

**ITEM 06 : 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<sup>2</sup> 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.

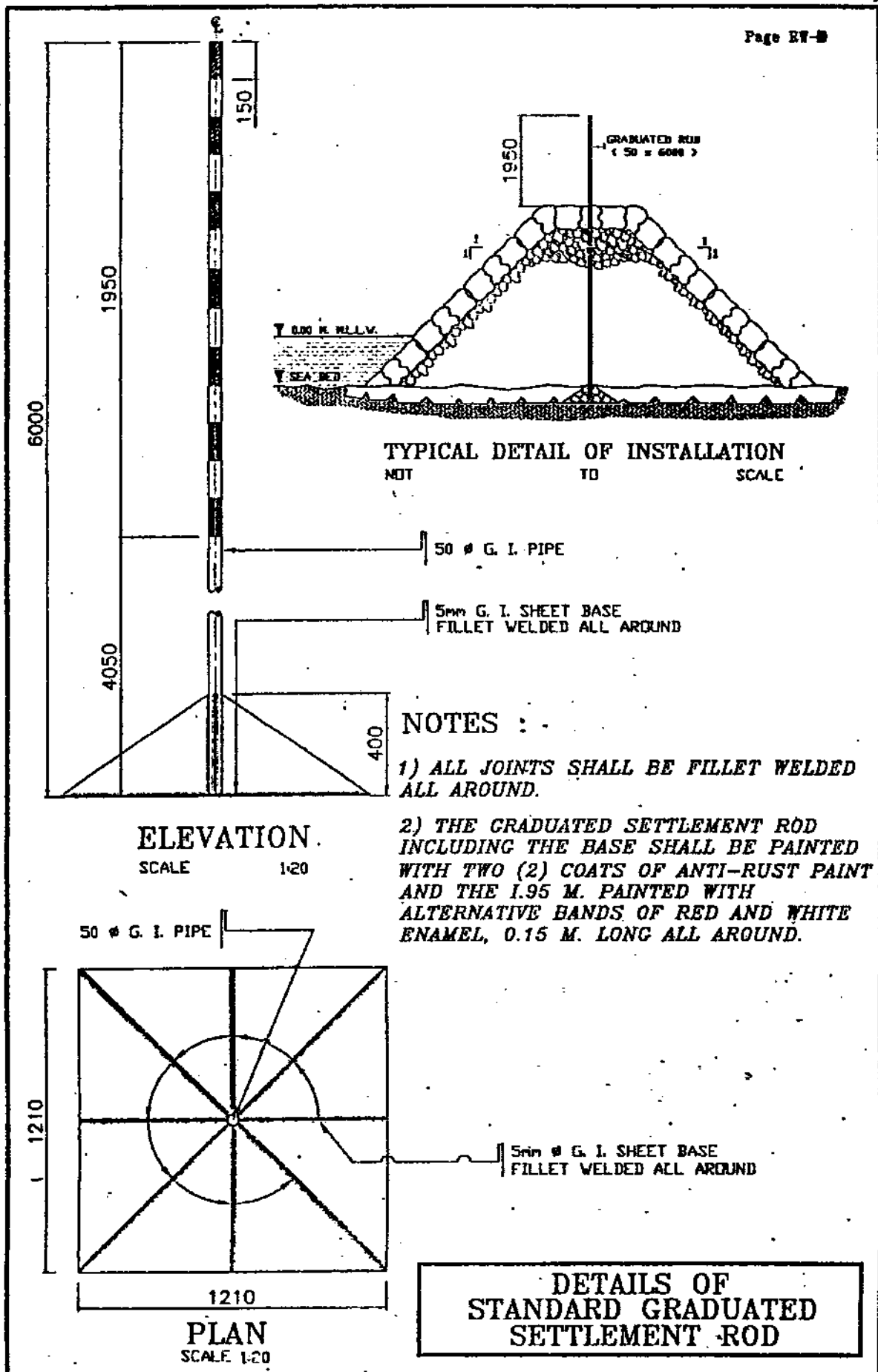
#### **FIELD COMPACTION TEST**

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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## ITEM 07 : AGGREGATE BASE COURSE

### SCOPE OF WORK

This Item shall consist of furnishing, placing and compacting an aggregate base course 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 (NO. 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 smoothing, 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<sup>2</sup> 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 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  $\frac{2}{3}$  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 as 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 that 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  $\frac{1}{2}$  of the normal lot length. If the length of the last unit is shorter than  $\frac{1}{2}$  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 : INTERLOCKING CONCRETE BLOCK PAVEMENT

### SCOPE OF WORK

This specification covers the construction of interlocking concrete block pavement on a prepared base courses and the laying of leveling course sand bedding all in accordance with the Specifications and Drawings.

### MATERIAL REQUIREMENTS

#### CONCRETE

Concrete for the interlocking concrete block shall be 41.4 MPa (6,000 psi). Mixing and casting shall be in accordance with the Section "Reinforced Concrete" and the form and dimensions shall be as shown on the Drawings.

Additional requirements shall be as follows:

Minimum 28 day compressive strength	-	41.4 MPa
Minimum aggregate	-	19 mm
Minimum water-cement ratio	-	0.47
Minimum cement content	-	470 kg/m <sup>3</sup>

#### SAND LEVELLING COURSE (Sand Cushion)

Materials for sand cushion shall consist of sand with uncoated grains, free from injurious amount of dust, lumps of clay, soft or flaky particles, shale, alkali, organic matter, loam or other deleterious substances. Beach sand shall not be allowed for use.

### EXECUTION

#### LAYING OF INTERLOCKING CONCRETE BLOCKS

Concrete blocks shall be laid dry and shall have attained the minimum 28 day compressive strength of 41.4 MPa (6,000 psi). No block with chipped surface, cracks or fabricated not to the dimension and truly square as shown on the drawings shall be used in the block work.

Block work shall be done in uniform manner such that the lines along the length or across the length formed by the edges of the blocks shall remain parallel all throughout the length and width of the pavement and the corners of the pavement forced by the lines of the edge between blocks for all sides shall be 4mm. The top of blocks forming the surface of the pavement shall be kept to the line, grade, slope and elevation as shown on the drawings.

The placing pattern of Interlocking concrete blocks shall be 45 degrees herringbone.

#### JOINTING AND COMPACTION

After laying the edges, the Interlocking concrete blocks shall be initially compacted into the sand bedding by means of a five (5) Horse Power (HP) vibratory plate compactor for at least two (2) passes.

Spread jointing sand over the block surface and swept into the joints using a soft brush. A second compaction with the vibrating plate compactor shall be performed for at least two (2) passes. The

Interlocking concrete block surface shall be proof rolled or compacted with an approved roller not less than 10 tons for at least two (2) passes to further seat the units in to the sand bedding. Lastly, excess jointing sand shall be swept off the surface.

#### **SAND LEVELLING CUSHION**

The sand shall be laid in thickness shown in the drawings spread out uniformly over the cement treated base (CTB) and in accordance with the lines and grades as directed by the Engineer.

#### **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.

## **ITEM 10 : INTERLINK/ CYCLONE WIRE MESH FENCE**

### **SCOPE**

This work covers all the following requirements regarding the construction of CHB wall, cyclone wire mesh or chain link fences and manufacturing and installation of steel angle frames as all other accessories in accordance with the lines, grades and dimensions shown in the drawings.

### **PHYSICAL PROPERTIES**

1. All steel, angle frames and accessories shall be inside and out in accordance with international standards for galvanizing BS EN1460.
2. The stiffeners of the steel fences shall be attached to the steel panels using the Welding Process.
3. The allowable tolerances on dimensions on the angular bars shall not exceed the following:
  - a. Thickness - 0.2mm  
(i.e. for 3mm required load bar thickness, the allowable thickness is from 2.8mm to above 3.0 mm only)
  - b. Height - 0.5mm  
(i.e. for 25mm required load bar height, the allowable height is from 24.5 to above 25mm only)
4. Welding shall be in accordance with the AWS Code and as herein specified or any other welding standard, approved by the Engineer.

### **MECHANICAL PROPERTIES**

The steel fence, barbed wire, steel gratings and angle framing supplier shall be required to submit test certificates for steel materials for the fence panel used in its manufacture; and for hot dip galvanizing which shall meet or exceed the following properties:

ASTM A36 Carbon Steel (Yield Strength = 250 Mpa; Tensile Strength = 400 Mpa)

### **DELIVERY, STORAGE, INSTALLATION AND MEASUREMENT**

1. Upon delivery at site, the hot dip galvanized steel fence panels, steel gratings and angle frames 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 steel fence panels steel gratings and angle frames shall not be exposed to sea water and other corrosive chemicals or substances prior to installation.

Installation of the steel fence panels, steel gratings and angle frames shall be in accordance with the Engineer.



## **MATERIALS**

### **1. Concrete Post**

Concrete post shall be made of Class A concrete in accordance with Item 9, Reinforced Concrete. The post shall be cast to the length shown on the detailed Plans, and shall have a smooth surface finish.

### **2. Steel Reinforcement**

Steel reinforcement for concrete post shall be deformed steel bars conforming to the provisions of Item 409, Reinforced Concrete.

### **3. Concrete Hollow Blocks (CHB)**

Concrete hollow blocks shall be standard machine vibrated, and shall have fine and even texture and well defined edges. Units shall be non-load bearing unless otherwise indicated in the drawings. Samples shall be submitted to the Engineer for approval.

### **4. Angular Bar**

The steel angular bar shall be ASTM A36 Carbon Steel with yield strength of 250MPa and Tensile Strength of 400MPa.

### **5. Cyclone Wire Mesh**

Cyclone Wire Mesh shall conform to the requirements of ASTM A 121, Class I.

## **SHOP DRAWING**

Prior to fabrication, the Contractor shall submit for the Engineer's approval shop drawings details of the proposed fencing.

## **CONSTRUCTION**

The Contractor shall perform such clearing and grubbing as may be necessary to construct the fence to required grade and alignment. Fence shall generally follow the contour of the ground. Grading shall be performed where necessary to provide a neat appearance.

The post shall be erected vertically in position inside the formwork of the foundation block prior to the placing of concrete shall be adequately supported by bracing to prevent movement of the post during the placing and setting of the concrete. The post shall be erected to the height and location shown on the Plans, or as ordered by the Engineer.

## **ITEM 11 : PILING WORKS (PSCSP)**

### **SCOPE OF WORK**

This section covers the minimum requirements for the fabrication, hauling, spotting, driving and finishing of the containment structure.

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

### **MATERIAL REQUIREMENTS**

#### **PRE-STRESSED CONCRETE SHEET PILES**

Pre-stressed concrete sheet 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 sheet 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, wires/strands, 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. Casting of pre-stressed concrete piles shall be in a manner that there shall be no leakage of concrete or grout into the space to be occupied by the steel. The ducts shall be of the correct cross-section, the ends being formed out as shown on the Drawings or as required by the pre-stressing system in use. Adequate means, subject to the Engineer's approval, shall be employed to ensure that their location is maintained exactly throughout the concreting operations. Passage shall be provided in the locations indicated on the Drawings for the injection and escape of grout and the release of air.

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 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. The Contractor shall splice the pile as shown on the drawings or other methods approved by the Engineer.

#### **TIE – RODS and FITTINGS**

All components of tie-rod assemblies to be supplied, assembled and installed by the Contractor shall be in accordance with the applicable requirements of the ASTM standards. The tie-rods shall have upset treaded ends and the minimum yield point shall be as shown on the drawings.

Bolts for assembly of structural steel and for connections or special sections shall conform to ASTM A325 and ASTM A 307 or as specified on the Drawings.

#### **EXECUTION**

Uncapped pile heads shall be protected against damage by the use of appropriate pile driving caps and/or cushions to centralize the driving impact.

The pile headers shall be of sufficient rigidity and fixity to hold the pile firmly in position and true alignment during driving operations.

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 2.5 tons or at least 25% (1/4) of the weight of sheet pile..

The fall of hammer shall not exceed 6m. (19.18 ft.) and shall be of uniform frequency to avoid injury to the piles.

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.

Piling shall commence from the interior outward as the lateral displacement of soil may influence driving and heaving of already driven piles.

Every effort shall be made to drive continuously without interruption.

The Contractor shall repair all damages to piles during driving. A minimum cut - off allowance, not less than 600 mm shall be provided for all corrections at in-place splices and at all the pile heads for removal after completion of the driving.

The piles which have been uplifted after being driven shall be re-driven to the required penetration after completing other activities in the nearby areas. As heaving is anticipated, survey benchmarks should be established and elevations must be taken of the driven piles adjoining the piles being driven to avoid pile displacement affected by the swell rise of sub-soil structures.

#### LENGTH OF PILES

The length of piles indicated in the drawings are predetermined lengths considering the actual soil classification and/or behavior based on geotechnical consultancy report.

#### 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.

#### PILE DRIVING 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.

#### TESTING OF MATERIALS

The requirements regarding testing of concrete and reinforcement used in reinforced concrete piles and sheet piles shall be in accordance with "Reinforced Concrete".

However, the Engineer may conduct the necessary testing at the approved fabricator's casting yard whenever he considers necessary. Tests shall be carried out at the Contractor's expense.

#### STORAGE AND HANDLING OF PILES

When raising or transporting piles, the Contractor shall provide slings or other equipment to avoid any appreciable bending of the pile or cracking of the concrete. Pile materials damaged in handling or driving shall be removed from the site and replaced by the Contractor at his expense.

Concrete piles shall be so handled at all times as to avoid breaking or chipping of the edges.

#### 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.

**ITEM 12 : PILING WORKS (RC CORNER SHEET PILE)**

**SCOPE OF WORK**

This section covers the minimum requirements for the fabrication, hauling, spotting, driving and finishing of the pier extension and back-up area.

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

**MATERIAL REQUIREMENTS**

**PRE-CAST REINFORCED CONCRETE (CORNER SHEET PILES)**

Pre-cast reinforced concrete (piles, sheet corner piles and sheet 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. The Contractor shall submit the casting method including casting schedule and shall obtain the approval of the Engineer before commencement of fabrication of the piles.
2. Pre-cast reinforced concrete (corner sheet piles) shall be supplied in accordance with the details and sections shown in the drawings. The class of concrete and quality of reinforcing steel shall be in accordance with the provisions of the specification for "Reinforced Concrete" unless otherwise noted in the drawings.
3. Casting of RC (corner sheet piles) shall be done with the length lying horizontally. The pile yard must be reasonably level and the ground sufficiently compact or hard, stable and not subject to any settlement, scour or erosion.
4. Pre-cast units shall be lifted only by lifting bars 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.
5. Each pre-cast member is to be uniquely and permanently marked to show its type, date of casting and length of pile.
6. Forms shall conform to the geometry of the pile with the provision of chamfer as shown on the Drawings.

**PRE-CAST REINFORCED CONCRETE**

Precast concrete for R.C. corner sheet piles and its reinforcement shall conform to the requirement of "Reinforced Concrete".

1. Fabrication Yard and Equipment shall be products of approved manufacturers regularly engaged in pile production of the same size or larger for a period of three years or more. However, the Contractors may be allowed to manufacture R.C piles upon presentation to the Engineer of proof that they have past experienced in manufacturing RC piles from their previous contracts having the same or bigger requirements.

Before casting of piles is started, approval shall be obtained of casting method, the casting yard and storage site and equipment. The Contractor shall provide all equipment necessary

for the fabrication of piles. Special care shall be made for curing, handling and transport of piles.

## 2. Casting and Fabrication

Piles shall be cast separately. The formwork for the piles shall have an even and solid bed and be constructed so that the piles can be easily removed from the form. The formwork and its placing shall be approved before casting of concrete. The formwork shall not be removed from its bed until the concrete has attained a compressive strength of at least 70% of its required 28 day strength.

The pile shall not be removed from its casting bed until it has reached its full 28 day compressive strength. Piles shall be moist cured for a period of 28 days after casting.

The Contractor shall determine the points where the piles will be supported during handling, transportation and storage. Care shall be taken to prevent piles from any damage during transportation. If the piles are placed in stacks, the supporting points at each layer shall be vertically over one another and the location of the supporting points shall be approved by the Engineer.

## 3. Formwork

Forms shall conform to the applicable provisions in Section, "Reinforced Concrete" Chamfers shall be provided at each corner of piles as indicated on the Drawings.

## 4. Marking

After the concrete has hardened, the piles shall be marked in approved format in durable paint indicating:

- a. Serial Number, marked close to both ends
- b. Date of casting, marked as (a)
- c. Date of arrival, marked as (b)
- d. Length of pile, marked as (c)
- e. Position of lifting points as approved by the Engineer
- f. Meter marks in two faces, throughout the length

## TIE – RODS and FITTINGS

All components of tie-rod assemblies to be supplied, assembled and installed by the Contractor shall be in accordance with the applicable requirements of the ASTM standards. The tie-rods shall have upset threaded ends and the minimum yield point shall be as shown on the drawings.

Bolts for assembly of structural steel and for connections or special sections shall conform to ASTM A325 and ASTM A 307 or as specified on the Drawings.

## GENERAL REQUIREMENTS

### Pile Length

Pile lengths shown on the Drawings are for estimating purposes only and are based upon probable lengths remaining in place in the completed structure.

1. Test piles of length shown on the drawings shall be driven at such points as designated by the Engineer that they may be left in place, cut off, and become a part

of the permanent structure. From their performance under driving, the Engineer will determine the lengths of piles required.

This pile shall be longer than ordinary piles shown in the pile schedule to provide for contingencies due to variations in soil behavior. Pile penetration observed per blow of the hammer shall be recorded. If refusal is observed while the required penetration is not yet obtained, the Contractor shall continue driving the pile with the aid of water jets. Water jets shall be carried out in all respect with rigorous control and not to detriment the surrounding ground or any part of the Works.

If necessary, test pile/s shall be spliced and re-driven until the bearing power and penetration are acceptable to the Engineer.

2. Lengths of regular piles shall be computed by the Hiley's Formula or other formulas accepted by the Engineer.

The above shall not be construed to mean that driving may stop when such penetration as shown on the plans has been secured, but that driving shall continue in every case until the total penetration obtained is satisfactory to the Engineer, regardless of the fact that sufficient bearing capacity as determined by the formula may be obtained at a lesser depth.

## EXECUTION

Uncapped pile heads shall be protected against damage by the use of appropriate pile driving caps and/or cushions to centralize the driving impact.

The pile headers shall be of sufficient rigidity and fixity to hold the pile firmly in position and true alignment during driving operations.

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

The required weight of ram for the diesel pile hammer is 2.5 tons.

The fall of hammer shall not exceed 6m. (19.18 ft.) and shall be of uniform frequency to avoid injury to the piles.

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.

Piling shall commence from the interior outward as the lateral displacement of soil may influence driving and heaving of already driven piles.

Every effort shall be made to drive continuously without interruption.

The Contractor shall repair all damages to piles during driving. A minimum cut - off allowance, not less than 600 mm shall be provided for all corrections at in-place splices and at all the pile heads for removal after completion of the driving.

The piles which have been uplifted after being driven shall be re-driven to the required penetration after completing other activities in the nearby areas. As heaving is anticipated, survey benchmarks should be established and elevations must be taken of the driven piles adjoining the piles being driven to avoid pile displacement affected by the swell rise of sub-soil structures.



## LENGTH OF PILES

The length of piles indicated in the drawings are predetermined lengths considering the actual soil classification and/or behavior based on geotechnical consultancy report. Pile driven to the required penetration but failed to develop the required bearing power shall be spliced and re-driven to attain at least the minimum required bearing power.

## 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.

## PILE DRIVING 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.

## TESTING OF MATERIALS

The requirements regarding testing of concrete and reinforcement used in reinforced concrete piles and sheet piles shall be in accordance with "Reinforced Concrete".

However, the Engineer may conduct the necessary testing at the approved fabricator's casting yard whenever he considers necessary. Tests shall be carried out at the Contractor's expense.

## STORAGE AND HANDLING OF PILES

When raising or transporting piles, the Contractor shall provide slings or other equipment to avoid any appreciable bending of the pile or cracking of the concrete. Pile materials damaged in handling or driving shall be removed from the site and replaced by the Contractor at his expense.

Concrete piles shall be so handled at all times as to avoid breaking or chipping of the edges.

## 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.

## **ITEM 13 : 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:

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

## **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 14 : 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 15 : 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
		Elongation	350% minimum	ASTM D412
		Hardness	76Hs maximum	ASTM D1456
	After Aging	Tensile Strength	Spring Type hardness test (Type A)	ASTM D2240
		Elongation		ASTM D412
		Hardness		ASTM D1456
	Compression Test		30% maximum	Aging by air heating: 70±1°C x 96 hours.
			Heat treatment: 70±1°C x 22 hours.	ASTM D2240
				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.

Ten percent (10%) of the total number of fenders to be supplied and rounded to a unit 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 less than 10% of the specified E
R = Reaction force,	R ≤ Specified R but not more than 10% of the specified R

## 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 16 : EXCAVATION WORKS

### SCOPE OF WORK

#### General Provisions

1. The area shall be excavated at the required depth as indicated on the Drawing/s.
2. The work includes furnishing of all labor, materials, plants and equipment required to complete/finish the excavation works.

#### Work Schedules

1. After examinations of all relevant data, coordination needs, work constrains, equipment to be used and other matters, a PERT/CPM diagram showing the detailed schedule/duration and sequences for the execution of excavation work shall be submitted to the Engineer for approval within 15 days before the proposed commencement of the Works.
2. Before the commencement of excavation works, the Contractor together with the Authority's Representatives and Surveyors shall conduct a pre-joint hydrographic and topographic survey which will form basis of actual quantity of excavated materials to be removed/excavated.
3. Prior to excavation works, the Contractor shall establish visible markers to clearly define the limits of the excavation.

### EQUIPMENT/LAYOUT OF WORK

#### Plant

1. The Contractor shall keep on the job sufficient equipment/plant to meet the requirement of the project.
2. The equipment/plant shall be in satisfactorily operating conditions and capable of efficiently performing the excavation works with safety as set forth herein and shall be subject to inspection by the Engineer at all times.

#### Physical Data/Layout of Work

1. The Authority does not guarantee to keep the project excavation area free from obstructions.
2. The Contractor shall conduct the work in such manner not to disrupt the port operational activities at all times.
3. The Contractor shall layout his work from the government established ranges and gauges which shall be pointed out to him prior to commencement of the excavation work but shall be responsible for all measurements in connection therewith.
4. The Contractor shall furnish, at his own expense, survey equipment, range markers, poles, buoys, etc., and labor as may be required in laying out any part of the excavation work.
5. The Contractor shall be responsible for the installation, maintenance and preservation of all gauges, ranges, platforms, excavation limit markers. Upon completion of the work, the Contractor shall promptly remove all ranges, markers, and other marker placed by him that may be detrimental to port operation.

## **EXECUTION**

### **EXCAVATION WORKS**

#### **Description**

1. This item shall consist for the removal of existing seabed/fill in conformity with the dimensions shown in hydrographic and topographic survey plan or as established by the Engineer.
2. The excavated suitable materials shall be used if proven to pass the requirements as backfilling materials.
3. The excavated good materials shall be stockpiled within the project site to be designated by the Engineer. The good materials shall be used for backfilling as directed by the Engineer.

#### **Progress of Work**

1. Upon mobilizing sufficient labors, materials, plants and equipment, the Contractor shall works at such hours as may be necessary, subject to existing laws, to ensure the prosecution of work in accordance with the approved schedule (PERT/CPM). If the Contractor falls behind the approved excavation schedule, the Engineer may require the Contractor to increase the number of shifts and/or equipment without extra cost to the Authority.
2. Failure of the Contractor to comply with the requirements shall be reasonable grounds to assume that the Contractor is not performing the excavation work with such diligence as will insure completion within the specified time, in which case, the Engineer may be compelled to take steps to protect the interest of the PPA.
3. When the Contractor elects to work overtime and on Sundays and legal holidays, appropriate authority from those concern must be secured and notice of his intention to do so shall be submitted to the Engineer within the reasonable time in advance thereof.
4. The Contractor shall submit daily excavation reports in duplicate within two (2) days after the end of the day covered by the report duly signed by the Contractor or his duly authorized representative and the Engineer. The report shall be made in forms and to be provided by the Authority.
5. The Contractor shall take necessary measures to protect the life and health of his men in accordance with the existing laws and regulations of the Government. The Contractor shall provide safety devices to Engineer and personnel while on board the equipment/plant in performance of their official duties.
6. The Contractor shall put up and maintain such markers and buoys as will prevent any accident in consequence of his excavation work. No liability whatsoever attaches to the Authority, if as a result of the operations or installation, an accident happens in the project area. The Contractor shall hold the Authority free and harmless against any or all claims of persons involve in such accidents.

### **EXCAVATED MATERIALS**

1. Disposal of excavated unsuitable materials from seabed shall be transported and deposited at 10.00 kms. (minimum) away from the area to be excavated.

2. Stockpiling and usage of excavated materials from existing backfill shall be approved by the Engineer in coordination with the Agency.

#### **Displace Materials**

1. Should the Contractor, during the progress of the excavation works, lose, dump, throw overboard, sink, misplace any materials, plant, machinery or appliance which may be dangerous to or obstruct navigation and/or port operations activities, the Contractor shall immediately give notice with description and location of such obstruction to the Authority and when required, shall mark the obstruction until such time the same is removed.
2. Should the Contractor refuse, neglect or delay compliance with the above requirements, such obstructions shall be removed by the Authority and the cost of its removal shall be deducted from any money due or to become due to the Contractor or proceeded against his performance bond.
3. Any excavated materials that is deposited other than the designated area will not be paid and the Contractor shall be required to remove such misplaced materials and deposit it to where directed at his expense.

#### **INSPECTION**

1. No PPA Project Engineer or Authority's Representative is authorized to change any provisions of the excavation specifications without written authorization of the Authority.
2. Nor shall the presence or absence of a PPA project Engineer or Authority's Representative relieve the Contractor from any of his responsibility under the Contract.

#### **PAY LIMITS**

It is to be clearly understood that no payments will be made for excavation beyond the excavation limits. The Contractor shall bear all the cost of over excavation beyond the project depth and in addition, of any remedial measures ordered by the Authority or its representative to be taken in areas over excavation is not permitted.

#### **SOUNDINGS**

1. The Contractor, in the presence or joint with the Authority's Representative and during the progress of the excavation works, shall perform continuous checking of the depth thru soundings.
2. For the purpose of work progress payments; the Contractor, jointly with the Authority's Representative and/or Surveyors, shall conduct soundings on areas subjected to excavation activities during the month or the preceding period for which payment is being claimed.
3. The Contractor will be responsible for all costs involved in the above mentioned such as costs for the survey equipment, measurement, markings, materials and other cost related thereto.



## ITEM 17 : 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 - (PEC)  
Philippine National Standard - (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 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**

#### **Specifications:**

Rated	: 100 Watt 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 and branch circuit breakers for panel board shall have the rating, capacity and number of 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-in 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 18 : PROJECT BILLBOARD**

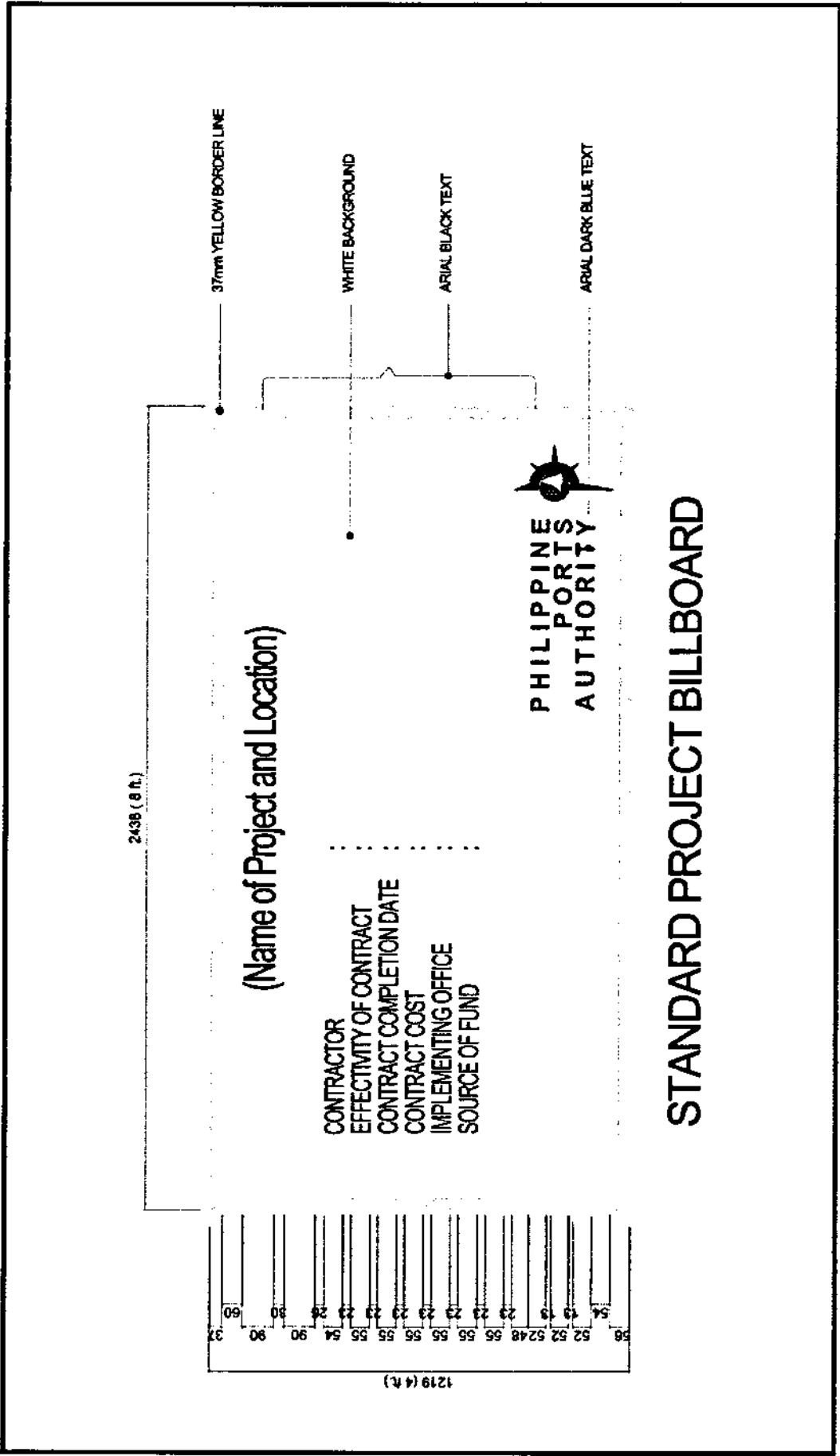
**SPECIFICATION**

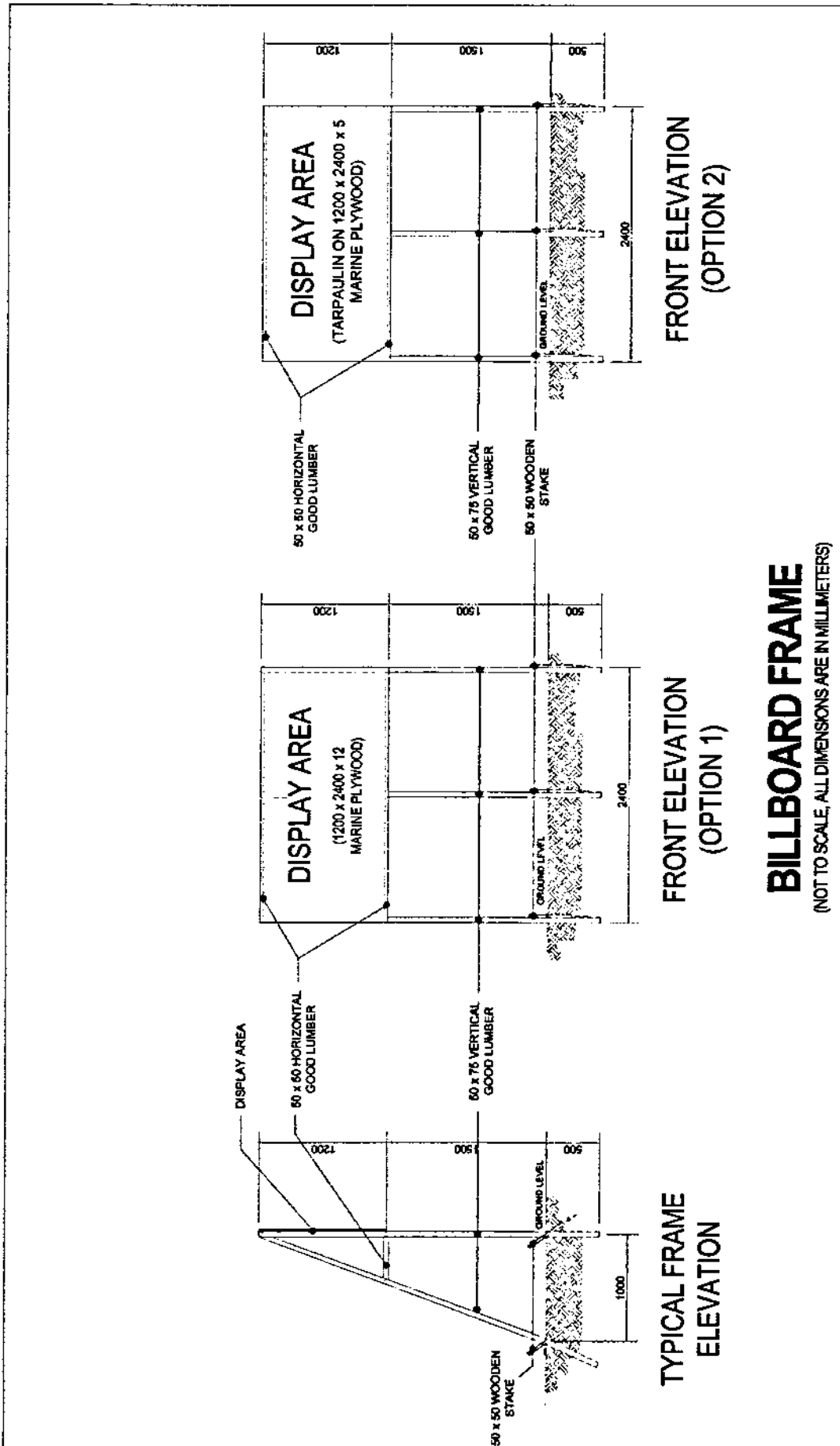
The Project Billboard shall be installed at location(s) designated by the Engineer.

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.





## ITEM 19 : 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.

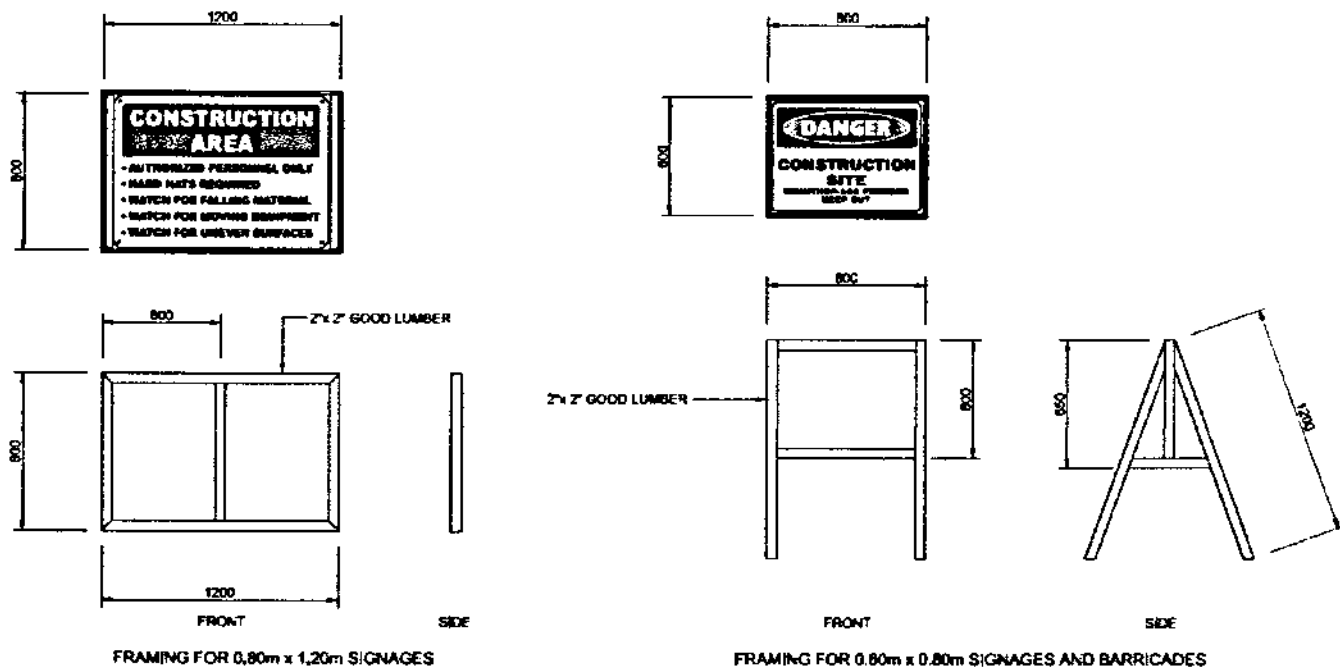
### SPECIFICATION

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:

01 of 28	Vicinity Map, Development Plan, General Notes and List of Drawings
02 of 28	General Plan
03 of 28	Drainage Layout Plan
04 of 28	Paving Plan
05 of 28	Key Piling Plan
06 of 28	Sheet Piling Plan, Detail of Channel/Wale, Detail of Wale Splice
07 of 28	Section A-A, Section B-B
08 of 28	Section C'-C', Section C"-C"
09 of 28	Section D-D, Section E-E
10 of 28	Section F-F, Section G-G
11 of 28	Section H'-H', Section H"-H"
12 of 28	Section I-I, Section J-J
13 of 28	Section K-K
14 of 28	Detail of Breasting Dolphin
15 of 28	Detail of Retaining Wall-1A, Detail of Retaining Wall-1B, Detail of Retaining Wall-2A, Detail of Retaining Wall-2B
16 of 28	Detail of Mooring Block-1, Detail of Mooring Block-2, Detail of Mooring Block-3, Detail of Retaining Wall-3, Detail of Wing Wall
17 of 28	Detail of Interlocking Concrete Block, Section Detail of Concrete Edging, Detail of Catch Drain Manhole, Detail of Catch Drain Manhole Cover
18 of 28	Detail of Tie Rod, Detail of Anchor Pile Block, Detail of Anchor Wall, Detail of Anchor Block
19 of 28	Detail Cone Type Rubber Fender (1000H) and Accessories

20 of 28	Detail of 100 Tons Mooring Bollard (Tee Head)
21 of 28	Detail of 35 Tons Mooring Bollard (Tee Head), Detail of Rubber Dock Fender (V-500h X 1500L)
22 of 28	Typical Section of Steel Sheet Piles
23 of 28	Detail of Pre-Stress Concrete Pile (450mm X 450mm)
24 of 28	Detail Elevation and Section of Pre-Stress Concrete Sheet Piles
25 of 28	Detail Elevation and Section of R.C. Corner Pile
26 of 28	Detail of Fence
27 of 28	Port Lighting Layout Plan, General Notes, Legend
28 of 28	Detail of Floodlight Connection, Schedule of Load, Single Angle Bar Floodlight Steel Tapered Lamp Post, Led Floodlight Fixture, Specifications

**SECTION VIII**

**BILL OF QUANTITIES**  
**and**  
**ATTACHMENTS**

**BILL OF QUANTITIES**  
**CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
**Port of Ozamiz, Ozamiz City, Misamis Occidental**

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
<b>BILL NO. 1</b>	<b>GENERAL EXPENSES</b>				
1.01	Mobilization, demobilization and cleaning	lot	1		
1.02	Rental of temporary site office and residence for the Engineer and staff	mo.	20		
1.03	Maintain temporary site office and residence for the Engineer and staff	mo.	20		
1.04	Provide Construction Safety and Health Program in the execution of the project	mo.	20		
<b>TOTAL FOR BILL NO. 1</b>					<b>-</b>

**BILL OF QUANTITIES**  
**CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
**Port of Ozamiz, Ozamiz City, Misamis Occidental**

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
<b>BILL NO. 2</b>	<b>CONSTRUCTION OF BACK-UP AREA</b>				
2.01	Remove and turn over to authority existing mooring bollard	set	5		
2.02	Remove and turn over to authority existing RDF	set	6		
2.03	Demolish and dispose existing CHB fence	sq.m.	120		
2.04	Demolish and dispose existing concrete pavement for roro ramp	sq.m.	407		
2.05	Demolish and dispose concrete of existing breasting dolphin	cu.m.	17		
2.06	Cutting of existing RC piles up to elevation mean lower low water (MLLW)	no.	9		
2.07	Chipoff existing rc curb, flush to deck level and smoothened with mortar	l.m.	39		
2.08	Supply and deliver to site steel pipe sheet piles (A252 Grade 2, 1,000mm Ø x 15mm thk) including welding of interlock connectors, sand blasting and other incidental works.	m.t.	893		
2.09	Application of polyurethane external coating for steel pipe sheet piles (Polyurethane : 32-10 @ 1,500 microns dry film thickness or equivalent)	sq.m.	1,169		
2.10	Handle, pitch and drive steel pipe sheet piles (1,000mm x 15mm thk)	l.m.	2,325		
2.11	Cutting of driven steel pipe sheet piles up to cut-off elevation including turn-over to authority of excess piles	no.	93		

**BILL OF QUANTITIES**  
**CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
**Port of Ozamiz, Ozamiz City, Misamis Occidental**

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
2.12	Supply, fabricate and install steel channel wale including splice plates, bolts, washers and other accessories	kg	8,057		
2.13	Extract clogged materials from steel pipe sheet piles	cu.m.	550		
2.14	Supply and place sand filler for steel pipe sheet piles	cu.m.	756		
2.15	Supply and place 3,500 psi concrete filler for steel pipe sheet piles	cu.m.	275		
2.16	Supply and install reinforcing steel cage for steel pipe sheet piles	kg	39,473		
2.17	Supply and place 1000 kg rocks	cu.m.	961		
2.18	Supply and place 50-100 kg rocks	cu.m.	9,048		
2.19	Supply and place 3,500 psi concrete for retaining walls, anchor wall, wingwall, mooring block, fender block, anchor pile block, rc curb and perimeter fence column	cu.m.	695		
2.20	Supply and install steel reinforcement for retaining walls, anchor wall, mooring block, fender block, anchor pile block, rc curb, perimeter fence column and CHB	kg	57,255		
2.21	Supply and install geotextile fabric	sq.m.	4,044		
2.22	Supply and place sand and gravel fill	cu.m.	36,216		
2.23	Supply, spread and compact selected fill materials	cu.m.	4,954		

**BILL OF QUANTITIES**  
**CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
**Port of Ozamiz, Ozamiz City, Misamis Occidental**

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
2.24	Supply, spread and compact aggregate base course	cu.m.	931		
2.25	Supply and place portland cement concrete pavement (PCCP, 300mm thk.)	sq.m.	419		
2.26	Supply, spread and compact 10% cement treated base course (150mm thk.)	cu.m.	813		
2.27	Supply and spread leveling sand cushion (50mm thk.)	cu.m.	271		
2.28	Supply and Install Interlocking Concrete Blocks Pavement (100mm x 200mm x 125mm)	sq.m.	5,415		
2.29	Construct concrete edging including steel reinforcement	sq.m.	231		
2.30	Construct CHB wall (150mm thk.) for perimeter fence	sq.m.	103		
2.31	Supply and place plain cement plaster finish for CHB wall and column	sq.m.	257		
2.32	Supply, fabricate and install various materials for cyclone wire mesh fence	sq.m.	167		
2.33	Supply and install 32mmØ x 12.00m tie-rod including accessories	set	20		
2.34	Supply and install 60mmØ x 15.00m tie-rod including accessories	set	27		
2.35	Supply and install 70mmØ x 17.00m tie-rod including accessories	set	45		
2.36	Supply and deliver to site 0.35m x 0.525m PSC sheet piles	l.m.	2,163		



**BILL OF QUANTITIES**  
**CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
Port of Ozamiz, Ozamiz City, Misamis Occidental

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
2.37	Supply and deliver to site RC corner sheet piles a. RC sheet corner pile no.1 b. RC sheet corner pile no.2	l.m. l.m.	21 21		
2.38	Handle, pitch and drive 0.35m x 0.525m PSC sheet piles and RC corner sheet piles	l.m.	2,205		
2.39	Supply and deliver to site 0.45m x 0.45m PSC anchor piles	l.m.	2,691		
2.40	Handle, pitch and drive 0.45m x 0.45m PSC anchor piles	l.m.	2,691		
2.41	Chipping and cutting of driven concrete piles up to cut-off elevation including disposal of debris	l.m.	222		
2.42	Supply and install 610mmØ RCP for drainage	l.m.	116		
2.43	Construct catch drain manhole including cover	no.	8		
2.44	Supply and place gravel bedding	cu.m.	33		
2.45	Supply and place anchor blocks.	no.	20		
2.46	Supply and deliver to site rubber dock fender (Cone type fender, 1000H ) including accessories	set	6		
2.47	Supply and deliver to site rubber dock fender (V-type 500H x 1500L)	set	12		
2.48	Install rubber dock fender including accessories	set	18		

**BILL OF QUANTITIES**  
**CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
Port of Ozamiz, Ozamiz City, Misamis Occidental

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
2.49	Supply and deliver to site mooring bollard (100T, T-head) including accessories	set	6		
2.50	Supply and deliver to site mooring bollard (35T, T-head) including accessories.	set	4		
2.51	Install mooring bollard including accessories	set	10		
2.52	Excavate existing seabed up to required elevation prior to laying of rocks	cu.m.	2,968		
<b>TOTAL FOR BILL NO. 2</b>					.

**BILL OF QUANTITIES**  
**CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
**Port of Ozamiz, Ozamiz City, Misamis Occidental**

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
<b>BILL NO. 3</b>	<b>CONSTRUCTION OF BREASTING DOLPHIN</b>				
3.01	Supply and deliver to site 0.45m x 0.45m PSC piles	l.m.	250		
3.02	Handle, pitch and drive 0.45m x 0.45m PSC vertical piles	l.m.	54		
3.03	Handle, pitch and drive 0.45m x 0.45m PSC batter piles	l.m.	196		
3.04	Chipping and cutting of driven PSC piles up to cut-off elevation including disposal of debris	no.	9		
3.05	Supply and place 3,500 psi concrete for breasting dolphin	cu.m.	17		
3.06	Supply and install steel reinforcement for breasting dolphin	kg	965		
3.07	Supply and deliver to site rubber dock fender (V-type 500H x 1500L)	set	1		
3.08	Install rubber dock fender including accessories	set	1		
3.09	Supply and deliver to site mooring bollard (35T, T-head) including accessories.	set	1		
3.10	Install mooring bollard including accessories	set	1		
<b>TOTAL FOR BILL NO. 3</b>					<b>-</b>

**BILL OF QUANTITIES**  
**CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
**Port of Ozamiz, Ozamiz City, Misamis Occidental**

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
<b>BILL NO. 4</b>	<b>PORT LIGHTING SYSTEM</b>				
4.01	Supply, deliver and install electrical works for port lighting system as shown in the plan	lot	1		
4.02	Construct lamp post foundation	no.	2		
<b>TOTAL FOR BILL NO. 4</b>					-

**BILL OF QUANTITIES**  
**CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
**Port of Ozamiz, Ozamiz City, Misamis Occidental**

NO. (1)	DESCRIPTION OF WORK (2)	UNIT (3)	QTY. (4)	UNIT PRICE (Pesos) (5)	AMOUNT (Pesos) (4) x (5)
<b>BILL NO. 5</b>	<b>REIMBURSABLE ITEMS</b>				
5.01	Provide reimbursable items necessary in the implementation of the project as determined by the Authority	lot	1	2,945,388.42	2,945,388.42
<b>TOTAL FOR BILL NO. 5</b>					<b>2,945,388.42</b>

## **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<sup>2</sup>

**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      Remove and turn over to authority existing mooring bollard**

The quantity to be paid for shall be the actual quantity in set of existing mooring bollard to be removed and turned over to authority 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      Remove and turn over to authority existing RDF**

The quantity to be paid for shall be the actual quantity in set of existing RDF to be removed and turned over to authority 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      Demolish and dispose existing CHB fence**

The quantity to be paid for shall be the actual area in square meter of existing CHB fence, demolished and disposed 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      Demolish and dispose existing concrete pavement for ro-ro ramp**

The quantity to be paid for shall be the actual area in square meter of existing concrete pavement, demolished and disposed for ro-ro ramp 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      Demolish and dispose concrete of existing breasting dolphin**

The quantity to be paid for shall be the actual volume in cubic meter of concrete of existing breasting dolphin, demolished and disposed 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      Cutting of existing RC piles up to elevation Mean Lower Low Water (MLLW) elevation**

The quantity to be paid for shall be the actual number of existing RC piles, cut off up to elevation Mean Lower Low Water (MLLW) 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      Chip off 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 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 2.08      Supply and deliver to site steel pipe sheet piles (A252 Grade 2, 1,000mm Ø x 15mm thk.) including welding of interlock connectors, sand blasting and other incidental works**

The quantity to be paid for shall be the actual weight in metric tons of steel pipe sheet piles (A252 Grade 2, 1,000mm Ø x 15mm thk.) including welding of interlock connectors, sand blasting and other incidental works, 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 2.09      Application of polyurethane external coating for steel pipe sheet piles (Polyurethane: 32-10 @ 1,500 microns dry film thickness or equivalent)**

The quantity to be paid for shall be the actual area in square meter of polyurethane external coating (Polyurethane: 32-10 @ 1,500 microns dry film thickness or equivalent), applied on the steel pipe sheet piles 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      Handle, pitch and drive steel pipe sheet piles (1,000mm Ø x 15mm thk.)**

The quantity to be paid for shall be the actual length in linear meter of steel pipe sheet piles (1,000mm Ø x 15mm thk.), 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 2.11      Cutting of driven steel pipe sheet piles up to cut-off elevation including turn over to authority of excess piles**

The quantity to be paid for shall be the actual number of driven steel pipe sheet piles, cut-off up to required elevation including turn over to authority of excess piles 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 2.12      Supply, fabricate and install steel channel wale including splice plates, bolts, washers and other accessories**

The quantity to be paid for shall be the actual weight in kilogram of steel channel wale including splice plates, bolts, washers and other accessories, supplied, fabricated 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      Extract clogged materials from steel pipe sheet piles**

The quantity to be paid for shall be the actual volume in cubic meter of clogged materials from the steel pipe sheet piles, extracted 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 sand filler for steel pipe sheet piles**

The quantity to be paid for shall be the actual volume in cubic meter of sand filler for steel pipe sheet piles, 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 place 3,500 psi concrete filler for steel pipe sheet piles**

The quantity to be paid for shall be the actual volume in cubic meter of 3,500 psi concrete filler for steel pipe sheet piles, 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 2.16      Supply and install reinforcing steel cage for steel pipe sheet piles**

The quantity to be paid for shall be the actual weight in kilogram of reinforcing steel cage for steel pipe sheet piles, 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 2.17      Supply and place 1000 kg. rocks**

The quantity to be paid for shall be the actual volume in cubic meter of 1000 kg. 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 2.18      Supply and place 50-100 kg. rocks**

The quantity to be paid for shall be the actual volume in cubic meter of 50-100 kg. 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 2.19      Supply and place 3,500 psi concrete for retaining walls, anchor wall, wing wall, mooring block, fender block, anchor pile block, rc curb and perimeter fence column**

The quantity to be paid for shall be the actual volume in cubic meter of 3,500 psi concrete for retaining walls, anchor wall, wing wall, mooring block, fender block, anchor pile block, rc curb and perimeter fence column, supplied, set-in-place and finished 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 2.20      Supply and Install steel reinforcement for retaining walls, anchor wall, mooring block, fender block, anchor pile block, rc curb, perimeter fence column and CHB**
- The quantity to be paid for shall be the actual weight in kilogram of steel reinforcement for retaining walls, anchor wall, mooring block, fender block, anchor pile block, rc curb, perimeter fence column and CHB, 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 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 2.22      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 2.23      Supply, spread and compact selected fill materials**
- The quantity to be paid for shall be the actual volume in cubic meter of selected fill materials 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 2.24      Supply, spread and compact aggregate base course**
- The quantity to be paid for shall be the actual volume in cubic meter of aggregate base course 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 2.25      Supply and place portland cement concrete pavement (PCCP, 300mm thk.)**
- The quantity to be paid for shall be the actual area in square meter of portland cement concrete pavement (PCCP, 300mm thk.), 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 2.26      Supply, spread and compact 10% cement treated base course (150mm thk.)**

The quantity to be paid for shall be the actual volume in cubic meter of 10% cement treated base course (150mm thk.) 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 2.27      Supply and spread leveling sand cushion (50mm thk.)**

The quantity to be paid for shall be the actual volume in cubic meter of leveling sand cushion (50mm thk.), supplied and spread 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 2.28      Supply and install Interlocking Concrete Blocks Pavement (100mm x 200mm x 125mm)**

The quantity to be paid for shall be the actual area in square meter of interlocking concrete blocks pavement (100mm x 200mm x 125mm) to be 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 2.29      Construct concrete edging including steel reinforcement**

The quantity to be paid for shall be the actual area in square meter of concrete edging including steel reinforcement, constructed 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 2.30      Construct CHB wall (150mm thk.) for perimeter fence**

The quantity to be paid for shall be the actual area in square meter of CHB wall (150mm thk.) for perimeter fence, constructed 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 2.31      Supply and place plain cement plaster finish for CHB wall and column**

The quantity to be paid for shall be the actual area in square meter of plain cement plaster finish and column, 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 2.32      Supply, fabricate and install various materials for cyclone wire mesh fence**

The quantity to be paid for shall be the actual area in square meter of various materials for cyclone wire mesh fence, supplied, fabricated 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 2.33      Supply and install 32mmØ x 12.00m tie-rod including accessories**

The quantity to be paid for shall be the actual quantity in set of 32mmØ x 12.00m 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 2.34      Supply and install 60mmØ x 15.00m tie-rod including accessories**

The quantity to be paid for shall be the actual quantity in set of 60mmØ x 15.00m 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 2.35      Supply and install 70mmØ x 17.00m tie-rod including accessories**

The quantity to be paid for shall be the actual quantity in set of 70mmØ x 17.00m 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 2.36      Supply and deliver to site 0.35m x 0.525m PSC sheet piles**

The quantity to be paid for shall be the actual length in linear meter of 0.35m x 0.525m PSC 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 2.37      Supply and deliver to site RC corner sheet piles**

- a) RC sheet corner pile no. 1
- b) RC sheet corner pile no. 2

The quantity to be paid for shall be the actual length in linear meter of RC corner sheet 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 2.38      Handle, pitch and drive 0.35m x 0.525m PSC sheet piles and RC corner sheet piles**

The quantity to be paid for shall be the actual length in linear meter of 0.35m x 0.525m PSC sheet piles and RC corner sheet 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 2.39      Supply and deliver to site 0.45m x 0.45m PSC anchor piles**

The quantity to be paid for shall be the actual length in linear meter of 0.45m x 0.45m PSC 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 2.40      Handle, pitch and drive 0.45m x 0.45m PSC anchor piles**

The quantity to be paid for shall be the actual length in linear meter of 0.45m x 0.45m PSC 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 2.41      Chipping and cutting of driven concrete piles up to cut off elevation including disposal of debris**

The quantity to be paid for shall be the actual length in linear meter of driven concrete piles to be chipped and cut 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 2.42      Supply and install 610mmØ RCP for drainage**

The quantity to be paid for shall be the actual length in linear meter of 610mmØ RCP for drainage, 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 2.43      Construct catch drain manhole including cover**

The quantity to be paid for shall be the actual number of catch drain manhole including cover, 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 2.44      Supply and place gravel bedding**

The quantity to be paid for shall be the actual volume in cubic meter of gravel bedding, 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 2.45      Supply and place anchor blocks**

The quantity to be paid for shall be the actual number of anchor 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 2.46      Supply and deliver to site rubber dock fender (Cone type Fender 1000H) including accessories**

The quantity to be paid for shall be the actual quantity in set of rubber dock fender (Cone type Fender 1000H) including accessories, 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 2.47      Supply and deliver to site rubber dock fender (V-type 500H x 1500L) including accessories**

The quantity to be paid for shall be the actual quantity in set of rubber dock fender (Cone type Fender 1000H) including accessories, 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 2.48      Install rubber dock fender including accessories**

The quantity to be paid for shall be the actual quantity in set of rubber dock fenders 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 2.49      Supply and deliver to site mooring bollard (100T, T-head) including accessories**

The quantity to be paid for shall be the actual quantity in set of mooring bollard (100T, T-head) including accessories, 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 2.50      Supply and deliver to site mooring bollard (35T, T-head) including accessories**

The quantity to be paid for shall be the actual quantity in set of mooring bollard (35T, T-head) including accessories, 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 2.51      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 2.52      Excavate existing seabed up to required elevation prior to laying of rocks**

The quantity to be paid for shall be the actual volume in cubic meter of existing seabed, excavated up to required elevation prior to laying of rocks 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**

**CONSTRUCTION OF BREASTING DOLPHIN**

**Item 3.01      Supply and deliver to site 0.45m x 0.45m PSC piles**

The quantity to be paid for shall be the actual length in linear meter of PSC piles (0.45m x 0.45m), 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 3.02      Handle, pitch and drive 0.45m x 0.45m PSC vertical piles**

The quantity to be paid for shall be the actual length in linear meter of 0.45m x 0.45m PSC vertical 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 3.03      Handle, pitch and drive 0.45m x 0.45m PSC batter piles**

The quantity to be paid for shall be the actual length in linear meter of 0.45m x 0.45m PSC batter 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      Chipping and cutting of driven PSC piles up to cut off elevation including disposal of debris**

The quantity to be paid for shall be the actual number of driven PSC piles to be chipped and cut 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 3.05      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, 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 3.06      Supply and install steel reinforcements for breasting dolphin**

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 3.07      Supply and deliver to site rubber dock fender (V-type 500H x 1500L) including accessories**

The quantity to be paid for shall be the actual quantity in set of rubber dock fender (V-type 500H x 1500L) including accessories, 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 3.08      Install rubber dock fender including accessories**

The quantity to be paid for shall be the actual quantity in set of 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.

**Item 3.09      Supply and deliver to site mooring bollard (35 Tons, T-head) including accessories**

The quantity to be paid for shall be the actual quantity in set of mooring bollard (35 Tons, T-head) including accessories, 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 3.10      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.

**BILL NO. 4**

**PORT LIGHTING SYSTEM**

**Item 4.01      Supply, deliver and install electrical works for port lighting system as shown in the plan**

The quantity to be paid for shall be the actual quantity in lot of electrical works for port lighting system as shown in the plan to be supplied, delivered and installed 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 4.02      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.



**BILL NO. 5**

**REIMBURSABLE ITEMS**

**Item 5.01      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	Crane Barge (319 GW, minimum) with 60T crane, owned
2	units	Crawler Crane (30T, minimum), owned
1	units	Pile Hammer (Diesel, 10,500 kg.m.), owned
1	unit	Pile Hammer (Diesel, 7,500 kg.m.), owned
2	units	Drop Hammer (2T, minimum), owned/leased
1	unit	Clamshell, owned
2	units	Concrete Mixer (1-bagger, minimum), owned
2	units	Concrete Vibrator (3.5 hp, minimum), owned
1	unit	Concrete Screeder, owned
1	unit	Concrete Cutter (5 hp, minimum), owned
1	unit	Forklift (1.36T), owned
2	units	Bar Cutter (electric, 25mm dia min.), owned
2	units	Bar Bender (electric, 25mm dia min.), owned
2	units	Dump Truck (8 cu.m., minimum), owned
1	unit	Water Truck with pump (1,000 gal., minimum), owned
2	units	Suction Hose, (100mm, minimum), owned
1	unit	Centrifugal Trash Pumps (100mm, 16hp), owned
1	unit	Air-Compressor (250 cfm, minimum), owned
2	units	Jack Hammer, owned
1	unit	Welding Machine (400 amp., minimum), owned
2	units	Oxy/Acetylene Cutting Outfit, owned
1	unit	Tugboat (500hp, minimum), owned/leased
1	unit	Road Roller (12.05T, vibratory, minimum), owned/leased
1	unit	Road Grader (125 hp, minimum), owned/leased
1	unit	Payloader (1.06cu.m., 93 hp, minimum), owned/leased
1	unit	Backhoe (0.40 cu.m., 94.30 hp, minimum), owned/leased
1	unit	Concrete Bucket, owned/leased
2	units	Transit Mixer (5-6 cu.m. cap., minimum), owned/leased
2	units	Plate Compactor (5 hp, minimum), owned

## **CONSTRUCTION SAFETY AND HEALTH REQUIREMEN**

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**

- |    |      |              |
|----|------|--------------|
| 75 | pcs. | Hard Hats    |
| 75 | pcs. | Gloves       |
| 4  | pcs. | Goggles      |
| 2  | pcs. | Aprons       |
| 8  | pcs. | Safety Belts |
| 75 | pcs. | Safety Shoes |
| 8  | pcs. | Life Lines   |

#### **Safety Devices**

- |   |       |                   |
|---|-------|-------------------|
| 1 | lot   | Barricades        |
| 1 | lot   | Warning signs     |
| 2 | units | Fire extinguisher |

Medical and First Aid System                      -                      For twenty (20) mos.

### **NOTE:**

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

**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 Construction of Back-up Area and RC Wharf on Fill, Port of Ozamiz, Ozamiz City, Misamis Occidental**;
- (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	P
2	Construction of Back-up Area	
3	Construction of Breasting Dolphin	
4	Port Lighting System	
5	Reimbursable Items	
	<b>TOTAL AMOUNT OF BID (including VAT)</b>	<b>P</b>

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 **Construction of Back-up Area and RC Wharf on Fill, Port of Ozamiz, Ozamiz City, Misamis Occidental 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	Title of the Project				Unit of Measure	Quantity
			Title of the Project	Title of the Project	Title of the Project	Title of the Project		
1. Off-shore pile driving of steel pipe piles	l.m.	1,163						
2. Off-shore pile driving of concrete piles	l.m.	2,573						
3. Reinforced Concrete Works	cu.m.	494						
4. Rock Works a) 1000 kg./pc. b) 50-100 kg./pc.	cu.m. cu.m.	481 4,524						
5. Fill Materials	cu.m.	20,585						
6. Construction of Portland Cement Concrete Pavement (PCCP)	sq.m.	210						
7. Construction of Interlocking Concrete Block Pavement	sq.m.	2,708						

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, 1<sup>st</sup>, 2<sup>nd</sup> & 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) <sup>1)</sup>	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	Materials Engineer - One (1) year
Project Engineer - Three (3) years	Materials Engineer I - for projects costing up to 100M
Foreman - Five (5) years	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 INFORMATION (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 contract;
  - c) Made an estimate of the facilities available and needed for the contract to be bid, if any; and
  - d) Inquire or secure Supplemental / Bid Bulletin(s) issued for the *Construction of Back-up Area and RC Wharf on Fill, Port of Ozamiz, Ozamiz City, Misamis Occidental*.

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

### A F F I D A V I T

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 contract;
  - c) Made an estimate of the facilities available and needed for the contract to be bid, if any; and
  - d) Inquire or secure Supplemental / Bid Bulletin(s) issued for the *Construction of Back-up Area and RC Wharf on Fill, Port of Ozamiz, Ozamiz City, Misamis Occidental*.



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. \_\_\_\_\_

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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 contract;
  - c) Made an estimate of the facilities available and needed for the contract to be bid, if any; and
  - d) Inquire or secure Supplemental / Bid Bulletin(s) issued for the *Construction of Back-up Area and RC Wharf on Fill, Port of Ozamiz, Ozamiz City, Misamis Occidental*.

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 = 115.50m x 50.00m = 5,775.00 sq.m)

1. Remove and turn over to authority existing mooring bollard (5 sets), existing RDF (6 sets), demolish and dispose existing CHB Fence (120 sq.m.), existing concrete pavement (407 sq.m.), concrete of existing breasting dolphin (17 cu.m.) including cutting of existing concrete piles (9 pcs) up to elevation MLLW and chipping of existing rc curb, flush to deck level (39 l.m.)
2. Supply and drive A252 Grade 2, 1000mmØ x 15m thk. Steel pipe sheet piles 893 m.l. equivalent to 2,325 l.m.) including application of polyurethane external coating (1,169 sq.m.), supply and place of sand filler (756 cu.m.), concrete filler (275 cu.m.), installation of reinforcing steel cage bar (39,473 kg of various sizes), extraction of clogged materials (550 cu.m.) and cutting of SPSP up to cut off el. (93 pcs.)
3. Supply and installation of steel channel wale (8,057 kg), tie rod of various sizes (45 sets – 70mmØ x 17m, 27 sets- 60mmØ x 15m and 20 sets – 32mmØ x 12m), geotextile fabric (4,044 sq.m.) and anchor block (20 sets)
4. Construction of rock bulkhead (10,009 cu.m.), fill materials (41,170 cu.m), reinforced concrete for retaining wall, anchor wall, mooring block, fender block, rc curb, anchor pile block, wing wall and perimeter fence column (695 cu.m. of concrete and 57,255 kg of reinforcing steel bars of various sizes)
5. Supply and drive of concrete piles (0.35m x 0.525m psc sheet piles – 2,163 l.m. and rc corner sheet piles - 42 l.m. and 0.45m x 0.45m PSC piles – 2,691 l.m.), including chipping and cutting of newly driven piles up to required elevation (222 pcs)
6. Construction of CHB wall (103 sq.m.), including plastering (257 sq.m.) and various materials for cyclone wire mesh (167 sq.m.)
7. Construction of portland cement concrete pavement (300mm thk., 419 sq.m.) and interlocking concrete block pavement (5,415 sq.m.), including aggregate base course (931 cu.m.), cement treated base course (813 cu.m.), sand cushion (271 cu.m.) and concrete edging (231 sq.m.)
8. Construction of catch drain manhole (8 sets) and reinforced concrete pipe (610mmØ – 116 l.m.) including gravel bedding (33 cu.m.)
9. Supply and install rubber dock fender of various sizes (Cone Type Fender, 1000H x 100 – 6 sets and V-type 500H x 1500L – 12 sets) and mooring bolidard of various sizes (100T, T-Head – 6 sets and 35T, T-head – 4 sets)

**B. CONSTRUCTION OF BREASTING DOLPHIN  
(Number = 1 set)**

1. Supply and drive of 0.45m x 0.45m psc piles (250 l.m.), including chipping/ cutting (9 pcs)
2. Construction of reinforced concrete for breasting dolphin (17 cu.m. of concrete and 965 kg of reinforcing bars of various sizes)
3. Supply and install rubber dock fenders, V-type, 500H x 1500L (1 set) and mooring bollards, 35 tons, T-head (1 set)

**C. PORT LIGHTING SYSTEM**

1. Supply and installation of single angle bar floodlight steel post, 10.00m ht., hot dipped galvanized (2 sets) with 100 watt LED floodlight fixture (4 sets)

**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.

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Signature  
(Authorized Signing Official)

**MANPOWER SCHEDULE**

Name of Project : \_\_\_\_\_

Proposed Project Description : \_\_\_\_\_

Location : \_\_\_\_\_

MANPOWER (Minimum)	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	19	20
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 : \_\_\_\_\_

[illegible]

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)
<b>TOTAL</b>		

### 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 CONSTRUCTION OF BACK-UP AREA AND RC WHARF ON FILL**  
**PORT OF OZAMIZ, OZAMIZ CITY, MISAMIS OCCIDENTAL**

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."

**WITNESSETH:**

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

WITNESSES:

\_\_\_\_\_

ACKNOWLEDGMENT