

# Marine

## Master Specification

### MA-DR-C1 Dredging Works

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## MA-DR-C1 Dredging Works

### 1 General

- 1.1 This Part specifies the requirements for setting out and undertaking the dredging, and measurement of dredging work.

### 2 Approvals and Licenses

- 2.1 Unless otherwise stated by the Contract Documents, the Principal shall obtain Development Approval (if required) for the Works.
- 2.2 The Contractor shall obtain and pay for all dredging licences and other associated permits and fees including those required by the Environment Protection Authority.

### 3 Quality Requirements

- 3.1 The Contractor's procedures shall at a minimum address the following:
- a) dredging of material;
  - b) dredging of material / seagrass mix;
  - c) dredging of seagrass only;
  - d) disposal management methods;
  - e) determination of shape and depth of dredged areas;
  - f) verification of channel shape; and
  - g) frequency and density of measurements.
- 3.2 If not provided beforehand, the procedures shall be submitted at least 14 days prior to the commencement of site work.
- 3.3 Provision of the procedures listed in this Clause shall constitute a **Hold Point**.

### 4 Environmental Management

The Contractor shall undertake works in accordance with PC-ENV1 "Environmental Management" and PC-ENV2 "Environmental Protection Requirements".

### 5 Plant

- 5.1 The Contractor shall use the plant nominated in the Contract Documents and ensure that it is:
- a) properly maintained and in good working order to allow maximum efficiency in operation; and
  - b) fit and suitable for the work under the Contract.
- 5.2 Access to the site by labour and land based support vehicles shall be limited to:
- a) the Contractor gaining the approval of the Local Council and, where applicable, local land owners, lessees or authorities having control over that land; and
  - b) the use of existing tracks.
- 5.3 The Contractor shall not remove plant from the work site prior to completion, without the consent of the Principal, except where conditions pose a threat to the safety of the Contractor's personnel or equipment.
- 5.4 Where the Contractor elects to remove the plant from a site prior to dredging work at that site being completed, the Contractor shall be liable for any costs associated with the demobilising, transport and re-establishment of such plant.

- 5.5 Floating plant can access the site from any seaward direction. Floating plant may also be launched and retrieved from a boat ramp provided written agreement is obtained from the boat ramp owner. The Contractor shall be responsible for any arrangements and costs associated with the launching and retrieval of plant. Alternative launch points may only be used with the approval of the Principal.

## 6 Setting Out and Dredging

- 6.1 The Contractor shall carry out dredging in the areas to be dredged as indicated in the Functional and Operational Requirements or in accordance with any direction of the Principal.
- 6.2 The Contractor is responsible for setting out the works. The dredge shall be fitted with a certified Differential Global Positioning Satellite (DGPS) system or equivalent to ensure positional control to dredge the area accurately.
- 6.3 The Contractor will be given a datum level and detailed drawings clearly demarcating the area to be dredged.
- 6.4 The Contractor shall install a standard tide gauge board at a convenient point. Tide levels vary significantly around South Australia and atmospheric conditions can cause further significant departures from predicted tides.

## 7 Debris

- 7.1 The areas to be dredged may contain debris on the seabed, such as old moorings, anchors, etc. It is the responsibility of the Contractor to "sweep" the area with an anchor handling tug, or similar vessel, to ensure the area to be dredged is clear and safe for the dredge to operate.

## 8 Pollution Management

- 8.1 The Contractor shall ensure that all dredging and related activities undertaken in accordance with the Environment Protection Act 1993.
- 8.2 The Contractor shall ensure that materials to be dredged have been assessed by a contamination specialist in accordance with Environment Protection Act 1993, Environment Protection (Water Quality) Policy 2015 and where relevant the Commonwealth Environment Protection (Sea Dumping) Act 1981, prior to dredging.
- 8.3 The Contractor shall ensure that materials to be dredged are managed in accordance with Environment Protection Act 1993, Environment Protection (Water Quality) Policy 2015 and where relevant the Commonwealth Environment Protection (Sea Dumping) Act 1981.

## 9 Material to be Dredged

- 9.1 The dredged material may contain fines capable of producing a noticeable plume at the dredge and disposal site. These fines may take a long time to settle thereby leaving the plume noticeable for many days.
- 9.2 The materials likely to be encountered are:
- a) Seagrass
    - i) For the purpose of this Contract, seagrass is defined as marine plant growth of any variety that may be found in any area to be dredged. Seagrass may contain significant quantities of sand mixed with it. Seagrasses tend to have a neutral density in seawater, may give erroneous correlation between the dredging plant's density and pressure graphs, and have the potential to block or otherwise interfere with the pump and suction pipe.
    - ii) Seagrasses may have established themselves or have been deposited in the areas to be dredged and the Contractor shall take measures to effectively deal with these as they arise.
    - iii) The Contractor shall dredge and dispose of seagrass or a seagrass/sand mixture.

- iv) Failure on the part of the Contractor to effectively deal with seagrass may attract reduced payment and may be considered a breach of the Conditions of Contract.
- b) Sand
  - i) Areas to be dredged may contain various pockets of fine and coarse sand build up (shoaling).
- c) Contaminated materials
  - i) The Contractor shall ensure that all activities related to the management, stockpiling, relocation, disposal of contaminated materials are undertaken in accordance with the Environment Protection Act 1993, where relevant the Commonwealth Environment Protection (Sea Dumping) Act 1981 and under guidance of a contamination specialist.
  - ii) Should any unexpected potentially contaminated material be identified during dredging activities, a contamination specialist shall be engaged to assess the materials and provide advice on management of the materials.
- d) Potential or Actual Acid Sulphate Soils
  - i) The Contractor shall ensure that materials to be dredged have been assessed by a contamination specialist in accordance with Environment Protection Act 1993, Environment Protection (Water Quality) Policy 2015, and EPA Guideline, Site Contamination – acid sulfate soil materials EPA 638/07 (November 2007), prior to dredging.
  - ii) The Contractor shall ensure that materials to be dredged are managed in accordance with Environment Protection Act 1993, Environment Protection (Water Quality) Policy 2015, and EPA Guideline, Site Contamination – acid sulfate soil materials EPA 638/07 (November 2007).
- e) Other Material
  - i) The Contractor shall also remove any silt, clay or any other material that may be encountered from the areas to be deepened and dispose of the material as directed by the Principal.

## 10 Disposal of Dredged Material

- 10.1 The Contractor shall dispose of all dredged material in accordance with the approved Quality Plan, Dredge Management Plan (DMP) and Water Quality Monitoring Program (WQMP).
- 10.2 If discharge pipes are to be used, they shall be placed either on the sea bed or floating on the water in a direct line from the dredge to the discharge site. The pipeline shall be clearly marked with floating buoys with the appropriate navigational signals to prevent other vessels from crossing the pipeline.
- 10.3 If offshore discharge diffusers are to be used, they shall be located on a floating pontoon provided with suitable moorings to secure the diffuser in all weather conditions. Discharge from the diffuser will be in a downward direction, with a deflector plate located centrally in the path of the discharge such that the flow is evenly directed horizontally in all directions. The Contractor shall move the diffuser from time to time to prevent accumulation of discharge in one location.

## 11 Accuracy of Dredging

- 11.1 The Contractor shall dredge to the declared / target depths within the range of – 300 mm to + 00 mm over the areas unless otherwise specified, with side slopes not steeper than 1:10 for stability.
- 11.2 The Principal shall only consider claims for side slopes lower than 1:10 under special cases such as the side slope under the toe of a breakwater. The Contractor shall provide written notice detailing such an occurrence within 48 hours of the occurrence becoming known to the Contractor.
- 11.3 The Contractor shall limit the depth and profile of dredging operations near breakwaters, wharves / jetties, revetment structures, etc., such that the structural integrity of such structures is not compromised. The Contractor shall be responsible for obtaining all information from the Principal relating to such depths and profile limitations in advance of starting operations. The Contractor shall be liable for any damage caused to any structure due to over-dredging near the structure.

## 12 Preservation of Existing Depths

- 12.1 The Contractor shall ensure that the depths in the existing area and associated areas are not reduced by the operations.
- 12.2 The Contractor shall bear the full responsibility and be liable for any damage to boating caused by non-observance of these conditions, and remove, at the Contractor's cost, any material displaced into adjacent areas by the operations.

## 13 Measurement of Dredging Work

- 13.1 The Contractor shall record and maintain a daily productive rate of pumping. The Contractor shall carry out a test dredge of the material prior to commencing the dredging operation using the continuous recording devices, pressure gauges and any other associated instrumentation.
- 13.2 The following pressures are to be established under normal operating conditions with the dredge and equipment fully assembled, including the connection of the entire discharge line:
  - a) suction and delivery pressures when pumping sea water only; and
  - b) suction and delivery pressures when pumping dredge material at a rated capacity.
- 13.3 Completion of the Test Dredge shall constitute a **Hold Point**.
- 13.4 The hours of non-productive dredging will be determined by the Principal from the continuous chart records showing the pressures on the suction and delivery sides of the pump. The Principal shall be provided with 2 clear and legible copies of all pressure records and the log as soon as practicable after the conclusion of each day's dredging. After checking, an initialled copy of the records and log will be returned to the Contractor.
- 13.5 The Principal shall accept an acceptable data printout from a mass flowmeter or similar device which records the mass of the material passing through the discharge pipe as it leaves the dredge.

## 14 Contractor's Obligations

- 14.1 The Contractor shall use adequate and appropriate plant and resources, including personnel with suitable training, education and experience.
- 14.2 The Principal may alter the sequence of works depending on dredging efficiencies and direct the Contractor to dredge any given area within or adjacent to the site. Any such directions will be in writing and include reasonable time to re-locate the dredge.
- 14.3 Once dredging has commenced, the Contractor shall continue dredging until the works are complete and shall not interrupt the dredging cycle.

## 15 Hydrographic Surveys

- 15.1 The Contractor shall undertake Progress Hydrographic Surveys immediately prior to commencing dredging works, every four weeks while the works are in progress, and immediately on completion of the works.
- 15.2 Progress Hydrographic Surveys shall be reduced to Chart Datum and be used to verify by hydrographic methods that dredging to the required tolerances has been satisfactorily completed.
- 15.3 Progress Hydrographic Surveys shall cover the areas dredged and the areas to be dredged.
- 15.4 The pre-dredge and post-dredge hydrographic surveys shall cover the whole harbour to the extent of the Principal supplied hydrographic survey.
- 15.5 The surveyor shall calculate the volumes to be dredged and/or the actual dredged volumes for various areas within the works, based on the difference in survey between the current survey and the previous survey.

- 15.6 For the post-dredge hydrographic survey undertaken immediately on completion of the works, the surveyor shall also calculate the dredged volumes for various areas within the works based on the difference between the post-dredge and pre-dredge hydrographic surveys.
- 15.7 Volumes may be used by the Principal as a measure of reasonable rate of progress. The unit of measurement will be cubic metre (solid) for dredged volumes as calculated from the surveys.
- 15.8 The Contractor shall provide a copy of all Progress Hydrographic Survey results to the Principal within 3 working days of completion of that survey.
- 15.9 The Principal may direct the Contractor to undertake a Progress Hydrographic Survey at any time.
- 15.10 The Principal may alter the sequence of dredging depending on these survey results and dredging efficiency.
- 15.11 The Contractor shall retain the plant in the area until the post-dredge hydrographic survey has been completed and plotted and the work passed as satisfactory.
- 15.12 Separate payment for Progress Hydrographic Surveys will be made and shall include volume calculations.
- 15.13 Accuracy of Progress Hydrographic Surveys:
  - a) The soundings shall be accurate to  $\pm 50$  mm (vertical), and the locations at which the soundings are taken shall be within  $\pm 1.0$  m (horizontal). Soundings within the channel width shall be taken at 5 m intervals.
  - b) The Contractor's personnel shall be competent in handling all survey equipment such as Depth Sounders (Electronic Distance Measuring equipment) and DGPS systems (or equivalent). The Contractor shall submit test certificates of all survey equipment to be used in the works, showing such equipment has been tested by an accredited testing authority within 12 months prior to start of this Contract. The Contractor shall also ensure that the Depth Sounder (for example frequency of transducer) being used is of the right type in relation to the seabed characteristics expected.
  - c) The Contractor shall undertake a Test Survey covering a sample section of the area to be dredged, as directed by the Principal, prior to commencing dredging operations, for comparison to the Principal's Hydrographic Survey to determine that the Contractor's survey equipment operates to the required tolerances.

## 16 Dredge Management Plan

- 16.1 The Contractor shall prepare a Dredge Management Plan in accordance with the conditions of their current dredging licence from the South Australian Environment Protection Authority (SA EPA).
- 16.2 The Contractor shall submit the Dredge Management Plan to the Principal for approval.
- 16.3 Following approval by the Principal, the Contractor shall submitting the Plan to the EPA for approval.
- 16.4 The Contractor shall provide a copy of the SA EPA approved Dredge Management Plan to the Principal prior to commencing dredging works.

## 17 Stakeholder Communication Management Plan for Dredging

- 17.1 The Contractor shall develop and implement a Stakeholder Communication Management Plan for the Works in consultation with the Principal and key stakeholders.
- 17.2 The Contractor shall submit the Stakeholder Communication Management Plan to the Principal for approval.
- 17.3 Following approval by the Principal, the Stakeholder Communication Management Plan will be included in the Dredge Management Plan and will be submitted to the EPA for approval.

## 18 Biofouling

- 18.1 The vessels and equipment associated with the dredging activities pose risks of introducing new marine pests and diseases from biofouling. The vessels and equipment should be clean before arriving at each dredging site, so as to not introduce or spread any more aquatic pests (e.g. a vessel originating from the Port River which has exotic species that are not found at the dredging site) and cleaned before moving to new regions.
- 18.2 The Contractor shall undertake the following:
- a) Biofouling management plans shall be developed and submitted to Biosecurity SA (PIRSA) for each of the vessels involved. The management plan shall consider inspection and cleaning prior to movement of the vessels to new regions using the following resources:
    - i) National Biofouling Management Guidelines for Non-Trading Vessels  
[http://www.marinepests.gov.au/marine\\_pests/publications/Documents/Biofouling\\_guidance\\_NT.pdf](http://www.marinepests.gov.au/marine_pests/publications/Documents/Biofouling_guidance_NT.pdf)
    - ii) National Biofouling Management Guidelines for Commercial Vessels  
[http://www.marinepests.gov.au/marine\\_pests/publications/Documents/Biofouling\\_guidelines\\_commercial\\_vessels.pdf](http://www.marinepests.gov.au/marine_pests/publications/Documents/Biofouling_guidelines_commercial_vessels.pdf)
    - iii) IMO guidelines  
<http://www.imo.org/en/OurWork/Environment/Biofouling/Documents/RESOLUTION%20MEPC.207%5b62%5d.pdf>
  - b) A record book shall be a mandatory requirement prior to commencement of operations. The record book shall also include significant dates outlined in the management plan, such as hull inspections and cleaning.
  - c) As water will be returned to the marine environment as a result of dredge spoil dewatering operations, it should be free from marine pests, with appropriate management strategies in place (e.g. filtering of particulates).

## 19 Daily Diary Records

- 19.1 The Contractor shall keep a daily log, specifying the number of hours, of the following events, as a minimum requirement, whilst the Contractor's personnel are actively engaged at that site:
- a) Commencement time;
  - b) Productive dredging, including all pressure and volumetric measurements required;
  - c) Non-productive work, such as work on anchors, discharge pipes and blockages;
  - d) Repairs to plant;
  - e) Standby;
  - f) Hydrographic surveys;
  - g) Weather conditions and any changes thereto, including wind speed, direction and strength;
  - h) Sea conditions;
  - i) Water quality parameters; and
  - j) Finishing time.
- 19.2 The log shall include full particulars, including time and duration for each of the above events as applicable.
- 19.3 The Contractor shall, at the end of its operations on each day, mark on an appropriate chart the discharge points and area(s) dredged that day. This shall include details of the material dredged and the depths achieved according to the Contractor's control survey. Depths shall be recorded on a 5 x 5 m grid.

## 20 Hold Points

20.1 The following is a summary of Hold Points referenced in this Part:

**Table MA-DR-C1 20-1 Hold Points**

<b>Document Ref.</b>	<b>Hold Point</b>	<b>Response Time</b>
3.3	Provision of Quality Requirement procedures	14 Working Days
13.3	Completion of Test Dredge	5 Working Days