

Weketahi and Marawhara Stream – Dune Profiles Interpretation

Comments:

Profiles AC1 and AC1B have provided good control points (base line comparison) for related survey profiles to the south, and help confirm the Marawhara and Weketahi stream channels (to the north and where they intersect the dunes/land) are relatively stable and not subject to any pronounced meander. This was expected, but the results help to confirm the northern extent of where the streams start to meander to the south east and impact the dunes.

Profile AC2 clearly demonstrates the above, and depicts landward retreat of the dune toe by approximately 2m over the 4 month survey period. Although stream meander in conjunction with the impact of higher tides is inducing loss/erosion in this location, 10m of dune still remains seaward of the trigger point with the road set another 20m further landward from the trigger point. In summary the road is still afforded a sufficient buffer in this location.

Profile AC3 depicts the most significant change (over the survey period since September 2011). The dune toe has retreated approximately 15m in response to rapid meander of the combined streams, in conjunction with beach lowering and the influence of some wave action/surge during extreme high tides. The trigger point in this location has been reached and exceeded by approximately 2m leaving approximately 35m meters of dune width (to the road boundary). Although sufficient dune width still remains, affording the road protection, the loss of frontal dune in this location has also included the majority of preferable dune species (Spinifex / Pingao), which will need to be reintroduced/planted over winter (at the conclusion of stream retaining/dredging and dune reshaping).

Profile AC4 which has been surveyed since 2005, provides the southern control to the survey/monitoring program and confirms the influence of combined stream meander (dune erosion) does not extend past this point, which was also expected. The extended survey period for this location and confirmation of a stable dune profile (cross section) depicted, can therefore be used for planning /design of any dune reshaping works (and associated dune slopes) to the north.

Summary:

To conclude, the surveys as attached confirm a notable landward retreat of the dune toe along the central portion of the subject site, and associated loss of dune vegetation along the seaward fringe. Although the central section of dunes between profiles AC1B and AC3 continue to provide a suitable buffer to Marine Parade (adjacent infrastructure), the stream meander has resulted in a steep scarp approximately 4m high inducing further instability and making pedestrian access difficult. Continued/progressive retreat of the dunes in the vicinity of profile AC2 and AC3 may further complicate any subsequent dune reshaping/planting (i.e. the required batter/slope needed to be formed) prior to dune plants being reintroduced. It is recommended that stream retraining is undertaken this summer if a consent variation is granted (as per the methodology previously specified).

**The above information refers to dune survey profiles undertaken on 29/09/2011 and 18/01/2012. Profiles, maps and photos attached.*