor of any planter box—if they must be located in the planter, contact the Operations Manager to discuss solutions.

Planter boxes should be built out of concrete

Extra care must be taken with planter boxes constructed out of blockwork to ensure the cores to the block work are fully filled with concrete, all perps and bed joints are fully filled and struck flush and bagged up where necessary to provide a flat substrate for membrane adherence.

Waterproof membranes must terminate over the top of the planter wall

Waterproof membranes must terminate over the top of the planter wall and protected from above e.g. terminate under a flashing, or have some other pressure seal, refer above to figure 2.17.

Install an overflow

As with our previous lessons learnt about stormwater overflow/overland flow, all planter boxes should have an overflow installed (where possible), or some path to surcharge and overflow away from the building, for example making the exterior wall lower than the interior wall.

Fixings should be high grade stainless steel

If any fixings are located within the planter box, they should be high grade of Stainless Steel, as they are in constant contact with water.



Cast-in cast iron floor drain.

Drainage riser pipes require 5mm slots all the way up

These need to have larger slots cut into the pipe to allow adequate drainage. See photo of inadequate drainage slots. Slots should be about 5mm, or two passes of a grinder, evenly spaced around and up the pipe. The pipe should be wrapped in geofabric.

Avoid penetrations through the floor

If penetrations must occur through the base, discuss with the Operations Manager about constructing a plinth to be waterproofed.

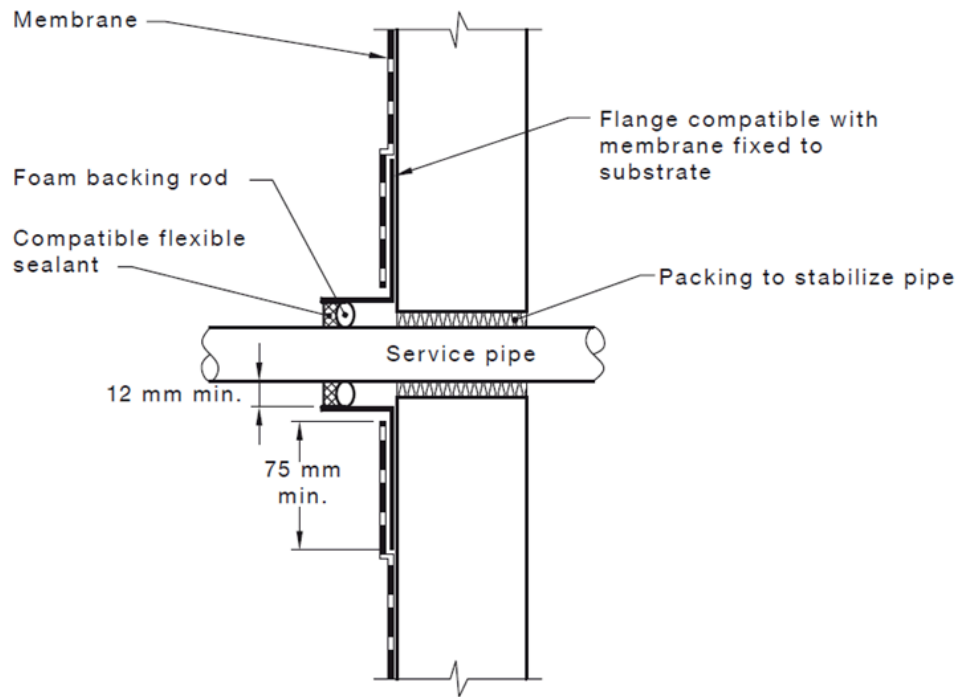
Wall penetrations to turn out at the height of the mulch layer of the wall, sealed and waterproofed, wherever possible

For services that require penetrations through the wall of the planter box need to be cast into the wall, turn out at the height of the mulch layer of the wall, and be sealed and waterproofed over the top.

Figure 2.11 of AS 4654.2 offers a best practice detail, but mulch-height and rigid section of conduit to membrane are the most important considerations – flexible conduits and cables will flex and break the membrane.



Drainage riser pipes require 5mm slots, or two p...



NOTE: Prime service pipe to allow for proper adhesion between sealant and pipe interface.

FIGURE 2.11 TYPICAL PENETRATION

Figure 2.11 of AS 4654.2



Penetrations must never come up through the floor

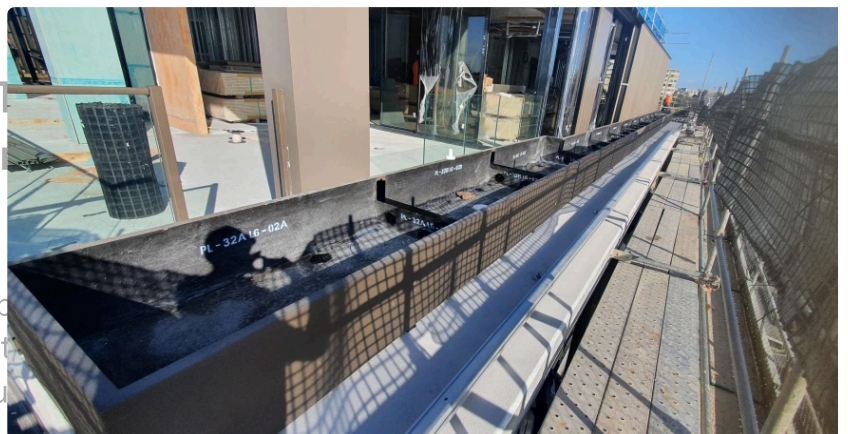


ations must turn out at the height of the mulch layer of

CASE STUDY:

The Oxlade Apartments - 'Tips' for pre-fabricated planter boxes

At The Oxlade Apartments, we used pre-fabricated GRC Planter boxes on the floor which created the following issues



GRC Planter boxes on The Oxlade Apartments

- The design included to string them together to appear as one large planter, but each planter is its own individual product, and as such needed its own drainage outlet.

- Default fixing method was to bolt through the bottom of the planter. Better option would be to build a pedestal/post structure to fix through the wall at mulch height.
- Pre-applied membrane was very low quality.

For more information, contact Shane Watts

Operations and Maintenance: some inspection and maintenance requirements should be briefed to the Facilities Managers via the O&M manuals at handover. This includes:

- Inspection of the overflow risers at least once per year just prior to the wet season
 - Ensure drainage slots are not blocked or damaged.
 - Clear/remove any excess mulch, soil or plant matter away from the inlet.
 - Inspect the inside of the riser to just below the floor of the planter ideally using a remote camera.
- Inspect the areas immediately adjacent to or below the planters for signs of root creep, cracking, damage or unwarranted moisture – six monthly or yearly
- Flush the riser to release build-up of fine particles that will build up on the geofabric around the pipe slots and the drainage cell where adjacent to the slotted pipe – yearly prior to the wet season.
- Locally excavate sections of the planter to check if root build up is excessive and requires root reduction or plant replacement - every two years.



For more information about constructing quality planter boxes, contact [James Nelson](#).

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