

APPROXIMATE LIMIT OF FISH HABITAT BOUNDARY

POTENTIAL PUBLIC RECREATIONAL AREA

PROPOSED TOWNSVILLE PORT ACCESS ROAD ALIGNMENT

ROSS RIVER

BOUNDARY STREET

ARCHER STREET

BENWELL ROAD

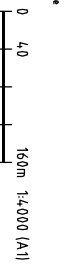
BREAKWATER OPTION 1

BREAKWATER OPTION 2

REVISIONS

No.	BY	DATE	DESCRIPTION	APPD

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THE SIGNING OF THIS TITLE BLOCK CONFIRMS THE DESIGN AND DRAWING OF THIS PROJECT HAVE BEEN PREPARED AND CHECKED IN ACCORDANCE WITH THE MAUNSELL QUALITY ASSURANCE SYSTEM TO ISO 9001:2000

DESIGNED	CHECKED
DRAWN	CHECKED
APPROVED	DATE

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Maunsell Australia Pty Ltd A.B.N. 20 093 846 925  
RPED No.

Queensland Government  
The Coordinator-General  
Modified for Townsville Port Authority from 2006 Feasibility Report to QLD Government Coordinator General.

**OPTION 1**

- MARINA SAND FILL AREA - 343,000m<sup>2</sup>  
EXISTING LEVEL = APPROX. RL2.0m  
REQUIRED LEVEL = RL5.2m  
= 343,000m<sup>2</sup> x 3.2m  
= 1,097,600m<sup>3</sup>
- MARINA DREDGE AREA - 77,000m<sup>2</sup>  
ASSUMING 2.5m OF SAND DEPTH  
= 77,000m<sup>2</sup> x 2.5m  
= 192,500m<sup>3</sup>
- MARINA DREDGE AREA - 70,000m<sup>2</sup>  
[EXCLUDING BOAT RAMP AREA]  
ASSUMING 2.0m OF SANDY CLAY DEPTH  
= 70,000m<sup>2</sup> x 2.0m  
= 140,000m<sup>3</sup>
- DIFFERENCE**  
= 1,097,600m<sup>3</sup> - (192,500m<sup>3</sup> + 140,000m<sup>3</sup>)  
= 765,100m<sup>3</sup> REQUIRED
- OUTER HARBOUR AREA 1 - 470,000m<sup>2</sup>  
POTENTIAL SAND DREDGE QUANTITY  
ASSUMED WATER DEPTH OF 3.0m  
PROPOSED DREDGE DEPTH OF 2.5m  
= 470,000m<sup>2</sup> x 2.5m  
= 1,175,000m<sup>3</sup>
- OUTER HARBOUR AREA 2 - 406,000m<sup>2</sup>  
POTENTIAL SAND DREDGE QUANTITY  
ASSUMED WATER DEPTH OF 5.0m  
PROPOSED DREDGE DEPTH OF 3.5m  
= 406,000m<sup>2</sup> x 3.5m  
= 1,421,000m<sup>3</sup>
- POTENTIAL PUBLIC RECREATIONAL AREA - 20,000m<sup>2</sup>  
EXISTING LEVEL = APPROX. RL2.0m  
REQUIRED BEACH SLOPE = 1 on 8  
= 18,650m<sup>3</sup>
- CONCLUSION**  
= (1,175,000m<sup>3</sup> + 1,421,000m<sup>3</sup>) - (765,100m<sup>3</sup> + 18,650m<sup>3</sup>)  
= 1,812,250m<sup>3</sup> IN SURPLUS

**NOTE:** SANDY CLAY MATERIAL TO BE USED IN AREAS OF LOW LOADINGS

**OPTION 2**

- MARINA SAND FILL AREA - 343,000m<sup>2</sup>  
EXISTING LEVEL = APPROX. RL2.0m  
REQUIRED LEVEL = RL5.2m  
= 343,000m<sup>2</sup> x 3.2m  
= 1,097,600m<sup>3</sup>
- MARINA DREDGE AREA - 77,000m<sup>2</sup>  
ASSUMING 2.5m OF SAND DEPTH  
= 77,000m<sup>2</sup> x 2.5m  
= 192,500m<sup>3</sup>
- MARINA DREDGE AREA - 70,000m<sup>2</sup>  
[EXCLUDING BOAT RAMP AREA]  
ASSUMING 2.0m OF SANDY CLAY DEPTH  
= 70,000m<sup>2</sup> x 2.0m  
= 140,000m<sup>3</sup>
- DIFFERENCE**  
= 1,097,600m<sup>3</sup> - (192,500m<sup>3</sup> + 140,000m<sup>3</sup>)  
= 765,100m<sup>3</sup> REQUIRED
- OUTER HARBOUR AREA 1 - 35,500m<sup>2</sup>  
POTENTIAL SAND DREDGE QUANTITY  
ASSUMED WATER DEPTH OF 3.0m  
PROPOSED DREDGE DEPTH OF 2.5m  
= 35,500m<sup>2</sup> x 2.5m  
= 88,750m<sup>3</sup>
- OUTER HARBOUR AREA 2 - 4,880m<sup>2</sup>  
POTENTIAL SAND DREDGE QUANTITY  
ASSUMED WATER DEPTH OF 5.0m  
PROPOSED DREDGE DEPTH OF 3.5m  
= 21,700m<sup>2</sup> x 3.5m  
= 75,950m<sup>3</sup>
- CONCLUSION**  
= (187,500m<sup>3</sup> + 75,900m<sup>3</sup> = 263,400m<sup>3</sup>) - 765,100m<sup>3</sup>  
= 501,700m<sup>3</sup> IN DEFICIT

**NOTE:** SANDY CLAY MATERIAL TO BE USED IN AREAS OF LOW LOADINGS

**PRELIMINARY**  
**SUBJECT TO CHANGE**

DATE	ISSUE
25.01.08	1

TOWNSVILLE MARINE INDUSTRIES & REC. BOATING PRECINCT  
PROPOSED DEVELOPMENT AREA  
FIGURE 2

Drawn: PRELIM.  
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