BUSUANGA PORT DEVELOPMENT PROJECT
PORT OF BUSUANGA, BUSUANGA, PALAWAN

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 those for dredging and reclamation works, and instructions, notifications and recommendations made by the Engineer.

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.

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 SAFETY

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

6.1 CONCRETE WORKS

6.1.1 GENERAL

All works falling under this category shall include reinforced concrete for all kinds and parts of any reinforced concrete structure.

6.1.2 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.

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.

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 for deck or floor slabs, beams and girders of the structure shall develop a minimum 28-day compressive cylinder strength of 3,500 psi. unless otherwise indicated in the drawings.

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

All concrete used shall be machine-mixed at the site. Each batch shall be mixed at the mixer's design speed, for at least 1-112 minutes after all concrete materials are simultaneously placed in the mixer. The ideal rotation speed of the mixer shall be between 14 and 20 rpm.

All mix contents of the mixer shall be thoroughly removed before any succeeding batch is placed.

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 for accurately measuring and controlling the amount of water used in each batch and for automatically recording the number of revolutions of the mixer.

Hand mixing of concrete will only be allowed in case of mixer breakdown, in which case it shall be stopped as soon as pouring for the particular section is completed, or at a construction joint as directed by the Engineer.

Re-tempering or remixing of partially hardened concrete with the addition of water will not be permitted.

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 I .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.

7. Concrete spacer of 3" thickness shall be provided to maintain the concrete covering of steel reinforcements.

8. Concrete epoxy shall be provided to have a complete bond between the old concrete and the new one.

6.1.9 FORMS AND FALSEWORK

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 falseworks 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.

6.1.10 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.

6.1.11 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.

6.1.12 ARCHITECTURAL FINISH

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

6.1.13 PLACING OF REINFORCEMENT

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

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

6.1.14 REINFORCING BAR SPLICES

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 specified yield strength of the reinforcing bar. For adjacent bars splices shall staggered.

6.1.15 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 fields".

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

Samples shall be taken by the Contractor under dose 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 test representing the class of concrete shall be equal to or greater than the specified strength and not more than one (1) strength test in ten (10) shall have an average value less than 90% of the remaining work, or in the procedure of curing the concrete.

6.1.17 FIELD TESTS

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.

7.0 MOORING SYSTEMS

7.1.1 MATERIAL REQUIREMENTS

1. Mooring cleats shall be of the dimensions, weight, capacities and design in accordance with shop drawing approved by the Engineer and shall be fabricated by approved manufacturers with cast steel conforming to the following requirements or approved equivalent.

   The size of the bolts, nuts and washers shall be in accordance with the specifications of the manufacturer. However, the length of the bolts shall be as indicated on the drawings. The anchor plate shall be connected the holding down bolt with 12.5 mm weld, as show on the drawings. All bolts, nuts, washers, etc. that are exposed shall be galvanized to the satisfaction of the Engineer. Provide lead cover for exposed threads of galvanized anchor bolts. Samples of the bolts, nuts, washers and anchor plates shall be submitted to the Engineer for approval before being used in the works.

a.) The upper parts of cleats not embedded in concrete shall be painted. The surface of cleats shall be cleaned thoroughly by wire brush or other means prior to painting to remove rust or any other contamination which may interfere with bond of paint to metal. The exposed surface shall be which may interfere with bond of paint to metal. The exposed surface shall be coated with rust proof paint and finishing paint, which shall be coal-tar epoxy of 120 micron thickness in accordance with JIS K5623 or the approved standard.

b.) Alternative

The Contractor can submit to the Engineer's approval cleats different from these specifications but with the capacities indicated in the drawings.

c.) Concrete foundations/base of cleats shall conform to the requirements of Section 6, "Concrete Works."

d.) Visual Inspection

All cleats delivered to site shall be inspected by the Engineer for any signs of flaws or defects inimical to usage.

e.) Mill Test Certificates

Two (2) copies of mill test reports shall be submitted certifying that materials meet the specified standards.

f.) Tests and Inspection

Inspection of all materials and methods of fabrication shall be carried out by the Contractor. However, the Engineer reserves the right to inspect all facilities at any time during the manufacture to ensure that the materials and workmanship are in accordance with the specifications and the best workmanship.

8.0 REVETMENT/SLOPE PROTECTION

8.1.1 GENERAL

Work under this Contract shall be in accordance with Division 1, "General Requirements" and shall apply to this Section, whether herein referred to or not.

8.1.1.1 SCOPE OF WORK

This Specification covers the construction of all revetments for the Project. The works to be carried out shall be, but not limited to the following:

1. Supply and laying of erosion protection mat (filter fabric) as shown in the drawings. Refer to Section 3.8 "Reclamation" of these Specifications.

2. Supply and laying of granular core rocks as shown in the drawings.

3. Casting of reinforced concrete curbs as shown in the drawings.

8.1.1.2 SURVEY AND SETTING OUT

1. Topographic/Hydrographic Surveys: Prior to commencement of the Work the Contractor shall conduct a topographic/hydrographic survey in conjunction with the Engineer instructions. This survey shall form the basis for future quantity measurements.

2. The Contractor shall set out Works and shall be solely responsible for accuracy of such setting out. Prior to placement of any materials, the Contractor shall establish visible construction markers to clearly define horizontal limits of Works.

8.2.2 MATERIAL REQUIREMENTS

1. Type of Revetment (as shown in the drawings).

2. Concrete curb shall be fabricated in accordance with Section 3.2 - Concrete Works. Use fc' = [25] MPa.

3. The weight of individual pieces may exceed the maximum specified in the drawings by up to 25 percent.

8.3.3 EXECUTION

1. Revetments may be constructed by any method acceptable to the Engineer. Prior to start of work, the Contractor shall submit his method and sequence of construction for approval to the Engineer. The Engineer's approval of the method and sequence of construction shall not release the Contractor from the responsibility to achieve the satisfactory implementation of the Work.

2. Core rocks shall be placed as uniformly as possible by controlled dumping or by other means acceptable to the Engineer.

3. Reinforced concrete blocks where required or as indicated in the Drawings shall be placed individually by a crane equipped or by other means acceptable to the Engineer.

8.4.4 QUARRY SITE AND ROCK QUANTITY

1. It is the Contractor's responsibility to make necessary surveys / investigations on quarry sites applicable to the Works, taking into consideration the nature of the rock works required under the Contract such as required quality, total quantity and daily required quantity, transportation method and route etc.,

2. The Contractor shall submit data on characteristics of proposed quarry sites together with the location of sites, test results of their products and samples for the approval of the Engineer.

3. When the Contractor intends to operate a quarry for the Works, the Contractor shall take all the responsibilities in connection with its operation including, but not limited to, obtaining all necessary permits and approvals, payment of safety measures or like (if any), provisions and maintenance of safety measures and temporary access roads, all of private and public roads and temporary jetties to be used to transport quarried materials and the compliance with all regulations etc. required by the authorities having jurisdiction over any part of the operation.

   Should any explosive be used in the quarry operations, the Contractor shall be responsible to meet laws and regulations, wherever applicable, established by the Local Government and Central Government Department concerned.

4. Despite the Engineer's previous approval of the natural rock and borrow pits, the Engineer reserves the right to suspend any operation in connection with the rock, if, in its opinion, such rock is not suitable for the work. In such case, the Contractor shall comply with the Engineer's instructions.

8.1.5 MEASUREMENT AND PAYMENT

1. Quantities of granular /core rock, and rock fragments to be paid for shall each be measured in cubic meters. The volumes to be paid for shall be measured by taking cross-sections of the sea bed on the site of work at 10 meter intervals or closer, if necessary, immediately before placing the rock. The volumes of the different classes of rock shall then be computed based on the neat lines and elevations shown on the drawings and on the foregoing data, with probable settlement as shown in the drawings.

2. Unless otherwise directed by the Engineer, measurement for settlement shall be done by providing a 28mm diameter x 6.0m round bar calibrated rod attached or welded to the center of a one (1) x one (1) m steel plate at 6mm thick. Measuring device shall be installed at 20.0m interval prior to laying of 1st stage rock.

3. Concrete works for reinforced concrete curb shall be measured and paid for by the length in linear meters of each type of curb along its front face at the finished grade elevation. Reinforcing steel bars for R.C. curb shall be measured in accordance with Section 3.2, "Concrete Works".

9. 0 CLEARING WORKS

The Contractor shall remove all temporary structures erected, excess materials and construction debris within the construction/port area upon completion of the project.