
APPENDIX 5

Appendix 5: Slipway Inspection at
Brunswick Harbour
Wednesday 22.4.2015



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28.4.2015

NSW Trade and Investment, Crown Lands
Attn: Andrew Hartley

RE: Slipway inspection at Brunswick Harbour, Wednesday 22.4.2015

As per your instructions and detail set out in your letter of variation to contract RFQ CI 14 137, CDS carried out an underwater inspection and survey of the slipway at Brunswick Harbour on the 22.4.2015.

It is apparent very quickly that this slipway is no longer in working order. Deterioration of sleepers and rails is advanced, both in and above water. The rail track shows significant section loss and a lot of the dogs(holding down fittings) of the track have snapped or are breakable by hand due to severe corrosion. Additionally there is a severe deformation of the southern track near it's top end. The trolley is also in an unserviceable, advanced deteriorated stage.







The reference height/datum 0.0m for level measurements was established and assumed at the top of the tracks, at the top of the concrete pad which is at the base of a bollard at the top of the southern track.



This is also the highest point of both the northern and southern track. The rails that begin at this point are also assumed chainage 0.0m for distance measurements towards and into the water.

The track width is 2.4m and the timber sleepers are set a distance of approx. 1m apart.

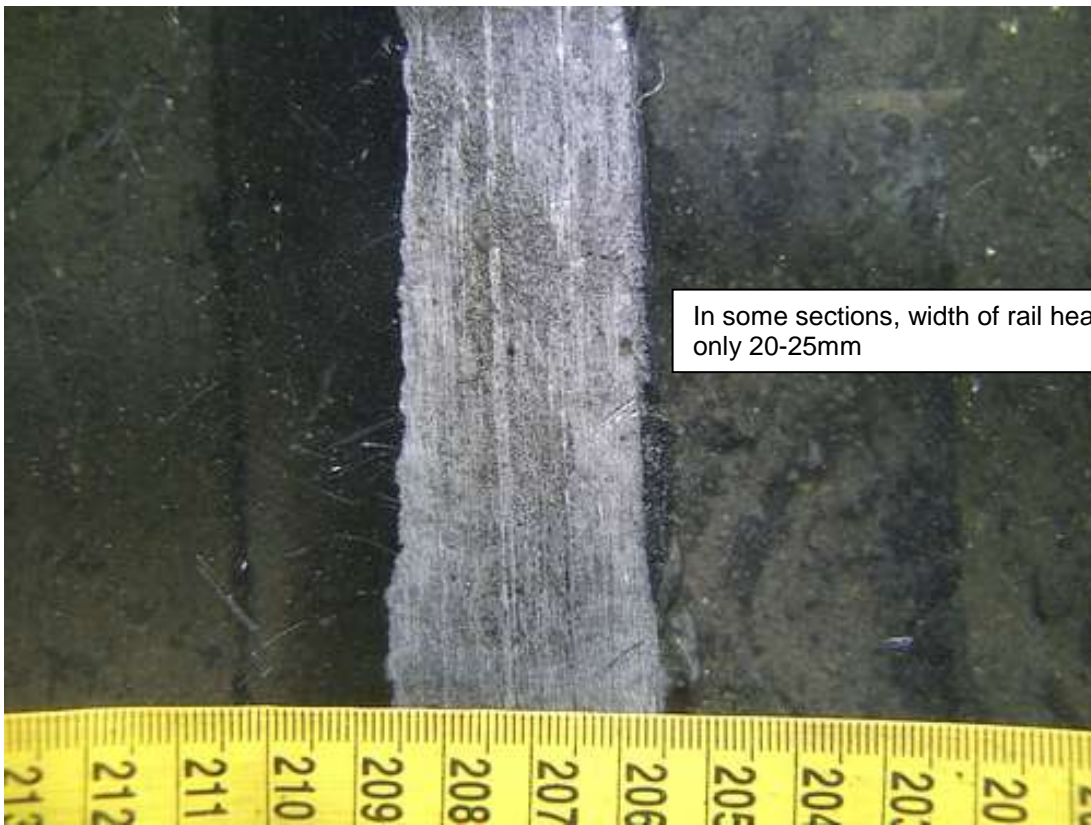


The decline of the track is initially approx. 0.95m every 10m and appears to gradually increase to 1.2m to 1.4m every 10m from about chainage. 18-20m. At chainage 24m sand is covering the track, sleepers and ballast all the way out to the unknown termination of the rail.

Probing in the sand allowed us to follow the rail to chainage 33m, where the rail is covered by approx. 0.4m of sand and is approx. -3.6m below datum at that point. Both north and south rail appear to terminate/be missing at this point and no continuation of the rails further out into the harbour basin could be detected from there due to the thick sand cover. Dredging or jet probing would be required to investigate the track further out from this point. A table with the measurements taken as well as a field sketch are attached to this report to further document these findings.

Please note that the condition of the track where visible is extremely poor, in some places the width of the head of the track is only about 20mm instead of the approx. 55mm full width, indicating total section loss due to corrosion. The section loss is also evident in the web of the tracks and at the base of the tracks. Most dogs also show advanced stage of corrosion, as some of them can be broken by hand, they no longer serve their function of holding the track in position.





Most sleepers that were accessible underwater are in very poor condition, some of them show advanced stages of rot and borer infestation. In most areas the rotting, soft timber can be removed by diver's knife tip to depths of up to 30-50 mm. The picture below shows timber condition as well as advanced deterioration of rail and dogs.



Estimation of ballast quantities:

As the track is only exposed to chainage 24m, which approximately coincides with the extend of concrete walls above water that run along both sides of the track towards the harbour basin, reasonably accurate estimation of ballast quantity is not possible. Here are our thoughts: The thickness of ballast would be a minimum of 0.4m to 0.6m from top of sleepers/base of tracks. Within the concrete wall contained area this would (at an average width of approximately 5.5m between chainage 13m (approx.. MHWL) and chainage 24m) amount to about $11 \times 5.5 \times 0.6 =$ approx. 36m^3 of ballast. The observable ballast near the surface ranges in size between 20mm and 100mm. There are lots of muddy fines within the ballast.

From chainage 24m to what may be an end of tracks near chainage 33-35m there should be a further $25\text{-}35\text{m}^3$ of ballast expected as thickness would not be expected to be any less, width may be 1-1.5m less.

No calculation is possible at this stage beyond chainage 35m as it is unknown if the track extends beyond this distance. Sand cover from there onwards is a minimum of 0.4-0.6m. Our sand level measurement at chainage 50m returned -4.3m below datum, if the slope of rail (as measured between chainage 20m and 30m continued to there it would be at approx. -5.5m (about 4.4m water depth at MHWL) and at that about 1.2m below measured sand level at that chainage of -4.3m. It is unlikely that the track extends that far, but it may be assumed that the slipway rails terminated at least at a depth of 3.5m of water at MHWL, thus allowing the trolley to be between 2.8 and 3m

underwater at high tide. This would put the end of the rail near chainage 40m and could therefore add another 15-20m³ of ballast (and old sleepers and track) at assumed similar thickness and width to the equation.

In summary, due to the lack of accurate dimension and depths to rail and ballast, as best as we can assume quantities, there may be approximately 70-90m³ of ballast under the rails in the below MHWL area of this slipway.

Set out below is a table with the height measurements as taken on 22.4.2015

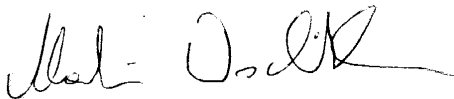
Distance/chainage frop top bollard	Southern rail level	Sand level	Northern Rail level
0m	-0.0m		-0.0m
5m	-0.45m		-0.46m
10m	-0.88m		-0.9m
15m	-1.35m		-1.35m
20m	-1.87m		-1.88m
25m	-2.5m	-2.5m	-2.49m
30m	-3.1m	-2.9m	-3.1m
35m	approx. -3.7m	-3.3m	approx. -3.7m
40m	unknown	-3.7m	unknown
45m	unknown	-4.2m	unknown
50m	unknown	-4.3m	unknown

The field sketch from the day is included at the end of the report for further clarification.

Summarising, practical use of the slipway in it's current condition is not possible. Significant work and/or repair would be required to return this slipway into a safe working condition.

Please contact me if you require further clarification or wish to discuss further details of the survey.

Thank you



Martin Woschitzka
Director

COMMERCIAL DIVING SOLUTIONS PTY LTD

BRUNSWICK SLIPWAY 22.4.2015

Bollard at top of sthn rail, chainage 0.0m,
 top of rail at 0.0m at level 0.0m !!
 northern rail

