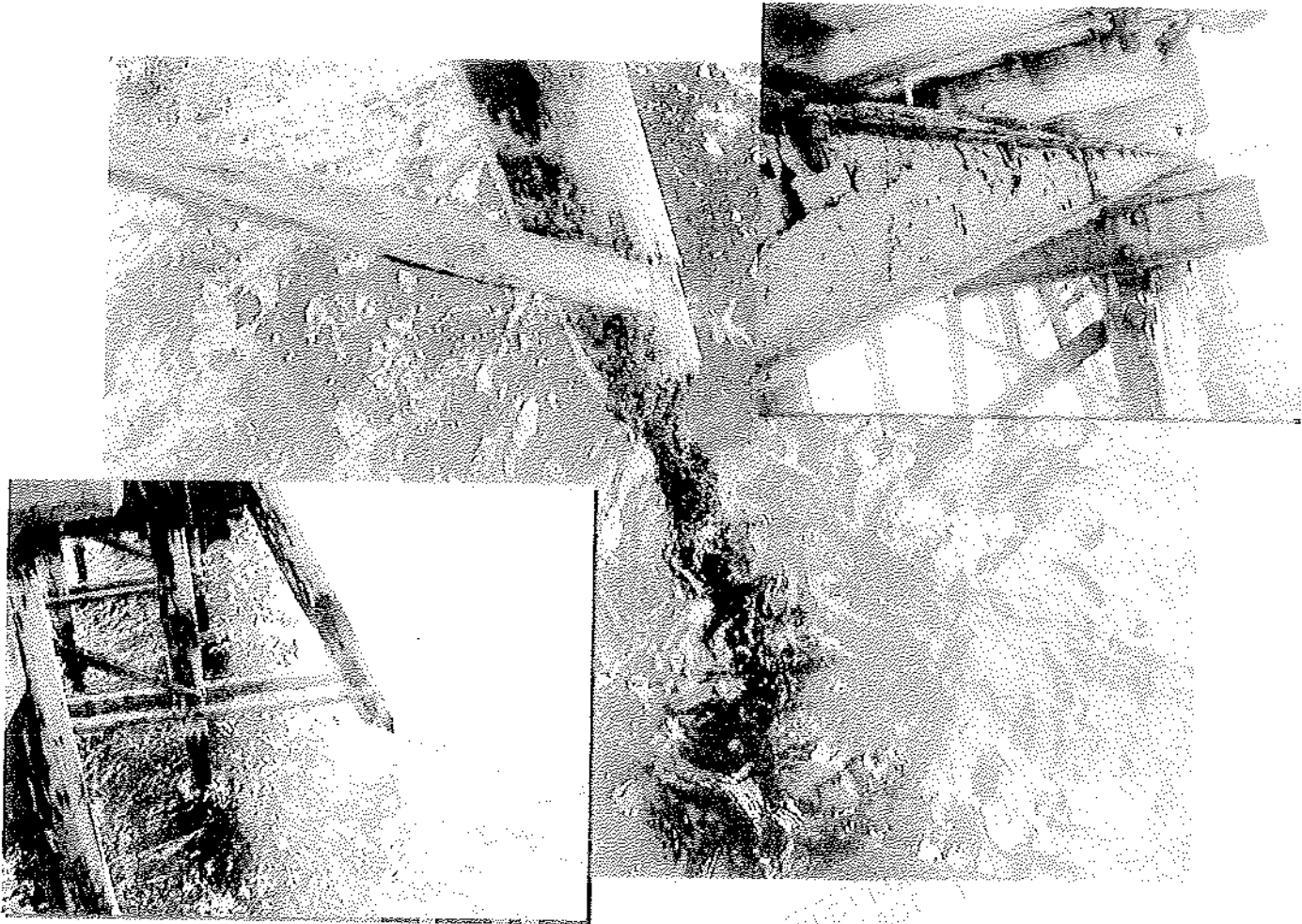


RAPID BAY JETTY

STRUCTURAL CONDITION REPORT



FINAL REPORT

December 2004



EXECUTIVE SUMMARY

The Structures Group, Pavements and Structures, have been engaged by Marine Facilities to provide an assessment of the structural condition of the Rapid Bay Jetty. The assessment included a site inspection of the Jetty, a review of previous engineering condition reports and a desktop analysis of the pile condition data.

Overwhelming evidence now exists to close the Jetty from bent 26 onwards as it poses an unacceptable risk to users. This section of the jetty has major structural defects arising from a lack of maintenance with the condition of various sections of the structure being very poor bordering on unsafe.

The original timber piles from bents 1 to 6 are in a satisfactory condition as are the steel box piles between bents 7 and 26. However, 69% of the original timber piles between bents 27 and 79 are heavily necked or completely severed and are classified as Poor or Very Poor.

The superstructure steelwork is generally in a poor condition with substantial amounts of flaking and delamination corrosion resulting in large amounts of section loss with holes in both the webs and flanges of the girders not uncommon.

Conclusions / Recommendations

Bents 27 to 79

- The risk of a two span collapse for this part of the structure has been determined as **EXTREME**. Risk mitigation options necessitate immediate action and require the development and implementation of a specific risk management plan.
- The condition of the jetty has deteriorated to the extent that maintenance is no longer an option with the replacement of the majority of structural elements now required OR the construction of a new jetty on an alternative alignment.
- The closure of the Jetty from bent 26 is recommended **immediately**.

Start of Jetty to Bent 26

- The risk of a two span collapse for this part of the structure has been determined as **MODERATE**. Risk mitigation should include a regular inspection program and periodic monitoring (by measurement) of the residual steel thicknesses of both the girders and crossheads at a number of locations.
- The section of jetty up to bent 26 could remain open but given that doubts exist about its future serviceability there appears to be little benefit in attempting to keep it open. This section is tidal with generally low water depth and therefore would not appeal to users for fishing or diving purposes if left open.

6 CONCLUSION / RECOMMENDATIONS

6.1 Start of Jetty to Bent 26

This section of the jetty is in a better condition than the rest of the structure, primarily because the majority of the timber piles have been replaced with steel piles. The risk of a structural failure has been determined as **MODERATE**.

It is strongly recommended that Materials Technology, Transport SA be engaged to measure the residual thicknesses of both the girders and crossheads at a number of locations. This will allow the degree of corrosion to be measured and hence determine the remaining life for this section of the structure.

This section of the jetty could remain open but given that doubts exist about its future serviceability, there appears to be little benefit in attempting to keep this section of the jetty open.

6.2 Bent 27 to Bent 79

The condition of this section of the jetty has now reached the stage where it poses an unacceptable risk to users. The risk of a two span collapse has been determined as **EXTREME**. The timber piles have deteriorated to the extent that they could fail during rough seas or collapse simply as a result of total section loss.

The collapse of a pile in the centre or on the eastern side of a bent would possibly result in the collapse of two spans of the jetty. The replacement of these timber piles has been recommended as far back as 1992 and their poor condition can no longer be ignored. Numerous piles are also suffering from Teredo Worm infestation, which may result in the timber appearing fine, but being entirely eaten away inside.

Pile deterioration rates between 1998 and 2003 (bents 27 to 79) predict that by 2007 42% of all piles will be in a very poor condition requiring replacement

The superstructure steelwork is also in a very poor condition.

It is recommended that due to the poor condition of the piles and superstructure steelwork that this section of the jetty immediately be closed to public access.



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