Project Name: **Port Elizabeth Foreshore Rehabilitation: Short-Term Solution**

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1. GENERAL

This specification covers the requirements for the dredging works required as part of the Port Elizabeth Foreshore Rehabilitation project.

2. INTERPRETATIONS

2.1. Supporting specifications

The specifications listed in this section must be read in conjunction with this specification.

Hydrographic Surveys Generic Technical Specification

IHO Standards for Hydrographic Surveys, Special Publication No. 44, 5th Edition, February 2008.

3. CONTRACTOR'S EQUIPMENT

3.1. General

The Contractor submits a full description of the equipment planned for Providing the Works.

The Contractor obeys all vessel speed and navigational requirements within the Port. All Port protocols are observed by the Contractor including the hiring of Harbour Pilots and/or the application for exemptions as required. Where the use of divers is required, the Contractor ensures that the latest requirements, restrictions and regulations in this regard are complied with.

4. MATERIALS, PLANT AND WORKMANSHIP

4.1. Dredging

4.1.1. Nature of material to be dredged

The *Contractor* in planning its dredging works takes note that there is a possibility of encountering unknown objects or obstructions below ground level or seabed level.

4.1.2. Classification of materials for dredging purposes

Materials

Material will be identified and classified in accordance with Table 6 of BS 6349 - Part 5 modified as set out below. The applicable classification of material includes the following:

Sands Coarse 0.6mm - 2 mm

Medium 0.2 mm – 0.6 mm

Fine 0.06 mm – 0.2 mm

Silts 0.002 mm – 0.06 mm

Clays	Below 0.002 mm

Clays will be classified in accordance with their undrained shear strength as follows:

Very soft	< 20 kPa
Soft	20 to 40 kPa
Firm	40 to 75 kPa
Stiff	75 to 150 kPa
Hard	> 150 kPa

4.2. Classes of Material to be dredged

Commented [PM1]: Dredging of armour rock and underlayers

The *Contractor* must remove existing 3-t dolos and armour rock, some of which may be under water. Existing revetment also consists of underlayers (including armour rock), which can be classified as "Boulder" and "Large Boulder" according to BS EN ISO 14688-1: 2018. Beyond these layers, is coarse soil with a particle size of ≤20 mm. These are all type of materials that will have to be dredged up to the required trench depth.

5. EXECUTION

5.1. Dredging

Dredging of this sandy material must be carried out to the lines and levels shown on the drawings. Existing seawall material, including rocks and dolosse (or pieces thereof), must be removed as far as required to dredge to the required level.

The toe trench must be at a depth of -2.866 m MSL or refusal. The toe must be placed within the trench as specified in the drawings. Dredging should allow for encountering rocks or concrete within the dredge area.

The *Contractor*, when devising his methods and considering the risks, takes cognisance of:

- Dredging slope instability risks that can be induced by aggressive dredging and steep temporary slopes;
- The potential variances in dredge slopes, which will not be consistent and vary depending on properties of in-situ material.
- Sediment movement into the trench following initial dredging, or from slope instabilities on the seaward side of the dredged slopes.

Surveys of the dredged trenches must be carried out immediately prior to placement of concrete armour units to ensure that levels have not been altered by siltation or slumping of slopes. Accreted material must be removed, and the dredged trenches must be re-surveyed as required. Where

accretion of material occurs, the *Contractor* dredges, excavates and maintains the trenches to the tolerances given in Clause 6 of this specification and, if necessary, corrects incorrect profiles.

5.1.1. Precautions

The *Contractor* complies with the instructions of Port Control regarding shipping and navigation safety.

The Contractor complies with the environmental requirements included in the Works Information and required by legislation. The *Contractor* takes cognisance of the requirements for the monitoring and mitigation of dredge plumes and turbidity levels. The *Contractor* therefore takes all necessary precaution in its planning and during the execution of the Works to achieve these requirements.

The *Contractor* further notes that there is a risk of encountering man-made debris and potential snagging of the submersible dredge pump.

5.1.2. Method statements

Dredging operations must not commence without the *Contractor* having submitted a method statement to the *Supervisor* for acceptance. The method statement for each operation must include a comprehensive safety and environmental risk assessment.

5.1.3. Dredging works records

The *Contractor* must submit a daily diary to the *Supervisor*, the minimum contents of which must include the following:

i. Date and time
ii. Equipment type and name
iii. Description of the dredging/excavation area
iv. Daily production and material type
v. Details of working time, downtime and standby time during each shift
vi. Coordinates of the vessel in time-track plots
vii. Working area of the last 24hrs in comparison to the dredging plan

The *Contractor* must provide the *Project Manager/Supervisor* with unlimited access to all dredging and/or dumping vessels as well as the right to witness all dredging operations, including the right to make photographic and video recordings.

5.1.4. Disposal of dredged material

All dredged and excavated material must be disposed of at the designated offshore disposal site.

5.2. Surveys

5.2.1. Detailed surveys must be carried out over the areas to be dredged. The following surveys are required as a minimum:

i. Multibeam survey of the dredge area and adjacent slopes (in-survey)
ii. Multibeam survey of the dredge disposal areas (in- and out-survey)
iii. Progress multibeam surveys of areas dredged more than 2 m in the vertical direction since the previous multibeam survey of the area
iv. Multibeam survey of toe trench prior to placement of units in the trench

5.2.2. Hydrographic surveys

All hydrographic surveys must be carried out to the requirements as specified in Hydrographic Surveys Generic Technical Specification.

The general survey requirements apply:

In-surveys: A multi-beam survey of the area that needs to be dredged and the disposal areas, including a 30 m offset along the seaward perimeter, must be carried out, no earlier than two weeks before commencement of the dredging of that particular area. This is in order to allow sufficient time for checking, verification and acceptance by the *Supervisor*. Surveys must be repeated if a storm with a significant wave height larger than 2.2 m occurs after the in-survey and before dredging commences.

Other surveys: A multi-beam survey of the area that has been dredged and of the areas where material has been disposed of, including a 30 m offset along the seaward perimeter, must be carried out, directly after the dredging operation. The *Supervisor's* acceptance must be obtained before any rock or armour units are placed. If any additional dredging is required, then the *Contractor* must carry out additional surveys to confirm that dredge levels and dredge disposal areas are in accordance with the specifications. Surveys must be repeated if a storm with a significant wave height larger than 2.2 m occurs after dredging and before rock or dolos units are placed on the seawall slopes and toe trench.

6. TOLERANCES

6.1. Dredging

For final acceptance, the following tolerances apply to dredged and excavated areas.

Table 6-1: Tolerances for dredging.

Levels (m)		**Lines (m)**	
+ (up)	**- (down)**	**+ (outside)**	**- (inside)**
0.0	-0.2	1.0	-0.0

Any areas that don't meet the tolerances stated above must be re-dredged by the *Contractor* and re-surveyed to prove compliance with the required tolerances.

7. TESTING

7.1. Dredging

7.1.1. Turbidity

Monitoring of sediment levels in the water column must commence at least one month prior to dredging activities. Continuous real-time monitoring of suspended sediment levels in the water column during dredging operations must be implemented for the duration of the dredging works to ensure that acceptable thresholds are not exceeded.

Sampling, testing and guideline level/thresholds to be as provided in the environmental specifications.

All tests must be performed by an accredited laboratory and submitted to the *Supervisor* for acceptance. Guideline levels and corrective actions are described in the Environmental Management Plan (EMP).

Prior to the commencement of testing, the *Contractor* must describe how it intends to retrieve the required samples and how testing will be performed and submit the proposed methodology to the *Supervisor* for acceptance.