Technical Specifications

I. GENERAL CONDITION

The Work generally consist of furnishing of all labor, materials and equipment required to carry out and complete the ***Repair of Perimeter Fence, Gate and Drainage System, Port of Bulalacao, Oriental Mindoro,*** in accordance with the contract drawings and in conformity with these specifications.

PLANS AND SPECIFICATIONS

All drawings, whether in small scale or detailed, are intended to correspond with specifications to form part thereof and the contract documents. Where figures are given, they are to be followed in preference to measurement by scale. Anything shown on the drawings but not indicated in the specifications or vice-versa or anything not expressly set forth in either but which is reasonably implied, shall be furnish and installed as though specifically shown and mentioned in both, without extra cost to PPA.

II. SCOPE OF WORKS

1.00 General Expenses

1.01 Mobilization, Demobilization and Cleaning Up

The Contractor shall mobilize and put into work all personnel, plant, and equipment required to undertake the works. The minimum equipment required to be mobilized at site are the following:

	Equipment Description	*Quantity*
1	Backhoe (0.52cu.m,/90hp)	One (1) Unit
2	Payloader (1.06 cu.m., 93hp)	One (1) Unit
3	Oxy/Acetylene Cutting Outfit	One (1) Unit
4	Concrete Cutter, 5hp	One (1) Unit
5	Road Grader, 125hp	One (1) Unit
6	Road Roller (10T/130HP vibratory)	One (1) Unit
7	Water Truck (16000 liters)	One (1) Unit
8	Concrete Mixer (1-bagger)	Two (2) Units
9	Concrete Vibrator (3.5 hp)	Two (2) Units
10	Jackhammer w/ compressor, 350cfm	One (1) Unit
11	Bar Cutter (25mm bar dia. max)	One (1) Unit
12	Bar Bender (25mm bar dia. max)	One (1) Unit
13	Chain Block with Stand	One (1) Unit

2.0 Perimeter Fence

2.01 Remove and Dispose Existing Perimeter Fence and other Structures

The work includes the furnishing of all labor and equipment required to carry out the remove and dispose existing perimeter fence and other structures and as instructed by the PPA Engineer.

Waste materials shall be hauled and dumped in the area designated by the engineer/PPA representative while salvaged materials shall be turned over to the Authority.

2.02 Excavation, Backfilling and Compaction including Gravel Bedding

The work includes the furnishing of all labor and equipment required to carry out the excavation, backfilling and compaction including gravel bedding as instructed by the PPA Engineer.

Excavation

All excavations shall be carried out to the lengths, width, and depths necessary to complete the work as shown on the drawings and as instructed by the PPA Engineer.

The Contractor shall as deemed necessary take all necessary precautions to ensure that excavated surfaces are kept clean and dry. The Contractor shall keep the excavated areas or trenches free from ground water or water from any other sources.

The Contractor shall provide all temporary support or sheathing or any other measure necessary to prevent excavated earth surface from any movement or cave-in.

All surplus materials shall be disposed of at disposal areas designated by the PPA Engineer or at such disposal area approved for use by local authorities. Recoverable materials intended to be used for backfilling of trenches shall be stored/stockpiled at a location approved/directed by the PPA Engineer.

Backfilling and Compaction

Aggregate base course materials shall be natural gravel or crushed stone of maximum size of 19 mm. It shall be clean and free from vegetable matters lumps or balls of clay and other deleterious substances. The material shall be of such nature that it can be compacted readily to form a firm and stable base.

The base course bedding shall be laid according to its prescribed thickness and width as indicated on the Drawings and/or as directed by the PPA Engineer.

Placing of concrete shall not be allowed unless compaction requirements have been complied with as directed by the PPA Engineer.

2.03 Supply and Place 300mm Thk 3500psi Concrete for Perimeter Fence

The work shall include but not limited to the furnishing of all labor, materials, equipment and incidentals necessary to complete the supply and placing of 3500 psi concrete fence.

Concrete

The work shall include but not limited to the supply and placing of concrete inclusive of transport in accordance with these specifications and where shown on the Drawings.

Specifications of the materials comprising the concrete mixture shall conform to the following:

Cement – the cement to be used shall be ordinary Portland cement, ASTM Type 1 designation C150

Fine Aggregate – for concrete and mortar shall be clean and complying with ASTM C33 specifications for concrete aggregates. The sand shall come from approved sources and sand which in the opinion of the PPA Engineer has become contaminated shall be rejected and removed from site.

Coarse Aggregate – shall comply with ASTM C33 specification. It may either be natural gravel or stone crushed to the desired size and shall only be obtained from approved quarries.

Water – clean fresh potable water shall be used for the mixing of all concrete and mortar mixtures. Sea water shall not be used at any time.

Concrete mixer shall be stationary mixer i.e. one bagger mixer. The mixer must be capable of combining the materials into a uniform mixture and of discharging this mixture without segregation.

Concrete shall be handled from one bagger mixer, placed to final deposit in a continuous manner, as rapidly as practicable and without segregation or loss of ingredients until the activity of placing concrete is completed.

Prior to placing of concrete, debris, dirt and other foreign materials shall be removed from the interior of the forms and from inner surface of mixing equipment. Temperature steel reinforcing bars shall be secured in position and shall be inspected and approved by the PPA Engineer before placing the concrete.

Ideally, the temperature of concrete during the period of mixing, transport and placing should not be more than 32º C. Where cold joints tend to form or where surfaces set and dry too rapidly or plastic shrinkage cracks tend to appear, concrete shall be kept moist by fog sprays, or other approved means, applied shortly after placement and before finishing.

Where applicable, immediately after placing, each layer of concrete shall be compacted by internal concrete vibrators supplemented by hand spading, rodding and tamping as necessary.

Concrete shall be protected adequately from injurious action by sun, rain, flowing water and mechanical injury and shall not be allowed to dry out from the time it is placed until the expiration of the minimum curing periods specified herein. Curing shall be accomplished by moist curing or by application of liquid membrane forming compound.

As the work progresses, cylinder samples shall be taken and tested in accordance with standards for testing of concrete cylinder samples. One set of three cylinders shall be sampled for every 50 cu.m. of concrete placed or at least one set shall be made for each day of concrete pouring. Tests will be made at 7 and 28 days from time of sampling. The average of the strengths of the three cylinders tested shall not be lower than the specified compressive strength of 3,500 psi.

2.04 Supply and Place Reinforcing Steel Bars for Concreting Works

The work shall include but not limited to the furnishing of all labor, materials, equipment and incidentals necessary to complete the supply and placing of RSB for concreting works.

Steel reinforcement used shall have deformed surfaces and shall conform to ASTM as follows:

16 mm Ø and above – ASTM 305, Min. Yield Strength of 414 MPa

12 mm Ø and below – ASTM A615-74a, Min. Yield Strength of 275 Mpa

Reinforcement shall be free of loose or flaky rust and mill scale, or coating and any other substance that would reduce or destroy the bond with concrete. Wire brushing of the concrete may be required before fixing in order to achieve the required condition. Reinforcement shall not be bent or straightened in a manner injurious to the steel or concrete. The use of heat to bend or straighten reinforcement shall not be permitted. Bars with developed cracks or splits shall be rejected and replaced.

Splices and overlapping in reinforcement where applicable shall conform to current standards and accepted engineering practice. Lap lengths shall not be less than 40 times the reinforcing bar diameter or as shown on the drawings or otherwise directed by the PPA Engineer. All laps shall be staggered or made at points where steel stress has fallen to less than half the allowable stress. Where lap shall not be staggered or be made at points of reduced stress, lap length shall be increased by 30%.

2.05 Supply and Place CHB including Reinforcement and 20mm Thick Cement Plaster Finish

The work shall include but not limited to the furnishing of all labor, materials, equipment and incidentals necessary to complete the supply and placing of including reinforcement and 20mm thick cement plaster finish

Concrete Hollow Blocks

CHB shall be ready made products of approved fabricator regularly engaged in the production of CHB for a period of five years or more.

6” and 4” CHB shall be of standard manufacture, machine vibrated, with fine and even texture and well-defined edges.

CHB upon delivery to the site shall be stacked under a shed or otherwise protected from exposure to the weather and from contact with soil. Care shall be exercised in handling the blocks to avoid chipping and breakage. Damaged blocks shall be rejected and removed from the site immediately.

Preparation of Surfaces plastering works

All surfaces shall be cleaned and projections, dust, loose particles and other materials which would prevent good bond shall be removed.

All surfaces shall be thoroughly wetted before plastering.

- Refer to Item 2.04 for specification of RSB

2.06 Supply, Spread and Compact Selected Filling Materials

The work includes the furnishing of all labor and equipment required to carry out the supply, spread and compact including filling material bedding as instructed by the PPA Engineer.

- Refer to Item 2.02 for specification of compaction

2.07 Supply, Spread and Compact 200mm Thk Gravel Base Course Materials

The work includes the furnishing of all labor and equipment required to carry out the supplying, supply, spread and compact 200mm thk gravel base course materials as instructed by the PPA Engineer.

- Refer to Item 2.02 for specification of compaction

2.08 Supply and Place 300mm Thk 3500psi Concrete for Pavement

The work shall include but not limited to the furnishing of all labor, materials, equipment and incidentals necessary to complete the supply and placing of 3500 psi concrete pavement

- Refer to Item 2.03 for specification of concrete

2.09 Supply and Place Paint on Perimeter Fence and Gate

The work includes the furnishing of all labor and equipment required to carry out the supply and placing of paint on perimeter fence and gate as indicated on the Drawings and/or as directed by the PPA Engineer.

Materials to be used

1. Elastomeric Paint (Ready mixed) for exterior concrete/masonry & hardiflex wall/ceiling surface.

All painting works shall be done under conditions which shall not jeopardize the appearance or quality of the painting in any way. The

Engineer shall have the right to reject all material such as high solid modified epoxy paint and polyurethane finish paint or work that is unsatisfactory, and require the replacement of either or both at the expense of the Contractor.

The Contractor shall endeavor to protect the work of others during the time repainting work is in progress. The Contractor shall be responsible for any and all damage to any other work in the course of his painting job. Protective coverings shall be used to protect floors, fixtures and equipment while painting; care shall be exercise to prevent paint being spattered unto surfaces which are not painted.

WORKMANSHIP

All painting work shall be first class and in accordance with the best standard and practices of the trade.

The Contractor shall examine carefully all surfaces to be painted and before beginning any of his work shall make sure that the work of other trades has been installed in a workman like condition ready to receive paint. Metal surfaces shall be clean, dry, and free from mill scale, rust, grease, oil or any other substance which could affect the quality of the painting.

Paint shall be applied at proper consistency and each coat shall be brushed evenly free of brush marks, sags, and runs. Care shall be exercise to avoid lapping of paint on glass or hardware. Paint shall be sharply applied to require lines. Finish paint surfaces shall be free from defects or blemishes. Surfaces from which such paint cannot be removed satisfactorily shall be painted or repainted as required to produce a finish satisfactorily to the Engineer.

Succeeding paint coatings shall be applied only when the previous coat is hard and dry.

All painting materials shall be used in strict accordance with manufacturers' directions, spread or flowed on smoothly with proper film thickness and without runs, sags, skips or other defects.

PREPARATION OF PAINT

Paint containers shall be delivered to the job site in manufacturer's unopened containers and shall be opened only required for use. Paint shall be mixed only in the designated room or space in the presence of the Engineer or his representative. Paint shall be thoroughly stirred or agitated to uniformly smooth consistency suitable for proper application. Unless otherwise specified or approved, no materials shall be reduced, changed, or use except in accordance with manufacturer's label or tag on container. In all cases, paint shall be prepared and handled in a manner to prevent deterioration and inclusion of foreign matter.

PREPARATION OF SURFACES

All surfaces shall be free from dirt, dust, oil grease, efflorescence, loose cement, chalk and other deleterious matter shall be removed and

surface roughened when necessary to insure good paint adhesion. The method of surface preparation shall be left to the discretion of the Contractor, but results obtained shall be satisfactory to the Engineer.

All holes, cracks and depression shall be neatly filled with patching plaster, mixed and applied to match existing plaster. Patches shall be sanded flush and smooth and properly sealed before applying prime coat.

For metal, dirt, weld splatter, rust, scale and other contaminants shall be removed by scraping, wire brushing and sanding as required. Oil and grease shall be removed with mineral spirits or appropriate solvent.

3.00 Drainage System

3.01 Removal and Disposal of Unsuitable Materials and Debris

The work includes the furnishing of all labor and equipment required to carry out the removal and disposal of unsuitable materials and debris and other structures and as instructed by the PPA Engineer.

Waste materials shall be hauled and dumped in the area designated by the engineer/PPA representative while salvaged materials shall be turned over to the Authority.

3.02 Excavation, Backfilling and Compaction

The work includes the furnishing of all labor and equipment required to carry out the excavation, backfilling and compaction as instructed by the PPA Engineer.

- Refer to Item 2.02 for specification of excavation, backfilling and compaction

3.03 Supply and Place Reinforced Concrete Pipe Culvert (RCPC) including Manhole and Restoration of Existing Pavement

The work includes the furnishing of all labor and equipment required to carry out the supply and placing of reinforced concrete pipe culvert (RCPC) including manhole and restoration of existing pavement as indicated on the Drawings and/or as directed by the PPA Engineer.

Materials to be used

- Reinforced Concrete Pipe Culvert (RCPC), Dia. 36"

- Refer to Item 2.03 and 2.04 for specification of concrete and RSB, respectively

III. MEASUREMENT FOR PAYMENT

In accordance with Section II Scope of Works of this Technical Specifications, the pertinent items of work described therein and to be executed by the contractor shall be measured and paid for according to the following terms:

- All scope of works, activities shall be paid in accordance with the unit price for said item of works done/completed indicated in the Bill of Quantities (BOQ), plan and certified by the PPA Engineer.

IV. As-Built Drawings and Photographs

1.00 Photographs taken before, during and after completion of the project shall be submitted as part of the documentary requirements for the progress billing.

2.00 At the completion of the Project, the Contractor shall prepare three (3) sets of “As-built” Drawings which shall be submitted to the PPA, PMO-Mindoro as part of the documentary requirements for the formers final billing. The as-built drawings shall indicate therein all the original items of work, changes, deviations and additional work items (if any), undertaken by the contractor to complete the project. The as-built drawings shall bear the title block prescribed by the PPA and shall be signed by the contractor’s authorized representative prior to submission to PPA, PMO-Mindoro.

Section VII.
Drawings

Section VIII.
Bill of Quantities