

Sorell Council Southern Beaches CERMP Outfall Project

Outfall Project 5_SE112501

First Avenue
Anna Wilson December
2023



Brief

Manage Sorell Southern beach stormwater outfalls to protect dunes and beaches from erosion and pollutants as per the Sorell Council Coastal and Estuarine Risk Mitigation Project.

Each outfall project will follow a number of overarching principles to ensure that works are good for the community and will tie in with overall stormwater and pollution management objectives.

SESE112501 Brief

Coastal erosion affecting site around entrance to beach and at outfall location. Erosion is continuing to move coastal landform inwards.

Look at mitigating erosion.

Consider if outfalls may be combined.



Infiltrate water into the ground



Maintain Native Environment



Create Maintainable Systems



Manage Pollutants



Consider Community

SE112501 First Avenue existing conditions



Figure 1 Survey of First Ave investigation site.

The entrance to Okines beach contains two stormwater pipe outfalls, a 600mm dia pipe to the north discharging onto the beach at RL1.763 and a 375mm dia pipe (SE112501) discharging to the south of the access steps halfway up the erosion cut at RL 2.44.

The embankment surrounding the access has eroded out to a vertical wall and is collapsing around the entrance and outfall.

Investigations



Figure 2 image of outfall SE112501

Outfall analysis



Figure 4 Outfall SE112502

Analysis of the outfalls shows that neither outfall is causing significant damage to the area and neither is creating a large litter load – although the northern outfall SE112502 had a very small load of small litter. SE112502 is 600mm dia and carries stormwater from the main Road – Old Forcett Road – and an undeveloped lot upstream of Old Forcett Road.

The Entura Stormwater System Management Plan (Kovacevic, 2020) shows that the location has a small amount of overland flow in a 1% but is not considered a high risk area.

Embankment Analysis:

Site analysis shows that the stormwater outlet is not the cause of the erosion at this site. The erosion is coastal and is caused by continued wave motion against the base of the embankment. The erosion has caused the slope to become too vertical for vegetation to grow on and has therefore lost protection from the wave energy.

Under this scenario the erosion will continue to push back the unprotected vertical face by eroding the base of the face and causing the top of the face to eventually collapse. The collapse, if significant enough, may stabilise the face if a shallow grade embankment is created which is stabilized by plants.

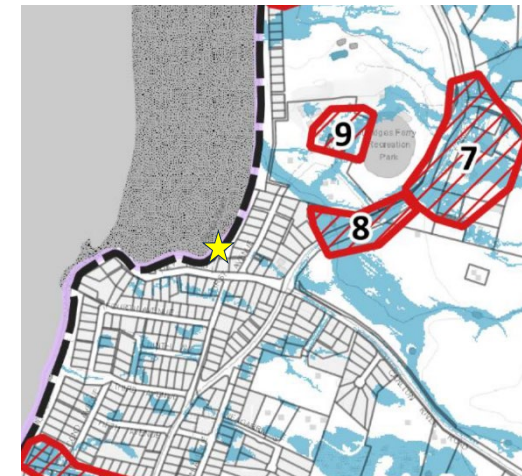


Figure 3 Section from Entura Stormwater System Management Plan fig 3.4 Potential flooding problem locations – Dodges Ferry,



Figure 5 Existing infrastructure showing possible stormwater link

Outfall Consolidation discussion

Given the existing levels it is possible to consolidate the outfalls at this location. This would involve installing two new manholes and extending the 375mm line through to the 600mm line as shown.

At this stage I recommend not pursuing consolidation at this location for several reasons:

- Each outfall is currently able to handle its stormwater load without causing problems. If you increase the load at outfall SE112502 it may increase the flow enough to trigger erosion problems.
- The load on 600mm dia pipe at SE112502 is likely to increase under future development scenarios. Diverting the 375mm dia pipe may increase the flow beyond an acceptable level.
- The outfalls are not in high risk zone for pollution. The largest driver of pollution in this location is Old Forcett Road, the 375 mm dia line catchment area is small and residential only. It does not appear to contain noticeable pollution levels.
- A possible green treatment option was considered for this site between the dwellings and the coastal embankment. This is unlikely to be successful in this location as the existing 600mm pipe is 2m below surface levels.
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This option may be reconsidered when or if Lot 1 Od Forcett Road is developed and flows into the 600 dia line can be quantified. If this lot is developed and puts extra load into this location, and the location is required for treatment this option may be reconsidered.

Note that there will be barriers to treatment options such as the depth of pipe and the likely existence of the groundwater table.

Recommendations

The recommendations are to manage the coastal erosion impact and stabilise the embankment. Note that coastal erosion is a natural and constant impact on coastal areas. Requiring that the embankments stabilise to suit existing urban development will require management.

The works in this location have been recommended to achieve the following aims;

- Maintain the natural look of the landscape
- Create an embankment slope that supports vegetation to minimise wave energy impact
- Create a base that is resistant to erosion whilst absorbing wave energy rather than deflecting it.
- Ensure the base is varied to absorb wave impact
- Minimise ongoing maintenance.
- Trial this style of embankment stabilisation.

Species	Spacing
Atriplex paludosus	1/m2
Atriplex cineria	1/m2
Correa alba	1/m2
Carpobrotus rossii 'Pig Face'	4/m2
Myoporum insulare	1/4m2
Leucopogon parviflorum	1/4m2
Dodonaea viscosa	1/4m2
Allocasuarina verticillata	2 in site near top of embankment

Construction recommendation:

- Concrete hard rock– sound dolerite, basalt or granite, boulders of increasing size to the edge of the existing rock platform to act as a toe for the embankment.
- Remove the two casurina trees overhanging the embankment
- Batter the embankment down to the rock toe. Batter back to no steeper than 1 in 4 slope..
- Compact batter and cover with jute mesh for stabilisation whilst plants establishing
- Remove approximately 2.4m of existing stormwater pipe to bring pipe back in line with new batter.
- Place headwall at end of existing 375mm dia culvert
- Rock pitch drain from culvert to rock toe.
- Plant embankment at 300 centres with a mix of the following: **Total plant area approx. 55m2 – additional planting may be required for site disturbance.**

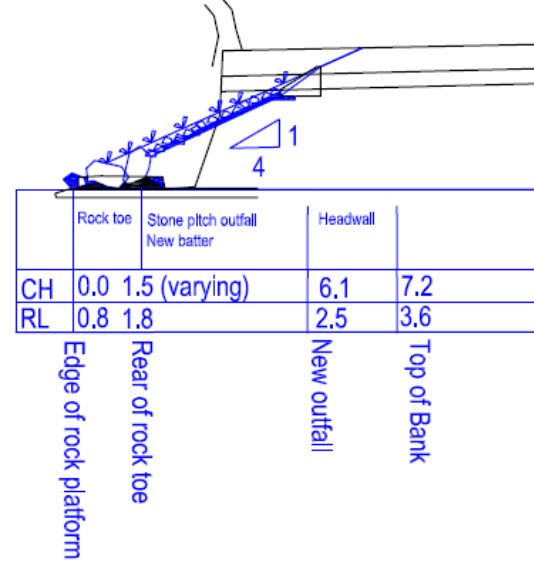
References

- Kovacevic, S. (2020). *Sorell Stormwater System Management Plan*. Hobart: Entura.
- Wilson, A., Atkins, H., Flanagan, J., Deegan, E., Jack, S., Weller-Wong, A., & Edrich, M. (2021). *Tasmanian Stormwater Policy Guidance and Standards for Development*. Hobart: Derwent Estuary Program and Local Government Association of Tasmania.

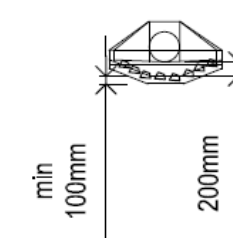
Construction Plan

Rocks graded back from rock outcrop, 3 to 5 rocks deep with a variable face.
 Concreted into place
 Concrete 200mm thick. Varying depths. Some spaces left between rocks for water egress.
 Concrete - N25
 Cover embankment with jute mesh pinned at 3 pins / m2
 Mesh to be buried at top of bank 150mm deep and compacted in lightly.
 Overlap and bottom end to be pinned at 300mm centres.
 Pins - Mild Steel - min length 300mm.

Indicative Cross Section First Ave Outfall Area



Ex surface - batter to grade.
 Remove 2 casurinas on edge of embankment
 Remove pipe end to match new grade
 Install 375dia endwall as per TSD SW-17



DRAIN DETAIL
 NOT TO SCALE
 As per TSD R-33
 Match to endwall
 Key in under endwall 300



NOTES:

While all reasonable effort has been made to locate all visible above ground services, there may be other services which were not located during the field survey.

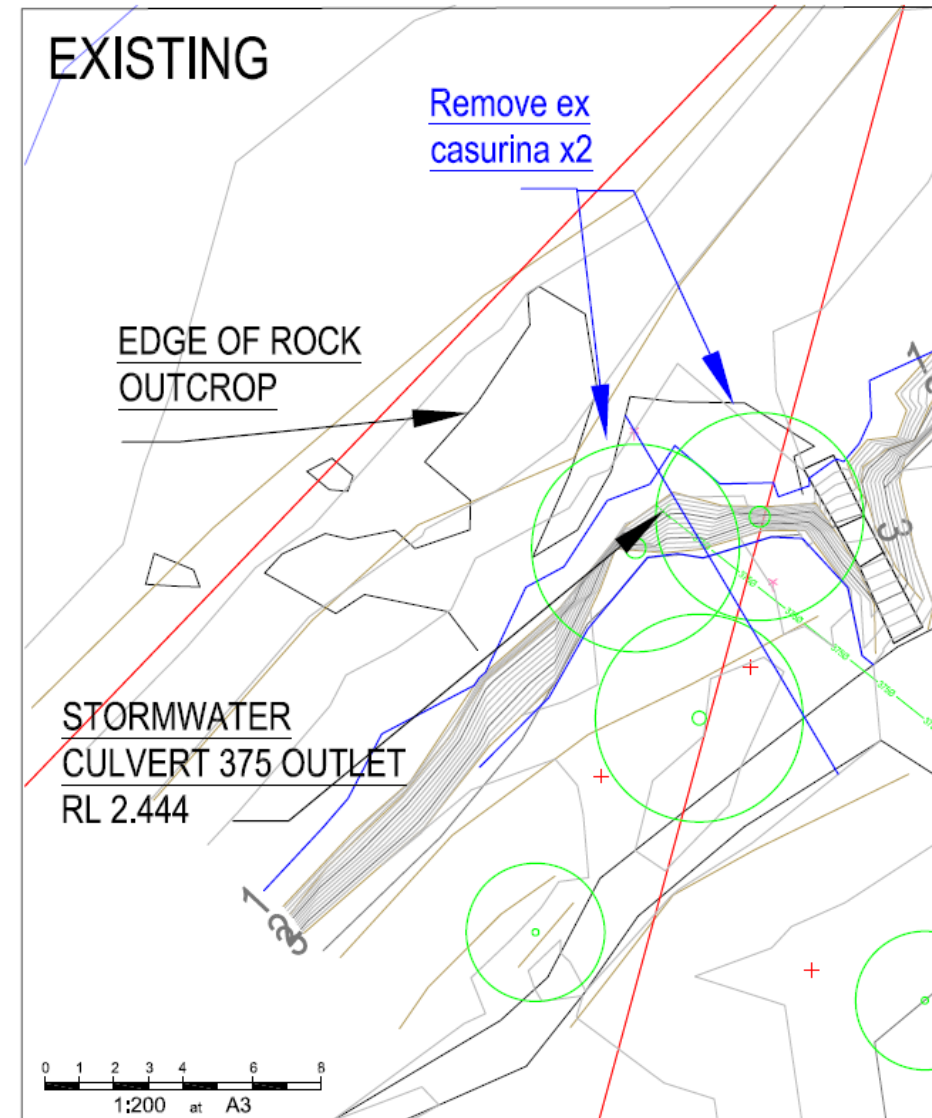
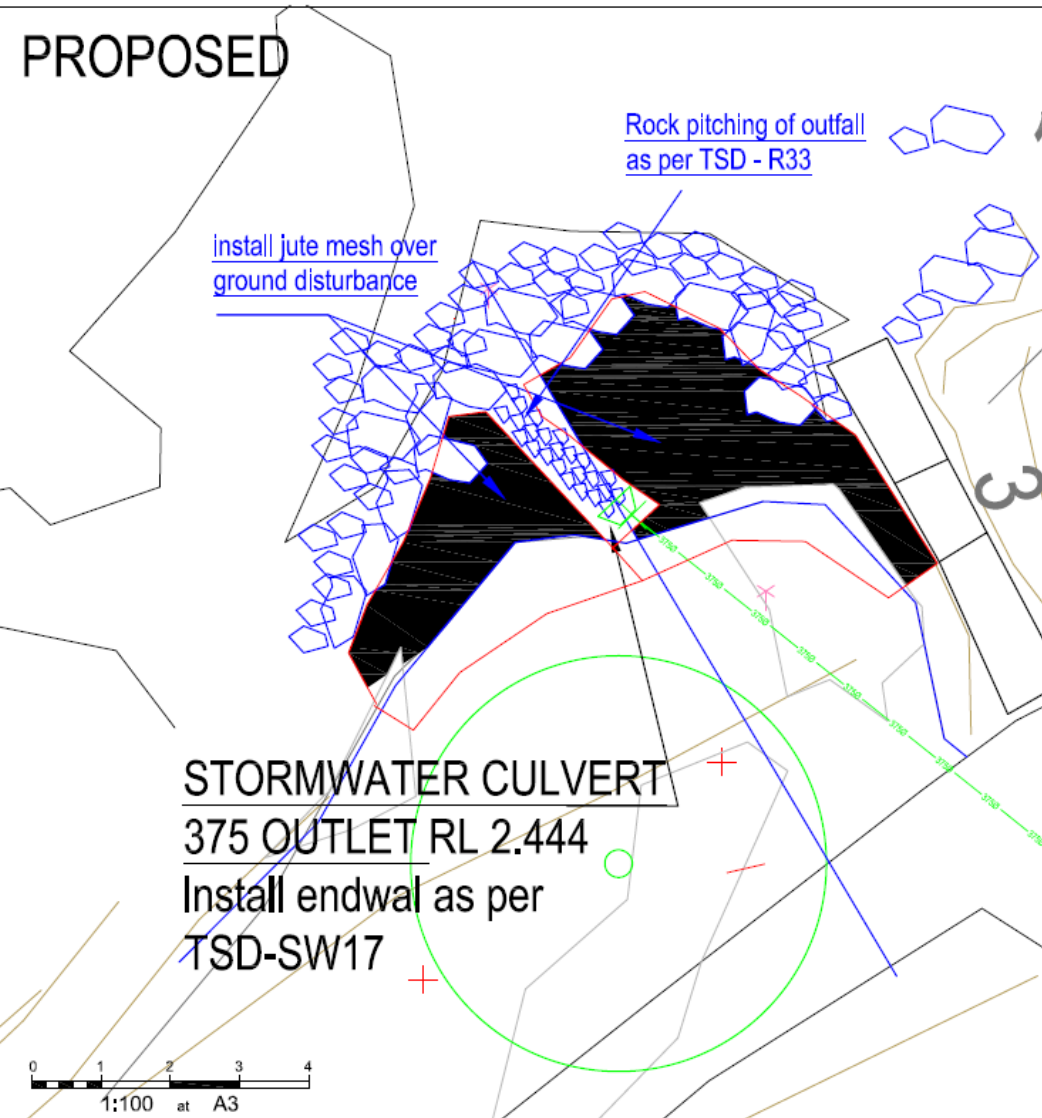
The title boundaries as shown on this plan were not marked at the time of the survey and have been determined by existing title dimensions and occupation (where available) only and not by field survey, and as a result are considered approximate only. This plan should not be used for building to boundary, or to prescribed set-backs, without further survey.

Prior to any demolition, excavation, final design or construction on this site, a full site inspection should be completed by the relevant engineers.

All survey data is 3D. The level (z-value) of any specific feature can be interrogated with a suitable CAD package. Spot heights of all features, including pipe inverts, are included in the model space but are not displayed on the PDF. Spot heights are organised into appropriate layers, and can be displayed as required.

DATUM - Vertical : AHD per SPM 8151 with reputed AHD level of 3.262 from SURCOM on 01/12/2023

Date of Survey : 29/11/23



- LIST MAP BOUNDARY APPROXIMATE ONLY
- ENBANKMENT EROSION LEDGE
- BANK TOP
- BANK BOTTOM
- ROCK OUTCROP
- DRAIN
- WATER EDGE
- HIGH WATER LINE
- BOX CULVERT
- GRATED PIT
- CULVERT 100
- CULVERT 150
- CULVERT 225
- CULVERT 300
- CULVERT 375
- CULVERT 450
- CULVERT 525
- CULVERT 600
- CULVERT 675
- CULVERT 750
- BITUMEN CENTRE
- BITUMEN EDGE
- ROAD EDGE
- KERB LIP
- KERB BACK
- FOOTPATH
- DRIVEWAY
- VEHICLE TRACK
- CONCRETE SLAB
- MINOR BUILDING
- WALL
- WATER-TANK ABOVEGROUND
- STEPS
- UNDERSIDE OF EAVES
- FENCE
- GATE
- PERM SURVEY MARK
- △ BENCH MARK
- TITLE PEG
- PHOTO CONTROL POINT
- NAIL
- SPIKE
- + NATURAL SURFACE
- TREE
- STORMWATER MANHOLE
- × CULVERT 100
- × CULVERT 150
- × CULVERT 225
- × CULVERT 300
- × CULVERT 375
- × CULVERT 450
- × CULVERT 525
- × CULVERT 600
- × CULVERT 675
- × CULVERT 750
- ✦ ROAD SIGN
- PYLON
- TELSTRA PIT
- × WATER UNCLASSIFIED
- STAYWIRE
- ▽ 200mm BLUEMETAL
- 500 - 800mm ROCK - HARD
- 1200 - 1500mm ROCK - HARD

WARNING:
 BOUNDARIES HAVE BEEN
 DERIVED FROM LISTMAP DATA
 AND SHOULD BE CONSIDERED
 APPROXIMATE ONLY

Design By: A. Wilson B.Eng Env Stormwater Design 126 George St DULCOT TAS 7045 m 0400 415 322 e wilsonandw@outlook.com.au	Survey By: LEARY COX & CRIPPS LAND & ENGINEERING SURVEYORS	Project Name and Address: LEWISHAM SCENIC DRIVE LEWISHAM TAS 7173	Drawing Title: DETAIL PLAN	Client: TIVOLI GREEN PTY LTD	SCALE: 0 1 2 3 4 1:100 at A3	Contour Interval: 0.200 m	FILE REF: 13699
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