the mixing may be waived when, in the judgment of the Engineer, the aggregate is sufficiently free from moisture, so that there will be no harmful effects on the cement.

d. When a truck mixer is used for transportation, the mixing time in stationary mixer may be reduced to 30 seconds and the mixing completed in a truck mixer. The mixing time in truck mixer shall be as specified for truck mixing.

JOINTS

1. No reinforcement, corner protection angles or other fixed metal items shall be run continuously through joints containing expansion-joint filler, through crack-control joints in slabs on grade and vertical surfaces.

2. Preformed Expansion Joint Filler

a. Joints with Joint Sealant

At expansion joints in concrete slabs to be exposed, and at other joints indicated to receive joint sealant, preformed expansion-joint filler strips shall be installed at the proper level below the elevation with a slightly tapered, dressed-and-oiled wood strip temporarily secured to the top thereof to form a groove. When surface dry, the groove shall be cleaned of foreign matter, loose particles, and concrete protrusions, then filled flush approximately with joint sealant so as to be slightly concave after drying.

b. Finish of concrete at joints

Edges of exposed concrete slabs along expansion joints shall be neatly finished with a slightly rounded edging tool.

c. Construction Joints

Unless otherwise specified herein, all construction joints shall be subject to approval of the Engineer. Concrete shall be placed continuously so that the unit will be monolithic in construction. Fresh concrete may be placed against adjoining units, provided the set concrete is sufficiently hard not to be injured thereby. Joints not indicated shall be made and located in a manner not to impair strength and appearance of the structure. Placement of concrete shall be at such rate that the surface of concrete not carried to joint levels will not have attained initial set before additional concrete is placed thereon. Lifts shall terminate at such levels as are indicated or as to conform to structural requirements as directed. If horizontal construction joints are required, a strip of 25mm square-edged lumber, beveled to facilitate removal shall be tacked to the inside of the forms at the construction joint. Concrete shall be placed to a point 25mm above the underside of the strip. The strip shall be removed one hour after the concrete has been placed. Any irregularities in the joint line shall be leveled off with a wood float, and all laitance removed. Prior to placing additional concrete, horizontal construction joints shall be prepared.

Construction Joint which is not indicated in the Drawings shall be located as to least affect the strength of the structure. Such locations will be pointed out by the Engineer.

PREPARATION FOR PLACING

Hardened concrete, debris and foreign materials shall be removed from the interior of forms and from inner surfaces of mixing and conveying equipment. Reinforcement shall be secured in position, and shall be inspected, and approved before placing concrete. Runways shall be provided for wheeled concrete-handling equipment. Such equipment shall not be wheeled over reinforcement nor shall runways be supported on reinforcement.

Notice of any concreting operations shall be served to the Engineer at least three (3) days ahead of each schedule.
PLACING CONCRETE

1. Handling Concrete

Concrete shall be handled from mixers and transported to place for final deposit in a continuous manner, as rapidly as practicable, and without segregation or loss of ingredients until the approved unit of work is completed. Placing will not be permitted when the sun, heat, wind or limitations of facilities furnished by the Contractor prevent proper finishing and curing of the concrete. Concrete shall be placed in the forms, as close as possible in final position, in uniform approximately horizontal layers not over 40cm deep. Forms splashed with concrete and reinforcement splashed with concrete or form coating shall be cleaned in advance of placing subsequent lifts. Concrete shall not be allowed to drop freely more than 1.5m in unexposed work nor more than 1.0 m in exposed work; where greater drops are required, tremie or other approved means shall be employed.

2. Time Interval between Mixing and Placing

Concrete mixed in stationary mixers and transported by non-agitating equipment shall be placed in the forms within 30 minutes from the time ingredients are charged into the mixing drum. Concrete transported in truck mixers or truck agitators shall be delivered to the site of work, discharged in the forms within 45 minutes from the time ingredients are discharged into the mixing drum. Concrete shall be placed in the forms within 15 minutes after discharged from the mixer at the jobsite.

3. Hot Weather Requirements

The temperature of concrete during the period of mixing while in transport and/or during placing shall not be permitted to rise above 36 °C. Any batch of concrete which had reached a temperature greater than 36 °C at any time in the aforesaid period shall not be placed but shall be rejected, and shall not thereafter be used in any part of the permanent works.

a. Control Procedures

Provide water cooler facilities and procedures to control or reduce the temperature of cement, aggregates and mixing handling equipment to such temperature that, at all times during mixing, transporting, handling and placing, the temperature of the concrete shall not be greater than 36 °C.

b. Cold Joints and Shrinkage

Where cold joints tend to form or where surfaces set and dry too rapidly or plastic shrinkage cracks tend to appear, concrete shall be kept moist by fog sprays, or other approved means, applied shortly after placement, and before finishing.

c. Supplementary Precautions

When the aforementioned precautions are not sufficient to satisfy the requirements herein above, they shall be supplemented by restricting work during evening or night. Procedure shall conform to American Concrete Institute Standard ACI 305.

4. Conveying Concrete by Chute, Conveyor or Pump

Concrete may be conveyed by chute, conveyor, or pump if approved in writing. In requesting approval, the Contractor shall submit his entire plan of operation from the time of discharge of concrete from the mixer to final placement in the forms, and the steps to be taken to prevent the formation of cold joints in case the transporting of concrete by chute, conveyor or pump is disrupted. Conveyors and pumps shall be capable of expeditiously placing concrete at the rate most advantageous to good workmanship. Approval will not be given for chutes or conveyors requiring changes in the concrete materials or design mix for efficient operation.

a. Chutes and Conveyors

Chutes shall be of steel or steel lined wood, rounded in cross section rigid in construction, and protected from overflow. Conveyors shall be designed and operated and chute sections shall be set, to assure a uniform flow of concrete from mixer to final place of deposit without segregation of ingredients, loss of mortar, or change in slump. The discharged portion of each chute or conveyor shall be provided with a device to prevent segregation. The chute and conveyor shall be thoroughly cleaned before and after each run. Waste material and flushing water shall be discharged outside the forms.

b. Pumps shall be operated and maintained so that a continuous stream of concrete is delivered into the forms without air pockets, segregation or changes in slump. When pumping is completed, concrete remaining in the pipeline shall be ejected and wasted without contamination of concrete already placed. After each operation, equipment shall be thoroughly cleaned and the flushing water shall be splashed outside the forms.

5. Wall and Abutments

No load shall be placed upon finished walls, foundations or abutments until authorized by the Engineer. Minimum time before loading shall be 7 days.

6. Concrete Placing on Wharf

When placing concrete on wharf decks, the Contractor shall:

Ensure that rate of placing is sufficient to complete proposed placing, finishing and curing operations within the scheduled time; that experienced finishing machine operators and concrete finishers are provided to finish the deck; that curing equipment and finishing tools and equipment are at the site of work and in satisfactory condition for use.
Immediately prior to placing, the Contractor shall place scaffolding and wedges and make necessary adjustments. Care shall be taken to ensure that settlement and deflection due to added weight of concrete will be minimal. The Contractor shall provide suitable means to readily permit measurement of settlement deflection as it occurs.

Should any event occur which, in opinion of the Engineer, would prevent the concrete conforming to specified requirements, the Contractor shall discontinue placing of concrete until corrective measures are provided satisfactory to the Engineer. If satisfactory measures are not provided prior to initial set of concrete in affected areas, the Contractor shall discontinue placing concrete and install a bulkhead at a location determined by the Engineer. Concrete in place beyond bulkheads shall be removed. The Contractor shall limit the size of casting to that which can be finished before beginning of initial set.

COMPACTION

1. Immediately after placing, each layer of concrete shall be completed by internal concrete vibrators supplemented by hand-spading, rodding, and tamping. Tapping or other external vibration of forms will not be permitted unless specifically approved by the Engineer. Vibrators shall not be used to transport concrete inside the forms. Internal vibrators submerged in concrete shall maintain a speed of not less than 7,000 impulses per minute. The vibrating equipment shall at all times be adequate in number of units and power to properly consolidate all concrete.

2. Spare units shall be on hand as necessary to insure such adequacy. The duration of vibrating equipment shall be limited to the time necessary to produce satisfactory consolidation without causing objectionable segregation. The vibrator shall not be inserted into the lower courses that have begun to set. Vibrator shall be applied vertically at uniformly spaced points not further apart than the visible effectiveness of the machine.

EPOXY BONDING COMPOUND

Before depositing new concrete on or against concrete that has set, the surfaces of the set concrete shall be thoroughly cleaned so as to expose the coarse aggregate and be

free of laitance, coatings, foreign matter and loose particles. Forms shall be re-tightened. The cleaned surfaces shall be moistened, but shall be without free water when concrete is placed. ASTM C 881. Provide Type I for bonding hardened concrete to hardened concrete; Type II for bonding freshly mixed concrete to hardened concrete; and Type III as a binder in epoxy mortar or concrete, or for use in bonding skid-resistant materials to hardened concrete. Provide Class B if placement temperature is between 4 to 16 °C; or Class C if placement temperature is above 16°C.

FINISHES OF CONCRETE

Within 12 hours after the forms are removed, surface defects shall be remedied as specified herein. The Temperature of the concrete, ambient air and mortar during remedial work including curing shall be above 10 °C. Fine and loose material shall be removed. Honeycomb, aggregate pockets, voids over 13mm in diameter, and holes left by the rods or bolts shall be cut out to solid concrete, reamed, thoroughly wetted, brush-coated with neat cement grout, and filled with mortar. Mortar shall be a stiff mix of one part Portland cement to not more than 2 parts fine aggregate passing the No. 16 mesh sieve, with a minimum amount of water. The color of the mortar shall match the adjoining concrete color. Mortar shall be thoroughly compacted in place. Holes passing entirely through walls shall be completely filled from the inside face by forcing mortar through the outside face. Holes which do not pass entirely through wall shall be packed full. Patchwork shall be finished flush and in the same plane as adjacent surfaces. Exposed patchwork shall be finished to match adjoining surfaces in texture and color. Patchwork shall be damp-cured for 72 hours. Dusting of finish surfaces with dry material or adding water to concrete surfaces will not be permitted.

CONCRETE FINISHING DETAILS

1. Concrete Paving

   After concrete is placed and consolidated, slabs shall be screeded or struck off. No further finish is required.

2. Smooth Finish

   Required only where specified; screed concrete and float to required level with no coarse aggregate visible. After surface moisture has disappeared and laitance has been removed, the surface shall be finished by float and steel trowel. Smooth finish shall consist of thoroughly wetting and then brush coating the surfaces with cement to not more than 2 parts fine aggregate passing the no. 30 mesh sieve and mixed with water to the consistency of thick paint.

3. Broom Finish

   Required for paving; the concrete shall be screeded and floated to required finish level with no coarse aggregate visible. After the surface moisture has disappeared and laitance has been removed, surface shall be float-finished to an even, smooth finish. The floated surfaces shall be broomed with a fiber bristle brush in a direction transverse to the direction of the main traffic.

ITEM 04 : AGGREGATE BASE COURSE

SCOPE OF WORK

This Item shall consist of furnishing, placing and compacting an aggregate base coursed on a prepared subgrade/subbase in accordance with this Specification and lines, grades, thickness and typical cross-sections shown on the Plans or as established by the Engineer.

MATERIAL REQUIREMENTS

Aggregate base course shall consist of hard, durable particles or fragments of crushed stone, crushed slag or crushed or natural gravel and filler of natural or crushed sand or other finely divided mineral matter. The composite material shall be free from vegetable matters and lumps or balls of clay, and shall be of such nature that it can be compacted readily to form a firm, stable base.

In some areas where the conventional base course materials are scarce or non-available, the use of 40% weathered limestone blended with 60% crushed stones or gravel shall be allowed, provided that the blended materials meet the requirements of this Item.

The base material shall conform to the grading requirements of Table 3.1, whichever is called for in the Bill of Quantities.

Table 3.1 Grading Requirements

Sieve Designation		Mass Percent Passing	
Standard mm	Alternate US Standard	Grading A	Grading B
50	2"	100	
37.5	1 – 1/2"	-	100
25.0	1"	60 - 85	-
19.0	3/4"	-	60 - 85
12.5	1/2"	35 - 65	-
4.75	No. 4	20 - 50	30 - 55
0.425	No. 40	5 - 20	8 - 25
0.075	No. 200	0 - 12	2 - 14

The portion of the material passing the 0.075mm (No. 200) sieve shall not be greater than 0.66 (two/thirds) of the fraction passing the 0.425mm (No. 40) sieve.

The portion of the material passing the 0.425mm (No. 40) sieve shall have a liquid limit of not greater than 25 and a plasticity index of not more than 6 as determined by AASHTO T89 and T90, respectively.

The coarse aggregate retained on a 2.00mm (No. 10) sieve shall have a mass percent of wear not exceeding 50 by the Los Angeles Abrasion Test as determined by AASHTO T 96.

The material passing the 19mm (3/4 inch) sieve shall have a minimum soaked CBR-value of 80% tested according to AASHTO T 193. The CBR-value shall be obtained at the maximum dry density determined according to AASHTO T 180, Method D.

If filler, in addition to that naturally present, is necessary for meeting the grading requirements or for satisfactory bonding, it shall be uniformly blended with the crushed base course material on the road or in a pugmill unless otherwise specified or approved. Filler shall be obtained from sources approved by the Engineer, free from hard lumps and shall not contain more than 15 percent of material retained on the 4.75mm (N0. 4) sieve.

EXECUTION

PLACING

The aggregate base material shall be placed at a uniform mixture on a prepared sub-base (selected fill) in a quantity which will provide the required compacted thickness. When more than one layer is required, each layer shall be shaped and compacted before the succeeding layer is placed.

The placing of material shall begin at the point designated by the Engineer. Placing shall be from vehicles especially equipped to distribute the material in a continuous uniform layer or windrow.

The layer or windrow shall be of such size that when spread and compacted the finished layer be in reasonably close conformity to the nominal thickness shown on the Plans.

When hauling is done over previously placed material, hauling equipment shall be dispersed uniformly over the entire surface of the previously constructed layer, to minimize rutting or uneven compaction.

SPREADING AND COMPACTING

When uniformly mixed, the mixture shall be spread to the plan thickness, for compaction.

Where the required thickness is 150mm or less, the material may be spread and compacted in one layer. Where the required thickness is more than 150 mm, the aggregate base shall be spread and compacted in two or more layers of approximately equal thickness, and the maximum compacted thickness of any layer shall not exceed 150 mm. All subsequent layers shall be spread and compacted in a similar manner.

The moisture content of sub-base material shall, if necessary, be adjusted prior to compaction by watering with approved sprinklers mounted on trucks or by drying out, as required in order to obtain the required compaction.

Immediately following final spreading and smoothening, each layer shall be compacted to the full width by means of approved compaction equipment. Rolling shall progress gradually from the sides to the center, parallel to the centerline of the road and shall continue until the whole surface has been rolled. Any irregularities or depressions that develop shall be corrected by loosening the material at these places and adding or removing material until surface is smooth and uniform. Along curbs, headers, and walls, and at all places not accessible to the roller, the base material shall be compacted thoroughly with approved tampers or compactors.

If the layer of base material, or part thereof, does not conform to the required finish, the Contractor shall, at his own expense, make the necessary corrections.

Compaction of each layer shall continue until a field density of at least 100 percent of the maximum dry density determined in accordance with AASHTO T 180, Method D has been achieved. In-place density determination shall be made in accordance with AASHTO T 191/ASTM D 1556.

TRIAL SECTION

Before finish grade construction is started, the Contractor shall spread and compact trial sections as directed by the Engineer. The purpose of the trial sections is to check the suitability of the materials and the efficiency of the equipment and construction method which is proposed to be used by the Contractor. Therefore, the Contractor must use the same material, equipment and procedures that he proposes to use for the main work. One trial section of about 500 m^2 shall be made for every type of material and/or construction equipment/procedure proposed for use.

After final compaction of each trial section, the Contractor shall carry out such field density tests and other tests required as directed by the Engineer.

If a trial section shows that the proposed materials, equipment or procedures in the Engineer's opinion are not suitable for subbase, the material shall be removed at the Contractor's expense, and a new trial section shall be constructed.

If the basic conditions regarding the type of material or procedure change during the execution of the work, new trial sections shall be constructed.

SURVEYS AND SETTING OUT WORKS

Before the commencement of the pavement works, the Contractor together with the Engineer shall conduct topographic survey which will form the basis of quantity measurement.

The Contractor shall set out the works and shall be solely responsible for the accuracy of such setting-out.

Prior to placement of any material, the Contractor shall establish visible construction markers to clearly define horizontal limits of the Work.

TOLERANCES

The aggregate base course shall be laid to the designed level and transverse slopes shown on the Plans. The allowable tolerances shall be in accordance with following:

Permitted variation from design THICKNESS OF LAYER	± 10 mm
Permitted variation from design LEVEL OF SURFACE	+ 5 mm -10 mm
Permitted SURFACE IRREGULARITY Measured by 3-m straight-edge	5 mm
Permitted variation from design CROSSFALL OR CAMBER	± 0.2%
Permitted variation from design LONGITUDINAL GRADE over 25 m in length	± 0.1%

ITEM 05 : ROCKWORKS

SCOPE OF WORK

The work includes the furnishing of all labor, materials and equipment required for the rock works including armour rocks, underlayer and rock fill in accordance with the Specifications and as indicated in the drawings or as directed by the Engineer.

SETTING OUT OF WORKS

1. Topographic/Hydrographic Survey

   Prior to commencement of Works, the Contractor together with the Engineer shall conduct topographic and hydrographic surveys in order to establish the actual field condition or bathymetry of the project site. The said survey shall be used as the basis of quantity measurement.

2. The Contractor shall set out the Works and shall solely be responsible for the accuracy of such undertaking. Visible construction markers shall be used to clearly define horizontal limits prior to placing of any material.

MATERIAL REQUIREMENTS

1. All rocks to be used shall be angular, hard, durable and not likely to disintegrate in seawater. Rock layers to be installed should more or less be "global in shape", "angular in surface" and should avoid "river run rocks". Rocks that are sub-angular may be subject to the approval of the Engineer. Rounded or well rounded pieces will not be accepted.

2. All rocks shall have a minimum unit weight of 2,650 kg per cubic meter (specific gravity 2.65) of solid materials when measured dry.

3. Rocks with specific gravity higher than the above specified is preferable and will readily be accepted. But no adjustment (increase) in the contract price will be made on this account.

4. Rocks of the primary cover layer shall be sound, durable and hard. It shall be free from laminations, weak cleavages, and undesirable weathering, and shall be of such character that it will not disintegrate from the action of the air, seawater, or in handling and placing. All stone shall be angular quarry stone.

5. All rocks shall conform to the following test designations:

Apparent specific gravity	ASTM C 127
Abrasion	ASTM C 535

EXECUTION

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.

5. The finish bulkhead shall be true to grade and section. The spaces/voids between rocks shall be filled/sealed with 2 kg. to 16 kg. rocks and shall be approved by the Engineer before placing geotextile filter thereon to prevent the filling materials (soil and sand) from escaping to cause scouring and settlement of finished surface.

STORAGE OF MATERIALS

Quarried rock materials shall be stored by weight/class or in a manner approved by the Engineer and in a yard kept clean, free from undesirable materials.

SAMPLING TEST

1. Thirty (30) days prior to commencement of rock works, samples and test results of rock material which conforms to the Specifications called for in the Contract shall be submitted to the Engineer for evaluation and approval.

2. Rock samples from different sources and of different classes shall also be submitted, together with test results and its corresponding certificates, for the Engineer's approval.

3. Rocks accepted at the quarries before shipments or at the site before placement shall not be used as a waiver. The Engineer has the right to reject any inferior rock quality.

4. Samples for each class of approved materials are to be kept in the field for comparison/checking of delivered rock materials. A test shall be required for every 1,500 cu.m.

CROSS-SECTIONS OF COMPLETED ROCKWORK

Cross-sections showing the elevations of the completed rock works and the terrain of the existing seabed prior to construction shall go together with every progress report and request for progress or final payment.

Rock works which was previously paid should be easily identified from sections being requested for payment.

ITEM 06 : GEOTEXTILE FABRIC

SCOPE OF WORK

This work covers all the following requirements regarding the installation of geotextile (filter fabric) in accordance with the lines, grades, and dimensions shown in the drawings.

MATERIAL REQUIREMENTS

The geotextile fabric shall meet the following requirements in full. If required, a sample of 1.0 sq.m. shall be supplied to the Engineer for approval and retention for purposes of comparative testing against materials randomly sampled from the site.

1. PHYSICAL PROPERTIES

   a. The geotextile material shall be a nonwoven needle punched type comprising of needle punched polypropylene fibers or its equivalent.

   b. The geotextile material shall be UV stabilized to ensure retention of minimum 70% original tensile strength after 90 days exposure to sunlight. The manufacturer shall submit test results to the Engineer for approval.

   c. The geotextile must be highly resistant to long term contact with damp cementatious substances or acid or alkali solutions in the pH range 2-13. The manufacturer shall submit test data to ensure resistance of the polymer.

2. MECHANICAL AND HYDRAULIC PROPERTIES

   The geotextile supplier is required to certify that the materials delivered to site will be proven to meet or exceed the following properties:

TECHNICAL PROPERTIES	UNIT	MINIMUM	TEST STANDARD
A. Physical Characteristics:			
Minimum Mass (per unit area)	(g/m^2)	540	ASTM D5261
Thickness (F=2 kpa)	mm	4.5	ASTM D5199
B. Mechanical Properties:			
Tensile Strength (md/cd)	kN/m	13/22	ASTM D4595
Tensile elongation (md/cd)	%	90/40	ASTM D4595
CBR Puncture Resistance	N	3000	ASTM D6241
C. Hydraulic Properties:			
Effective Opening Size (O_{90} Wet Sieving)	(mm)	0.08	ASTM D4751
Water Permeability: Permittivity	(s^{-1})	0.5	ASTM D4491

Note:

Tolerances:

Mechanical Properties	-1.0% of the Minimum Value
Hydraulic Properties	-1.0% of the Minimum Value

EXECUTION

1. The geotextile shall be delivered to site with an outer wrapper to protect it from exposure to the elements.

2. Prior to laying of geotextile filter, stone filler shall be placed between gaps or voids of armour / core rocks as likewise mentioned in the requirements of Item "Rock Works".

3. The non-wooven geotextile filter shall be installed and lay manually at site as per design drawings. The filter shall be laid lengthwise down slopes and appropriately anchored along the top edge.

4. The Engineer reserves the right to sample geotextile delivered to site for individual quality control testing at the contractor's expense. A material not meeting the manufacturer's certified values will be rejected from the site.

5. The geotextile shall be proven to resist dynamic puncture damage when subject to impact stress from stone armour (200-400 kg.) dropped from a minimum height of 2.0 m. and should be laid on at least 1-foot sand and gravel bedding. Geotextile failing to resist puncture shall not be accepted.

6. To facilitate site Quality Assurance, each roll of geotextile delivered to site shall be clearly labeled with brand name, grade, and production batch number.

7. Geotextile overlaps shall be at least 1.0 m unless otherwise stated on the drawings. Alternatively, geotextile overlaps are to be heat-welded or sewn using appropriate polypropylene or other synthetic thread and portable hand sewing equipment.

ITEM 07 : RECLAMATION AND FILL

SCOPE OF WORK

This item shall consist of the construction of back-up area in accordance with the Specifications and in conformity with the lines, grades, and dimensions shown on the Plans or established by the Engineer.

The area to be upgraded shall be as indicated on the Drawings.

The works includes furnishing of all labor, materials and equipment required to complete/finish the upgrading of the area in accordance with the Drawings and the Specifications.

The following major items of works are included:

1. Supply and fill of suitable materials to places required to upgrade elevation of areas as shown in the drawings.

   a. Compaction of fill materials
   b. Supply and placing of filter fabric

2. The work may also include the construction of temporary dike or structure to enclose the reclamation material before the completion of a permanent waterfront containment structure.

MATERIAL REQUIREMENTS

1. Filling Materials

   a. General

      All sources of filling materials shall be approved by the Engineer.

      Appropriate quantities of sample of all materials to be used in the Works shall be submitted for acceptance and approval by the Engineer thirty (30) days before the commencement of work.

      General filling shall consist of approved material from approved sources of suitable grading obtained from excavation, quarries or borrow pits, without excess fines, clay or silt, free from vegetation and organic matter.

      Sample of approved materials shall be kept/stored in the field for ready reference/comparison of the delivered materials.

      The Contractor shall ensure that adequate quantities of required materials that comply with the specifications and quality approved by the engineer are available at all times.

   b. Fill Materials other than Dredged/Excavated Materials

      Fill materials for reclamation purposes other than dredged materials shall be pit sand, quarry run, gravel or mine tailings. The fill material shall be of the same quality or better as approved by the Engineer.

c. Type of Filling Materials

c.1 Selected Fill Materials

All materials used for fill shall be free of rock boulders, wood, scrap materials, organic matters and refuse.

The material shall not have high organic content and shall meet the following requirements:

i. Not more than 10 percent by weight shall pass the No. 200 sieve (75 microns).

ii. Maximum particles size shall not exceed 75 mm.

iii. The fill materials shall be capable of being compacted in the manner and to the density of not less than 95%.

iv. The material shall have a plasticity index of not more than 6 as determined by AASHTO T 90.

v. The material shall have a soaked CBR value of not less than 25% as determined by AASHTO T 193.

c.2 Sand and Gravel Fill

The materials shall be composed of at least 50% sand and 50% gravel in terms of volume and shall be free from rock boulders, wood, scrap, vegetables, and refuse. The materials shall not have organic content and the maximum particle size shall not exceed 100mm diameter. Source of materials shall be river or mountain quarry or manufactured.

c.3 Excavated Materials

The excavated materials shall be used for backfilling as directed by the Engineer.

EXECUTION

Reclamation and Fill

a. General

The Contractor shall be responsible for all ancillary earthworks that are necessary for the reception of the fill material and including, all spout handling, temporary dike or shoring construction where necessary, temporary protection to dikes in the sea and drainage of excess water.

The arrangements of these ancillary earthworks shall be laid out in consultation with the Engineer and to the Engineer's satisfaction and care shall be taken to minimize the loss of fill.

b. Replacement, backfilling and reclamation may be done by any method acceptable to the Engineer. Prior to start of Work, the Contractor shall submit his method and sequence of performing the works to the Engineer for approval. However, the Engineer's approval of the method and sequence of construction shall not release the Contractor from the responsibility for the adequacy of labor and equipment.

c. The Engineer shall approve the type of material to be used as fill prior to its placement. If the material is rejected, such material shall be deposited into areas designated or as directed by the Engineer.

d. Reclamation of fill material shall be placed in horizontal layers not exceeding 200mm (8 inches), loose measurement, and shall be compacted as specified before the next layer is placed. Effective spreading equipment shall be used on each lift to obtain uniform thickness prior to compacting. As the compaction of each layer progresses, continuous leveling and manipulating will be required to assure uniform density. Water shall be added or removed, if necessary, in order to obtain the required density. Removal of water shall be accomplished through aeration by plowing, blading, dicing, or other methods satisfactory to the Engineer.

Dumping and rolling areas shall be kept separate, and no lift shall be covered by another until the necessary compaction is obtained.

Hauling and leveling equipment shall be so routed and distributed over each layer of the fill in such a manner as to make use of compaction effort afforded thereby and to minimize rutting and uneven compaction.

TRIAL SECTION

Before finish grade construction is started, the Contractor shall spread and compact trial sections as directed by the Engineer. The purpose of the trial sections is to check the suitability of the materials and the efficiency of the equipment and construction method which is proposed to be used by the Contractor. Therefore, the Contractor must use the same material, equipment and procedures that he proposes to use for the main work. One trial section of about 500 m^2 shall be made for every type of material and/or construction equipment/procedure proposed for use.

After final compaction of each trial section, the Contractor shall carry out such field density tests and other tests required as directed by the Engineer.

If a trial section shows that the proposed materials, equipment or procedures in the Engineer's opinion are not suitable for sub-base, the material shall be removed at the Contractor's expense, and a new trial section shall be constructed.

If the basic conditions regarding the type of material or procedure change during the execution of the work, new trial sections shall be constructed.

CROSS-SECTIONS OF COMPLETED RECLAMATION

Cross-sections showing the elevations of the completed reclamation and the terrain of the existing seabed prior to construction shall go together with every progress report and request for progress or final payment.

FIELD COMPACTION TEST

Field Density tests to determine the percent of compaction of the material (selected fill, aggregate base course, etc) shall be conducted. Compaction of each layer thereafter shall continue until a field density of 95 percent of the maximum dry density in accordance with AASHTO T/180 Method D has been achieved. In place density determination shall be made in accordance with AASHTO T191/ ASTM D 1556.

TOLERANCE

Elevation : plus 5 cm.

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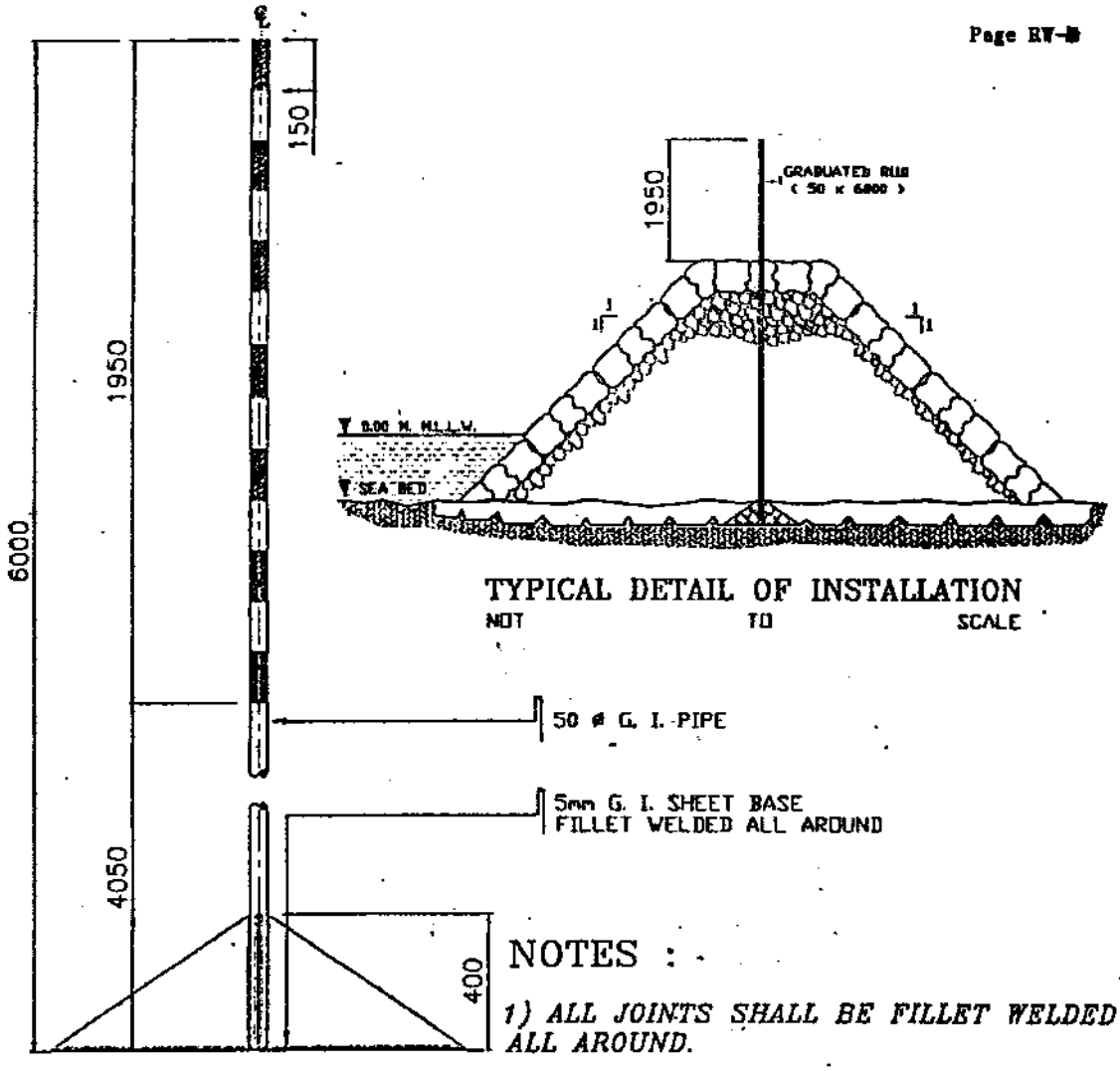


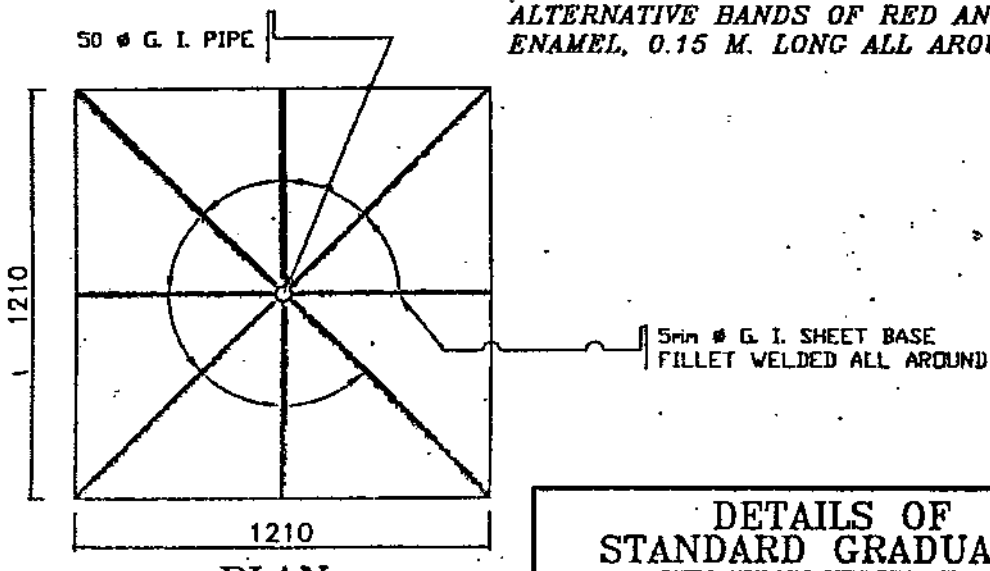
ELEVATION
SCALE 1:20

TYPICAL DETAIL OF INSTALLATION
NOT TO SCALE

NOTES :

1) ALL JOINTS SHALL BE FILLET WELDED ALL AROUND.

2) THE GRADUATED SETTLEMENT ROD INCLUDING THE BASE SHALL BE PAINTED WITH TWO (2) COATS OF ANTI-RUST PAINT AND THE 1.95 M. PAINTED WITH ALTERNATIVE BANDS OF RED AND WHITE ENAMEL, 0.15 M. LONG ALL AROUND.



PLAN
SCALE 1:20

DETAILS OF STANDARD GRADUATED SETTLEMENT ROD

ITEM 08 : PORTLAND CEMENT CONCRETE PAVEMENT

SCOPE OF WORK

The works include the furnishing of all labor, materials and equipment required for the construction of gravel base course and concrete pavement. The works shall be in accordance with the lines and grades shown on the Drawings and in conformity with the Specifications.

MATERIAL REQUIREMENTS

Cement

Portland cement shall conform to the requirements of the Section "Reinforced Concrete".

Fine Aggregate

The fine aggregate shall be well-graded from coarse to fine and shall conform to the requirements of the Section "Reinforced Concrete".

Coarse Aggregate

Coarse aggregate shall conform to the requirements of the Section "Reinforced Concrete".

Water

Clean, fresh, potable water shall be used for the mixing of all concrete and mortar and shall be from a source approved by the Engineer. Sea water or brackish water shall not be used.

Admixture

Admixture shall only be used with the written permission of the Engineer. If air-entraining agents, water reducing agents, set retarders or strength accelerators are permitted to be used, they shall not be used in greater dosages than those recommended by the manufacturer, or as permitted by the Engineer. The cost shall be considered as already in the Contractor's unit cost bid for concrete.

TIE BARS AND SLIP BARS

Tie bars shall be deformed bars conforming to the requirements specified in AASHTO M 31 or M 42, except that rail steel shall not be used for tie bars that are to be bent and re-straightened during construction, sizes as indicated on the Drawings. The deformed bars shall be Grade 40 and shall be shipped in standard bundles, tagged and marked in accordance with the Code of Standard practice of the Concrete Reinforcement Steel Institute.

Slip bars shall be smooth round steel bars conforming to the requirements specified in AASHTO M 31 or plain M 42.

Joint Filler

Poured filler for joint shall conform to the requirements of AASHTO M173.

EXECUTION

Concrete Class

The concrete for pavement shall satisfy the following requirements:

Minimum 28-day comprehensive strength	:	24 MPa
Minimum Flexural Strength	:	3.8 MPa
Maximum Aggregate size	:	25 mm
Maximum water cement ratio	:	0.52

Proportioning, Consistency and Mixing of Concrete

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

Preparation

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

Formwork Construction

Formwork shall comply with the requirements of the Section "Reinforced Concrete". Forms shall be of steel, of an approved section and shall be straight and of a depth equal to thickness of the pavement at the edge. The base of the forms shall be of sufficient width to provide necessary stability in all directions. The flange braces must extend outward on the base not less than 2/3 the height of the form.

All forms shall be rigidly supported on a bed of thoroughly compacted material during the entire operation of placing and finishing the concrete. They shall be set with their faces vertical so as to produce a surface complying with the required tolerance.

Adjacent lanes may be used in lieu of forms for supporting finishing equipment provided that proper protection is afforded to the concrete of the adjacent lanes to prevent damage, and provided further that the surface of the concrete carrying the finishing equipment does not vary by more than 3mm in each meter length. Adjacent lanes in lieu of forms may not be used until the concrete is at least seven (7) days old. Flanged wheels of the finishing equipment shall not be operated on the concrete surface. The inside edge of supporting wheels of the finishing machine shall not operate closer than 100mm from the edge of the concrete lane.

Alternative to placing forms, slip-forming may be used. Slip-form paving equipment shall be equipped with the traveling side forms of sufficient dimensions, shape and strength to support the concrete laterally for a sufficient length of time during placement to produce pavement of the required cross section. No abrupt changes in longitudinal alignment of the pavement will be permitted. The horizontal deviation shall not exceed 20mm from the proper alignment established by the Engineer.

Joints

All joints, longitudinal, transverse, etc., shall be constructed as shown on the Drawings and shall be clean and free of all foreign material after completion of shoulder work prior to acceptance of the work and in accordance with the following provisions:

Longitudinal and Transverse Contact Joints:

Longitudinal contact joints are joints formed between lanes that are poured separately. Transverse contact joints are joints formed between segments of a lane that are poured separately. Transverse contact joints shall be formed perpendicular to pavement centerline at the end of each day of concrete placing, or where concreting has been stopped for 30 minutes or longer but not nearer than 1.5 meters from sawed contraction joints. All contact joints shall have faces perpendicular to the surface of the pavement. Tie bars of the size, length and spacing shown on the Drawings shall be placed across longitudinal and transverse contact joints.

Placing Concrete

The concrete shall be deposited and spread in order that segregation will not occur and place a uniform layer of concrete whose thickness is approximately 20 mm greater than that required for the finished pavement is placed. Rakes shall not be used for handling concrete.

In order to prevent the introduction into the concrete of earth and other foreign materials, the men whose duties require them to work in the concrete, shall in general, confine their movements to the area already covered with fresh concrete. Whenever it becomes necessary for these men to step out of the concrete, their footwear shall be washed or otherwise thoroughly cleaned before returning to the concrete. Repeated carelessness with regard to this detail will be deemed sufficient cause for removing and replacing such worker.

During the operation of striking off the concrete, a uniform ridge of concrete at least 70 mm in height shall be maintained ahead of the strike-off screed for its entire length. Except when making a construction joint, the finishing machine shall at no time be operated beyond that point where this surplus can be maintained in front of the strike-off screed.

After the first operation of the finishing machine, additional concrete shall be added to all low places and honeycombed spots and the concrete rescreeded. In any rescreeding, a uniform head of concrete shall be maintained ahead of the strike-off for its entire length. Honeycombed spots shall not be eliminated by tamping or grouting.

Workers on the job shall have mobile footbridges at their disposal so that they need not walk on the wet concrete.

In conjunction with the placing and spreading, the concrete shall be thoroughly spaded and vibrated along the forms, bulkhead, and joints.

The internal vibrators shall be of pneumatic, gas-driven, or electric type, and shall operate at a frequency of not less than 3,200 pulsations per minute.

Whenever the placing of the concrete is stopped or suspended for any reason, for a period of 30 minutes or longer, a suitable bulkhead shall be placed so as to produce a vertical transverse joint. If an emergency stop occurs within 2.5 meters of the contraction or an expansion joint the concrete shall be removed back to the joint. When the placing of the concrete is resumed, the bulkhead shall be removed and a new concrete placed and vibrated evenly and solidly against the face of previously deposited concrete. Any concrete

in excess of the amount needed to complete a given section or that has been deposited outside the forms shall not be used in the work.

The Contractor shall provide suitable equipment for protecting the fresh concrete in case of rain, such as screens which will cause the rain water to run off beyond the edges of the paving, rain proof tarpaulins or other methods approved by the Engineer. The equipment shall be sufficient to shelter from rain all areas equal to that paved in two hours of work.

Finishing Concrete

The concrete shall be compacted and finished by a mechanical, self-propelled finishing machine of approved type, having two independently operated screeds. If a machine possessing only one screed is approved, the screed will not be less than 450 mm wide and shall be equipped with compensating springs to minimize the effect of the momentum of the screed on the side forms. The number of driving wheels, the weight of the machine and the power of the motor shall be so coordinated as to prevent slippage. The top of the forms and the surface of the finishing machine wheels shall be kept free from concrete or dirt.

The machine shall at all times be in first-class mechanical condition and shall be capable of compacting and finishing the concrete are herein described. Any machine which causes displacement of the side forms from the line or grade to which they have been properly set, or causes undue delay due to mechanical difficulties, shall be removed from the work and replaced by a machine meeting the Specifications.

The finishing machine shall be operated over each section of pavement two or more times and at such intervals as will produce the desired results. Generally, two passes of the finishing machine are considered the maximum desirable.

The concrete shall be vibrated, compacted, and finished by a vibratory finishing machine. The vibratory machine shall meet the requirements for ordinary finishing, and shall be one of the following type:

1. The machine shall have two independently operated screeds; the front screed shall be equipped with vibratory units with a frequency of not less than 3,500 pulsations per minute. There shall be not less than one vibratory unit for each 2.5 meters length or portion thereof, of vibratory screed surface. The front screed shall not be less than 300mm wide and shall be equipped with a "bull nose" front edge built on a radius of not less than 50mm. This type of vibratory finishing machine shall be operated in such manner that each section of pavement will receive at least one vibratory pass, but not more than two passes, unless otherwise directed, or ;

2. The machine shall be equipped with an independently operated vibratory "pan" (or pans) and two (2) independently operated screeds, the "pan" shall be mounted in a manner that will permit it to come in contact with the forms and will permit vibration of the full width of lane simultaneously.

   There shall be not less than one vibratory unit for each 2 m. length or portion thereof, of vibrating pan surface. The vibratory units in any individual pan shall be synchronized and have a frequency of not less than 3,500 pulsations per minute. The front screed shall be capable of operating in a position that will strike off the concrete at a sufficient height above the top of the forms to allow for proper compaction with the vibrating pan. This type of vibratory finishing machine shall be operated in such manner than each section of pavement will receive at least one vibratory pass but not more than two passes, unless otherwise directed.

After the final pass of the finishing machine and when the concrete has started to dry, the surface of the pavement shall be finished with an approved longitudinal float. The float may be operated either manually or by mechanical means. The float may be either of wood or metal shall be straight and smooth and light in weight so as not to displace or sink into the concrete surface.

To be effective, the float shall be at least 300mm wide and 3m long. When manually operated, the float shall be moved from edge to edge with a wiping motion and advance one (1) meter or more.

The succeeding trip shall overlap the previous trip. A light smoothing lute at least 3 meters long may be used provided approved by the Engineer.

The surface of the pavement shall be tested by the Contractor, before the final belting, with an approved standard straightedge 3 meter in length. Irregularities so detected shall be corrected immediately. Special attention shall be given to the concrete adjacent to transverse joints to insure that the edges thereof are not above the grade specified or the adjacent concrete below grade. All depressions or projections shall be corrected before any initial set has developed in the concrete.

After the concrete has been brought to the required grade, contour and smoothness, it shall be finished by passing over the concrete a drag of one or two burlap clothes, which give the surface the required roughness. The vehicles used to carry these cloths may be independent of the concrete-laying machine or may be incorporated with it and may be operated either by hand or mechanically.

Hand finishing will be permitted only on variable width sections of the pavement and other places where the use of the finishing machine would be impractical. Hand finishing shall be accomplished by means of the hand-operated strike-off template of either steel or steel-shod wood construction. The striking template shall be operated forward with a combined longitudinal and transverse motion and shall be so manipulated that neither end will be raised off the side forms. A similar tamper shall be used for tamping the concrete.

As soon as the concrete has attained its initial set, the edges of the pavement, the longitudinal joints, the construction dummy and expansion joints not sawn shall be carefully finished with an edging tool having radius of at least 5mm. The tools, the special accessories for cutting impressed joints and methods of workmanship shall be such as will produce a joint whose edges are of the same quality of concrete as the other portion of the pavement. Methods and workmanship which make use of excess mortar or grout in this area shall be eliminated. Unnecessary tool marks shall be eliminated during work, and the edges left smooth and true to line.

Striking Forms

Forms shall remain in place at least 12 hours after the concrete has been placed. When working conditions are such that the early strength gain of the concrete is delayed, the forms shall remain in place for a longer period, as directed by the Engineer. Bars or heavy load shall not be used against the concrete when still in the forms. Any damage to concrete resulting from form removal shall be repaired promptly by the Contractor as directed by the Engineer without any additional payment to the Contractor.

Curing Concrete

Unless otherwise ordered by the Engineer, curing of concrete shall be done by any method specified in the Section "Reinforced Concrete".

Cleaning and Sealing Joints

After completion of the required curing and before opening of the pavement to traffic, all joints shall be thoroughly cleaned of all concrete aggregate fragments or other materials.

After removal of side forms, the ends at transverse expansion joints at the edges of the pavement shall be carefully cleaned of any concrete within the expansion spaces for the entire depth of slab, care being taken not to injure the ends of the joints. Expansion and contraction joints shall then be poured with a hot joint sealer to the depth as indicated on the Drawings. Joint sealer shall be poured using approved hand pouring pots, with liquid at a temperature not less than that recommended by the approved manufacturer.

Opening to Traffic

The pavement shall be closed to traffic, including the vehicles of the Contractor, for a period of 10 days after the concrete is placed or longer if in the opinion of the Engineer, the weather conditions make it necessary to extend this time. The Contractor shall furnish, place and maintain satisfactory barricades and lights as directed, to exclude all traffic from the pavement.

Any damage to the pavement due to traffic shall be repaired or replaced at the expense of the Contractor. Paving mixers, mechanical concrete spreaders and finishers and other heavy paving equipment shall not be operated on completed concrete lanes in order to construct alternate lanes until after the regular curing period is completed. Even then, planks shall be laid on the finished pavement or other precautions taken to prevent damage to the concrete pavement.

Pavement Smoothness, Thickness and Tolerance

Portland cement concrete pavement shall be constructed to the designed level and transverse slope shown on the Drawing. The allowable tolerance shall be as listed hereunder:

1.	Permitted variation from design thickness of layer	+ - 5mm
2.	Permitted variation from design level of surface	+ - 5mm

The thickness of the pavement will be determined by measurement of cores from the completed pavement in accordance with AASHTO T 148.

The completed pavement shall be accepted on a lot basis. A lot shall be considered as 2,500 sq.m of pavement. The last unit in each slab constitutes a lot in itself when its length is at least ½ of the normal lot length. If the length of the last unit is shorter than ½ of the normal lot length, it shall be included in the previous lot.

Other areas such as intersections, entrances, crossovers, ramp, etc., will be grouped together to form a lot. Small irregular areas may be included with other unit areas to form a lot.

ITEM 09 : DRAINAGE WORKS

SCOPE OF WORK

The works shall consist of excavation, backfilling and construction of lateral drains, construction of manholes, reconnection to existing lateral and other related works in accordance with the dimensions, size, elevation and grade as shown on the drawing and shall conform with the Specification.

At least thirty (30) days before the start of any construction related to drainage works, the Contractor shall submit to the Engineer for his approval, shop drawings of the drainage work he intends to construct. The shop drawings shall include the materials and the general method of installation he intends to employ.

MATERIAL REQUIREMENTS

SELECTED FILL

Fill shall be in accordance with Item "Reclamation and Fill".

CRUSHED AGGREGATE BASE COURSE

Gravel base course shall be in accordance with Item "Crushed Aggregate Base Course".

CONCRETE

Mixing/Casting and steel reinforcements shall be in accordance with Item "Reinforced Concrete" while the dimensions shall be as shown on the Drawings.

CEMENT MORTAR

Cement mortar shall consist of one part portland cement to two parts of fine aggregate with water added as necessary to obtain the required consistency.

REINFORCED CONCRETE PIPE

The fabrication of reinforced concrete pipes shall conform to the Specifications of ASTM C-76. The Engineer reserves the right to inspect and test the pipe delivered for intended purpose. Defects that are discovered after acceptance of delivery of the pipe but before installation shall be a cause for rejection.

Reinforced steel bar for pipe shall be in accordance with Item "Reinforced Concrete" while concrete to be used shall be 4,000 psi.

EXECUTION

EARTHWORKS

All earthworks for concrete pipe culvert shall conform to the lines, grades and elevations shown on the drawings or as directed by the Engineer.

The lateral drain shall be excavated to the depth, grade and width established by the Engineer. The bedding surface shall provide a firm foundation of uniform density throughout the entire length. Soft, spongy, or otherwise unstable material encountered that will not provide a firm foundation for the concrete drainage shall be removed to the full width of the trenches and replaced by suitable

material to a depth of not less than 30 cm. 100mm thick gravel bedding shall be used as foundation or otherwise as specified.

PIPE LAYING

The pipe shall be tested for water-tightness of joints before backfilling the trench. Unsatisfactory work shall be corrected without additional cost to the PPA. The collar shall have set sufficiently prior to backfilling.

LATERAL DRAIN

Concrete cover and the existing steel gratings shall be set to the required elevations as shown on the drawings to fit the adjoining surfaces and shall be installed after the adjoining concrete is struck off and finished, and the fit on the frames shall be such that there is no rocking.

All completed structures shall be thoroughly cleaned of any accumulations of silts, debris or foreign matter of any kind, until finally accepted and put into service.

CATCH BASIN INLETS, MANHOLES AND OUTLETS

Lid frames shall be set to the required elevations as shown on the drawings to fit the adjoining surfaces. Lids shall be installed after the adjoining concrete is struck off and finished, and the fit on the frames shall be such that there is no rocking.

Where reconstruction of existing catch basin inlets, manholes, outlets, or similar structures are indicated, the work shall be in accordance to the details and elevations as shown on the drawings, including re-installation of existing metal frames, grates and lids, or replacing of concrete covers instead of grates that may have been lost or found lacking. All completed structures shall be thoroughly cleaned of any accumulations of silts, debris or foreign matter of any kind, until finally accepted and put into service.

FIELD DENSITY TEST

Field Density tests to determine the percent of compaction of the fill material shall be conducted until a field density of at least 95 percent of the maximum dry density in accordance with AASHTO T180, Method D has been achieved. In place density determination shall be made in accordance with AASHTO T191.

ITEM 10 : PILING WORKS (PRE-STRESSED CONCRETE PILES)

SCOPE OF WORK

This section covers the minimum requirements for the fabrication, hauling, spotting, driving and finishing of all foundation piles to be used in wharves/piers/platforms.

The Contractor may however, adopt, in addition to this minimum requirements additional provisions as may be necessary to insure the successful prosecution of the work related to foundation piling.

METHOD STATEMENT

Before the commencement of any piling works, the Contractor shall submit (allowing sufficient time for consideration) to the Engineer for approval a Safety Policy and a Method Statement which shall include the following information:

1. Program of Works detailing sequence and timing of individual portions of works.

2. Maximum proposed lead at any stage of driving between a pile and its neighbor and the limitations of same if hard driving is encountered.

3. Contingency plan in the event of encountering obstructions or reaching driving refusal to minimize disruption/delay especially when using pitch and drive methods.

MATERIAL REQUIREMENTS

TYPE OF FOUNDATION PILES

Pre-stressed concrete foundation piles to be used shall be in accordance with the design as shown on the Drawings and called for in the proposal.

PRE-STRESSED CONCRETE PILES

Pre-stressed concrete piles shall be constructed in accordance with the standard practice employed for the particular system specified and as directed by the Engineer subject to the following clauses.

1. Pre-stressed concrete piles shall be of readymade products of approved fabricator regularly engaged in the production of pre-stressed concrete piles.

2. If an alternative system of pre-stressing to that shown in the Drawings is proposed by the Contractor, full details, procedures and explanations shall be submitted in writing to the Engineer for his approval. When approved for the work, the provisions of this Specification and such other provisions as he may require shall be fully satisfied.

3. Concrete strength, high tension wires/strands, reinforcing bars to be used for pre-stressed concrete work shall be as specified in the Drawings.

4. The Contractor shall submit the casting method including pre-stressing, application of stress and casting schedule and shall obtain the approval of the Engineer before commencement of fabrication of the piles.

5. The Contractor shall arrange for the Engineer to have free access to the place of manufacture of the piles.

6. Piles shall be cast on a horizontal platform in approved steel moulds and details of the formwork and methods of concreting shall be as specified. The concreting of each pile shall be completed on one continuous operation and no interruption shall be permitted.

   The pile butt must be formed truly square to the axis of the pile. Provision for standard splicing shall be provided unless otherwise ordered by the Engineer.

7. Anchorages shall be made from steel of a suitable quality to withstand permanently the forces imposed upon them, and shall in general be in accordance with the normal practice of the proprietors of the pre-stressing system in use.

8. Application of stress, grouting of pre-stressing cables, protection of pre-stressing cable anchorages and other necessary steps to complete the pre-stressing process shall conform to the standard practice of the pre-stressing system in use or as directed by the Engineer.

9. When the stress has been transferred to the pile, the pile shall exhibit no curvature in its length on any face greater than 3 millimeters deviation along a chord of 15 meters (1 in 500).

10. Pre-cast pre-stressed units shall be lifted only by lifting holes/hook as indicated in the Drawings, or when not provided can be lifted by slings placed securely at corresponding points. Units shall be kept in the upright position at all times and shock shall be avoided. Any unit considered by the Engineer to have become sub-standard in any way shall be rejected and replaced by an acceptable unit.

11. Each pre-stressed member is to be uniquely and permanently marked to show its type, date of casting, length of pile and any control markings as ordered by the Engineer

12. Forms shall conform to the geometry of the pile with the provision of chamfer as shown on the Drawings.

13. Not less than five (5) cylindrical specimens shall be made for each casting batch of which at least two (2) shall be reserved for 28-day test, one (1) for 7-day, one (1) for 14-day, and one (1) test prior to lifting of pre-stressed concrete piles from the casting bed. Lifting of piles shall only be done if the result of the compressive strength has reached at least 60% of the specified compressive strength.

14. Wires/strands specifications shall be in accordance with ASTM A 416.

EXECUTION

HANDLING OF PILES

All piles shall be carefully lifted at the location of the lifting points as indicated in the Drawings. Other practical and convenient methods may be used subject to the approval of the Engineer.

DRIVING OF PILES

A diesel pile hammer shall be used for driving the pre-stressed concrete piles.

The required weight of ram for the diesel pile hammer is 3.5 tons.

Piles driven shall be held firmly in position in axial alignment with the hammer by means of leads of adequate length. Approved cushions shall be provided to the pile butts.

PILE SPLICING

General Provision

1. The alignment of piles shall be plumb and the length of upper and lower segment shall be in accordance in the approved plans.

2. The splice shall be embedded at least 4m from the design depth elevation.

Surface Preparation

Concrete piles to be bonded must be thoroughly cleaned, free of dirt, paint, grease, oil, curing compound and other contaminants. The concrete surface must be dry. Clean the dowels with steel brush to removed rust and other impurities. Blow compressed air to the dowel holes.

Pile Splicing Epoxy

Piling splicing epoxy is a two components, low viscosity, rapid cure, chemical resistant epoxy with high physical strength.

Preparation and Application of Epoxy Mortar

Mixing and ratio of pile splicing epoxy and dry silica sand, application and curing of epoxy mortar shall refer to product manual.

Compressive Strength

The compressive strength of epoxy mortar (Pile Splicing Epoxy + Dry Silica Sand) shall be at least 1.2 times the design compressive strength of pile or 6,000psi.

Mechanical Properties of Epoxy

Cured state at 27° C (80° F) for 24 hours

Mechanical Properties	**Specification (Test Methods)**
Ultimate Tensile Strength	ASTM D 638
Ultimate Flexural Strength	ASTM D 790
Hardness	ASTM D 2240
Compressive Strength at 1 hour cure	ASTM D 695
Compressive Strength with Silica Sand	**ASTM D 695**

PILE CHIPPING

Each pile shall be chipped-off to required elevation as indicated in the drawing. The contractor shall ensure that no damaged/cracked on the main pile will occurred after each chipping. Reinforcement from driven piles (dowels and strand) shall not be cut and will be incorporated to the construction of deck. Splicing of dowels are allowed in case of pile cutting due to early refusal.

BEARING POWER OF PILES

Each pile shall be driven to attain not less than the required minimum bearing power shown in the pile schedule, as determined by the Hiley's Formula as follows:

For Diesel Pile Hammer : $$R = \frac{1}{6} \times \frac{2WH}{S + 2.54}$$

INTERRUPTED DRIVING

When driving is stopped before final penetration is reached and/or refusal is attained, the record of pile penetration shall be taken only after a minimum of 30 cm. (12 in.) total penetration has been obtained on resumption of driving.

ALIGNMENT TOLERANCE

Piles driven shall be within the allowable tolerance in alignment of 10 cm. (4 in.) in any direction.

DAMAGED AND MISDRIVEN PILES

1. Piles shall not be more than 10 cm. (4 in.) out of place at cut-off level. All vertical piles shall not be more than 2% out of plumb.

2. Any pile damaged by improper driving or driven out of its proper location, or driven out of elevation fixed on the plans, shall be corrected correspondingly at the Contractor's expense by any of the following methods:

   a. Withdrawal of the pile and replacement by a new pile.

   b. Driving a second pile adjacent to the defective one.

   c. Splicing an additional length.

The method to be adopted in each case shall be at the discretion of the Engineer.

OBSTRUCTION

Where boulders or other obstructions make it impossible to drive certain piles in the location shown and to the required bearing strata, the Engineer may order additional pile or piles driven at other suitable location.

RECORDS

The Contractor shall keep records of each pile driven and shall furnish the Engineer two (2) signed typewritten/computerized copies. The records shall show the number of blows per 0.50 m. of initial penetration taken from the free fall elevation of the pile down to penetration depth of 5.0 m., the penetration under the last 10 blows, and the calculated safe load according to the Hiley's Formula as stated in bearing power of piles.

ITEM 11 : CONSTRUCTION JOINTS

SCOPE OF WORK

This item shall consist of the manufacturing and installation of construction joints / expansion joints in accordance with the details, and at the locations, lines, grades and dimensions shown in the drawings.

MATERIAL REQUIREMENTS

1. All construction joints / expansion joints shall be hot-dipped galvanized inside and out in accordance with international standards for galvanizing BS EN1460.

2. Painted finish shall be rejected.

3. All steel gratings and angle bars for construction joints / expansion joints shall be hot-dipped galvanized except for the nuts, washers and bolts which shall be stainless steel.

4. Welding shall be in accordance with the AWS Code and as herein specified or any other welding standard, approved by the Engineer.

The Contractor shall be required to submit test certificates for steel materials for the construction / expansion joints joints used in its manufacture; and for hot-dip galvanizing which shall meet or exceed the specifications under "Zinc Coating".

EXECUTION

DELIVERY, STORAGE AND INSTALLATION

1. Upon delivery at site, the hot-dipped galvanized construction joints / expansion joints shall not be subjected to the following activities:

   a. Re-fabrication
   b. Cutting
   c. Grinding
   d. Welding
   e. Sawing
   f. Any hot works or similar activities

2. Stainless steel nuts and bolts may be tack welded using stainless steel welding rods.

3. The construction joints / expansion joints shall not be exposed to sea water and other corrosive chemicals or
   substances prior to installation.

ITEM 12 : ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL

SCOPE OF WORK

This specification covers the requirements for zinc coating (galvanizing) by the hot-dip process on iron and steel products made from rolled pressed and forged shapes, casting, plates, bars and strips.

This specification covers both fabricated and un-fabricated products, for example, assembled steel products, structural steel fabrications, large tubes already bent or welded before galvanizing, and wire work fabricated from uncoated steel wire. It also covers steel forgings and iron castings incorporated into pieces fabricated before galvanizing or which are too large to be centrifuged (or otherwise handled to remove excess galvanizing bath metal).

MATERIAL REQUIREMENTS

STEEL OR IRON

The specification, grade or designation, and type and degree of surface contamination of the iron or steel in articles to be galvanized shall be supplied by the purchaser to the hot-dip galvanizer prior to galvanizing.

The presence in steels and weld metal, in certain percentages, of some elements such as silicon, carbon and phosphorus tends to accelerate the growth of the zinc-iron alloy layer so that the coating may have a matte finish with a little or no outer zinc layer.

EXECUTION

FABRICATION

The design and fabrication of the product to be galvanized shall be in accordance to the plans and specifications. ASTM Practices A 143, A 384 and A 385 provide guidance for steel fabrication for optimum hot-dip galvanizing and shall be complied with in both design and fabrication.

CASTINGS

The composition of heat treatment of iron and steel castings shall conform to specifications designated by the purchaser. Some types of castings have been known to show potential problems being embritttled during normal thermal cycle of hot-dip galvanizing. The requirements for malleable iron castings to be galvanized are stipulated in ASTM specification A 47.

ZINC

The zinc used in the galvanizing bath shall conform to ASTM Specification B 6. If a zinc alloy is used as the primary feed to the galvanizing bath, then the base material used to make that alloy shall conform to ASTM Specification B 6.

BATH COMPOSITION

The molten metal in the working volume of the galvanizing bath shall contain not less than an average value of 98.0% zinc by weight.

COATING PROPERTIES

Table 1 – Minimum Average Coating Thickness Grade by Material Category

Material Category	All Specimens Tested Steel Thickness Range (Measured), mm (in.)				
	< 1/16 (<1.6)	1/16 to < 1/8 (1.6 to < 3.2)	1/8 to < 3/16 (3.2 to 4.8)	> 3/16 to < 1/4 (> 4.8 to < 6.4)	≥ 1/4 (≥ 6.4)
Structural Shapes & Plate	45	65	75	85	100
Strip and Bar	45	65	75	85	100
Pipe and Tubing	45	45	75	75	75
Wire	35	50	60	65	80

COATING THICKNESS

The average thickness of coating for all specimens tested shall conform to the requirements of Table 1 for the categories and thickness of the material being galvanized. Minimum average thickness of coating for any individual specimen is one coating grade less than that required in Table 1. Where products consisting of various material thicknesses or categories are galvanized, the coating thickness grades of each thickness range and material category of material shall be shown in Table 1. The specification of coating thickness heavier than those required by Table 1 shall be subject to mutual agreement between the galvanizer and Engineer.

For articles whose surface area is greater than 100,000 mm^2 (160 $in.^2$) (multi-specimen articles), each test article in the sample must meet the appropriate minimum average coating thickness grade requirements of Table 1. Each specimen coating thickness grade comprising that overall average for each test article shall average not less than one coating grade below that required in Table 1.

For articles whose surface area is equal to or less than 100,000 mm^2 (160 $in.^2$) (single-specimen articles), the average of all test articles in the sample must meet the appropriate minimum average coating thickness grade requirements of Table 1. For each test article, its specimen coating thickness shall not be less than one coating grade below that required in Table 1.

No individual measurement or cluster of measurements at the same general location on a test specimen shall be cause for rejection under this specification provided that when those measurements are averaged with the other dispersed measurements to determine the specimen coating thickness grade for that specimen, the requirements of the above specifications as appropriate are met.

The coating thickness grades in Table 1 represent the minimum value obtainable with a high level of confidence for the ranges typically found in each material category. While most coating thicknesses will be in excess of those values, some materials in each category may be less reactive (for example, because of chemistry or surface condition) than other materials of the steel category spectrum. Therefore, some articles may have a coating grade at or close to the minimum requirements shown in Table 1. In such cases, the precision and accuracy of the coating thickness measuring technique should be taken into consideration when rejecting such articles for coating thickness below that is required by this specification.

FINISH

The coating shall be continuous (except as provided below), and as reasonably smooth and uniform in thickness as the weight size and shape of the item. Except for local excess coating thickness which would interfere with the use of the product or make it dangerous to handle (edge tears or spikes), rejection for non-uniform coating shall be made only for plainly visible excess coating not related to design factors such as holes, joints, or special drainage problems. Since surface smoothness is a relative term, minor roughness that does not interfere with the intended use of the product, or roughness that is related to the as-received (un-galvanized) surface condition, steel chemistry to zinc shall not be grounds for rejection.

Surfaces that remain uncoated after galvanizing may be renovated in accordance with the methods in ASTM Practice A 780 provided that the following conditions are met:

1. Each area subject to renovation shall be 25mm (1 in.) or less in its narrowest dimension.

2. The total area subject to renovation on each article shall be no more than ½ of 1% of the accessible surface area to be coated on that article, or 22,500mm^2 (36 in.^{2}) per ton of piece weight, whichever is less. Inaccessible surface areas are those which cannot be reached for appropriate surface preparation and application of repair materials as described in ASTM Practice A 780.

3. The thickness of renovation shall be that is required by the thickness grade for the appropriate material category and thickness range in Table 1 in accordance with the coating thickness requirements, except that for renovation using zinc paints, the thickness of renovation shall be 50% higher than that required by table 1, but not greater than 0.0254mm (4.0 mils).

4. When areas requiring renovation exceed the criteria previously provide, or are inaccessible for repair, the coating shall be rejected.

THREADED COMPONENTS IN ASSEMBLIES

The zinc coating on external threads shall not be subjected to a cutting, rolling or finishing tool operation, unless specifically authorized by the purchaser. Internal threads may be tapped or retapped after galvanizing. Coatings shall conform to the requirements of ASTM Specification A 153/A 153 M.

APPEARANCE

Upon shipment from the galvanizing facility, galvanized articles shall be free from uncoated areas, blisters, flux deposits and gross dross inclusions. Lumps, projections, globules or heavy deposits of zinc which will interfere with the intended use of the material will not be permitted. Plain holes of 12.5mm (1/2 in.) diameter or more shall be clean and reasonably free from excess zinc. Marks in the zinc coating caused by tongs or other items used in handling the article during the galvanizing operation shall not be cause for rejection unless such marks have exposed the base metal, and the bare metal areas exceed the criteria provided in number 1 and 2 of Subsection "Finish".

Whenever dross is present in a form other than finely dispersed pimples in the coating and is present in such amount as to be susceptible to mechanical damage, it will be considered as "gross".

ADHERENCE

The zinc coating shall withstand handling consistent with the nature and thickness of the coating and the normal use of the article, without peeling or flanking. Although some material may be formed after galvanizing, in general the zinc coating on the articles covered by this specification is too heavy to permit severe bonding without damaging the coating.

SAMPLING

A lot is a unit of production or shipment from which a sample may be taken for testing. Unless otherwise agreed upon between the galvanizer and the purchaser, or established within this specification, the lot shall be as follows:

1. For testing at a galvanizer's facility, a lot is one or more articles of the same type and size comprising a single order or a single delivery load, whichever is smaller, or any number of articles identified as a lot by the galvanizer, when these have been galvanized within a single production shift and in the same bath.

2. For test by the purchaser after delivery, the lot consists of the single order or the single delivery load, whichever is smaller, unless the lot identify, established in accordance with the above, is maintained and clearly indicated in the shipment by the galvanizer.

The method of selection and number of test specimens shall be agreed upon between the galvanizer and the purchaser. Otherwise, the test specimens shall be selected random from each lot. In this case, the minimum number of specimens from each lot shall be as follows:

Number of Pieces in Lot	Number of Specimens
3 or less	All
4 to 500	3
501 to 1,200	5
1,201 to 3,200	8
3,201 to 10,000	13
10,001 and over	20

A test specimen which fails to conform to any requirement of this specifications shall not be used to determine the conformance to other requirements.

TEST REQUIREMENTS

Magnetic Thickness Measurements:

The thickness of the coating shall be determined by magnetic thickness gauge measurements in accordance with ASTM Practice E 376. For each specimen, five or more measurements shall be made at points widely dispersed throughout the volume occupied by the specimen so as to represent as much as practical, the entire surface area of the test specimen. The average of the five or more measurements thus made for each specimen is the specimen coating thickness.

For articles whose surface area is greater than 100,000 mm^2 (160 in^2), in the average of the three specimen coating thickness grades comprising each test article is the average coating thickness for that test article. A specimen must be evaluated for each steel category and material thickness within the requirements for each specimen of the test article

For articles whose surface area is equal to or less than 100,000 mm^2 (160 in^2), the average of all specimen coating thickness grades is the average coating thickness for the sample.

The use of magnetic measurement method is appropriate for larger articles, and may be appropriate for smaller articles when such is practical using ASTM Practice E 376.

Stripping Method

The average weight of coating may be determined by stripping a test article, a specimen removed from a test article, or group of test articles in the case of very small items such as nails, etc., in accordance with Test method ASTM A 90/A 90m. The weight of coating per unit area thus determined is converted to equivalent coating thickness values in accordance with Table 2, Coating Thickness Grade (rounding up or down as appropriate). The thickness of coating thus obtained is the test article coating thickness, or in the case of a specimen removed from a test article, is the specimen average coating thickness.

Table 2 – Coating Thickness Grade [A]

Coating Grade	mils	oz/ft^2	µm	g/m^2
35	1.4	0.8	35	245
40	1.4	1.0	45	320
50	2.0	1.2	50	355
55	2.2	1.3	55	390
60	2.4	1.4	60	425
65	2.6	1.5	65	460
75	3.0	1.7	75	530
80	3.1	1.9	80	565
85	3.3	2.0	85	600
100	3.9	2.3	100	705

[A] Conversions in Table 2 are based on the metric thickness value equivalents from the next earlier version, using conversion factors consistent with Table X 2.1 in Specification A 653/A 653M, rounded to the nearest 5 µm (0.0002 in.). The conversion factors used are: mils = µm x 0.03937; oz/ft^2 = µm x 0.002316; g/m^2 = µm x 7.067.

Weighing Before or After Galvanizing

The average of coating may be determined by weighing articles before and after galvanizing, subtracting the first weigh from the second and dividing the result by the surface area. The first weigh shall be determined after pickling and drying, and the second after cooling to ambient temperature. The weight of coating per unit area thus determined is converted to equivalent coating thickness values according to Table 2 (rounding up or sown as appropriate). The thickness of coating thus obtained is the test article coating thickness.

Microscopy

The thickness of coating may be determined by cross-sectional and optical measurement in accordance with ASTM Test Method B 487. The thickness thus determined is a point value. No less than five such measurements shall be made at locations on the test article which are as widely dispersed as practical, so as to be representative of the whole surface of the test article. The average of no less than five such measurement is the specimen coating thickness.

Adhesion

Determine adhesion of the zinc coating to the surface of the base metal by cutting or prying with the point of a stout knife, applied with considerable pressure in a manner tending to remove a portion of the coating. The adhesion shall be considered inadequate if the coating flakes off in the form of a layer of the coating so as to expose the base metal in advance of the knifepoint. Do not use testing carried out at edges or corners (points of lowest coating adhesion) to determine adhesion of the coating. Likewise, do not use removal of small particles of the coating by paring or whittling to determine failure.

Embrittlement

Test for embrittlement may be made in accordance with ASTM Practice A 143

The galvanized article should withstand a degree of bending substantially the same as the ungalvanized article. Flaking or spalling of the galvanized coating is not be constructed as anembrittlement failure.

Inspection, Rejection and Retest

The material shall be inspected at the galvanizer's plant prior to shipment. However, by agreement the purchaser may make the tests which govern the acceptance or rejection of the materials in his own laboratory or elsewhere.

When inspection of materials to determine conformity with the visual requirements of Subsection "Finish" warrants rejection of a lot, the galvanizer may sort the lot and submit it once again for acceptance after he has removed any nonconforming articles and replace them with conforming articles.

Materials have been rejected for reasons other than embrittlement may be stripped and regalvanized, and again submitted for inspection and test at which time they shall conform to the requirements of this inspection.

Transport and Storage

Galvanized components shall, wherever possible, be transported and stored under dry, well-ventilated conditions to prevent the formation of wet storage staining.

Either zinc phosphate or chromate passivation treatment after galvanizing may be used to minimize the wet storage staining which may occur on articles unable to be stored in dry, well-ventilated conditions.

Provided the coating thickness complies with the requirements of Subsection "Coating Thickness", no further remedial action is required to the stained areas.

ITEM 13 : MOORING AND FENDERING SYSTEM

SCOPE OF WORK

1. The work includes furnishing of all labor, materials and equipment to complete the installation of mooring bollards and fenders in piers/wharves.

2. The work shall include the supply, transport, handling, storage and installation of fenders systems in the newly constructed piers.

3. The Contractor shall furnish and install the necessary fittings as shown on the drawings and/or specified.

Supplementary parts necessary to complete and install each item of works shall be included whether or not shown or specified. The Contractor shall furnish to relevant trades all anchors, fastenings, inserts, fittings, fixtures or the like to be installed on or required for securing the works.

The Contractor shall submit shop drawings of all fitting works prior to placing orders and commencement of any fabrication.

MATERIAL REQUIREMENTS

MOORING SYSTEM

Designated load capacity of mooring bollards shall be as shown in the drawings, and shall be referred to as the maximum load capacity. The mooring bollards shall be at rupture stage upon reaching the maximum load capacity.

Mooring bollards shall be of the dimensions, weights, capacities and designs as shown in the drawings and shall be fabricated by approved manufacturer with cast steel conforming to the requirements indicated in the plan/drawings, or approved equivalent.

The size of the bolts, nuts and washers shall be in accordance with the specifications provided in the plans/drawings. The anchor plate shall be connected to the holding down bolt as shown in the plans/drawings. All bolts, nuts, washers etc., that are exposed shall be hot-dip galvanized.

Samples of the bolts, nuts, washers and anchor plates shall be submitted to the Engineer for approval before being used in the Works.

The upper part of bollards and base plates which are not embedded in concrete shall be painted. The surface of bollards 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 coated with rust proof paint and finishing paint, which shall be coal-tar epoxy of 120m micron thickness in accordance with JIS K5623 or the approved standard.

Base Steel:

Chemical composition and mechanical properties of base metal to be used for fabrication of mooring bollard and its accessories shall comply with ASTM A36 and other required standard stated therein.

Concrete Foundation :

Concrete foundation for mooring bollards shall conform to the requirements of the Section concerning "Reinforced Concrete".

Visual Inspection :

All mooring bollards delivered to Site shall be inspected by the Engineer for any signs of flaws or defect inimical to usage.

Mill Test Certificates:

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

Test 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 Specifications and the best of workmanship.

FENDER SYSTEM

The rubber fenders should comply with the performance requirements specified in the table provided on the plan/drawings of RDF.

PHYSICAL PROPERTIES OF MATERIALS

The rubber for the fenders shall be of high quality natural rubber, synthetic rubber or mixed rubber blended with carbon black used in the rubber industry and shall have sufficient resilience and anti-ageing, weathering, abrasion, wear and oil resistant properties. The rubber dock fenders shall be free from bubbles, cracks and other harmful defects.

The physical properties of the rubber compound used for the fenders shall comply with the following requirements:

Physical Properties and Test Method

Test Item			Properties	Test Method	
Physical Test	Before Aging	Tensile Strength	160kg/sq.m minimum	Test piece: Dumbell No. 3	ASTM D412
		Elongation	350% minimum		ASTM D1456
		Hardness	76Hs maximum	Spring Type hardness test (Type A)	ASTM D2240
	After Aging	Tensile Strength	Not less than 80% of original value	Aging by air heating: 70±1°C x 96 hours.	ASTM D412
		Elongation			ASTM D1456
		Hardness	Not more than original value +8°		ASTM D2240
	Compression Test		30% maximum	Heat treatment: 70±1°C x 22 hours.	ASTM D395

Note: Equivalent Standards are acceptable.

FITTINGS AND ANCHORAGE

Anchor bolts and connecting hardware shall be fabricated using type of steel specified (ASTM A36) and to the required shapes and sizes shown on the approved plan/drawings.

TESTING, SAMPLING, INSPECTION, ACCEPTANCE, MARKING AND PACKAGING

Testing

Sample rubber dock fenders that shall be incorporated in the project shall be subjected to tests. It shall pass the required energy absorption and reaction force at a certain deflection as indicated in the plan.

The Contractor shall be required to submit test certificates showing compliance to the above requirements. The test certificates shall be certified by an independent testing institute / organization recognized by the Authority.

All units shall be tested for performance. The fender shall be compressed repeatedly three (3) times to the maximum deflection at the speed from 2 to 8 cm. per minute. The load and deflection values shall be recorded with the precision of 0.1tf and 0.5mm respectively. The results shall be plotted in the form of load-deflection-energy absorption curves. The average data obtained in the second and third test loading shall be considered as performance values.

Inspection

All fenders of each type shall be inspected for compliance to specified dimensions and all fenders shall be inspected for any sign of flaw or defect inimical to its use.

All anchor bolts and fittings shall be inspected. The material used for the fabrication of bolts and fittings shall be covered by the manufacturer's certified mill certificate and shall be verified by the Authority.

Acceptance Tolerance

The acceptance tolerance shall be based on the following:

1. Fender Dimension

Length	:	-2% to +4%
Width	:	-2% to +4%
Height	:	-2% to +4%
Thickness	:	-2% to +8%

2. Anchor Bolt Holes in Fender

Diameter of the Hole	:	+2.0mm
Pitch of the Hole	:	+4.0mm

3. Acceptance tolerance for all fenders supplied shall be as follows:

E = Energy absorption,	E ≥ Specified E but not more than 10%
R = Reaction force,	R ≤ Specified R but not more than 10%

Marking

All fender units shall be clearly numbered and marked. Each fender shall have the following markings.

1. Fender type and manufacturer's name or trade mark
2. Production serial number
3. Date of manufacture or its abbreviation
4. Main dimensions
5. Project identification as follows:

Name of Port/Project : _____

Year supplied : _____

Packaging

The fenders shall be packaged on wooden crate or wrapped individually with Polypropylene sheets except when shipped containerized. The bolts and fittings should be placed in crates and suitably treated for protection when transported by sea and stored in port areas.

EXECUTION

MOORING / FENDERING SYSTEM

All units shall be installed at the locations shown on the drawings and as directed by the Engineer.

ITEM 14 : ELECTRICAL WORKS

SCOPE OF WORK

The work to be done shall consist of fabricating, trenching, furnishing, delivering and installing electrical materials/fixtures completed in accordance with all the details of the electrical works as shown on the drawings including materials, labor, tools and equipment and all incidental works as found necessary.

Refer to electrical plans/drawings for location and extent of work involved.

GENERAL REQUIREMENTS

a) All works shall be done in accordance with the requirements of the publications and agencies having jurisdiction, as well as the requirements of the approved standards.

1.	National Fire Protection Association	-	(NFPA)
2.	National Electrical Manufacturer Association	-	(NEMA)
3.	Underwriter Laboratories, Inc.	-	(UL)
4.	Philippine Electrical Code Philippine National Standard	- -	(PEC) (PNS)
5.	Federation Specification: Circuit Breaker, Molded Case, Branch Circuit and Service		
6.	American National Standard Institute	-	(ANSI)
7.	American Society for Testing and Materials	-	(ASTM)
8.	Illuminating Engineering Society	-	(IES)
9.	Light Emitting Diode	-	(LED)

b) The electrical power will be connected to the existing local cooperative supply. The supply voltages shall be 220 volt, single phase (1Ø), and 60 hertz.

c) The Contractor shall employ a licensed Registered Electrical Engineer or Master electrician to perform or to supervise and to conduct the continuous inspection of all electrical work.

d) The Contractor shall first obtain approval from the Authority before procurement, fabrication or delivery of electrical materials to the site. Partial submittals will not be acceptable and will be returned without review. Submittals shall include the Manufacturer's Name, Trade Name, Place of Manufacture, Catalog Model or Number, Nameplate Data, Size, Layout Dimensions, Capacity, Project Specification and Paragraph Reference, Technical Society Publication References and other information necessary to establish contract compliance of each item to be furnished.

e) All excavations fill and backfill and concrete works involved herein, shall be carried to the required elevations and shall conform to the provisions of specification under Earthwork and Concrete Construction of this tender document.

f) The materials and equipment to be furnished shall be standard products of reputable manufacturer engaged in the reproduction of such materials and equipment.

g) All permits and electrical fees required for this work shall be obtained at the expense of the Contractor. The Contractor shall furnish the Engineer-in-Charge, the final Certificates of Inspections and approval from the proper government authorities after the completion of work. The Contractor shall prepare all as- built plans and all other paper works as required by the enforcing authorities.

h) The Contractor shall furnish and install electrical materials as shown in the drawings. A licensed Electrical Engineer or Master Electrician is required to implement the installation of the electrical system. A licensed electrical contractor shall oversee/conduct the installation of the main circuit breaker.

i) Electrical installation shall conform to the requirements of Philippine Electrical Code (PEC) and the other approved standards.

j) The contractor shall install all electrical works with the supervision of the qualified Registered Electrical Engineer (REE) or Master Electrician. All electrical installation applications regardless of capacity and voltage whether new, addition or revision shall be accompanied by electrical plans signed and sealed by a duly licensed Professional Electrical Engineer (PEE).

MATERIAL REQUIREMENTS

All materials shall be brand new and shall be of the approved type meeting all the requirements of the Philippine Electrical Code and bearing the Philippine Standard Agency (PSA) mark.

PRODUCTS

WIRES AND CABLES

The conductor material to be furnished and installed shall be copper wire Heat-Resistant Thermoplastic (THHN/THWN-2). All conductors shall be rated 600 volts insulation and shall be standard for all sizes.

CONDUIT AND FITTINGS

Underground PVC conduit shall be polyvinyl chloride with concrete covered. It shall be manufactured to schedule 40 outside diameter. All fittings and bends shall be solvent bonded using manufacturers recommended product.

LED FLOODLIGHT FIXTURE 100 WATT OR EQUIVALENT

Specifications:

Rated	: 100 Watt LED or equivalent
Color Temperature	: Warm white
Driver	: Bridgelux
Beam Angle	: 120 degrees
IP Grade	: IP 65, Slim Type Series
Lumen	: 9000 -10000 lm
Input Voltage	: AC 100 -277 VAC Meanwell w/ Power Surge Protection

PANEL BOARD

Panel board shall conform to the schedule of panel board as shown on the approved plans with respect to supply characteristics, rating of main lugs or main circuit breaker, number and ratings and capacities of branch circuit breakers.

Panel board shall consist of a factory completed dead front assembly mounted in an enclosing NEMA 3R cabinet consisting of code gauge galvanized sheet steel box with trim and door.

Main circuit breakers for panel board shall have the rating, capacity and poles as shown on the approved plans. Breakers shall be thermal magnetic type solid state-type with interrupting capacity of 10,000 amperes symmetrical minimum. Breaker terminal shall be UL listed as suitable for type of conductor provided. Breaker shall be the bolt-on type (that is, bolted to the current carrying bus). Plug-in circuit breakers are not acceptable

SINGLE ANGLE BAR FLOODLIGHT STEEL TAPERED LAMP POST

Lamp Post shall be 10.0 m ht. single angle bar steel tapered, furnished installed and tested as shown on the approved plans. The post/s shall be dimensioned for a wind velocity of 185 km/hr. It shall be locally fabricated or manufactured. The post shall be Hot –Dipped Galvanized, prime-coated with red lead and shall be painted at site with the final coating preferably aluminum paint to be approved by the Engineer.

EXECUTION

INSTALLATION

Lamp Post shall be installed as shown on the approved plans.

Pole Setting: Depth as shown on the approved plans.

Construction of reinforced concrete lamp post foundation shall be in accordance with the shape and dimensions as shown on the approved plans.

Excavations / backfilling required before /after installation of lamp post with the trench shall conform to the provisions of Earthwork and Concrete construction.

WORKMANSHIP

The work throughout shall be executed in the best and most thorough manner under the direction of and at the satisfaction of the Registered Electrical Engineer or Master Electrician, who will interpret the intent meaning of the drawings and specification and shall have the power to reject any work and materials which in his judgment, are not in full accordance therewith.

TESTING OPERATIONS

When the electrical installation is completed, the Contractor shall test the installed electrical materials and equipment in the presence of Registered Electrical Engineer or Master Electrician. The system shall be free from any defects, shorts or grounds. The Contractor at no extra cost shall furnish all necessary instruments and personnel required for the testing.

GUARANTEE

Upon completion and before final acceptance of the work, the Contractor shall furnish the Engineer a written guarantee stating that all works executed are free from defects on materials and workmanship. The guarantee shall be for a period of one year from the date of the final acceptance. Any work that becomes defective during the said period shall be corrected / replaced by the Contractor at his own expense in a manner satisfactory to the Authority.

ITEM 15 : PROJECT BILLBOARD

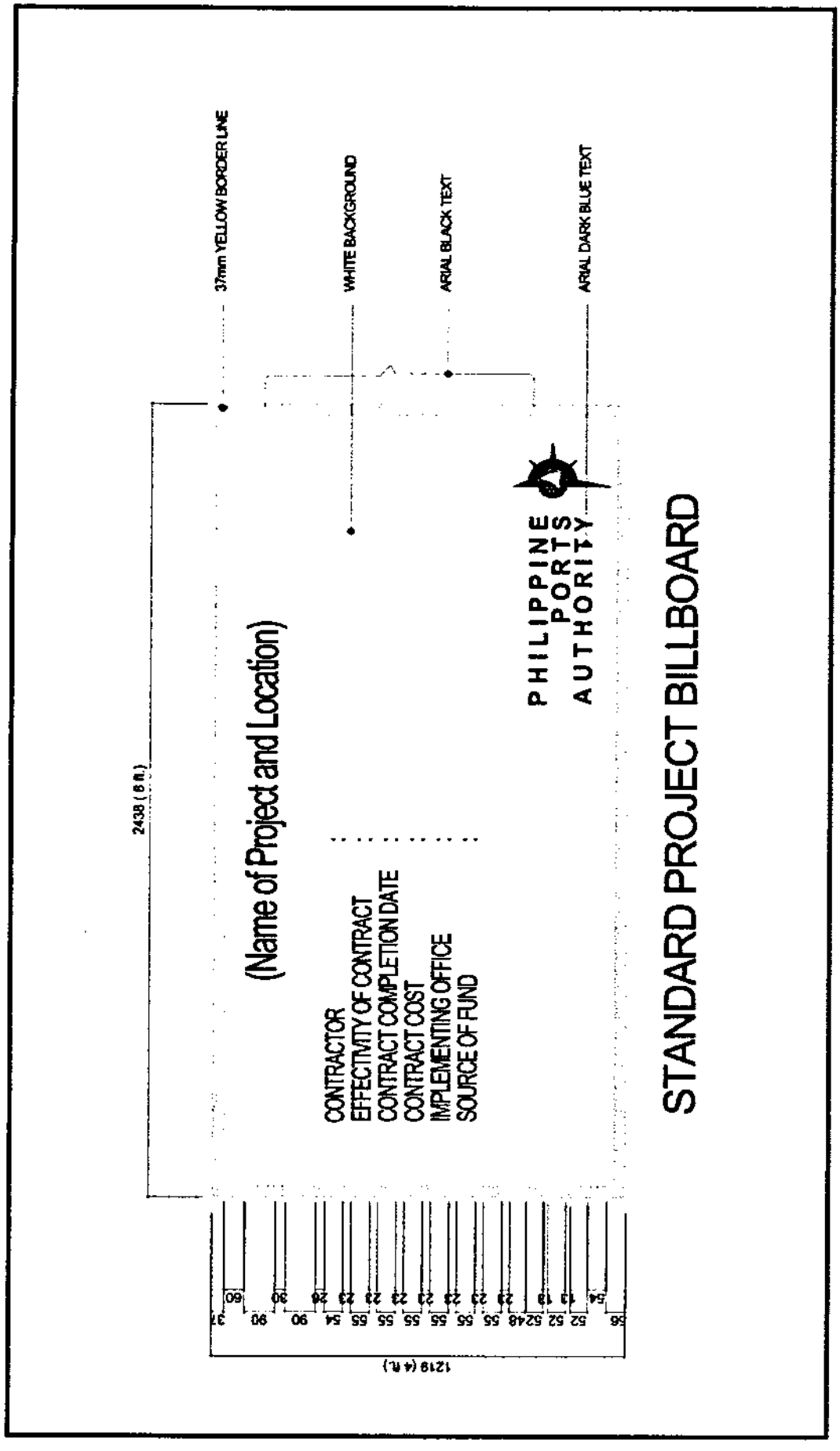
SPECIFICATION

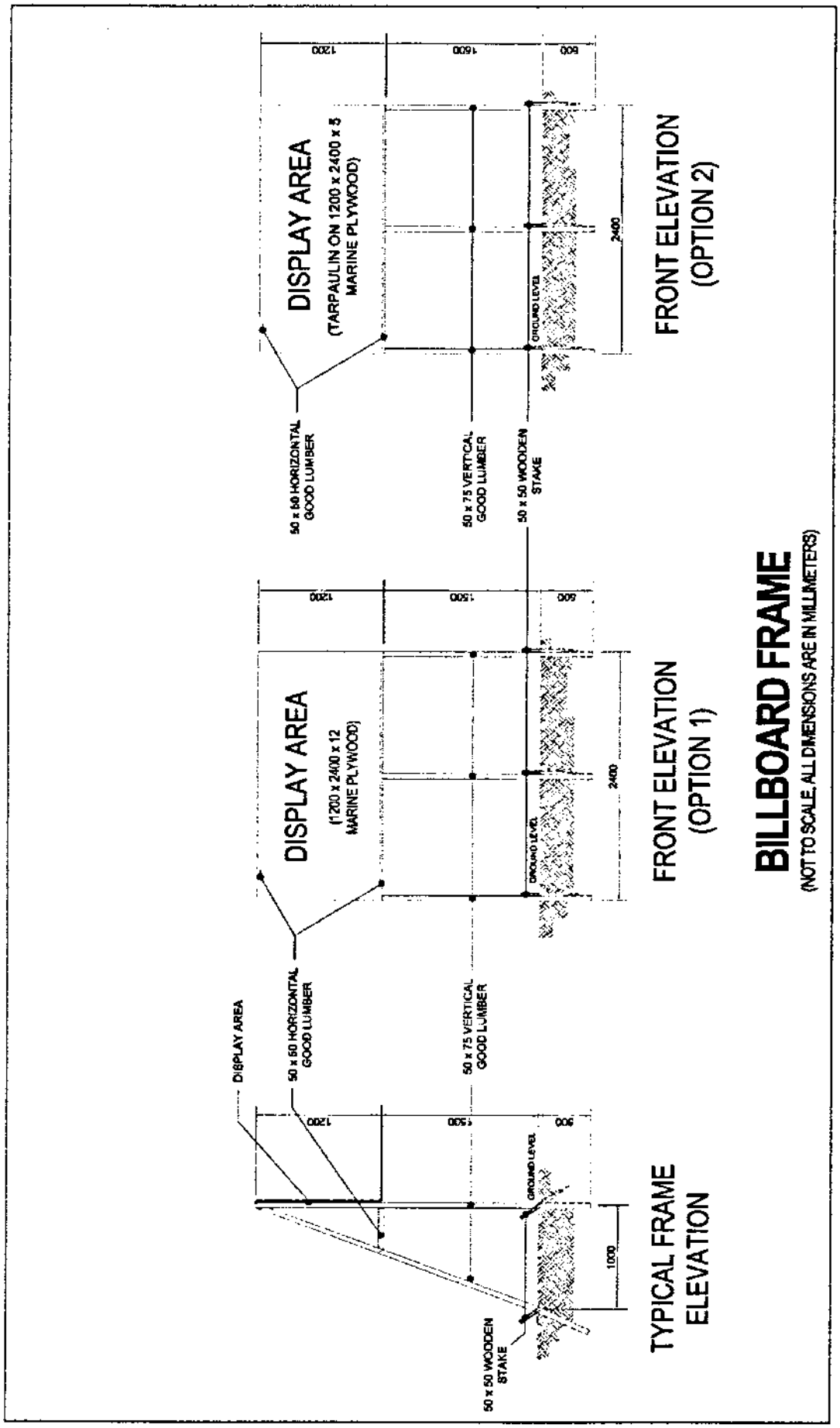
The Project Billboard shall be installed at location(s) designated by the Engineer.

The size and specifications of materials for the standard billboard shall be 4ft. x 8ft. (1,200mm x 2,400mm) using ½ inch (12mm) marine plywood or tarpaulin poster on 3/16 inch (5mm) marine plywood.

Project billboards shall not contain Name(s) and/or picture(s) of any personages.

See attached drawings for further details of the standard billboard.


37mm YELLOW BORDER LINE
WHITE BACKGROUND
ARIAL BLACK TEXT
ARIAL DARK BLUE TEXT
2438 (8 ft.)
(Name of Project and Location)
CONTRACTOR
EFFECTIVITY OF CONTRACT
CONTRACT COMPLETION DATE
CONTRACT COST
IMPLEMENTING OFFICE
SOURCE OF FUND
PHILIPPINE
PORTS
AUTHORITY
STANDARD PROJECT BILLBOARD
1219 (4 ft.)


DISPLAY AREA
(TARPAULIN ON 1200 x 2400 x 5
MARINE PLYWOOD)
50 x 50 HORIZONTAL
GOOD LUMBER
50 x 75 VERTICAL
GOOD LUMBER
50 x 50 WOODEN
STAKE
GROUND LEVEL
1200
1600
600
2400
FRONT ELEVATION
(OPTION 2)
DISPLAY AREA
(1200 x 2400 x 12
MARINE PLYWOOD)
50 x 50 HORIZONTAL
GOOD LUMBER
50 x 75 VERTICAL
GOOD LUMBER
GROUND LEVEL
1200
1500
600
2400
FRONT ELEVATION
(OPTION 1)
DISPLAY AREA
50 x 50 HORIZONTAL
GOOD LUMBER
50 x 75 VERTICAL
GOOD LUMBER
50 x 50 WOODEN
STAKE
GROUND LEVEL
1200
1500
600
1000
TYPICAL FRAME
ELEVATION
BILLBOARD FRAME
(NOT TO SCALE, ALL DIMENSIONS ARE IN MILLIMETERS)

"To all our contractors, suppliers, and service providers, all we ask is for you to

SPEED UP

your contracts and **FINISH**

AHEAD of schedule,

WITHOUT SACRIFICING

QUALITY

of work, and **REASONABLENESS OF COST** agreed upon. Gawin niyo 'yan at hindi tayo maghihiwalay ng landas (Do that and we will not part ways)."

A Message from
DOTr Secretary Arthur Tugade

@DOTrPH @DOTrPH www.dotr.gov.ph

ITEM 16 : SAFETY SIGNAGES AND BARRICADES

DESCRIPTION

This work includes the furnishing and installing of safety signages and barricades in accordance with the specifications and to the details shown below in the drawings, or as directed by the Engineer.

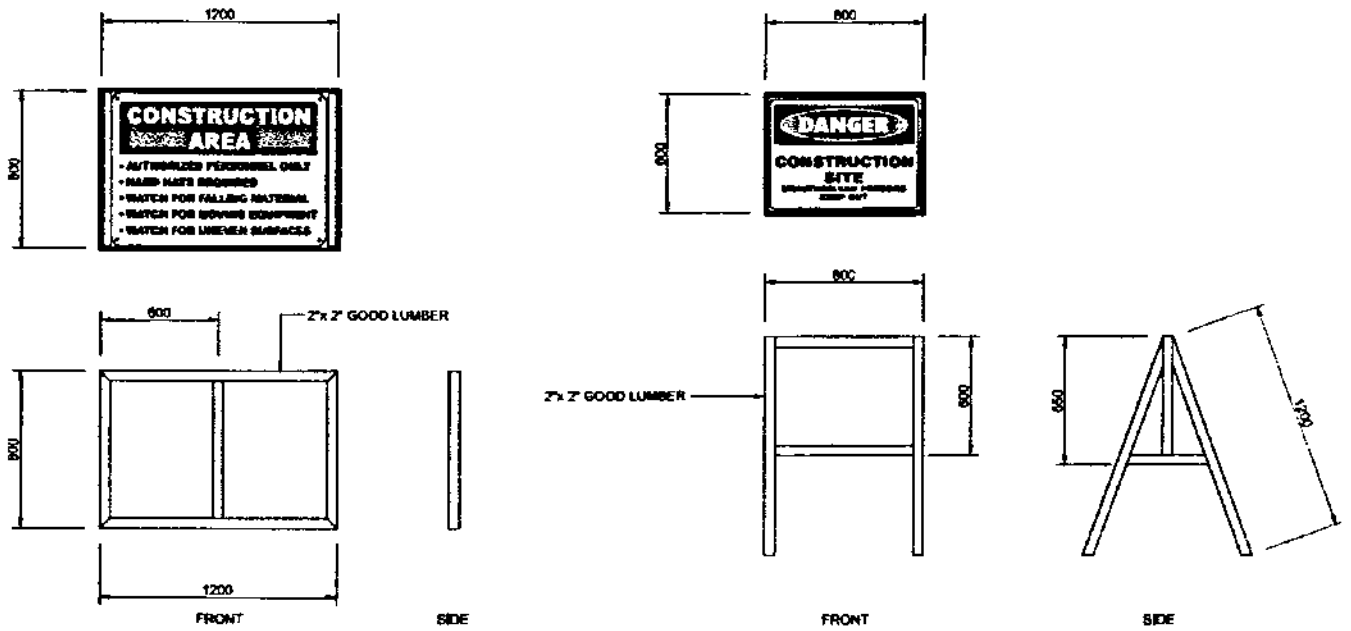
SPECIFICATION

The Signage's and Barricades shall be installed at location(s) designated by the Engineer.

The sizes of the standard signages shall be 2-2/3ft x 4ft (800mm X 1,200mm) for fixed type and 2ft x 2–2/3ft (600mm x 800mm) for mobile type. For barricade standard 2ft x 2–2/3ft (600mm x 800mm) shall be provided.

The materials to be used for signages and barricades are ½ inch (12mm) marine plywood or tarpaulin poster on 2" x 2" (50mm x 50mm) good lumber frame (see drawing below).

The printing or painting shall be the discretion of the Engineer.



STANDARD PLAN FOR SIGNAGES AND BARRICADES

SECTION VII

PROJECT DRAWINGS

SECTION VII

PROJECT DRAWINGS
(SEE ISSUED APPROVED PLANS)

LIST OF DRAWINGS:

1 OF 35	DEVELOPMENT PLAN, VICINTY MAP, GENERAL NOTES, LIST OF DRAWING
2 OF 35	GENERAL PLAN OF RC PIER
3 OF 35	SCHEDULE OF 400mm x 400mm P.S.C. PILES @ RC PIER, GENERAL PILING & FRAMING PLAN @ RC PIER
4 OF 35	SECTION A–A, SECTION B–B
5 OF 35	TYPICAL DETAIL OF PILE CAP FOR COUPLE–BATTER PILES, TYPICAL DETAIL OF PILE CAP FOR VERTICAL PILES, TYPICAL SECTION OF BEAM, TYPICAL SECTION OF CANTILEVER BEAM, TYPICAL TRANSVERSE BEAM REINFORCEMENT OF R.C. PIER, TYPICAL LONGITUDINAL BEAM REINFORCEMENT OF R.C PIER
6 OF 35	GENERAL PLAN OF @ RC PLATFORM–1
7 OF 35	SCHEDULE OF 400mm x 400mm P.S.C. PILES @ RC PLATFORM–1, GENERAL PILING & FRAMING PLAN @ RC PLATFORM–1
8 OF 35	SECTION C–C, SECTION D–D
9 OF 35	GENERAL PLAN OF @ RC PLATFORM–2
10 OF 35	SCHEDULE OF 400mm x 400mm P.S.C. PILES @ RC PLATFORM–2, GENERAL PILING & FRAMING PLAN @ RC PLATFORM–2
11 OF 35	SECTION E–E, SECTION F–F
12 OF 35	DETAIL OF REINFORCEMENT @ R.C. PIER, DETAIL OF BREATHER HOLES @ R.C. DECK, CURTAIN WALL–1, CURTAIN WALL–2,CURTAIN WALL–3, DETAIL OF CONSTRUCTION JOINT, DETAIL E
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14 OF 35	TYPICAL REINFORCEMENT OF FENDER BLOCK, TYPICAL ATTACHMENT OF FENDER, TYPICAL REINFORCEMENT OF MOORING BLOCK
15 OF 35	DETAIL OF ANCHOR BOLT (NORMAL), DETAIL OF RUBBER DOCK FENDER (V–500H X 1500L), DETAIL OF 25–TONS MOORING BOLLARD (TEE–HEAD)
16 OF 35	PILE ELEVATION SHOWING H.T.S. and SPIRALS, PILE ELEVATION SHOWING STIRRUPS AND CAGE BARS, SECTION A, SECTION B SECTION C
17 OF 35	BLOW–UP PLAN OF EXISTING RAMP FLUSHED TO DECK LEVEL, DETAIL OF BUILT–UP SECTIONS FOR EXISTING R.C. PILES, DETAIL OF RETAINING WALL, TYPICAL DETAIL OF BUILT–UP @ EXISTING RETAINING WALL, TYPICAL PAVEMENT DETAIL
18 OF 35	GENERAL PLAN OF RO–RO RAMP NO. 1 AND 2, PILE LAYOUT PLAN FOR RORO RAMP, RO–RO RAMP ELEVATION, SIDE ELEVATION, SCHEDULE OF 400mm x 400mm P.S.C. PILES @ R PIER
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20 OF 35	DETAIL OF BREASTING DOLPHIN
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22 OF 35	GENERAL PLAN OF BACK–UP AREA
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29 OF 35	TYPICAL DETAIL OF R.C. PILES, STANDARD 400mm x 600mm CANTILEVER SR.C. SHEET PILE, CORNER CANTILEVER R.C. SHEET PILE 1, CORNER CANTILEVER R.C. SHEET PILE 2, CORNER CANTILEVER R.C. SHEET PILE 3, 100x100x200x12mm STEEL ANGLE FOR PILE TIP
30 OF 35	DETAIL OF TRENCH GRATE (TG), TRENCH GRATE FRAMING LAYOUT, DETAIL OF CATCH DRAIN MANHOLE, SECTION @ OUTFALL, TYPICAL DETAIL OF LATERAL DRAINAGE
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SECTION VIII

BILL OF QUANTITIES
and
ATTACHMENTS

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO.	1 GENERAL EXPENSES				
1.01	Mobilization, demobilization and cleaning	lot	1		
1.02	Rental of temporary site office and residence for the Engineer and staff	mo.	18		
1.03	Maintain temporary site office and residence for the Engineer and staff	mo.	18		
1.04	Provide Construction Safety and Health Program in the execution of the project	mo.	18		
	TOTAL FOR BILL NO. 1				

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO.	2 CONSTRUCTION OF BACK-UP AREA				
2.01	Chip-off portion of existing R.C. Curb, flush to deck level and smoothen with mortar	l.m.	60		
2.02	Chip-off portion of existing deflector wall, flush to deck level and smoothen with mortar	l.m.	30		
2.03	Supply and deliver to site 400mm x 600mm RC sheet piles	l.m.	209		
2.04	Supply and deliver to site RC corner piles				
	a) RC corner pile - 1	l.m.	11		
	b) RC corner pile - 2	l.m.	11		
	c) RC corner pile - 3	l.m.	11		
2.05	Handle, pitch and drive PSC sheet piles and RC corner piles	l.m.	242		
2.06	Chipping of newly driven PSC sheet piles and RC corner piles up to the required elevation	no.	22		
2.07	Supply and place Sacked concrete for leveling of concrete blocks.	cu.m.	1		
2.08	Supply and install Concrete blocks including lifting handle:				
	a) Concrete block no. 1	no.	1		
	b) Concrete block no. 2	no.	4		
2.09	Supply and install 50mmØ x 11.00m tie rod including accessories	set	4		
2.10	Supply and place gravel bedding for retaining wall and catch drain manhole	cu.m.	11		

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
2.11	Supply and place 3,500psi concrete for anchor block, deflector wall, coping wall, RC curb, retaining wall, lateral drainage and manhole	cu.m.	292		
2.12	Supply & install steel reinforcement for anchor block, deflector wall, coping wall, RC curb, retaining wall, lateral drainage and manhole	kg.	28,781		
2.13	Supply and place 50-100 kg core rocks	cu.m.	2,226		
2.14	Supply and place 1,000 kg armour rocks	cu.m.	1,463		
2.15	Supply & install geotextile fabric	sq.m.	2,202		
2.16	Supply and place sand & gravel fill	cu.m.	9,757		
2.17	Supply, spread & compact selected fill	cu.m.	2,812		
2.18	Supply, spread & compact aggregate base course for back-up area	cu.m.	613		
2.19	Construct portland cement concrete pavement (300mm thk.) including reinforcement and asphalt joint sealer	sq.m.	3,067		
2.20	Supply and install lateral drainage cover including built-up angular frame	l.m.	79		
2.21	Supply and install catch drain manhole cover including built-up angular frame	set	7		
2.22	Supply and lay reinforced concrete pipe (400mm dia.) including concrete mortar and sand bedding	l.m.	1		
	TOTAL FOR BILL NO. 2				

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO.	3 RC PLATFORM 1				
3.01	Chip-off portion of existing R.C. curb, flush to deck level and smoothened with mortar	l.m.	24		
3.02	Supply and deliver to site 400mm x 400mm PSC piles	l.m.	3,112		
3.03	Handle, pitch and drive 400mm x 400mm vertical PSC piles	l.m.	2,232		
3.04	Handle, pitch and drive 400mm x 400mm batter PSC piles	l.m.	880		
3.05	Chipping of newly driven PSC piles up to the required elevation	no.	168		
3.06	Supply and place 3,500psi concrete for the superstructure	cu.m.	452		
3.07	Supply & install steel reinforcement for the superstructure	kg.	86,375		
3.08	Supply and install hot-dipped galvanized angle bar for construction joints including dowel bars	l.m.	130		
	TOTAL FOR BILL NO. 3				

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO.	4 RC PLATFORM 2				
4.01	Chip-off portion of existing R.C. curb, flush to deck level and smoothened with mortar	l.m.	24		
4.02	Supply and deliver to site 400mm x 400mm PSC piles	l.m.	2,932		
4.03	Handle, pitch and drive 400mm x 400mm vertical PSC piles	l.m.	2,052		
4.04	Handle, pitch and drive 400mm x 400mm batter PSC piles	l.m.	880		
4.05	Chipping of newly driven PSC piles up to the required elevation	no.	158		
4.06	Supply and place 3,500psi concrete for the superstructure	cu.m.	421		
4.07	Supply & install steel reinforcement for the superstructure	kg.	78,772		
4.08	Supply and install hot-dipped galvanized angle bar for construction joints including dowel bars	l.m.	177		
	TOTAL FOR BILL NO. 4				

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO.	5 RC PIER				
5.01	Remove existing rubber dock fenders and mooring bollard for re-installation	no.	9		
5.02	Chip-off portion of existing R.C. curb, flush to deck level and smoothened with mortar	l.m.	45		
5.03	Supply and deliver to site 400mm x 400mm PSC piles	l.m.	4,443		
5.04	Handle, pitch and drive 400mm x 400mm vertical PSC piles	l.m.	2,668		
5.05	Handle, pitch and drive 400mm x 400mm batter PSC piles	l.m.	1,775		
5.06	Chipping of newly driven PSC piles up to the required elevation	no.	187		
5.07	Supply and place 3,500psi concrete for the superstructure	cu.m.	490		
5.08	Supply & install steel reinforcement for the superstructure	kg.	89,274		
5.09	Supply and install hot-dipped galvanized angle bar for construction joints including dowel bars	l.m.	100		
5.10	Supply and deliver accessories for the removed mooring bollards	set	4		
5.11	Supply and deliver 25T mooring bollard (T-Head) & accessories	set	3		
5.12	Install mooring bollard including accessories	set	7		
5.13	Supply and deliver accessories for the removed rubber dock fenders	set	5		

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
5.14	Supply and deliver V-type Rubber Dock Fenders (V-500H x 1500L) and accessories	set	2		
5.15	Install Rubber Dock Fenders including accessories	set	7		
	TOTAL FOR BILL NO. 5				

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO.	6 RORO RAMP, 2 UNITS				
6.01	Supply and deliver to site 400mm x 400mm PSC piles	l.m.	972		
6.02	Handle, pitch and drive 400mm x 400mm batter PSC piles	l.m.	972		
6.03	Chipping of newly driven PSC piles up to the required elevation	no.	36		
6.04	Supply and place 3,500psi concrete for the superstructure	cu.m.	144		
6.05	Supply & install steel reinforcement for the superstructure	kg.	31,546		
6.06	Supply and deliver 25T mooring bollard (T-Head) & accessories	set	4		
6.07	Install 25T mooring bollard (T-Head) & accessories	set	4		
6.08	Supply and deliver V-type Rubber Dock Fenders (V-500H x 1500L) and accessories	set	6		
6.09	Install V-type Rubber Dock Fenders (V-500H x 1500L)	set	6		
	TOTAL FOR BILL NO. 6				

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO.	7 BREASTING DOLPHIN				
7.01	Supply and deliver to site 400mm x 400mm PSC piles	l.m.	632		
7.02	Handle, pitch and drive 400mm x 400mm vertical PSC piles	l.m.	200		
7.03	Handle, pitch and drive 400mm x 400mm batter PSC piles	l.m.	432		
7.04	Chipping of newly driven PSC piles up to the required elevation	no.	24		
7.05	Supply and place 3,500psi concrete for the breasting dolphin	cu.m.	41		
7.06	Supply & install steel reinforcement for the breasting dolphin	kg.	1,106		
7.07	Supply and deliver 35T mooring bollard (single pillar) & accessories	set	2		
7.08	Install 35T mooring bollard (single pillar) & accessories	set	2		
7.09	Supply and deliver V-type Rubber Dock Fenders (V-500H x 1500L) and accessories	set	4		
7.10	Install V-type Rubber Dock Fenders (V-500H x 1500L)	set	4		
	TOTAL FOR BILL NO. 7				

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO.	8 PORT LIGHTING SYSTEM				
8.01	Supply, deliver and install wires/cables	lot	1		
8.02	Supply, deliver and install conduit pipes including fittings of various sizes	lot	1		
8.03	Construct lamp post foundation	no.	5		
8.04	Construct concrete pedestal post	no.	1		
8.05	Supply deliver and install 10.0 m.ht single bar floodlight steel tapered lamp post in hot dip galvanized with 2 units -100 watt LED, floodlight fixtures	set	5		
8.06	Supply deliver and install protective devices in NEMA -3R Main: 30AT, 2P, 220V, CB Branch: 5- 15AT, 2P, 220V, CB	assy.	1		
	TOTAL FOR BILL NO. 8				

BILL OF QUANTITIES
ALEGRIA PORT DEVELOPMENT PROJECT
Port of Alegria, Buruanga, Aklan

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
BILL NO.	9 REIMBURSABLE ITEMS				
9.01	Provide reimbursable items necessary in the implementation of the project as determined by the Authority	lot	1	2,605,711.08	2,605,711.08
	TOTAL FOR BILL NO. 9				2,605,711.08

BASIS OF PAYMENT FOR WORK ITEMS INCLUDED IN THE PROPOSAL

The work items included in the proposal and the basis of payments are as follows:

BILL NO. 1

GENERAL EXPENSES

Item 1.01 Mobilization, demobilization and cleaning

The quantity to be paid for shall be the minimum equipment requirement enumerated in the bid documents mobilized, demobilized and cleaning of the site and accepted by the Engineer. The contract lump sum price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to mobilize and demobilize all the minimum equipment requirement enumerated in the bid documents including cleaning of the site. Fifty percent (50%) of the total amount shall be payable after the mobilization activity while the remaining (50%) payable after demobilization and cleaning.

Item 1.02 Rental of temporary site office and residence for the Engineer and staff

The quantity to be paid for shall be the actual rental for temporary site office and residence for the engineer and staff and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary for the provision of temporary site office and residence for the engineer and staff at least 48.00 m^2

Item 1.03 Maintain temporary site office and residence for the Engineer and staff

The quantity to be paid for shall be the actual services rendered in maintaining the site office and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the maintenance of the temporary site office and residence as well as other expenses such as provision for electric power, telephone bill, potable water supply, janitorial and security services.

Item 1.04 Provide construction safety and Health Program in the execution of the project

The quantity to be paid for shall be the actual implementation of construction safety and health program and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the implementation of the Construction Safety and Health Program, as required and approved by the Department of Labor and Employment (DOLE).

BILL NO. 2

CONSTRUCTION OF BACK-UP AREA

Item 2.01 **Chip off portion of existing RC curb, flush to deck level and smoothened with mortar**

The quantity to be paid for shall be the actual length in linear meter of portion of existing RC curb, flushed to deck level and smoothened with mortar in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.02 **Chip off portion of existing deflector wall, flush to deck level and smoothened with mortar**

The quantity to be paid for shall be the actual length in linear meter of portion of existing deflector wall, flushed to deck level and smoothened with mortar in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.03 **Supply and deliver to site 400mm x 600mm RC sheet piles**

The quantity to be paid for shall be the actual length in linear meter of 400mm x 600mm RC sheet piles, supplied and delivered to site in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.04 **Supply and deliver to site RC corner piles**
a) RC corner pile no. 1
b) RC corner pile no. 2
c) RC corner pile no. 3

The quantity to be paid for shall be the actual length in linear meter of RC corner piles of various sizes, supplied and delivered to site in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.05 **Handle, pitch and drive RC sheet piles and RC corner piles**

The quantity to be paid for shall be the actual length in linear meter of RC sheet piles and RC corner piles to be handled, pitched and driven in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.06 **Chipping of newly driven RC sheet piles and RC corner piles up to required elevation**

The quantity to be paid for shall be the actual length in linear meter of newly driven RC sheet piles and RC corner piles to be chipped off up to required elevation including disposal of debris in accordance with the plans and specifications and accepted by the

Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.07 Supply and place sacked concrete for leveling of concrete blocks

The quantity to be paid for shall be the actual volume in cubic meter of sacked concrete for leveling of concrete blocks, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.08 Supply and install concrete blocks including lifting handle
a) Concrete block no. 1
b) Concrete block no. 2

The quantity to be paid for shall be the actual number of concrete blocks of various sizes including lifting handle, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.09 Supply and install 50mmØ x 11.00m tie-rod including accessories

The quantity to be paid for shall be the actual quantity in set of 50mmØ x 11.00m tie-rod including accessories, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.10 Supply and place gravel bedding for retaining wall and catch drain manhole

The quantity to be paid for shall be the actual volume in cubic meter of gravel bedding for retaining wall and catch drain manhole, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.11 Supply and place 3,500 psi concrete for anchor block, deflector wall, coping wall, RC curb, retaining wall, lateral drainage and manhole

The quantity to be paid for shall be the actual volume in cubic meter of 3,500 psi concrete for the anchor block, deflector wall, coping wall, RC curb, retaining wall, lateral drainage and manhole, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.12 Supply and install steel reinforcements for the anchor block, deflector wall, coping wall, RC curb, retaining wall, lateral drainage and manhole

The quantity to be paid for shall be the actual weight in kilogram of reinforcing steel bars for the anchor block, deflector wall, coping wall, RC curb, retaining wall, lateral drainage and manhole, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.13 Supply and place 50-100 kg. core rocks

The quantity to be paid for shall be the actual volume in cubic meter of 50-100 kg. core rocks, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.14 Supply and place 1,000 kg. Armour rocks

The quantity to be paid for shall be the actual volume in cubic meter of 1,000 kg. armour rocks, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.15 Supply and install geotextile fabric

The quantity to be paid for shall be the actual area in square meter of geotextile filter fabric, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.16 Supply and place sand and gravel fill

The quantity to be paid for shall be the actual volume in cubic meter of sand and gravel fill, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. Hydrographic/Topographic Surveys before and after placing of sand and gravel fill shall be made to determine the actual elevations along the cross sections and the actual quantities for payment. Volume due to settlement as established using settlement plates shall also be considered for payment. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.17 Supply, spread and compact selected fill

The quantity to be paid for shall be the actual volume in cubic meter of selected fill to be supplied, spread and compacted in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.18 Supply, spread and compact aggregate base course for back-up area

The quantity to be paid for shall be the actual volume in cubic meter of aggregate base course for back-up area to be supplied, spread and compacted in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.19 **Construct Portland cement concrete pavement (300mm thk.) including reinforcement and asphalt joint sealer**

The quantity to be paid for shall be the actual area in square meter of cement concrete pavement (300mm thk.) including reinforcement and asphalt joint sealer, constructed in accordance with the plans and specifications and disposal of debris at the designated area and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.20 **Supply and install lateral drainage cover including built-up angular frame**

The quantity to be paid for shall be the actual length in linear meter of lateral drainage cover including built-up angular frame, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.21 **Supply and install catch drain manhole cover including built-up angular frame**

The quantity to be paid for shall be the actual quantity in set of catch drain manhole cover including built-up angular frame, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 2.22 **Supply and lay reinforced concrete pipe (400 dia.) including concrete mortar and sand bedding**

The quantity to be paid for shall be the actual length in linear meter of reinforced concrete pipe (400 dia.) including concrete mortar and sand bedding, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

BILL NO. 3

RC PLATFORM 1

Item 3.01 **Chip off portion of existing RC curb, flush to deck level and smoothened with mortar**

The quantity to be paid for shall be the actual length in linear meter of portion of existing RC curb, flushed to deck level and smoothened with mortar in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 3.02 **Supply and deliver to site 400mm x 400mm PSC piles**

The quantity to be paid for shall be the actual length in linear meter of PSC piles (400mm x 400mm), supplied and delivered to site in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 3.03 Handle, pitch and drive 400mm x 400mm vertical PSC piles

The quantity to be paid for shall be the actual length in linear meter of 400mm x 400mm vertical PSC piles, handled, pitched and driven in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 3.04 Handle, pitch and drive 400mm x 400mm batter PSC piles

The quantity to be paid for shall be the actual length in linear meter of 400mm x 400mm batter PSC piles, handled, pitched and driven in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 3.05 Chipping of newly driven PSC piles up to required elevation

The quantity to be paid for shall be the actual number of newly driven PSC piles, chipped off up to required elevation in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 3.06 Supply and place 3,500 psi concrete for superstructure

The quantity to be paid for shall be the actual volume in cubic meter of 3,500 psi concrete, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 3.07 Supply and install steel reinforcement for superstructure

The quantity to be paid for shall be the actual weight in kilogram of reinforcing steel bars, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 3.08 Supply and install hot dipped galvanized angle bar for construction joints including dowel bars

The quantity to be paid for shall be the actual length in linear meter of hot dipped galvanized angle bar for construction joints including dowel bars, supplied and installed in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

BILL NO. 4

RC PLATFORM 2

Item 4.01 **Chip off portion of existing RC curb, flush to deck level and smoothened with mortar**

The quantity to be paid for shall be the actual length in linear meter of portion of existing RC curb, flushed to deck level and smoothened with mortar in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 4.02 **Supply and deliver to site 400mm x 400mm PSC piles**

The quantity to be paid for shall be the actual length in linear meter of PSC piles (400mm x 400mm), supplied and delivered to site in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 4.03 **Handle, pitch and drive 400mm x 400mm vertical PSC piles**

The quantity to be paid for shall be the actual length in linear meter of 400mm x 400mm vertical PSC piles, handled, pitched and driven in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 4.04 **Handle, pitch and drive 400mm x 400mm batter PSC piles**

The quantity to be paid for shall be the actual length in linear meter of 400mm x 400mm batter PSC piles, handled, pitched and driven in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 4.05 **Chipping of newly driven PSC piles up to required elevation**

The quantity to be paid for shall be the actual number of newly driven PSC piles, chipped off up to required elevation in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 4.06 **Supply and place 3,500 psi concrete for superstructure**

The quantity to be paid for shall be the actual volume in cubic meter of 3,500 psi concrete, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 4.07 Supply and install steel reinforcement for superstructure

The quantity to be paid for shall be the actual weight in kilogram of reinforcing steel bars, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 4.08 Supply and install hot dipped galvanized angle bar for construction joints including dowel bars

The quantity to be paid for shall be the actual length in linear meter of hot dipped galvanized angle bar for construction joints including dowel bars, supplied and installed in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

BILL NO. 5

RC PIER

Item 5.01 Remove existing rubber dock fenders and mooring bollard for re-installation

The quantity to be paid for shall be the actual number of existing rubber dock fenders and mooring bollard, removed for re-installation in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.02 Chip off portion of existing RC curb, flush to deck level and smoothened with mortar

The quantity to be paid for shall be the actual length in linear meter of portion of existing RC curb, flushed to deck level and smoothened with mortar in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.03 Supply and deliver to site 400mm x 400mm PSC piles

The quantity to be paid for shall be the actual length in linear meter of PSC piles (400mm x 400mm), supplied and delivered to site in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.04 Handle, pitch and drive 400mm x 400mm vertical PSC piles

The quantity to be paid for shall be the actual length in linear meter of 400mm x 400mm vertical PSC piles, handled, pitched and driven in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.05 Handle, pitch and drive 400mm x 400mm batter PSC piles

The quantity to be paid for shall be the actual length in linear meter of 400mm x 400mm batter PSC piles, handled, pitched and driven in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.06 Chipping of newly driven PSC piles up to required elevation

The quantity to be paid for shall be the actual number of newly driven PSC piles, chipped off up to required elevation in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.07 Supply and place 3,500 psi concrete for superstructure

The quantity to be paid for shall be the actual volume in cubic meter of 3,500 psi concrete, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.08 Supply and install steel reinforcement for superstructure

The quantity to be paid for shall be the actual weight in kilogram of reinforcing steel bars, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.09 Supply and install hot dipped galvanized angle bar for construction joints including dowel bars

The quantity to be paid for shall be the actual length in linear meter of hot dipped galvanized angle bar for construction joints including dowel bars, supplied and installed in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.10 Supply and deliver accessories for the removed mooring bollards

The quantity to be paid for shall be the actual quantity in set of accessories for the removed mooring bollards, supplied and delivered in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.11 Supply and deliver 25T mooring bollard (T-head) and accessories

The quantity to be paid for shall be the actual quantity in set of 25T mooring bollard (T-head) and accessories, supplied and delivered in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full

compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.12 Install mooring bollard including accessories

The quantity to be paid for shall be the actual quantity in set of mooring bollard including accessories, installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.13 Supply and deliver accessories for the removed rubber dock fenders

The quantity to be paid for shall be the actual quantity in set of accessories for the removed rubber dock fenders, supplied and delivered in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.14 Supply and deliver V-type rubber dock fenders (V-500H x 1500L) and accessories

The quantity to be paid for shall be the actual quantity in set of V-type rubber dock fender (V-500H x 1500L) and accessories, supplied and delivered in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 5.15 Install rubber dock fender including accessories

The quantity to be paid for shall be the actual quantity in set of V-type rubber dock fender including accessories, installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

BILL NO. 6

RORO RAMP, 2 UNITS

Item 6.01 Supply and deliver to site 400mm x 400mm PSC piles

The quantity to be paid for shall be the actual length in linear meter of PSC piles (400mm x 400mm), supplied and delivered to site in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 6.02 Handle, pitch and drive 400mm x 400mm batter PSC piles

The quantity to be paid for shall be the actual length in linear meter of 400mm x 400mm batter PSC piles, handled, pitched and driven in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 6.03 Chipping of newly driven PSC piles up to required elevation

The quantity to be paid for shall be the actual number of newly driven PSC piles, chipped off up to required elevation in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 6.04 Supply and place 3,500 psi concrete for superstructure

The quantity to be paid for shall be the actual volume in cubic meter of 3,500 psi concrete, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 6.05 Supply and install steel reinforcement for superstructure

The quantity to be paid for shall be the actual weight in kilogram of reinforcing steel bars, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 6.06 Supply and deliver 25T mooring bollard (T-head) and accessories

The quantity to be paid for shall be the actual quantity in set of 25T mooring bollard (T-head) and accessories, supplied and delivered in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 6.07 Install 25T mooring bollard (T-head) including accessories

The quantity to be paid for shall be the actual quantity in set of 25T mooring bollard (T-head) including accessories, installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 6.08 Supply and deliver V-type rubber dock fenders (V-500H x 1500L) and accessories

The quantity to be paid for shall be the actual quantity in set of V-type rubber dock fender (V-500H x 1500L) and accessories, supplied and delivered in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 6.09 Install V-type rubber dock fenders (V-500H x 1500L)

The quantity to be paid for shall be the actual quantity in set of V-type rubber dock fender (V-500H x 1500L), installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

BILL NO. 7

BREASTING DOLPHIN

Item 7.01 Supply and deliver to site 400mm x 400mm PSC piles

The quantity to be paid for shall be the actual length in linear meter of PSC piles (400mm x 400mm), supplied and delivered to site in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 7.02 Handle, pitch and drive 400mm x 400mm vertical PSC piles

The quantity to be paid for shall be the actual length in linear meter of 400mm x 400mm vertical PSC piles, handled, pitched and driven in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 7.03 Handle, pitch and drive 400mm x 400mm batter PSC piles

The quantity to be paid for shall be the actual length in linear meter of 400mm x 400mm batter PSC piles, handled, pitched and driven in accordance with the plans and specifications, measured from the tip of piles to cut-off elevation and accepted by the Engineers. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 7.04 Chipping of newly driven PSC piles up to required elevation

The quantity to be paid for shall be the actual number of newly driven PSC piles, chipped off up to required elevation in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 7.05 Supply and place 3,500 psi concrete for breasting dolphin

The quantity to be paid for shall be the actual volume in cubic meter of 3,500 psi concrete for breasting dolphin, supplied and set-in-place in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 7.06 Supply and install steel reinforcement for breasting dolphin

The quantity to be paid for shall be the actual weight in kilogram of reinforcing steel bars for breasting dolphin, supplied and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 7.07 Supply and deliver 35T mooring bollard (single pillar) and accessories

The quantity to be paid for shall be the actual quantity in set of 35T mooring bollard (single pillar) and accessories, supplied and delivered in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 7.08 Install 35T mooring bollard (single pillar) including accessories

The quantity to be paid for shall be the actual quantity in set of 35T mooring bollard (single pillar) including accessories, installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 7.09 Supply and deliver V-type rubber dock fenders (V-500H x 1500L) and accessories

The quantity to be paid for shall be the actual quantity in set of V-type rubber dock fender (V-500H x 1500L) and accessories, supplied and delivered in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 7.10 Install V-type rubber dock fenders (V-500H x 1500L)

The quantity to be paid for shall be the actual quantity in set of V-type rubber dock fender (V-500H x 1500L), installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

BILL NO. 8

PORT LIGHTING SYSTEM

Item 8.01 Supply, deliver and install wires/cables

The quantity to be paid for shall be the actual quantity in lot of wires/cables to be supplied, delivered and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 8.02 Supply, deliver and install conduit pipe including fittings of various sizes

The quantity to be paid for shall be the actual quantity in lot of conduit pipe including fittings of various sizes to be supplied, delivered and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 8.03 Construct lamp post foundation

The quantity to be paid for shall be the actual number of lamp post foundation, constructed in accordance with the plans and specifications accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 8.04 Construct concrete pedestal post

The quantity to be paid for shall be the actual number of concrete pedestal post, constructed in accordance with the plans and specifications accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 8.05 Supply, deliver and install 10.0m ht. single bar floodlight steel tapered lamp post in hot dip galvanized with 2 units – 100 watt LED, floodlight fixtures

The quantity to be paid for shall be the actual quantity in set of 10.0m ht. single bar floodlight steel tapered lamp post in hot dip galvanized with 2 units – 100 watt LED, floodlight fixtures, supplied, delivered and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

Item 8.06 Supply, deliver and install protective devices in NEMA – 3R
Main : 30AT, 2P, 220V, CB
Branch: 5 – 15AT, 2P, 220V, CB

The quantity to be paid for shall be the actual quantity in assembly of protective devices in NEMA – 3R with Main and Branch as shown above to be supplied, delivered and installed in accordance with the plans and specifications and accepted by the Engineer. The contract unit price shall be full compensation for furnishing all materials, labor, equipment, tools and incidentals necessary to complete the work.

BILL NO. 9

REIMBURSABLE ITEMS

Item 9.01 Provide reimbursable items necessary in the implementation of the project as determined by the Authority.

The quantity to be paid for shall be the actual quantity of determined items by the Authority deemed necessary in the implementation of the project, supplied, delivered and accepted by the Authority. Payment for said items shall be made only upon complete delivery/acceptance of such. The contract lump sum price shall be full compensation for providing all determined items. The Contractor's Profit and Overhead, Contingencies and Miscellaneous (OCM) should not be included in the cost of said items. The amount of bid should be fixed as indicated in the amount stated in the Bid Data Sheet [ITB Clause 13.1(a)] and as provided in the Bill of Quantities (BOQ). Claims for payment shall be supported by Official Receipt(s) (OR) and at least three (3) canvasses. The amount to be paid for shall be the price indicated in the OR but should not exceed the contract lump sum price. The determined items shall be the property of PPA. Operation and maintenance shall be borne by PPA.

FACILITIES TO BE PROVIDED FOR THE ENGINEER & HIS STAFF

TEMPORARY FACILITIES OF THE CONTRACTOR

The Contractor shall provide and maintain such temporary offices, stores, workshops, latrines, housing and messing accommodations as are necessary. The location, dimension and layout of such buildings and places shall be subject to the approval in writing of the Engineer. By the end of the contract, the Contractor shall remove all buildings and the area shall be cleared and graded as required by the Engineer.

SITE OFFICE AND RESIDENCE FOR THE ENGINEER & STAFF

The Contractor shall provide and maintain a temporary site office and residence with an area of at least 48 square meters for use of the Engineer and staff, including all the necessary electricity, water, communication services and consumables.

MINIMUM EQUIPMENT REQUIREMENTS

1	unit/s	Air-Compressor (250 cfm, minimum), owned
1	unit/s	Backhoe (0.40 cu.m., 94.30 hp, minimum), owned
1	unit/s	Clamshell, owned
1	unit/s	Concrete Cutter, owned
1	unit/s	Concrete Mixer (1-bagger, minimum), owned
1	unit/s	Concrete Bucket, owned
1	unit/s	Concrete Screeder, owned
1	unit/s	Concrete Vibrator (3.5 hp, minimum), owned
1	unit/s	Crane Barge (319 GW, minimum) with 60T crane, owned
1	unit/s	Crawler Crane (30T, minimum), owned
1	unit/s	Pile Hammer (Diesel, 10,500 kg.m.), owned
1	unit/s	Drop Hammer (2T, minimum), owned
1	unit/s	Dump Truck (8 cu.m., minimum), owned
1	unit/s	Bar Bender (electric, 25mm dia min.), owned
1	unit/s	Bar Cutter (electric, 25mm dia min.), owned
1	unit/s	Jack Hammer, owned
1	unit/s	Oxy/Acetylene Cutting Outfit, owned
1	unit/s	Payloader (80 hp, minimum), owned
1	unit/s	Plate Compactor (5hp, minimum), owned
1	unit/s	Road Grader (125 hp, minimum), owned/leased
1	unit/s	Road Roller (12.05T, vibratory, minimum), owned/leased
1	unit/s	Transit Mixer (5-6 cu.m. cap., minimum), owned
1	unit/s	Tugboat (500hp, minimum), owned/leased
1	unit/s	Water Truck with pump (1,000 gal., minimum), owned
1	unit/s	Welding Machine (400 amp., minimum), owned
1	unit/s	Cargo Truck (5T, minimum), owned

CONSTRUCTION SAFETY AND HEALTH REQUIREMENT

The Contractor shall implement the construction safety and health program in accordance with the applicable provisions of the Occupational Safety and Health Standards (OSHS) of the Department of Labor and Employment (DOLE).

The Contractor, subject to the approval of the Engineer shall provide and maintain throughout the duration of the contract a medical room with at least 15 square meters together with all necessary supplies to be sited in the Contractor's main area.

The Contractor shall provide the following minimum requirements:

LABOR

1	no.	Safety Engineer / Officer
1	no.	Nurse / Health Officer

EQUIPMENT / MATERIALS

Personnel Protective Equipment

67	pcs.	Hard Hats
67	pcs.	Gloves
12	pcs.	Goggles
1	pcs.	Aprons
1	pcs.	Safety Belts
67	pcs.	Safety Shoes
1	pcs.	Life Lines

Safety Devices

1	lot	Barricades
1	lot	Warning signs
2	units	Fire extinguisher

Medical and First Aid System - For eighteen (18) mos.

NOTE:

The Contractor shall provide the above-cited minimum construction safety and health requirements or as required by the Engineer.

PPA MEMORANDUM CIRCULAR
No 02
Series of 2016
Attachment

REVISED SCHEDULE OF MINIMUM TEST REQUIREMENTS OF CONSTRUCTION MATERIALS FOR PPA INFRASTRUCTURE PROJECTS

Materials/Items of Work	*Required Tests*	*Minimum Incremental Frequency of Tests*
I. Construction of Pier/Wharf, Platform and Ramp		
Structural Concrete (SC)		
A Portland Cement	Quality Test	For every 2,000 bags (40kg) or fraction thereof
B Fine Aggregate	Quality Test for Grading, Elutriation (wash), Bulk Specific Gravity, Absorption, Mortar Strength, Soundness, Organic Impurities, Unit Weight, % Clay Lumps and Shale	For every 1,500 cubic meter or fraction thereof
C Coarse Aggregate	Quality Test for Grading, Bulk Specific Gravity, Absorption and Abrasion	For every 1,500 cubic meter or fraction thereof
D Water	Certificate from the Engineer or Quality Test for Density and Chloride Content	One per source
E Steel Bars	Mill Certificate and Quality Test for Chemical Composition and Mechanical Properties	For every 10,000 kg or fraction thereof
F Concrete	Compressive Strength on cylinder samples	1 set consisting of 3 concrete cylinder samples shall be taken from each day's pouring and to represent not more than 75 cu m of concrete or fraction thereof
	Slump Test	For every mix
G Admixture and Concrete Curing Materials	Quality Test	One per shipment
Piling (P)		
A Concrete Piles	Fabrication Report	One per fabrication
1 Concrete	Same test as for SC (F)	Same frequency as SC (F)
2 Steel Bars	Same test as for SC (E)	Same frequency as SC (E)
3 High Tension Strand	Test for Chemical Composition and Mechanical Properties	For every 20000kg or fraction thereof

Materials/Items of Work	Required Tests	Minimum Incremental Frequency of Tests
4 Coarse Aggregates	Same Test as for SC (C)	Same frequency as SC (C)
5 Fine Aggregates	Same Test as for SC (B)	Same frequency as SC (B)
B Steel Pipe Piles	Fabrication Report, Mill Certificate and Quality Test for Chemical and Mechanical properties	One per fabrication
1 Steel	Chemical Composition (refer below)	
	- Under 14" (355 60mm) Outside Diameter	2 from 200 pipe of fraction thereof
	- 14" to 36" (355 6 to 914mm) Outside Dia	2 from 100 pipe or fraction thereof
	- Over 36" (914mm) Outside Diameter	2 from 3000ft (914m) or fraction thereof
	Mechanical/Tensile	One (1) tension test shall be made on one length or fraction thereof of each size, or one piece of skelp representing each lot of 200 lengths or fraction thereof of each size
2 Polyurethane Coating	Mill Certificate and Quality Test	One per fabrication
3 Concrete	Same test as for SC (F)	Same frequency as SC (F)
4 Fine Aggregate	Same test as for SC (B)	Same frequency as SC (B)
5 Coarse Aggregate	Same test as for SC (C)	Same frequency as SC (C)
6 Steel Bars	Same Test as SC (E)	Same frequency as SC (E)
7 Water	Same Test as SC (D)	Same frequency as SC (D)
Rubber Dock Fenders (RDF)	Physical Test	All units
	Performance Test for Energy Absorption and Reaction Force	All units
Accessories		
Washer and Fixing Bolt, Anchor Bolt	Physical Test	All units
	Quality Test for Chemical Composition and Mechanical Properties	One per fabrication

Materials/Items of Work	***Required Tests***	***Minimum Incremental Frequency of Tests***
Mooring Bollard (MB) and Accessories (Hexagon Nuts, Plain Washer, Anchor Ring and Anchor Bolt)	Physical Test Quality Test for Chemical Composition and Mechanical Properties	All Units One per fabrication
II. Construction of Back-Up Area, Causeway and Pavement		
Sheet Piling (SP)		
A Concrete Sheet Piles		
1 Concrete	Same test as for SC (F)	Same frequency as SC (F)
2 Steel Bars	Same test as for SC (E)	Same frequency as SC (E)
3 High Tension Strands	Same test as for P (A 3)	Same frequency as P (A 3)
4 Fine Aggregates	Same test as for SC (B)	Same frequency as SC (B)
5 Coase Aggregates	Same Test as for SC (C)	Same frequency as SC (C)
B Steel Pipe Piles		
1 Steel	Same test as for P (B1)	Same frequency as P (B1)
2 Concrete	Same test as for SC (F)	Same frequency as SC (F)
3 Fine Aggregate	Same test as for SC (B)	Same frequency as SC (B)
4 Steel Bars	Same test as for SC (E)	Same frequency as SC (E)

Materials/Items of Work	***Required Tests***	***Minimum Incremental Frequency of Tests***
Rocks	Test for Apparent Specific Gravity and Abrasion	For every 1,500 cubic meter or fraction thereof
Geotextile Filter	Physical and Mechanical Test Mill Certificate	One per batch One per batch
Sand and Gravel Fill	Quality Test for Organic Impurities and Grading	For every 1,500 cubic meter or fraction thereof
Selected Fill	Quality Test for Grading, Plasticity and Laboratory Compaction Test Laboratory California Bearing Ratio (CBR) Field Density Test	For every 1,500 cubic meter or fraction thereof For every 2,500 cubic meter or fraction thereof For every layer of 150mm of compacted depth at least one group of three In-situ density test for every 500 sq m or fraction thereof
Aggregate Base Course	Quality Test for Grading and Plasticity Quality Test for Grading, Plasticity, Abrasion and Laboratory Compaction Test Laboratory California Bearing Ratio (CBR) Field Density Test	For every 300 cubic meter or fraction thereof For every 1,500 cubic meter or fraction thereof Same frequency as Selected Fill Same frequency as Selected Fill
Portland Cement Concrete Pavement (PCCP)		
A Portland Cement	Same test as for SC (A)	Same frequency as SC (A)
B Fine Aggregate	Same test as for SC (B)	Same frequency as SC (B)
C Coarse Aggregate	Same test as for SC (C)	Same frequency as SC (C)
D Water	Same test as for SC (D)	Same frequency as SC (D)
E Steel Bars (Dowels)	Same test as for SC (E)	Same frequency as SC (E)
F Joint Filler	Quality Test	One (1) per shipment

Materials/Items of Work	***Required Tests***	***Minimum Incremental Frequency of Tests***
G Admixture and Concrete Curing Material	Same test as for SC (G)	Same frequency as SC (G)
H Concrete	Same test as for SC (F)	Same frequency as SC (F)
	Flexural Test	3 beam samples for every 330 sq m or fraction thereof
I Completed Pavement	Core Test	1 set (3 specimen) for every 2,500 sq m and fraction thereof
Interlocking Concrete Blocks		
A Cement	Same test as for SC (A)	Same frequency as SC (A)
B Fine Aggregate	Same test as for SC (B)	Same frequency as SC (B)
C Coarse Aggregate	Same test as for SC (C)	Same frequency as SC (C)
D Water	Same test as for SC (D)	Same frequency as SC (D)
E Admixture & Concrete Curing Materials	Same test as for SC (G)	Same frequency as SC (G)
F Completed Blocks	Physical Test and Compressive Strength	6 blocks per day of fabrication
Cement Treated Base Course (CTB)		
A Portland Cement	Same test as for SC (A)	Same frequency as SC (A)
B Fine & Coarse Aggregates	Quality Test for Grading, Abrasion and Soundness	For every 1,500 cubic meter or fraction thereof
C Water	Same test as for SC (D)	Same frequency as SC (D)
D Completed CTB	Field Density Test	For every layer of 150mm of compacted depth at least one group of three in-situ density test every 500 sq m or fraction thereof
Retaining Wall/Coping Wall/RC Curb/RC Ditch/Shear Key/Concrete Blocks\Lean Concrete		
A Portland Cement	Same test as for SC (A)	Same frequency as SC (A)
B Fine Aggregate	Same test as for SC (B)	Same frequency as SC (B)

Materials/Items of Work	***Required Tests***	***Minimum Incremental Frequency of Tests***
C Coarse Aggregates	Same test as for SC (C)	Same frequency as SC (C)
D Water	Same test as for SC (D)	Same frequency as SC (D)
E Steel Bars	Same test as for SC (E)	Same frequency as SC (E)
F Admixture and Concrete Curing	Same test as for SC (G)	Same frequency as SC (G)
G Concrete	Same test as for SC (F)	Same frequency as SC (F)
Tie Rod		
A Steel	Same test as for SC (E)	One per batch
B Assembly	Performance Test (Tension)	One per batch
Tie Bars and Dowels	Same test as for SC (E)	For every 10,000 kg or fraction thereof per Tie bars and Dowels
Pipe Culverts and Storm Drains		
A Pipes	Test for Strength, Absorption and Physical	For every 50 pieces
B Mortar or Joint	Same Test as for SC (A,B and D) Alternative Test Same test as for SC (F) and Inspection Report	For every 25 pieces
Concrete Hollow Blocks		
A Portland Cement	Same test as for SC (A)	Same frequency as SC (A)
B Fine Aggregates	Same test as for SC (B)	Same frequency as SC (B)
C Water	Same test as for SC (D)	Same frequency as SC (C)
D Concrete	Same test as for SC (F)	Same frequency as SC (F)
E Completed CHB	Quality Test	One for every 500 pieces or fraction thereof
Construction Joints (CJ)		
A Angle Bars	Test for Physical and Mechanical Properties	One per batch
B Steel Bars	Same test as for SC (E)	One per batch
C Zinc (Hot Dip Galvanizing) Coatings	Physical Test for Appearance, Stripping, Weighing, Adherence and Adhesion	All units
	Coating Thickness Magnetic Thickness Measurement	1 set (3 specimen) for every 100,000 sq mm or fraction thereof

Materials/Items of Work	***Required Tests***	***Minimum Incremental Frequency of Tests***
Sacked Concrete		
A Cement	Same test as for SC (A)	Same frequency as SC (A)
B Fine Aggregates	Same test as for SC (B)	Same frequency as SC (B)
C Coarse Aggregates	Same test as for SC (C)	Same frequency as SC (C)
D Water	Same test as for SC (D)	Same frequency as SC (D)
E Concrete	Same test as for SC (F)	Same frequency as SC (F)
F Sack (jute)	Physical Test	One for every 50 pieces
Rubble Concrete		
A Cement	Same test as for SC (A)	Same frequency as SC (A)
B Fine Aggregates	Same test as for SC (B)	Same frequency as SC (B)
C Coarse Aggregates	Same test as for SC (C)	Same frequency as SC (C)
D Water	Same test as for SC (D)	Same frequency as SC (D)
E Concrete	Same test as for SC (F)	Same frequency as SC (F)
F Rocks	Same test as for ROCKS	Same frequency as ROCKS
Earthworks		
A Sub-grade preparation	Grading Test Plasticity Test (LL,PL,PI) Laboratory Compaction Test	For every 1,500 cubic meter or fraction thereof
	Density Test	For every layer of 150mm of compacted depth at least one group of three In-situ density test every 500 sq m or fraction thereof
B Structure Excavation	If excavated materials shall be used as Backfill Grading Test Plasticity Test (LL,PL,PI) Laboratory Compaction Test	For every 1,500 cubic meter or fraction thereof
	Density Test	For every layer of 150mm of compacted depth at least one group of three In-situ density test every 500 sq m or fraction thereof

PPA MEMORANDUM CIRCULAR
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Attachment

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Materials/Items of Work	***Required Tests***	***Minimum Incremental Frequency of Tests***
III Port Operations Building/Passenger Terminal Building/Transit Shed/Warehouse		
STRUCTURAL WORKS	Refer to Structural Concrete (SC) and Piling Works (P)	
ARCHITECTURAL WORKS		
Ceramic – Filled Liquid Membrane / Water Proofing, Hydrophobic Poreblocking Ingredients with Superplasticizer	Physical Property, Mechanical and Chemical Property, Leak Test / Flood Test	One per shipment
Paint	Quality Test	One 4-L can for every 100 cans or fraction thereof
Ceramic Tile	Inspection and Evaluation Report from the Engineer	One per shipment
Stainless Steel	Inspection and Evaluation Report from the Engineer	One per shipment
Roofing Materials	Inspection and Evaluation Report from the Engineer	One per shipment
Ceiling Materials	Inspection and Evaluation Report from the Engineer	One per shipment
ELECTRICAL AND MECHANICAL WORKS		
Wires / Cables	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per shipment
Electrical Devices	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per shipment
Fire Alarm System	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per item
Wiring Devices	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per shipment

Materials/Items of Work	Required Tests	Minimum Incremental Frequency of Tests
Protective Devices	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per shipment
Telephone System	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per item
CCTV System	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per item
CATV System	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per item
Background Music and Paging System	Inspection and Evaluation Report from the Engineer, Testing and Commissioning	One per item
Air Conditioning Units & Ventilation	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per item
Conduit Pipes	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per item
Lighting Fixtures	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per item
PLUMBING WORKS		
Pipes	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per item

Materials/Items of Work	Required Tests	Minimum Incremental Frequency of Tests
Fixtures	Inspection and Evaluation Report from the Engineer Testing and Commissioning	One per item
Pipe Culverts	Compression Strength Inspection and Evaluation Report from the Engineer	For every size not more than 25 pipes cast in the field
IV Miscellaneous Materials Fencing A Barbed Wire, Cyclone Wire Mesh, Chain Link B Concrete Post	 Physical Test (Dimensions and Coatings) Refer to Superstructure (SC)	 One per Batch Refer to Superstructure (SC)
Lamp Post A Structural Steel B Zinc (Hot Dip Galvanizing) Coatings	Physical Test (Dimensions) Same test as for SC (E) Same test as for CJ (C)	All units One per batch
Drainage Steel Grating	Same test as for SC (E) Inspection Report	One (1) batch
Metal Pipe (Cast Iron Galvanized, etc)	Physical Test (Dimensions and Coatings)	1 per delivery
Welding Works	Destructive and Non Destructive Test	One (1) per lot

NOTES
1. **Testing of RDF shall be performed only by an independent Testing Laboratory duly accredited by BRS, DOST and PPA**
2. **Testing of other materials shall be performed only by an independent Testing Laboratory duly accredited by BRS and PPA.**
3. **All other issuances which are otherwise inconsistent herewith are hereby revoked or otherwise amended.**

Approved

RAUL T. SANTOS
Officer-In-Charge,
Office of the General Manager

SECTION IX

BIDDING FORMS

Bid Form

Date: _____

ITB No: _____

To: **Philippine Ports Authority**
Bonifacio Drive, South Harbor,
Port Area, Manila

We, the undersigned, declare that:

(a) We have examined and have no reservation to the Bidding Documents, including Addenda, for the Contract **Alegria Port Development Project, Port of Alegria, Buruanga, Aklan**;

(b) We offer to execute the Works for this Contract in accordance with the Bid and Bid Data Sheet, General and Special Conditions of Contract accompanying this Bid;

The total price of our Bid, excluding any discounts offered below is:

BILL NO	DESCRIPTION	TOTAL AMOUNT
1	General Expenses	₱
2	Construction of Back-up Area	
3	RC Platform 1	
4	RC Platform 2	
5	RC Pier	
6	RoRo Ramp, 2 Units	
7	Breasting Dolphin	
8	Port Lighting System	
9	Reimbursable Items	
	TOTAL AMOUNT OF BID (including VAT)	₱

The discounts offered and the methodology for their application are: *insert information]*;

(c) Our Bid shall be valid for a period of 120 days from the date fixed for the Bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;

(d) If our Bid is accepted, we commit to obtain a Performance Security in the amount of *[insert percentage amount]* percent of the Contract Price for the due performance of the Contract;

(e) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from the following eligible countries: *[insert information]*;

(f) We are not participating, as Bidders, in more than one Bid in this bidding process, other than alternative offers in accordance with the Bidding Documents;

(g) Our firm, its affiliates or subsidiaries, including any subcontractors or suppliers for any part of the Contract, has not been declared ineligible by the Funding Source;

(h) We understand that this Bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal Contract is prepared and executed; and

(i) We understand that you are not bound to accept the Lowest Calculated Bid or any other Bid that you may receive.

(j) We likewise certify/confirm that the undersigned, is the duly authorized representative of the bidder, and granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for the **Alegria Port Development Project, Port of Alegria, Buruanga, Aklan** of the **Philippine Ports Authority**.

(k) We acknowledge that failure to sign each and every page of this Bid Form, including the Bill of Quantities, shall be a ground for the rejection of our bid.

Name: _____

In the capacity of: _____

Signed: _____

Duly authorized to sign the Bid for and on behalf of: _____

Date: _____

STATEMENT OF ALL ON-GOING GOVERNMENT AND PRIVATE CONTRACTS, INCLUDING CONTRACTS AWARDED BUT NOT YET STARTED, WHETHER SIMILAR OR NOT SIMILAR IN NATURE

Name of the Contract or Title Of the Project 1]	Owner's Name and Address	Nature/ Scope of Work 2]	Contractor's Role (in percentage) 3]	Total Contract Value At			Date of Award 5]	Value of Outstanding Works	Estimated Time of Completion	% of Accomplishment		Contract Duration 5]	
				Award	Project Completion	Escalated Value to Present Prices 4]				Planned	Actual	Start	Completed
A) Government Contracts i. On-going ii. Awarded but not yet started B) Private Contracts i. On-going ii. Awarded but not yet started													

NOTE:

1] As appearing or defined in the contract entered/executed by the parties
2] With special reference to the Scope of Works as described/enumerated in the advertised Invitation To Bid.
3] Indicate whether as Sole Contractor, Sub-Contractor or Member in a Joint Venture / Consortium
4] Indicate the FOREX used if Contract Value is expressed in a currency other than the Philippine Peso. Specify the "Escalation Factor" used to escalate the Contract Value from completion date to the advertisement date of the Invitation to Bid per section 23.11.2 (3) of R.A. 9184.
5] State Month and Year.

This Statement shall be supported by:
a) Notice of Award and/or Contract
b) Notice to Proceed

Name of Firm/Applicant

Authorized Signing Official

Date

STATEMENT OF THE BIDDER'S SINGLE LARGEST COMPLETED CONTRACT (SLCC) SIMILAR TO THE CONTRACT TO BE BID

Name of the Contract or Title Of the Project	Owner's Name and Address	Nature/Scope of Work	Contractor's Role and Percentage Of Participation	Total Contract Value At			Date of Award	Value of Outstanding Works	Contract Duration	
				Award	Completion	Escalated Value to Present Prices			Start	Completed

NOTE :

1. The prospective bidder must have completed an SLCC that is similar to the contract to be bid, and whose value, adjusted to current prices using the PSA consumer price indices, must be at least fifty percent (50%) of the ABC to be bid.

2. This Statement shall be supported by:

   a. Notice of Award and / or Notice to Proceed.
   b. Project Owner's Certificate of Final acceptance issued by the owner other than the Contractor or Constructors Performance Evaluation System (CPES) Final Rating, which must be at least satisfactory.

Name of Firm/Applicant

Authorized Signing Official

Date

EXPERIENCE RECORD ON SIMILARLY COMPLETED PROJECTS

Similar Major Operations of Work 1]	Unit of Measure	Quantity					Unit of Measure	Quantity
			Title of the Project	Title of the Project	Title of the Project	Title of the Project		
1. RC pile driving works (off-shore)	l.m.	6,167						
2. Reinforced Concrete Works	cu.m.	920						
3. Rock Works (50-1,000 kg./pc. To 2,000 kg./pc.)	cu.m.	1,845						
4. Placing of Fill Materials	cu.m.	6,285						
5. Construction of Portland Cement Concrete Pavement	sq.m.	1,534						

NOTE: 1] Submit the Certificate of Completion/Certificate of Acceptance by the project owner, Final Recapitulation/Bill of Quantities and/or Constructor Performance Evaluation System (CPES) ratings, 1st, 2nd & Final visit (if applicable). Projects with no Certificate of Completion/Acceptance and Recapitulation/Bill of Quantities shall not be considered.

2] The Owner's Certificate of Final Acceptance; or the Constructors Performance Evaluation Summary (CPES) Final Rating and/or the Certificate of Completion, must be satisfactory.

Name of Firm/Applicant | Authorized Signing Official | Date

(Revised Form : September 2012)

FINANCIAL DATA

A. The prospective bidder's audited Financial Statements, showing, among others, the prospective bidder's total and current assets and liabilities, stamped "RECEIVED" by the Bureau of Internal Revenue (BIR), or its duly accredited and authorized institutions, for the preceding calendar year which should not be earlier than two (2) years from the date of bid submission.

	Year
1. Total Assets	
2. Current Assets	
3. Total Liabilities	
4. Current Liabilities	
5. Net worth (1-3)	
6. Net Working Capital (2-4)	

B. The computation of the bidders Net Financial Contracting Capacity (NFCC) must be at least equal to the ABC to be bid, as follows:

NFCC = [(Current assets minus current liabilities) (15)] minus the value of all outstanding or uncompleted portions of the projects under ongoing contracts, including awarded contracts yet to be started coinciding with the contract to be bid.

NFCC = _____

Attached herewith are certified true copies of the audited financial statements stamped received by the BIR or BIR authorized collecting agent for the latest/immediately preceding calendar year.

_____
Name of Firm/Applicant

_____
Authorized Signing Official

Date:_____

NOTES:

If Partnership or Joint Venture, each Partner or Member Firm of Joint venture shall submit separate financial statements.

LIST OF CONTRACTOR'S PERSONNEL

I hereby declare that the following key personnel enumerated below, with attached resume/bio-data, including valid PRC License, for the various positions / functions, are available for the project applied for:

Position of Key Personnel	Name	No. of Key Personnel	Similar Experience in the Position (Years) 1]	Total Experience in the Position (Years)	Attachment(s)	Annex(es)
Project Manager					PRC License (CE Preferred) Complete Qualification and Experience Data Certificate of Commitment	Annex "_"
Project Engineer					PRC License (CE Preferred) Complete Qualification and Experience Data Certificate of Commitment	Annex "_"
Materials Engineer					PRC License (CE Preferred) Submit Valid and Renewed DPWH Certificate of Accreditation Submit Accreditation Identification Card as Materials Engineer Complete Qualification and Experience Data Certificate of Commitment	Annex "_"
Construction Safety and Health Officer					Certificate of Safety and Health Construction Related Course issued by DOLE Accredited Trainings Complete Qualification and Experience Data Certificate of Commitment	Annex "_"
Foreman					Complete Qualification and Experience Data Certificate of Commitment	Annex "_"
Other Position(s)					Complete Qualification and Experience Data Certificate of Commitment	Annex "_"

NOTE: 1. Minimum qualification requirements: (work experience is similar in nature and complexity to the project to be bid with regard to Registration Particulars of the Contractor's License)

Project Manager - Five (5) years
Project Engineer - Three (3) years
Foreman - Five (5) years

Materials Engineer – One (1) year
Materials Engineer I – for projects costing up to 100M
Materials Engineer II – for projects costing more than 100M

Name of Firm/Applicant

Authorized Signing Official

Date

REVISED FORM (September 2012)

LIST OF CONTRACTOR'S EQUIPMENT UNITS

I hereby declare that the following equipment listed below which are owned, leased or under purchase agreement are in good operating condition and are available for the duration of the project:

DESCRIPTION (Type, Model, Make)	No. of Unit(s)	Capacity Output 2]	Owned, Leased and/or under purchase agreement 1]	Submitted Proof of Ownership/Leased/ Purchase Agreement (Mark as Annex "A……Z")	OTHER INFORMATIONS (As Applicable)				
					Manufacturer	Engine Serial No.	Chassis No./ Name of Vessel	Location	Status

1] Indicate if owned or leased as listed in the Checklist/Bidding Documents. For owned equipment, as required, submit proof of ownership (i.e. deed of sale, sales invoice, official receipt). For Water Truck, Dump Truck and Transit Mixer submit LTO Certificate of Registration and valid Official Receipt. For owned barge/tugboat, submit Marina Certificate of Ownership and valid Cargo Ship Safety Certificate. For newly purchased barge/tugboat, submit Deed of Sale together with an application for Marina Certificate of Ownership duly received/authenticated by Marina with corresponding valid Cargo Ship Safety Certificate. For leased equipment, submit duly notarized copy of lease contract together with a copy of the Marina Owner's (Lessor's) Certificate and valid Cargo Ship Safety Certificate.

2] The unit of each equipment shall be as indicated in the Checklist/Bidding Documents, i.e GW (for crane barge), DWT (for deck barge and hopper barge), TON (for crane, road roller and drop hammer), kg.-m/blow (for diesel hammer), cu.m (for dump truck), hp. (for tugboat, road grader, bulldozer and concrete vibrator), cfm (for compressor), gal. (for water truck with pump), amp. (for welding machine), bagger (for concrete mixer).

Name of Firm/Applicant

Authorized Signing Official

Date

REVISED FORM (January 2011)

OMNIBUS SWORN STATEMENT FOR SOLE PROPRIETORSHIP

REPUBLIC OF THE PHILIPPINES)
CITY OF _____)SS

AFFIDAVIT

I (Name), of legal age, (Civil Status), (Nationality), and residing at (Address), after having been duly sworn in accordance with law, do hereby depose and state that:

1. I am the sole proprietor or authorized representative of (Name of Bidder) with office address at _____:

2. As the owner and sole proprietor or authorized representative of (Name of Bidder), I have full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for (Name of Project) of the Philippine Ports Authority, (as shown in the attached duly notarized "Special Power of Attorney" for the authorized representative);

3. (Name of Bidder) is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government / foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board;

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. (Name of Bidder) is authorizing the Head of the Procuring Entity or its duly authorized representative(s) to verify all the documents submitted;

6. The owner or sole proprietor is not related to the Head of Procuring Entity, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management office or the end – user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. (Name of Bidder) complies with existing labor laws and standards; and

8. (Name of Bidder) is aware of and has undertaken the following responsibilities as a Bidder:

   a) Carefully examine all of the Bidding Document:
   b) Acknowledge all conditions, local or otherwise, affecting the implementation of the contact;
   c) Made an estimate of the facilities available and needed for the contact to be bid, if any; and
   d) Inquire or secure Supplemental / Bid Bulletin(s) issued for the *Alegria Port Development Project, Port of Alegria, Buruanga, Aklan.*

9. (Name of Bidder) did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of _____ 20__ at _____, Philippines.

_____
Bidder's Representative / Authorized Signatory

SUBSCRIBED AND SWORN to before me this ___ day of *[month] [year]* at *[place of execution],* Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her [insert type of government identification card used], with his/her photograph and signature appearing thereon, with no. _____ and his/her Community Tax Certificate No. _____ issued on ____ at _____.

Witness my hand and seal this ___ day of *[month] [year]*.

NAME OF NOTARY PUBLIC
Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. _____ *[date issued], [place issued]*
IBP No. _____ *[date issued], [place issued]*

Doc. No. _____
Page No. _____
Book No. _____
Series of _____

OMNIBUS SWORN STATEMENT FOR PARTNERSHIP OR COOPERATIVE

REPUBLIC OF THE PHILIPPINES)
CITY OF _____)SS

AFFIDAVIT

I (Name), of legal age, (Civil Status), (Nationality), and residing at (Address), after having been duly sworn in accordance with law, do hereby depose and state that:

1. I am the duly authorized and designated representative of (Name of Bidder) with office address at (Address);

2. I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for (Name of Project) of the Philippine Ports Authority, accompanied by the duly notarized Special Power of Attorney, Board/Partnership Resolution or Secretary's Certificate (whichever is applicable);

3. (Name of Bidder) is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government / foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board;

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. (Name of Bidder) is authorizing the PPA General Manager or its duly authorized representative(s) to verify all the documents submitted;

6. None of the officers and members of (Name of Bidder) is related to the PPA General Manager, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management office or the end- user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. (Name of Bidder) complies with existing labor laws and standards; and

8. (Bidder) is aware of and has undertaken the following responsibilities as a Bidder:

   a) Carefully examine all of the Bidding Document:
   b) Acknowledge all conditions, local or otherwise, affecting the implementation of the contact;
   c) Made an estimate of the facilities available and needed for the contact to be bid, if any; and
   d) Inquire or secure Supplemental / Bid Bulletin(s) issued for the *Alegria Port Development Project, Port of Alegria, Buruanga, Aklan.*

9. (Name of Bidder) did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of _____ 20__ at _____, Philippines.

_____
Bidder's Representative / Authorized Signatory

SUBSCRIBED AND SWORN to before me this ___ day of *[month] [year]* at *[place of execution]*, Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her [insert type of government identification card used], with his/her photograph and signature appearing thereon, with no. _____ and his/her Community Tax Certificate No. _____ issued on ____ at _____.

Witness my hand and seal this ___ day of *[month] [year]*.

NAME OF NOTARY PUBLIC
Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. _____ *[date issued], [place issued]*
IBP No. _____ *[date issued], [place issued]*

Doc. No. _____
Page No. _____
Book No. _____
Series of _____

OMNIBUS SWORN STATEMENT FOR CORPORATION OR JOINT VENTURE

REPUBLIC OF THE PHILIPPINES)
CITY OF _____)SS

AFFIDAVIT

I (Name), of legal age, (Civil Status), (Nationality), and residing at (Address), after having been duly sworn in accordance with law, do hereby depose and state that:

1. I am the duly authorized and designated representative of (Name of Bidder) with office address at _____:

2. I am granted full power and authority to do, execute and perform any and all acts necessary to participate, submit the bid, and to sign and execute the ensuing contract for (Name of Project) of the Philippine Ports Authority, accompanied by the duly notarized Special Power of Attorney, Board Resolution or Secretary's Certificate;

3. (Name of Bidder) is not "blacklisted" or barred from bidding by the Government of the Philippines or any of its agencies, offices, corporations, or Local Government Units, foreign government / foreign or international financing institution whose blacklisting rules have been recognized by the Government Procurement Policy Board;

4. Each of the documents submitted in satisfaction of the bidding requirements is an authentic copy of the original, complete, and all statements and information provided therein are true and correct;

5. (Name of Bidder) is authorizing the PPA General Manager or its duly authorized representative(s) to verify all the documents submitted;

6. None of the officers, directors, and controlling stockholders of (Name of Bidder) is related to the PPA General Manager, members of the Bids and Awards Committee (BAC), the Technical Working Group, and the BAC Secretariat, the head of the Project Management office or the or end- user unit, and the project consultants by consanguinity or affinity up to the third civil degree;

7. (Name of Bidder) complies with existing labor laws and standards; and

8. (Name of Bidder) is aware of and has undertaken the following responsibilities as a Bidder:

   a) Carefully examine all of the Bidding Document:
   b) Acknowledge all conditions, local or otherwise, affecting the implementation of the contact;
   c) Made an estimate of the facilities available and needed for the contact to be bid, if any; and
   d) Inquire or secure Supplemental / Bid Bulletin(s) issued for the *Alegria Port Development Project, Port of Alegria, Buruanga, Aklan.*

9. (Name of Bidder) did not give or pay directly or indirectly, any commission, amount, fee, or any form of consideration, pecuniary or otherwise, to any person or official, personnel or representative of the government in relation to any procurement project or activity.

IN WITNESS WHEREOF, I have hereunto set my hand this ___ day of _____ 20__ at _____, Philippines.

_____
Bidder's Representative / Authorized Signatory

SUBSCRIBED AND SWORN to before me this ___ day of *[month] [year]* at *[place of execution]*, Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her [insert type of government identification card used], with his/her photograph and signature appearing thereon, with no. _____ and his/her Community Tax Certificate No. _____ issued on ____ at _____.

Witness my hand and seal this ___ day of *[month] [year]*.

NAME OF NOTARY PUBLIC
Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. _____ *[date issued], [place issued]*
IBP No. _____ *[date issued], [place issued]*

Doc. No. _____
Page No. _____
Book No. _____
Series of _____

REPUBLIC OF THE PHILIPPINES)
CITY OF _____)S.S.

BID-SECURING DECLARATION
Invitation to Bid No. _____

To : Philippine Ports Authority
Bonifacio Drive, South Harbor,
Port Area, manila

I, the undersigned, declare that:

1. I understand that, according to your conditions, bids must be supported by a Bid Security, which may be in the form of a Bid-Securing Declaration.

2. I/We accept that: (a) I/we will be automatically disqualified from bidding for any contract with any procuring entity for a period of two (2) years upon receipt of your Blacklisting Order; and, (b) I/we will pay the applicable fine provided under Section 6 of the Guidelines on the Use of Bid Securing Declaration, within fifteen (15) days from receipt of the written demand by procuring entity for the commission of acts resulting to the enforcement of the bid securing declaration under Sections 23.1 (b), 34.2, 40.1 and 69.1, except 69.1(f), of the IRR of RA 9184; without prejudice to other legal action the government may undertake:

3. I understand that this Bid-Securing Declaration shall cease to be valid on the following circumstances:

   (a) Upon expiration of the bid validity period, or any extension thereof pursuant to your request;

   (b) I am declared ineligible or post-disqualified upon receipt of your notice to such effect, and (i) I failed to timely file a request for reconsideration or (ii) I filed a waiver to avail of said right;

   (c) I am declared as the bidder with the Lowest Calculated Responsive Bid, and I have furnished the performance security and signed the Contract.

IN WITNESS WHEREOF, I have hereunto set my hand this _____ day of _____ 20 ____ at _____, Philippines.

_____
Name of Bidder's Authorized Representative
(Signatory's Legal Capacity)
AFFIANT

SUBSCRIBED AND SWORN to before me this __ day of *[month] [year]* at *[place of execution]*, Philippines. Affiant/s is/are personally known to me and was/were identified by me through competent evidence of identity as defined in the 2004 Rules on Notarial Practice (A.M. No. 02-8-13-SC). Affiant/s exhibited to me his/her *[insert type of government identification card used]*, with his/her photograph and signature appearing thereon, with no. _____.

Witness my hand and seal this ___ day of *[month] [year]*.

NAME OF NOTARY PUBLIC

Serial No. of Commission _____
Notary Public for _____ until _____
Roll of Attorneys No. _____
PTR No. __, *[date issued], [place issued]*
IBP No. __, *[date issued], [place issued]*
Doc. No. ___
Page No. ___
Book No. ___
Series of ____.

CONSTRUCTION METHODOLOGY

Name of Project : _____

Proposed Project Description : _____

Location : _____

MINIMUM SCOPE OF CONSTRUCTION METHODOLOGY

A. CONSTRUCTION OF BACK-UP AREA
(Area = 3,073 sq.m.)

1. Supply, driving and chipping of RC sheet piles and corner piles (242 l.m)
2. Supply and install tie-rods (4 sets)
3. Supply and placing of gravel bedding (11 cu.m.)
4. Supply and placing of concrete (292 cu.m.)
5. Supply and installation of steel reinforcement (28,781 kg.)
6. Supply and placing of rocks (3,689 cu.m.)
7. Supply and placing of geotextile fabric (2,202 sq.m.)
8. Supply and placing of fill materials (12,569 cu.m.)
9. Supply and placing of aggregate base course (613 cu.m.)
10. Construction of Portland Cement Concrete Pavement (3,067 sq.m.)
11. Supply and installation of lateral drainage cover (79 l.m.)
12. Supply and installation of catch drain manhole cover (7 sets)
13. Supply and laying of reinforced concrete pipe (1 l.m.)

B. RC PLATFORM 1
(Area= 1,308 sq.m.)

1. Supply, driving and chipping of 400mm x 400mm PSC piles (3,112 l.m.)
2. Supply and placing of concrete (452 cu.m.)
3. Supply and installation of steel reinforcement (86,375 kg.)

C. RC PLATFORM 1
(Area= 1,224 sq.m.)

1. Supply, driving and chipping of 400mm x 400mm PSC piles (2,932 l.m.)
2. Supply and placing of concrete (421 cu.m.)
3. Supply and installation of steel reinforcement (78,772 kg.)

D. RC PIER
(Area= 1,344 sq.m.)

1. Supply, driving and chipping of 400mm x 400mm PSC piles (4,443 l.m.)
2. Supply and placing of concrete (490 cu.m.)
3. Supply and installation of steel reinforcement (89,274 kg.)
4. Supply and install mooring bollard including furnishing new accessories for removed mooring bollard for re-installation (7 sets)
5. Supply and install rubber dock fenders including furnishing new accessories for removed RDF for re-installation (7 sets)

E. RORO RAMP, 2 UNITS
(Area= 198 sq.m.)

1. Supply, driving and chipping of 400mm x 400mm PSC piles (972 l.m.)
2. Supply and placing of concrete (144 cu.m.)
3. Supply and installation of steel reinforcement (31,546 kg.)
4. Supply and install mooring bollard (4 sets)
5. Supply and install rubber dock fenders (6 sets)

F. BREASTING DOLPHIN

1. Supply, driving and chipping of 400mm x 400mm PSC piles (632 l.m.)
2. Supply and placing of concrete (41 cu.m.)
3. Supply and installation of steel reinforcement (1,106 kg.)
4. Supply and install mooring bollard (2 sets)
5. Supply and install rubber dock fenders (4 sets)

G. PORT LIGHTING SYSTEM

1. Supply, deliver and install 10.0 m. ht. single bar floodlight steel tapered lamp post in hot dipped galvanized (5 sets) with 2-units 100 watt LED floodlight fixture each

NOTES:

The narrative construction method will guide and familiarize the contractor and the PPA on how the project shall be carried out in accordance with the highest standard of workmanship.

The construction method shall be consistent with the Bar Chart / S-Curve Schedule, Equipment Schedule and Manpower Schedule.

_____
Signature
(Authorized Signing Official)

MANPOWER SCHEDULE

Name of Project : _____

Proposed Project Description : _____

Location : _____

MANPOWER (Minimum)	CONTRACT DURATION (_____ Calendar Days)																	
	MONTHLY																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Project Manager																		
Project Engineer																		
Materials Engineer																		
Construction Safety and Health Officer																		
Foreman																		
Specify other applicable positions, ie.:																		
- Carpenter																		
- Steelman																		
- Mason																		
- Electrician																		
- Rigger																		
- Others																		

_____
Signature
(Authorized Signing Official)

EQUIPMENT UTILIZATION SCHEDULE

Name of Project : _____

Proposed Project Description : _____

Location : _____

EQUIPMENT (Minimum)	No. of Units	CONTRACT DURATION (_____ Calendar Days)																	
		M O N T H L Y																	
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18

_____
Signature
(Authorized Signing Official)

CASHFLOW BY QUARTER AND PAYMENT SCHEDULE

Name of Project: : _____

Proposed Project Description : _____

Location : _____

Project Duration (days or months)	Payment Schedule (Monthly, in Pesos)	Cash flow (Quarterly, in Pesos)
TOTAL		

NOTES

- The cash flow by quarter and payment schedule should be consistent with the Bar Chart and S-curb.
- Payment schedule shall not be more than once a month.

_____
Signature
(Authorized Signing Official)

SECTION X

CONTRACT FORM

Republic of the Philippines
PHILIPPINE PORTS AUTHORITY
PPA Building, Bonifacio Drive, South Harbor,
Port Area, Manila, Philippines

CONTRACT
FOR THE ALEGRIA PORT DEVELOPMENT PROJECT
PORT OF ALEGRIA, BURUANGA, AKLAN

This Contract made and entered into this _____ day of _____ 2019, in Manila, Philippines, by and between:

PHILIPPINE PORTS AUTHORITY, a government instrumentality created under Presidential Decree No. 857, as amended, with principal office at PPA Building, Bonifacio Drive, South Harbor, Port Area, Manila, represented herein by its duly authorized General Manager, **JAY DANIEL R. SANTIAGO**, and hereinafter referred to as "PPA";

- and -

_____, duly organized and existing in accordance with Philippine laws, with office and business address at _____, represented in this act by its _____, as evidenced by _____, a copy of which is hereto attached and made an integral part hereof as Annex "A", and hereinafter referred to as "CONTRACTOR."

W I T N E S S E T H:

WHEREAS, in accordance with Republic Act No. 9184 and its 2016 Implementing Rules and Regulations (IRR), PPA advertised and posted on the PPA website and PhilGEPS, as well as on its bulletin board, an Invitation to Bid for the _____;

WHEREAS, in response to the said advertisement _____ bidders submitted their respective bids for the foregoing project;

WHEREAS, after the opening of bids on _____ and the conduct of bid evaluation and post-qualification, the bid submitted by the CONTRACTOR at its unit and lump sum prices set forth in its proposal was found to be the _____ Bid in the amount of _____PESOS ( ), Philippine Currency;

WHEREAS, pursuant to Head Office BAC Resolution No. _____ Series of _____, award of contract was made to the CONTRACTOR in a Notice of Award dated _____, in the amount of _____ PESOS ( ), after submission of the required documents within the prescribed period and compliance to the conditions stipulated in the IRR;

WHEREAS, the CONTRACTOR duly accepted the award by signing its Conforme on the said Notice of Award;

NOW, THEREFORE, for and in consideration of the foregoing premises and the mutual stipulations herein contained, PPA and the CONTRACTOR have agreed, as follows:

1. In this Contract, words and expressions shall have the same meanings as are respectively assigned to them in the attached Contract Documents.

2. The following documents shall form part of this Contract:

   A. Bid Documents consisting of the following:

      A.1 Invitation to Bid;
      A.2 Instructions to Bidders;
      A.3 Bid Data Sheet;
      A.4 General and Special Conditions of Contract;
      A.5 Specifications
      A.6 Drawings/Plans;
      A.7 Addenda and/or Supplemental/Bid Bulletins, if any;

   B. Technical and Financial Proposals;
   C. Performance Security;
   D. Notice of Award of Contract with the Contractor's Conforme thereto; and
   E. Other contract documents that may be required by existing laws and PPA, such as:

      E.1 Construction Schedule and S-Curve;
      E.2 Manpower Schedule;
      E.3 Construction Methods;
      E.4 Equipment Utilization Schedule;
      E.5 Construction Safety and Health Program approved by the DOLE;
      E.6 Pert/CPM
      E.7 Duly Approved Program of Works and Cost Estimates;
      E.8 Certificate of Availability of Funds;
      E.9 Abstract of Bids; and
      E.10 Resolution of Award

3. In consideration of the payments to be made by PPA, the CONTRACTOR commits to complete the Works and remedy any defects therein in conformity with the provisions of this Contract and Contract Documents.

4. In consideration of the execution and completion of the Works and remedying any defects therein, PPA commits to pay the Contract Price or such other sum as may become payable under the provisions of this Contract and Contract Documents.

5. This Contract shall become effective after the same shall have been signed by the Parties hereof.

IN WITNESS WHEREOF, the Parties have hereunto signed this Contract on the date and place first hereinabove written.

PHILIPPINE PORTS AUTHORITY
TIN No. _____
By:

JAY DANIEL R. SANTIAGO
General Manager

_____

W I T N E S S E S:

_____ _____

ACKNOWLEDGMENT