

Boardwalk Working Group – Summary Overview

Background... By way of brief background, Col Ashford and Dirk Treloar conducted a site inspection of the existing boardwalk on Friday 27th June, 2014 between 10.00am and 11.50am for the purpose of reviewing proposed replacement design plans by MI Engineers with existing. Using these boardwalk design plans as input, Cross-Section design levels were assessed by Chainage Interval the entire length of the boardwalk and our findings/recommendations for your consideration follow...

Existing Boardwalk... The existing structure provides a 1500mm width clearance edge to edge of decking timber reducing to 1300mm clearance width between handrail posts. The collective thinking on an 1800mm clear width is not only recommended, but deemed to satisfy BCA requirements for disabled access.

There are a number of sections in cut where the boardwalk joists and handrail posts are “doubling” as retaining posts for walers. Given lateral load movement of sand against these walers, the handrail posts are required to take this additional lateral load -which we doubt they were designed for.

Importantly, the sectional gradients also appear to be compliant with BCA Guidelines for disabled access.

Most sections have handrails and posts, which in many instances are not required given BCA Guidelines and Outdoor Boardwalk Design Recommendations. A ‘toe-guard rail’ 120mm high will suffice in most places and importantly, deemed to satisfy BCA requirements.

The combination of 90mm x 19mm Treated Pine decking planks fixed with Galvanised ‘Timberlock’ Nails (amongst other things) has not proved durable and as such, reduced the ‘life’ of the boardwalk.

There are many unsound trees (borer activity, unstable due to lateral movement of sand and ‘deadwood’ overhanging the boardwalk) that present a ‘threat to life’ to pedestrians. These will need to be removed as part of the construction process. We recommend a Plan of Management addressing this issue be written and adopted by Council as part of any post-construction maintenance programme.

Proposed Boardwalk... The proposed replacement boardwalk plans incorporate several important design features that need to be assessed and re-evaluated. More specifically...

... Proposed design provides a 1500mm clearance width between handrail posts and needs to be increased to at least 1700mm for compliance purposes.

We recommend 1800mm clearance width throughout the boardwalk (Chainage 0.00 to 413.5) – not just in sections that would serve as passing bays. Importantly, emergency

services access (ATV, gurney, stretcher) needs to also be considered and addressed in design. Furthermore, this should be cost neutral in so far as 1800mm is a standard timber interval and a 1500mm deck plank would be cut from an 1800mm length wasting 300mm. Thus 1800mm would cost same with added benefit of minimal wastage.

... The proposed boardwalk design (Section A-A) calls for the installation of various grades of treated and seasoned timber, including softwood timber posts. As well as, hot dip galvanised metalwork fixing plates, nuts and bolts.

We recommend these details be reviewed by MI Engineers re-specified as a combination of suitable hardwood and marine grade 316 stainless steel fixing hardware.

... Proposed design involves deleting the existing 'switchback' section (Chainage 200 to 220) and replaces this with a bridge crossing that has a deck height between 826mm and 1806mm above existing.

Subsequent to this design feature, the proposed gradient and all design levels for the first 220m have been altered to achieve this. As the proposed design levels through this section are between 800 and 1800mm above existing deck height, this bridge will have a deck level 3200mm to 3500mm above Natural Ground Level. In terms of cost, at least 35% of the construction budget will be spent (lost) in this section.

We recommend the 'switchback' feature be retained for two key reasons... Discourages bike riders and/or skateboarders, and... it is more economical to retain than replace with proposed bridge. Refer to "Orange" highlighted section of Attachments

If the bridge is deleted, then design levels along the first 220m can be adjusted accordingly with the view of reducing the need for post and handrail installation and associated costs. To this last point, post and handrail detail is only required where the 'drop' height from deck to ground level exceeds 900mm – anything less can be 'toe-guard railed' at much less cost.

... There are sections of the boardwalk that are inside the "zone of influence" associated with the collapsing lake side sand dune, as evidenced by... Chainage 200 where the existing (and proposed) boardwalk is setback 5500mm from the edge of the collapse in this section, and ... Chainage 220 where the 'switchback' is setback 3000mm from the edge of the collapse in this section.

We recommend this issue be addressed as part of the construction works so as to stabilise the collapsing dune. This stabilisation work will need to be addressed from the waters' edge up to the dune crest. Refer to "Purple" highlighted section of Attachments.

... There are sections requiring retaining structures that need to be independent of the boardwalk itself – no "doubling". Those sections recommended to have this structural treatment are... Chainage 43 through 130 (stairs up from Amenities Block)... Chainage 220

through 246.5 along the left hand side (toward beach) of existing 'switchback' section in cut and right hand side between Chainage 230 through 246.5

We recommend a 'waler system' be detailed by MI Engineers and adopted as part of the Scope of Works for the project. Refer to "Pink" highlighted section of Attachments.

... The viewing platform at Chainage 270 is also affected by dune collapse and this issue needs to be addressed in the proposed design.

We recommend stabilisation of the collapsing sand dune and consider installing marine-grade (double galvanised or sleeved) screw piles as a foundation for structural posts along the beachside face of the viewing platform. Screw piles cause minimal ground disturbance/spoil... can be placed within tree root zones without trauma... accurately torqued to specified design loads... proven cost-effectiveness in these situations. Refer to "Blue" highlighted section of Attachments.

... The centre line of proposed boardwalk design between the viewing platform and seat (Chainage 270 through 320) involves raising the deck level to heights that exceed 900mm 'drop' in sections. This triggers the additional cost associated with post and handrail installation in these sections.

We recommend shifting the centre line alignment of the boardwalk between these chainages by up to 1800mm as this repositions the boardwalk in a relatively wide contour interval along the uphill (right hand) side of the dune that is level and stable. Doing so would reduce the 'drop' heights and delete the need for post and handrails in sections– hence save on cost. However, several trees would need to be removed (and replaced with same) in order to achieve this. Refer to "Green" highlighted section of Attachments.

... The proposed platform on the beach at the end of the replacement boardwalk at Chainage 413.5 is likely to suffer a similar fate to that of the existing boardwalk – buried under tonnes of wind borne and shifting dune sand. This aside, the platform is sited perilously close to the storm surge level reached by waves in the most recent event.

We recommend either deleting this design detail altogether, or installing it in a section less prone to prevailing conditions - say at Chainage 400.

Summary... As this boardwalk serves as the only public infrastructure capable of providing pedestrian (elderly, young children, disabled) and emergency services access to the beach, the Community needs (and deserves) an attractive and durable asset that not only achieves this now, but well in to the future. Particularly given increased usage frequency due to growth in tourism to the area.

With this aim in mind, and as Councillors have previously indicated, the low interest State Government loan funding this project (repayable over 7 years) can be increased to meet the requirements, as set by the Community. Given this, these should be the only determining factors when collectively reviewing Community needs – not necessarily Councils allocated budget.