**PART W60**

**DREDGING**

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**1. General**

This Part specifies the requirements for set out, undertaking the dredging and measurement.

**2. QUALITY REQUIREMENTS**

The Contractor's Procedures must at a minimum address the following:

* Dredging of material
* Dredging of material/seagrass mix;
* Dredging of seagrass only.
* Disposal management methods.
* Determination of shape and depth of dredged areas
* Verification of channel shape
* Frequency and density of measurements.

If not provided beforehand the procedures must be submitted at least 14 days prior to the commencement of site work.

Provision of the procedures listed in this Clause shall constitute a **hold point**.

**3. PLANT**

The Contractor must use the plant nominated in the Schedule of Technical Data and ensure that it is:

* properly maintained and in good working order to allow maximum efficiency in operation; and
* fit and suitable for the work under the Contract.

Access to the site by labour and land based support vehicles must be limited to

* The Contractor gaining the approval of the Local Council and where applicable; local land owners, lessees or authorities having control over that land; and
* The use of existing tracks.

The Contractor must 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.

Where the Contractor elects to remove the plant from a site prior to dredging work at that site being completed, the Contractor must be liable for any costs associated with the demobilising, transport and re-establishment of such plant.

**4. SETTING OUT AND DREDGING**

The Contractor must carry out dredging in the areas to be dredged as indicated in the **Contract Specific Requirements**, the Drawings or in accordance with any direction of the Principal.

The Contractor is responsible for setting out the works. The dredge must be fitted with a certified Differential Global Positioning Satellite (DGPS) system to ensure positional control to dredge the area accurately.

The Contractor will be given a datum level and detailed drawings clearly demarcating the area to be dredged.

The Contractor must 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.

**5. DISPOSAL OF DREDGED MATERIAL**

The Contractor must dispose of all dredged material in accordance with the approved Quality Plan, Environment Management Implementation Plan (EMIP) and Water Quality Monitoring Program.

If discharge pipes are to be used, they must 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 must be clearly marked with floating buoys with the appropriate navigational signals to prevent other vessels from crossing the pipeline.

If offshore discharge diffusers are to be used, they must 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 must move the diffuser to prevent accumulation of discharge in one location.

**6. ACCURACY OF DREDGING**

The Contractor must 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.

The Principal will only consider claims for side slopes mustower than 1:10 under special cases such as the side slope under the toe of a breakwater. The Contractor must provide written notice detailing such an occurrence within 48 hours of the occurrence becoming known to the Contractor.

The Contractor must 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 must be responsible for obtaining all information from the Principal relating to such depths and profile limitations in advance of starting operations. The Contractor must be liable for any damage cause to any structure due to over-dredging near the structure.

**7. PRESERVATION OF EXISTING DEPTHS**

The Contractor must ensure that the depths in the existing area and associated areas are not reduced by the operations.

The Contractor must 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.

**8. MEASUREMENT OF DREDGING WORK**

The Contractor must record and maintain a daily productive rate of pumping. The Contractor must 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.

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:

1. Suction and delivery pressures when pumping sea water only; and
2. Suction and delivery pressures when pumping dredge material at a rated capacity.

On completion of the Test Dredge a **HOLD POINT** shall apply.

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 must 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.

The Principal will 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.

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**PART 3**

**SURVEY**

**CONTENTS**

1. General

2. Quality Requirements

3. Progress Surveys

4. Accuracy of Progress Surveys

5. Hydrographic Survey

**1. General**

This Part specifies the requirements for undertaking progress surveys of the work and the Hydrographic Survey.

**2. QUALITY REQUIREMENTS**

The Contractor must prepare and implement detailed procedures and documentation for:

* determination of shape and depth of dredged areas
* verification of shape
* frequency and density of measurements.

If not part of the Post Tender Submission, the procedures must be submitted at least 28 days prior to the commencement of site work.

Provision of the procedures listed in this Clause shall constitute a **HOLD POINT**.

**3. PROGRESS SURVEYS**

The Contractor must undertake Progress Surveys on a regular basis, reduced to Chart Datum, to verify by hydrographic methods that dredging to the required tolerances has been satisfactorily completed. Progress surveys must cover the area dredged and the area to be dredged. 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 survey.

The Contractor must provide a copy of all Progress Survey results to the Principal within 3 working days of completion of that survey. The number of progress surveys to be carried out must be as per the provisional quantity given in the Schedule of Rates, or as directed by the Principal.

The Principal may direct the Contractor to undertake a Progress Survey at any time.

The Principal may alter the sequence of dredging depending on these survey results and dredging efficiency.

**4. Accuracy of Progress Surveys**

The soundings must be accurate to ± 50 mm (vertical), and the locations at which the soundings are taken must be within ± 1.0 m (horizontal). Soundings within the channel width must be taken at 5 m intervals.

The Contractor’s personnel must be competent in handling all survey equipment such as Depth Sounders (Electronic Distance Measuring equipment) and DGPS systems. The Contractor must 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 must 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.

The Contractor must 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.

**5. Hydrographic Survey**

The Principal will provide:

* Initial soundings of the area prior to the commencement of dredging and for the purpose of establishing markers; and
* Final soundings after completion of dredging.

The Principal will carry out a Hydrographic Survey of the area after completion of the dredging operation. The final survey will be carried out only when the Contractor has produced sufficient evidence that the required depths, to allowable tolerances, have been achieved over the entire project area. Any additional survey required due to the work not meeting Specification will be carried out at the Contractor’s expense.

The final survey will be carried out only during fine weather conditions and the Contractor must retain the plant in the area until the survey has been completed and plotted and the work passed as satisfactory. The final survey will not be carried out at weekends and the Contractor must schedule the work accordingly. Standby time will not be paid to the Contractor if the works concludes at the commencement of a weekend.

The Principal may also arrange a Hydrographic Survey of the area dredged during the Contract, at any time. Adjoining areas may also be surveyed to determine the extent of sand migration into dredged areas.

The Contractor may elect to do pre-dredge and post-dredge surveys at the Contractor’s expense.

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