Maintenance and renewal of permeable paving assets

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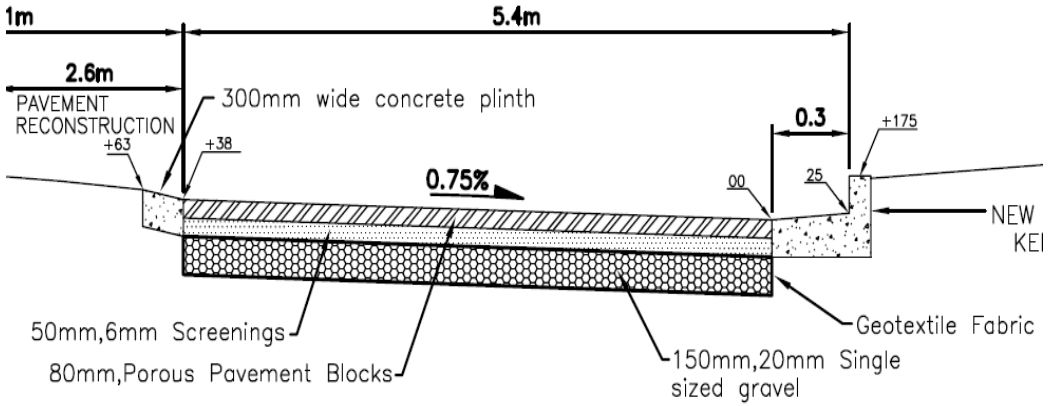
City of Charles Sturt

History of permeable paving in CCS

- Used in roadways not paths
- Predominantly near the coast due to sandy soils
- Usually for:
  - Reducing gutter flow widths & nuisance ponding
  - allowing water infiltration for trees
  - Soakage drainage system where no formal infrastructure exists
- Becoming more frequent

Kirkcaldy Avenue Parking Bays

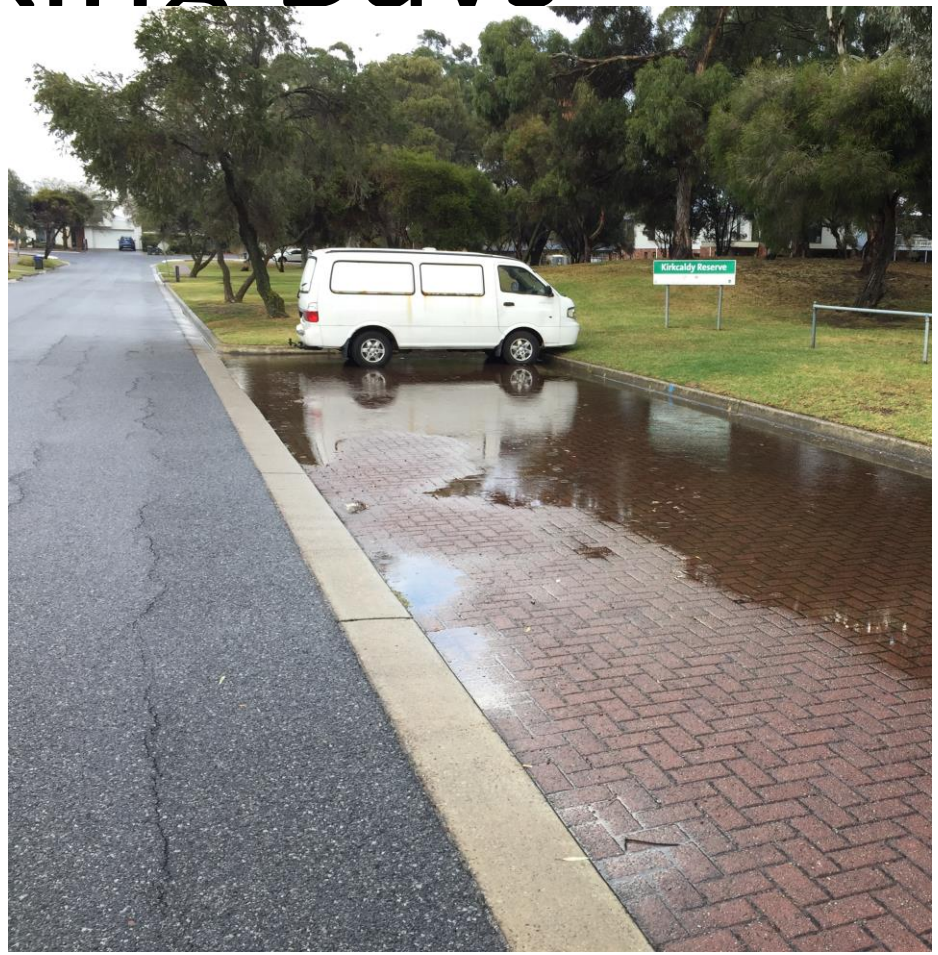
- Kirkcaldy Avenue, Grange
- Constructed in 1999 – one of our earliest systems.
- Intent – reduce gutter flow width and ponding in the roadway in smaller rain events
- Design – falls away from road to hold about 40mm of water
- 80mm Boral Hydrapave



TYPICAL CROSS SECTION (N.T.S.)

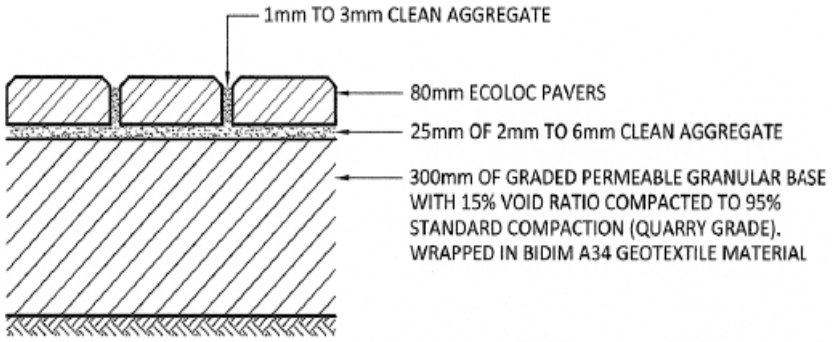
Kirkcaldy Avenue Parking Bays

- Swept 5 times a year
- Issues
  - Some decrease in performance – water holds then slowly soaks away
  - Serviceability issue with the ponding water – no complaints received
- Remedial action
  - High pressure clean – Approximately $1000
- Continue to monitor as no significant impact



Wilson Court Parking Bays

- Wilson Court, Grange
- Constructed in 2012/13FY
- Intent – prevent ponding due to leaf litter blockages from mature Norfolk pines.
- Design
  - change parking bays to outfall away from trees
  - 80mm Ecoloc permeable paving to ensure trees still received some road runoff



City of Charles Sturt

MEANS THE WORLD

Wilson Court Parking Bays

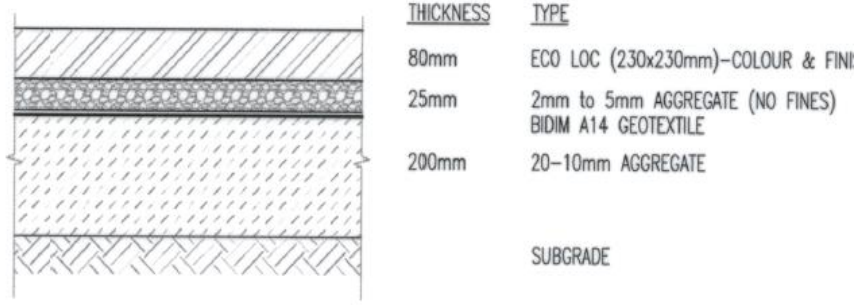
- Swept 5 times a year with additional reactive cleaning as requested
- Issues
  - difficult to do a thorough clean due to high carpark use
  - moss & pine needles blocking gaps

Wilson Court Parking Bays

- Remedial action
  - High pressure clean – 2 days labour – approx. $2000
  - Added to our “carpark” mini-sweeping program (should have been from the start) – no operational asset handover
- Further actions
  - Continue to monitor
  - May need some refurbishment (lift & relay of small sections)

Duke Lane, Semaphore Park

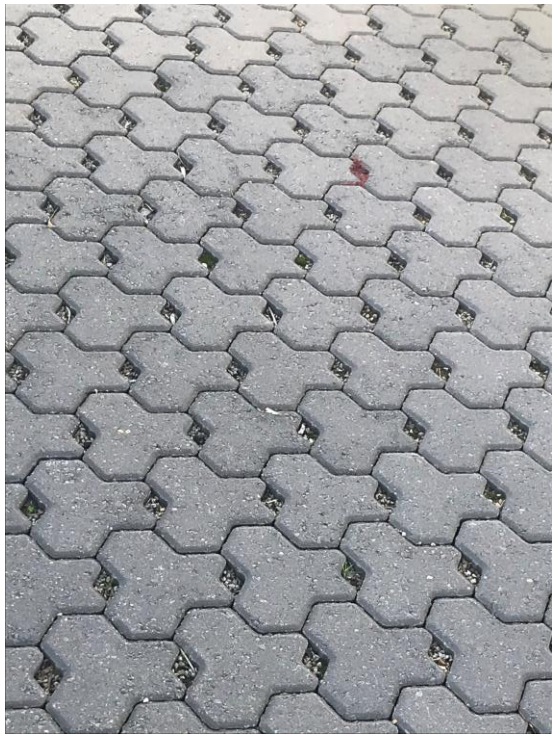
- Duke Lane, Semaphore Park
- Constructed in 2010
- Intent – provide drainage via soakage
- 80mm Ecoloc pavers



BLOCK PAVING – PERMEABLE

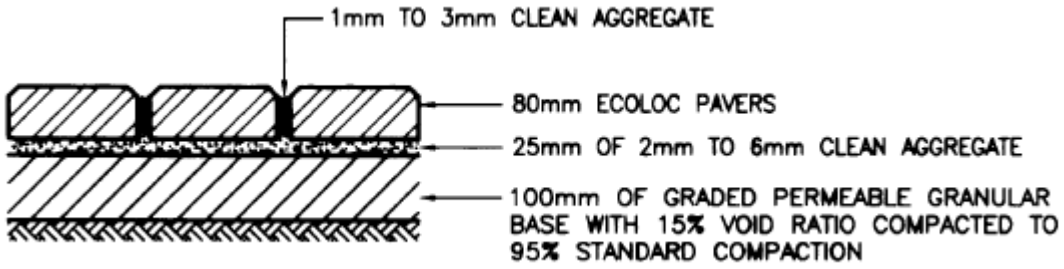
Duke Lane, Semaphore Park

- Currently not maintained
- No reported issues
- Remedial action – added to sweeper program



Lane 30 (Anthony St Lane)

- Behind Anthony Street, Henley Beach
- Constructed in 2010
- Intent – provide drainage via soakage to prevent flooding of properties at existing low point
- 80mm Ecoloc pavers



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MEANS THE WORLD

Lane 30 (Anthony St Lane)

- Swept every 6 months
- Resident complaint - mid 2018
  - water not draining due to tree debris and moss blocking gaps
  - ponding significantly and entering property
- Investigation after a rain event confirmed the issue was the gap between pavers was blocked

Lane 30 (Anthony St Lane)

- Remedial action
- Lift and relay 80m2 pavers at low point including replacement of the top geofabric and surface screenings – undertaken in late 2018/early 2019
- Some branches from overhanging tree were also trimmed (tree has since been removed by owner)
- Cost – $8000
- Continue to monitor after rain events

Marlborough St

- Marlborough St, Henley Beach (between Seaview & Military)
- Constructed in 2009
- Intent – reduce gutter flow widths at Emu crossing
- Permeable (no fines) kerb along length behind protrubance

Marlborough St

- Maintenance regime - none
- Issues – minimal, leaf litter usually clears itself due to runoff volume and grade. Has reduced gutter flow widths from 3m to 1m
- Remedial action - none

East Terrace

- East Terrace, Henley Beach
- Constructed in 2009
- Intent – reduce gutter flow widths and nuisance ponding
- Permeable (no fines) kerb installed adjacent trees

East Terrace

- Swept 5 times a year & high leaf area reactive
- Issues
  - permeable kerb gets blocked due to fine leaf litter
  - leaf litter and lifted sections prevents water reaching the permeable kerb

East Terrace

- Remedial actions
  - high pressure clean
  - 1 days labour – approx. $1000 work
- Further action
  - 21/22FY - Replace lifted sections and undertake trial to extend permeable kerb to length of parking bays
  - Expected cost - $10000

Conclusions

- Every location is different
- Emphasis on maintenance to minimise need for refurbishment
- Regular monitoring to enable adjustments to maintenance schedules before issues arise
- Refurbishment can be in targeted sections
- Consider impacts/consequences of reduced performance at design stage