SITE WORKS

1.0 MOBILIZATION & DEMOBILIZATION

1.1.1 GENERAL

Work under this Contract shall be in accordance with the terms and conditions stipulated in the Conditions of Contract and Section 1 "General Requirements" of these Specifications and shall apply to this Section whether herein referred to or not.

1.1.2 SCOPE OF WORK

This Section includes mobilization, demobilization, assembly and disassembly of equipment/plants including incidentals necessary to complete the work.

1.1.3 MOBILIZATION

a) The Contractor shall mobilize and put into operation all equipment and plants required to undertake the Contract.

b) Mobilization shall include the transferring to the job-sites of all equipment, plants, supplies and materials, personnel, and all items necessary for the execution and completion of the work, and shall also include the setting up of all equipment, instruments and all other plants until rendered operable, subject to the confirmation of the Engineer.

c) Sufficient supply of spares for the equipment and plants shall be carried on-site. Equipment/plants encountering breakdowns must be repaired on site by the most expeditious method possible at no cost to the Procuring Entity. In the event that the equipment/plants call for major repair works that cannot be undertaken at the site, the Contractor shall replace such equipment/plants with equal or better performance capacity at no additional mobilization costs to the Procuring Entity and the Contractor shall not be entitled to any time extension.

1.1.4 DEMOBILIZATION

Demobilization upon request of the Contractor and approved by the Engineer, shall include the following:

The dismantling, preparation and loading for removal and shipment of all Contractor’s plant, equipment and personnel at each site after completion of the works.

2.0 CONSTRUCTION PHOTOGRAPHS

a) Provide record progress photographs taken at a fixed point and angle as, when and where directed by the Engineer at intervals of not more than ten (10) days. The photographs shall be sufficient in number and location to record the exact progress of works. The Contractor shall provide the Engineer all the photographs stored in CDs- properly labeled. Billing photographs shall be in 4R size with corresponding billboard indicating the name of the project and location, bill number, item number, name of the person taking the photograph, date taken and the on-going activity.

3.0 MONTHLY PROGRESS REPORT

a) The Contractor shall maintain a daily log describing the important events pertaining to the Works, the working hours, the number of laborers employed, effective operation time of equipment, overtime hours, delays due to meteorological and maritime conditions, lack of labor, materials or equipment, progress made including instructions, notifications and recommendations made by the Engineer. The Contractor shall submit to the local DOLE office copy furnished the Authority the Minutes of Monthly Safety meetings and the Daily Accident/Treatment Report in prescribed form.

4.0 AS-BUILT DRAWINGS AND FINAL CONSTRUCTION REPORT

Within thirty (30) calendar days after the issuance of the Taking Over Certificate, the Contractor shall prepare and as-built drawings and a final construction report as draft. And within thirty (30) calendar days after the issuance of the Taking Over Certificate, the Contractor shall submit the Final Construction Report and Final As-Built drawings.

5.0 DEMOLITION WORK

5.1.1 DESCRIPTION

This section shall be applied to the demolition work of existing port structures as indicated on the Drawings.

5.1.2 GENERAL PROVISIONS

The Contractor shall be deemed to have satisfied himself of the site conditions, and to have included in his unit prices provision for all risks that may arise during or in connection with the work.

b) The demolition work shall be carried out by approved methods and equipment such as concrete breakers, gas-cutters, hydraulic jacks, compressed air disintegrators, etc., however, no blasting shall be used unless approved in writing by the Engineer and after obtaining the written permission of the concerned Authorities.

c) The Contractor shall provide suitable equipment, skilled labor and appropriate temporary works such as scaffoldings to ensure safety in his demolition works as well as in the adjacent area.

d) The Contractor shall demolish all the structural members above the level on which the subsequent and permanent works under this Contract will begin. To this end, the temporary construction works such as excavation shall be conducted by the Contractor.

e) Materials coming from the demolition works, except general earth, shall remain the property of the Procuring Entity, the designated part of which shall be stored by the Contractor at places specified by the Engineer's authorized Representative

5.1.3 PARTICULAR REQUIREMENTS

a) Steel Members

Demolished materials shall be removed from the site and dumped at the disposal areas approved by the Engineer.

b) Concrete and Other Members

Demolished members, shall be broken to small pieces and debris, and shall be removed from the site as soon as possible and dumped at the disposal areas approved by the Engineer.

c) Spalled concrete as well as corrosion on rebars on damaged pile caps pile shall be properly removed.

5.1.4 CONSTRUCTION METHODS

Prior to the commencement of any works herein, the Contractor shall submit his proposed works, and methods, including temporary works such as formwork, supports, scaffolding etc., for the Engineer's approval.

5.1.5 STORAGE AND DUMPING

Prior to the commencement of the demolition work, the Engineer shall submit to the Contractor a list in which all the materials to be salvaged and overhauled, as property of the Procuring Entity and the location of their storage shall be described. Materials embedded in concrete units shall not be salvaged.

The Contractor shall separate materials to be salvaged from debris. Salvaged materials shall be loaded, transported and unloaded by the Contractor at the specified locations.

Debris, if it does not contain any pollutant in the opinion of the Contractor may be dumped at the offshore area.

The Contractor may dump debris on land areas but out of the site, which areas shall be procured and prepared at his own expense. In this case, safety measures shall be undertaken in the transporting, unloading, covering and others as requested by the Engineer.

5.1.6 SAFETY

The Contractor shall be responsible for the safety of its workers. Wearing of personal protective equipments (PPEs) shall be mandatory.

At the end of each day's work, the site shall be left in safe condition, so that no part is in danger of toppling, or falling or creating hazards to personnel or equipment.

The construction site shall be properly lighted at night. Warning signs shall be properly located for the safety of the port users.

SPECIFICATIONS

6.0 CONCRETE PAVEMENT

6.1.1 MATERIALS

a. ***Cement***

Cement used shall be Type I Portland conforming to the requirements of the latest revision of ASTM C 150 "Standard Specifications for Portland Cement.".

b. ***Coarse Aggregates .***

Coarse Aggregates shall be washed, well graded, hard pieces of gravel, crushed gravel or rock conforming to the requirements of ASTM C 33 "Standard Specification for Concrete Aggregates".

c. **Fine Aggregates**

Fine Aggregates shall be washed sand, 'stone screenings or other inert materials of same characteristics, or any combination thereof composed clean, hard, strong, uncoated grains and free from injurious amount of dust, lumps of clay, shale, alkali, and organic matter. It shall conform to the

requirements of ASTM C33 "Standard Specifications for Concrete Aggregates". Beach sand shall not be used unless approved by the Engineer.

d. **Admixtures**

Unless otherwise required by field conditions admixtures may be used subject to the expressed approval of the Engineer. The cost thereof shall be considered as already included in the unit cost bid of the Contractor for the concrete.

e. **Tie Bars and Dowels**

Tie bars for joints shall be deformed steel bars conforming to the requirements specified in AASHTO M 31 or equivalent sizes as indicated in the drawings or as approved by the Engineer. The deformed steel bars shall be grade 40. Dowel bars shall be plain steel bars conforming to the requirements specified in AASTHO M 31 or equivalent.

f. **Joint Filler**

Poured filler for joint shall conform to the requirements of AASTHO M173. The filler for each joint shall be furnished in single piece for the depth and width required for the joint unless otherwise authorized by the Engineer.

6.1.2 METHOD OF CONSTRUCTION

6.1.2.1 Sub-grade Preparation

a. **Sub-grade of Existing Pavement**

Where the new pavement is to be constructed immediately after the removal of an existing concrete pavement and if so specified in the contract, the slab shall be broken into pieces with greatest dimension not more than 500 mm and the existing pavement material re-compacted or disposed of as directed by the Engineer. The resulting sub-grade level shall, as part of the pavement construction be shaped to conform to the required tolerances by placing and compacting when necessary a leveling course comprising of materials of the pavement course to be placed immediately above.

b. Proof Rolling

Unless otherwise ordered by the Engineer, a variable-load pneumatic tires roller shall be used to proof roll the sub-grade. The roller shall have a load variable within the range of (at least) from 10 to 45 tons, on an overall width not greater than 3.2m and shall have tires whose pressures are variable up to not less than 620 KN per square meter. The proof rolling shall consist of one pass of the roller along the center of each lane of the travelled way.

c. Protection of Completed Works

Any part of the sub-grade that has been completed shall be protected and any damaged resulting from the negligence on the pert of the Contractor shall be repaired by him as directed by the Engineer without additional payment.

The sub-grade when prepared too soon in relation to the laying of the sub-base, is liable to deteriorate, and in such case, the Contractor shall, without additional payment, repair, re-roll or re-compact the sub-grade as may be necessary to restore it to the state specified herein.

6.1.2.2 Aggregate Sub-base Course

a. Placing

The aggregate sub-base material shall be placed as a uniform mixture on a prepared sub-grade in a quantity which will provide the required compacted thickness.

b. Spreading and Compacting

When uniformly mixed, the mixture shall be spread to the paln thickness for compaction. When the required thickness is 150mm or less, the material may be spread and compacted in one layer.

6.1.2.3 Portland Cement Concrete Pavement

a. Concrete Class

The concrete for pavement shall satisfy the following requirements:

Minimum Compressive strength	-	24 MPa
Maximum Aggregate Size	-	38mm
Maximum Water Cement ratio	-	0.45

b. Proportioning, Consistency and Mixing of Concrete

The proportioning, consistency and mixing of concrete shall conform to the requirements of “Reinforced Concrete”.

c. Preparation

The base shall be properly watered and thoroughly moistened prior to placing of the concrete.

d. Form work Construction

Forms shall be of steel, of an approved section and shall be straight and of a depth equal to the thickness of the oavement at the edge. The base of the forms shall be of sufficient width to provide the necessary stability in all directions.

e. Joints

All joints, longitudinal, transverse, etc., shall be constructed as shown on the Drawings and shall be clean and free of all foreign material.

6.1.3 STORAGE OF MATERIALS

a. Cement shall, be stockpiled as closely as possible, in weatherproof storage sheds, stacks suitably elevated above ground to prevent cement absorption of moisture.

b. Aggregates shall be placed in stockpile in a manner preventing

segregation thereof and contamination with foreign materials.

c. Reinforcing steel bars shall be stored properly, covered and protected from humidity to prevent rusting and contamination with oil, dirt or other objectionable matters

6.1.4 DESIGNED STRENGTH OF CONCRETE

Concrete shall develop compressive cylinder strength of 3,500 psi. in seven days , unless otherwise indicated in the drawings.

Concrete for jacketing of damaged pile caps shall have strength of 4000psi in seven days mixed with epoxy bond to adhere to existing concrete.

6.1.5 TRIAL BATCH FOR CONCRETE

Thirty (30) calendar days before the start of concreting works, the Contractor shall submit design mixes and the corresponding test result made on sample thereof. Sampling and testing shall be in accordance with the ASTM Standard procedures for sampling and testing, for the particular design strength(s) required.

The particulars of the mix such as the slump and the proportionate weights of cement, saturated surface dry aggregates and water used shall be stated. Test results shall show 28-day strength(s) fifteen (15%) percent higher than the ultimate strength(s) required.

The design mix for concrete to be used shall be submitted together with at least three (3) standard cylinder samples for approval at least one (1) month prior to the start of each concreting schedule. Such samples shall be prepared in the presence of the Engineer.

Standard laboratory strength test for the 7, 14 and 28 days periods shall be taken to all concrete samples in addition to routine field tests, at cost to the Contractor. Only design mixes represented by test proving the required strength for 7, 14 and 28 days tests shall be allowed.

The cost of sampling, handling and transporting samples from jobsite to the laboratory and the cost of subsequent tests made until the desired mix is attained shall be for the account of the Contractor.

6.1.6 CONCRETE PROPORTION AND CONSISTENCY

Concrete proportion should produce mix consistencies that will work readily into angles and comers of the forms and around reinforcements irrespective of the method of placing employed, without permitting -the-materials to segregate or excess water to collect on the surface of the concrete and with separated individual particles of aggregates showing coating of mortar with proportionate amount of sand. The total aggregate

in the proportion used shall be such that when sieved, the weight passing the No. 4 standard sieve shall be thirty percent (30%) of the total.

The methods used for measuring materials going into the concrete mix shall permit easy checking and control of proportions at any time during the work.

6.1.7 MIXING OF CONCRETE

1. All concrete used shall be transit machine-mixed at the designated site. Each batch shall be mixed at the mixer's design speed.
2. All mixed contents of the mixer shall be thoroughly removed before any succeeding batch s placed.
3. The materials for the first batch shall contain sufficiently excess cement, sand, and water to coat the inside walls of the mixer without reducing the required mortar content of the mix. The mixer shall be provided with devices foe accurately measuring and controlling the amount of water used in each batch and for automatically recording the number of revolutions of the mixer.

6.1.8 PLACING OF CONCRETE

1. Concrete shall be placed in the presence of the Engineer only after the forms, reinforcing bars and other spaces to receive the concrete have been inspected and approved by him.
2. Concrete shall be placed only when wind and weather conditions will allow proper placement and curing of the concrete. Notice of any concreting operations shall be served to the Engineer at least three (3) days ahead of each schedule.
3. Mixed concrete shall be deposited in its final position within a practicable time. Each succeeding fresh deposit for particular structural member shall be placed at a practicable rate to prevent cold joints. Each successive fresh deposit of concrete shall be vibrated vertically at uniformly spaced points and levels, of such duration and intensity to compact the concrete thoroughly but shall be discontinued the moment segregation of materials is noticed.
4. Where concreting operations involve a fall more than 1.50meters (4.92 feet), the fresh concrete shall be poured through approved sheet metal conduit or pipes. The pipes shall be kept full of concrete and its lower end kept below the surface of concrete throughout, the, pouring operations.
5. Deposition of concrete shall be in such a way as to prevent segregation of the materials and the displacement of the reinforcement. Placing shall be done preferably with the use of buggies, buckets or wheel-borrows. Troughs, conveyors and pipes and the manner of use of each one shall be with the expressed permission of the Engineer.
6. Each layer of concrete shall be placed approximately normal as possible

in uniform layers not exceeding 0.30 meter, unless otherwise ordered. The rate of placing concrete in the forms shall preferably be 0.025 meter (0.082 feet) vertical rise per minute.

6.1.9 CURING AND WATER PROOFING

All concrete shall be cured for at least 14 days after the date of placing in accordance with the approved and accepted methods.

6.1.10 FINISHING OF CONCRETE SURFACES

Concrete surfaces shall conform accurately to the form, alignment, grades and sections shown in the drawings or as prescribed by the Engineer. It shall be free from bulges, ridges, honeycombing or roughness of any kind and shall be of a reasonably smooth wood float finish.

6.1.11ARCHITECTURAL FINISH

All exposed concrete exterior surfaces shall be given an architectural finish as directed by the Engineer.

6.1.12 PLACING OF REINFORCEMENT

Metal reinforcement shall be placed as accurately detailed on drawings and properly secured by approved means.

Generally, splice/s of reinforcement at points of maximum stress especially in slabs, beams and girders shall be avoided. Such splice/s may however be approved by the Engineer in writing provided the lap if bonded or butt welded is sufficient to transfer tensile stress between bars by at least 125% of the specific yield strength of the reinforcing bar. For adjacent bar splices shall be staggered.

All reinforcing steel shall be cleaned of all rust or scale and deleterious materials which tend to destroy the bond between the concrete and the steel. Concrete covering must be strictly observed.

For RC Platform, concrete spacer of 3” thickness shall be provided to maintain the concrete covering of steel reinforcements.

6.1.13 TEST ON CONCRETE

Test on concrete shall be in accordance with the following:

Concrete samples for tests shall be secured and molded in accordance With ASTM C172 – “Method of sampling Concrete”, and ASTM C31 – “Method of making Curing, Concrete Compression and Flexure Test specimens in the field”.

Strength tests on samples shall be made in accordance with ASTM C39

"Standard Method of Test for Compressive Strength of Molded Concrete Cylinder".

Not less than four (4) cylindrical specimens shall be made for each test of which at least two (2) shall be reserved for 28-day test. Not less than one (I) test shall be made for every fifty (50) cubic meters of concrete but in no case less than one (1) test for each day's concreting.

Samples shall be taken by the Contractor under the supervision of the Engineer; and shall be delivered as soon as practicable for testing, at his expense, to the designated laboratories.

The average strength of test samples representing any definite class of concrete used as well as the average of any five (5) consecutive strength tests representing the class of concrete shall be equal to or greater than the specified strength and not more than one (I) strength test in ten (10) shall have an average value less than 90% of the specified strength.

If the test results indicate strength values less than the required, the Project Manager shall have the right to order a change in the concrete proportion used for the remaining work, or in the procedure of curing the concrete.

6.1.14 FIELD TESTS

Prior to concrete pouring, Field Density Test (FDT) shall be carried out to test the compaction of base at the expense of the contractor.

Field Tests as may deem necessary to check on the quantity of the materials and mixtures and the manner of construction employed shall be conducted by the Project Engineer assigned to the project. And when such tests result to values less than that tolerated by standards set in applicable provisions of the ASTM Specifications referred herein, or contrary to accepted good Engineering practice, the Contractor shall comply to any instructions given by the Project Engineer to upgrade the materials used and method of construction employed.

6.1.15 CONSTRUCTION JOINTS

Concrete cutting shall be done within 48 hours after concrete pouring to allow proper expansion of concrete.

6.1.16 FORMS AND FALSEWORK (FOR RC PLATFORM)

All forms and false work to be used in the work must be designed, and constructed by the Contractor for rigidity and adequacy for carrying the loads of the fresh concrete and/or additional superimposed construction loads. The Authority may from time to time verify the adequacy and safety of such temporary works and may require the Contractor to submit detailed designed drawings of forms and false works proposed to be used. Approval of such drawings or design of forms, however, shall not relieve the Contractor of his

liability on resulting imperfections or damages to the finished concrete, or other damages which may directly result therefrom.

Forms may be re-used but shall be scrapped by a wire brush of all clinging mortar. Bulges should be planed and realigned prior to its use.

Prior to placing concrete form surfaces should be oiled for easy form removal. However, the oil coating should not be so thick as to stain and soften the concrete surface. Oil coatings should be applied before rebars are placed.

7.0 CLEARING WORKS

The Contractor shall remove all debris, sediments and other materials at the existing drainage system and properly dispose said materials as directed by the Engineer. Temporary structures erected, excess materials and construction debris within the construction/port area upon completion of the project shall also be removed.