

Note / Memo

**Haskoning Australia PTY Ltd.
Maritime & Aviation**

To: Julian Burgess (RMS)
From: Matthew Potter (RHDHV)
Date: 04 October 2018
Copy: Dave Doyle (RMS) and Greg Britton (RHDHV)
Our reference: M&ANT181004_Heritage Seawall
Classification: Project related

Subject: Stockton Boat Harbour Upgrading - Structural Adequacy of Heritage Seawall in North-Eastern Corner

Dear Julian,

This technical memorandum has been prepared in response to a request for consideration of the structural adequacy of the heritage seawall in the north-eastern (NE) corner of Stockton Boat Harbour. This matter was raised following detailed survey of the seawall alignment and crest levels. This recent survey (dated 19 September 2018) was completed during excavation works adjacent to the seawall and revealed that the seawall extended further westward from its change of alignment in the NE corner of the Boat Harbour than that assessed from an earlier survey (dated 6 October 2016). This is due to the recent excavation works uncovering a previously buried section of seawall that was not evident at the time of the earlier survey.

The proposed design of the upgrade works includes a rock revetment built around the perimeter of the Boat Harbour. The toe of the rock revetment has been set out to maintain a safe offset from the proposed floating marina pontoons, which have dictated the plan layout of the Boat Harbour. The rock revetment has been designed to incorporate the heritage seawall where practicable, with the crest level of the rock revetment along the eastern shoreline being defined at a fixed level to maintain visibility of the upper two block courses of the heritage seawall.

At the NE corner of the Boat Harbour the heritage seawall alignment changes from running along the eastern foreshore to extending westward alongside the existing Northern Groyne rock structure (refer **Figure 1**). It is proposed that the rock revetment would continue around the NE corner and would interface with the westward aligned section of the heritage seawall, approaching from both its southern and northern side.

Using the recent detailed survey of the heritage seawall and partial uncovering of the seawall toe as part of site excavation activities (refer **Figure 2**), we have determined the extent of the seawall that is able to be retained as part of the upgrade works. The seawall crest varies from a level of 1.9m AHD at its change in alignment from the eastern shoreline (CH1.2) to 1.5m AHD at its seaward end (CH10.9). The uncovered section of the seawall toe indicates that the toe is approximately 8 block courses below the crest, which corresponds to a height of around 1.2m based on a block height of approximately 150mm.



Figure 1: View looking towards NE corner showing partially built rock revetment and face of heritage seawall



Figure 2: View of uncovered toe of heritage seawall in NE corner of Boat Harbour

A plan and long section along the seaward face of the heritage seawall has been prepared (refer **Attachment A**) to show the elevations of the seawall crest and toe in comparison to the proposed rock revetment structure (armour and underlayer). The toe of the seawall would need to be protected by an armour and underlayer at least 2 rocks thick to prevent undermining of the material beneath the seawall toe by waves and currents within the Boat Harbour. The position at which this is achieved corresponds to CH5.6 on the long section. This requires a seawall length of approximately 5.3m to be demolished from CH5.6 to CH10.9. This section of the seawall is unable to be supported or protected by the adjacent proposed rock revetment and is unable to be underpinned with a foundation as the revetment profile extends several metres below the toe of the seawall.

The remaining 4.4m of the westward length of the seawall from the NE corner (from CH1.2 to CH5.6) would be retained and a seawall face height of 0.5-0.6m would still be visible above the proposed rock revetment (approximately 3-4 block courses). The visibility of the seawall corner is considered to be beneficial as the historical perimeter of the old Boat Harbour is able to be determined from the remnant structure and potentially supplemented with interpretive signage on the foreshore.

It is noted that a section of retained seawall between CH3.6 and CH5.6 could potentially be undermined by the proposed temporary excavation profile, which is nominally shown at a 1V:2H slope. This could be mitigated by local excavation of a steeper temporary batter slope of 1V:1.5H and/or with temporary shoring of the seawall prior to rock placement.

It is recommended that deteriorated sections of the retained seawall are remediated with appropriate grout and/or mortar repairs, particularly in sections that are proposed to be exposed above the revetment surface.

We trust that the above advice is sufficient to provide a basis for retaining a portion of the heritage seawall that is able to maintain its structural integrity in conjunction with the proposed excavation and revetment construction works around the perimeter of the Boat Harbour.

Kind Regards,



Matt Potter
Senior Engineer, Maritime & Aviation

Attachment A: Design Drawings

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