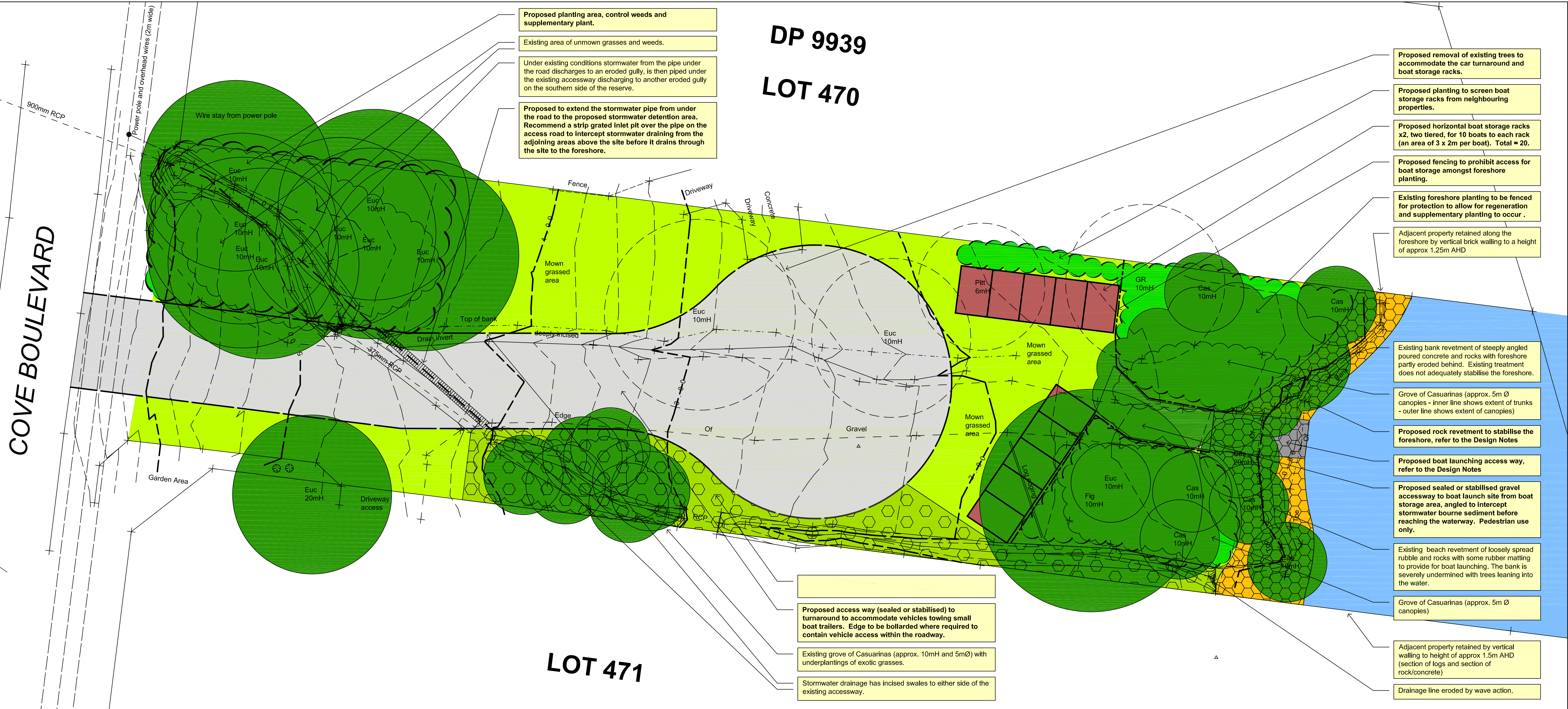


COVE BOULEVARD

DP 9939
LOT 470



Proposed planting area, control weeds and supplementary plant.

Existing area of unmown grasses and weeds.

Under existing conditions stormwater from the pipe under the road discharges to an eroded gully, is then piped under the existing accessway discharging to another eroded gully on the southern side of the reserve.

Proposed to extend the stormwater pipe from under the road to the proposed stormwater detention area. Recommend a strip grated inlet pit over the pipe on the access road to intercept stormwater draining from the adjoining areas above the site before it drains through the site to the foreshore.

Proposed removal of existing trees to accommodate the car turnaround and boat storage racks.

Proposed planting to screen boat storage racks from neighbouring properties.

Proposed horizontal boat storage racks x2, two tiered, for 10 boats to each rack (an area of 3 x 2m per boat). Total = 20.

Proposed fencing to prohibit access for boat storage amongst foreshore planting.

Existing foreshore planting to be fenced for protection to allow for regeneration and supplementary planting to occur.

Adjacent property retained along the foreshore by vertical brick walling to a height of approx 1.25m AHD

Existing bank revetment of steeply angled poured concrete and rocks with foreshore partly eroded behind. Existing treatment does not adequately stabilise the foreshore.

Grove of Casuarinas (approx. 5m Ø canopies - inner line shows extent of trunks - outer line shows extent of canopies)

Proposed rock revetment to stabilise the foreshore, refer to the Design Notes

Proposed boat launching access way, refer to the Design Notes

Proposed sealed or stabilised gravel accessway to boat launch site from boat storage area, angled to intercept stormwater borne sediment before reaching the waterway. Pedestrian use only.

Existing beach revetment of loosely spread rubble and rocks with some rubber matting to provide for boat launching. The bank is severely undermined with trees leaning into the water.

Grove of Casuarinas (approx. 5m Ø canopies)

Adjacent property retained by vertical walling to height of approx 1.5m AHD (section of logs and section of rock/concrete)

Drainage line eroded by wave action.

Proposed access way (sealed or stabilised) to turnaround to accommodate vehicles towing small boat trailers. Edge to be bollarded where required to contain vehicle access within the roadway.

Existing grove of Casuarinas (approx. 10mH and 5mØ) with underplantings of exotic grasses.

Stormwater drainage has incised swales to either side of the existing accessway.

LOT 471

DESIGN NOTES – Water Street Reserve:

LEGEND

Existing vegetation and individual trees
Key:
Cas Casuarina sp
Euc Eucalyptus sp
Pitt Pittosporum sp

Existing contours (250mm contour interval - 1m contours in bold)

Proposed (sealed or stabilised) vehicle accessway. Accessway from turnaround to launch site is pedestrian only.

Proposed stormwater detention area

Proposed foreshore rock revetment

Proposed boat launching pad

Proposed planting areas with existing vegetation as core

Existing water levels:

- For the period July 2010 to June 2011 the following tide levels are predicted:

| Tide: | Predicted level: | Equivalent to: | Onsite: |
|--------------|------------------|----------------|----------------------------|
| highest tide | 2.02m | 1.095m AHD | Approx current top of bank |
| lowest tide | 0.06m | - 0.865m AHD | Offshore – approx 70m* |

* Not accurately surveyed

- Need to allow for wave action caused by wind. Port Stephens Foreshore Mgt Plan 2009 recommends to allow for 900mm wave height. At high tide this translates to 1.995m AHD.
- Tide anomalies also occur, between minus 100mm and plus 200mm. The largest recorded in NSW at 590mm during an ocean storm in 1974.
- Evidence of inundation of the reserve (ie no grass growth and deposits of wrack) can be seen up to 1.5 to 1.8m from the top of bank (@ approx 1.2m AHD).

Climate Change:

- Possible scenarios for sea level rise due to climate change could include the following:

| | For 2050 Estimated mm: | For 2050 Recommended allowance mm: | For 2100 Estimated mm: | For 2100 Recommended allowance mm: |
|-----------------|------------------------------|---|------------------------------|---|
| Best case | 60 | 100 | 180 | 200 |
| Medium estimate | 220 | 250 | 560 | 550 |
| Worst case | 380 | 400 | 940 | 900 |

Source: A Snapshot of Future sea levels: Photographing the King Tide by DECCW NSW dated 12 January 2009

- To plan for 2050 would give the highest tide within a range of 1.155 to 1.495m AHD plus a wave height of 900mm gives a final range of 2.055 to 2.395m AHD (inundating the reserve by 17 to 25m as measured from the current high water mark). To accommodate this rise currently would require raising the reserve at the foreshore up to 1m above the adjacent lots.

Proposed foreshore protection (as per Port Stephens Foreshore Mgt Plan 2009):

- Loose porous rock revetment at maximum gradient of 1V:2H (1.6 at boat launching site)
- The Mgt Plan recommends a revetment crest height of 2.5m. This is not practical on this reserve for the reasons stated above. Adjacent property levels are estimated at around 1.25 to 1.5m AHD on the foreshore bank.
- Proposed to provide revetment to 1.25m AHD.
- Consideration to be given to the provision of a wading pool near the launch site to allow for foot cleaning at low tide.

- Detail engineering design required to determine location, levels and construction techniques. Refer to Section 3 and Figures 3.1 to 3.4 in Report No. 3001144.013 by Umwelt dated July 2006 for details of recommended construction. A copy of this report is included in the Reference Document for the Foreshore Management Plan.

Proposed boat launching accessway:

- Concrete ramp or consider rock revetment contained within gabions with open weave rubber matting finish to allow for stable surface for pedestrian access with a porous finish laid at max slope 1V:5H. Not designed for vehicle traffic.

Proposed accessway:

- Proposed to formalise (by sealing or stabilising) the vehicle access from Cove Boulevard to a defined turnaround area to accommodate access by vehicles towing small boat trailers. The access is to be provided to allow boats to be delivered to the site for permanent or temporary storage in the proposed boat racks.
- Boats can be carried from the proposed storage racks via the upgraded accessway to the upgraded launch site.
- Accessway to be crowned to direct drainage to the adjacent green and stormwater detention areas and to avoid draining directly down the accessway to the boat launching site on the foreshore.

Proposed stormwater management strategy:

- Proposed to pipe the stormwater from the existing discharge point on Cove Boulevard to the southern side of the internal accessway.
- A strip grated inlet pit to be provided over the pipe on the accessway to intercept drainage from uphill areas.
- A rock lined and planted detention area at the discharge point of the proposed pipe to filter the stormwater before it enters the waterway.
- Stormwater engineering required to assess the proposed strategy and to undertake detail design.

Proposed boat storage:

- Storage racks (2m x 3m area per boat) two tiered and horizontal.
- Consider installation of a water outlet to assist with cleaning.

Existing vegetation:

- Some mature trees will require removal to implement the proposed design in the following locations:
 - To accommodate the turnaround area (2-3 trees – Eucalypts and a Pittosporum)
 - To accommodate the foreshore rock revetment (3-5 trees – Casuarinas)
 - To accommodate the stormwater detention area (6-9 trees – Casuarinas)

Proposed foreshore planting:

- As recommended in the Port Stephens Foreshore Mgt Plan 2009 a buffer zone of vegetation is proposed adjacent to the foreshore to assist with foreshore stabilisation and filtering of stormwater before it enters the waterway. The planting to consist of indigenous trees, grasses and low shrubs. This foreshore planting to be fenced (in the manner of dune fencing) to halt boat storage under the trees.
- The area below Cove Boulevard to be managed as native planting to assist with filtering stormwater and to minimise mowing maintenance. The area to be contoured to encourage drainage of stormwater onto the planted area.
- The stormwater detention area to be planted as required to assist with bank stabilisation and filtering of stormwater.

Oyster leases:

- Existing accessways located through the oyster leases are not formal and are provided by the farmer.
- An unverified source indicates that the oyster lease offshore is current until 2019 and protected under the NSW Oyster Industry Sustainable Aquaculture Strategy (OISAS).
- The strategy indicates that for an oyster lease to be classified as a priority oyster aquaculture area should not be directly offshore from or within 50m either side of:
 - An area managed for public recreation
 - A public boat ramp or wharf
- The OISAS is due for revision next year according to its own triggers for review. It may be possible to request that the boundaries of the current lease be altered to accommodate the use of Water St Reserve as an area for public recreation and an area for public boat launching.

Aboriginal heritage:

- Heritage sites in the form of middens maybe present on the site. If discovered during construction works, works should halt immediately and the Local Aboriginal Land Council and NPWS contacted for direction.

Maintenance:

- Wrack should be left *in situ*. Removal of more than 20kg a day requires a permit from the Dept of Primary Industries. Wrack is important for fauna habitat and bank stabilisation.
- Use caution when using herbicides and pesticides near waterways. Use in accordance with EPA guidelines and manufacturer's directions.
- Maintain foreshore plantings intact for bank stabilisation. Recruit new trees to replace senescent plantings.

| Date: | Amendments: |
|----------|--|
| 6.07.10 | Draft issued to GLC for discussion |
| 26.07.10 | Amended draft issued to GLC for review |
| | |
| | |
| | |

Project:
Proposed Foreshore Upgrade
Water Street
East of Cove Boulevard
North Arm Cove NSW

Client:
Great Lakes Council

Sheet Title:
Landscape Concept Plan

Scale: Plan and Bar Scale @ 1:125 @ A1 sheet

Base drawing supplied by GLC

Date: June 2010

Dwg no: 1002/1 sheet 1 of 1

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