PORT OF PORT ELIZABETH

DOM PEDRO QUAY REFURBISHMENT

ANNEXURE A1 – DREDGING

DOCUMENT NUMBER: 2138436-ENG-SPEC-00

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2. SCOPE

This specification covers the requirements for the dredging of the Dom Pedro Quay Basin in the Port of Port Elizabeth.

Existing water depths in the basin vary between approximately 3.80m and 2.50m below Chart Datum Port (CDP). The required dredging, to be executed under this contract, is to reduce the general basin level to -3.40m and 4.40m CDP. It is required that dredged material be deposited in selected dump site offshore. The side slopes of the basin adjacent to the existing quay wall are to be re-profiled as indicated on the drawings.

3. INTERPRETATIONS

In addition to abbreviations described in SANS 2001 the following apply and have the meaning given.

PIANC: Permanent International Association of Navigation Congresses now called International Navigation Association (INA)

SABS: South African Bureau of Standards (recent South African Standards have the designation SANS rather than SABS.

4. MATERIALS

The materials to be dredged comprise typical alluvial deposits comprising intercalated lenses of sands, clays, and silts. The *Contractor* makes his own assessment of the dredgeability of these materials from the available geotechnical information contained in the design report.

The *Contractor* acknowledges, in planning his dredging and excavation work, that there is a possibility of encountering unforeseen objects or obstructions below ground level or seabed level, and maintains the ability to divert work to other areas should such objects or obstructions temporarily disrupt his operation.

Soils are identified and classified in accordance with Table 6 of BS 6349 Part 5, modified as set out below.

Boulders		larger than 200 mm
Cobbles		less than 200 mm larger than 60 mm
Gravels	Coarse	60 mm – 20 mm
		Medium 20 mm – 6 mm
		Fine 6 mm – 2 mm
Sand		Coarse 2 mm – 0,6 mm
		Medium 0,6 mm – 0,2 mm
		Fine 0,2 mm – 0,06 mm
Silts		0,06 mm – 0,002 mm
Clays		Below 0,002 mm

Clays are classified in accordance with their un-drained 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

5. EXECUTION

The *Contractor* determines his dredging programme to best suit his dredging equipment, its availability, and interaction with other floating plant used by the *Contractor* in consultation with the *Supervisor.*

The tug basin is dredged to a general depth of -3.4m and 4.40m CD Port. All the dredged material will be in the selected dump site offshore.

The dredging Equipment used for the works is to be suitable for the work required taking into consideration the sequence of construction, the nature of the work required, the volumes of material to be dredged, the type of material to be dredged, the disposal of dredged material, and the dredging tolerances.

In selecting approriate dredging Equipment, the *Contractor's* attention is drawn to the requirement to minimize turbulence and silt plumes in the basin during dredging operations. The Contractor is required to comply with the Environmental Authorisation and the conditions contained in the Record of Decision.

The *Contractor* takes all precautions, and at all times maintains radio communication between all his vessels and Port Control.

6. TOLERANCES

The acceptable dredge tolerance is a vertical tolerance of 0 m above the specified dredge profile and 0.5 m below the specified dredge profile generally, but with a tolerance of ± 0,25m from the specified dredge profile within 15 m of the existing quay walls.

Any areas that are above the specified depth or profile are re-dredged by the *Contractor* and re-surveyed at the *Contractor's* expense. Material dredged below the specified level and profiles is not paid for.

7. TESTING

Prior to commencing dredging operations the *Contractor* carries out a bathymetric in-survey using multi-beam sonar.

Multi-beam sonar bathymetric surveys are carried out as follows:

In-survey: No longer than two weeks before commencing dredging in any area.
Out-survey: Once the works have been completed in order to verify that the dredging complies with the specifications.

All survey work is carried out and certified by a qualified hydrographic surveyor appointed by the *Contractor,* and accepted by the *Supervisor.* Survey resuls are prepared by the *Contractor* as colour images with 0,5 m contours, and are supplied to the *Supervisor* as AutoCad compatible files together with ASCII data files (filtered to one point per square metre) containing XYZ data for each point.

The accuracy for seabed elevation measurements is better than ±100 mm vertical (Z co-ordinate) and 250 mm horizontal (X and Y co-ordinates). The LRA with a GPS should be employed to compare the design profile with the actual. The LRA should be fitted with the monitor.

Prior to commencement of a survey, the navigation system and multi-beam sonar is calibrated and accuracy/precision checked using an appropriate procedure. The accuracy/precision check is repeated at the original calibration and check site at the end of the survey. Gross error determination is documented. During the course of the survey, the dynamic accuracy and repeatability of position fixing is checked at a selected location.