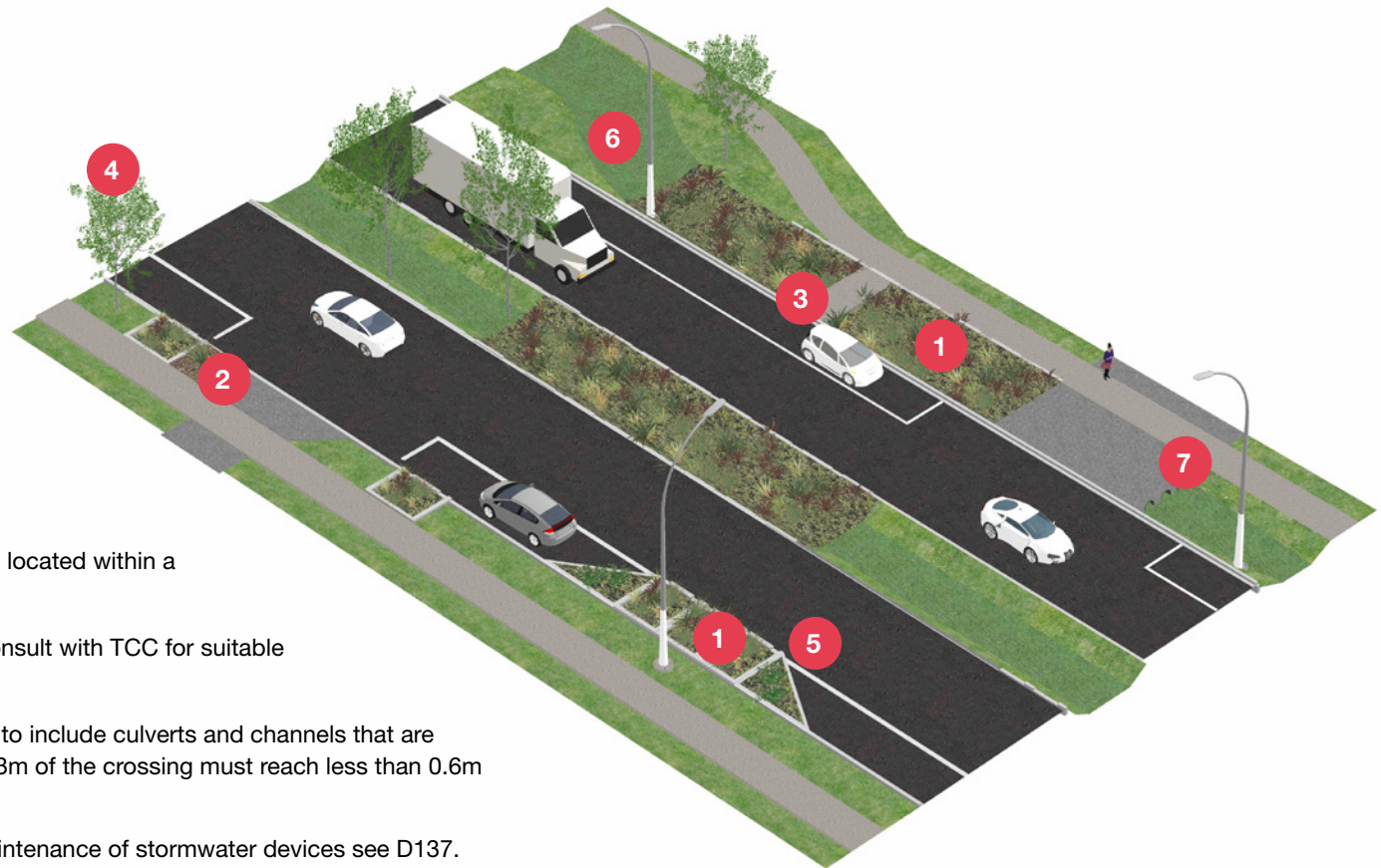


This element requires the use of appropriate measures to convey surface flows according to the volume and velocity of stormwater and the risk of harm to urban and natural environments.

- 1** Swales should be the first option for conveying large overland flow paths. They are required where streets form part of a critical path for evacuation in an emergency.
- 2** Flow depth and velocities on roads must be limited to the thresholds in section DS-4.5.2.12 in the IDC.
- 3** Car parks and cycle lanes are able to be located within a conveyance channel.
- 4** Conveyance swales can be planted with trees along their edges and groundcover species within the channel.
- 5** Vehicle crossings over a swale or significant overland flow path will require suitable culverts, fords or similar, to maintain surface flows and avoid localised flooding and are subject to hydraulic design.
- 6** Where overland flow paths cross private property, an easement is required and the area must be kept free of all structures and dense vegetation.

Note: For carriageway width requirements for maintenance of stormwater devices see D137

Typically includes porous paving, swale and/or raingarden for detention and retention to provide soakage into the ground. This is required to protect and enhance natural streams, water tables and aquifers. Stormwater must be permitted to soak away beneath the level of the pavement sub-grade. All roads with high traffic volumes and those with heavy freight, require some form of stormwater treatment so that pollutants (such as heavy metals) do not flow into our beaches, harbour and streams.



- 1 Raingarden can be used as an individual unit or stacked. See TCC's IDC Stormwater Chapter DS-5.
 - 2 Where adjacent to driveways, the space between the vehicle crossing and the raingarden should be planted.
 - 3 Raingardens and swales are not ideal to place alongside car parks. Where this occurs, suitable footpaths and pram crossings are required for pedestrian access.
 - 4 Trees can be located next to raingardens subject to root space requirements. Consult with TCC for suitable tree species.
 - 5 Planted build-outs can be used if raingardens are located within a car park lane.
 - 6 Trees can be located within infiltration swales. Consult with TCC for suitable tree species.
 - 7 Vehicle crossings and pedestrian crossings need to include culverts and channels that are subject to hydraulic design. Plant species within 3m of the crossing must reach less than 0.6m maximum height at maturity.
- Note: For carriageway width requirements for maintenance of stormwater devices see D137.