

### **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 08 : 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**

#### **BACK FILL**

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

#### **GRAVEL BEDDING**

Gravel Bedding/gravel base shall be in accordance with the specifications of Crushed Course Aggregates in "Reinforced Concrete".

#### **SAND BEDDING**

Sand bedding shall be in accordance with Item "Reinforced Concrete (Fine Aggregates)".

#### **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 while the testing requirements shall conform to ASTM C 497. 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.

Standard reinforcement details and concrete strength shall be in accordance with DPWH "Standard Two Meter Concrete Pipe Culvert".

#### **STEEL GRATING**

The fabrication of grating shall conform to requirements of Steel and Metal Works" and "Zinc Coatings on Iron and Steel"

All steel grades and dimensions shall conform with the approved plans.

## **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.

Methods of installation and typical bedding for pipe conduits if not included in the plans, shall conformed to DPWH "Standard Two Meter Reinforced Concrete Culvert".

### **LATERAL DRAIN**

Concrete cover and the 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.

## **CLEARING AND DISPOSAL**

Dumping or disposal of un-used excavated materials shall be coordinated to PMO. If the excavated materials are determined for disposal, the contractor will provide all necessary works and expenses for its completion in concurrence by the Engineer.

## ITEM 09 : 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 Rubber Dock Fenders (RDF).

PHYSICAL PROPERTIES OF MATERIALS

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

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

Physical Properties and Test Method

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

Note: Equivalent Standards are acceptable.

FITTINGS AND ANCHORAGE

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

TESTING, SAMPLING, INSPECTION, ACCEPTANCE, MARKING AND PACKAGING

Testing

All rubber dock fenders shall be tested for performance. 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.

The standard performance testing methodology shall be Method B, to wit:

1. Fender temperature shall be stabilized at 23 degrees plus or minus 5 degrees centigrade for at least 24 hours before compression testing.
2. Break-in of fender by deflecting 3 times to rated deflection.
3. Removed load from the RDF and allow recovering for a minimum of 1 hour.
4. Deflect RDF at speed of 2-8 cm/min once to rated deflection.

The testing apparatus shall be calibrated and certified within plus or minus 1% in accordance with ISO or equivalent JIS or ASTM requirements. Calibration shall be traceable to a national/international standard and shall be performed annually by an accredited third party organization. The RDF performance testing center shall be subjected to accreditation by PPA and notation and /or certification by DPWH-BRS prior to acceptance.

Inspection

All fenders of each type shall be inspected for compliance to specified dimensions and all fenders shall be inspected by the Engineer 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.

All RDF items/units shall be clearly numbered and marked indicated the following:

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 10 : ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL**

**SCOPE OF WORK**

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

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

**MATERIAL REQUIREMENTS**

**STEEL OR IRON**

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

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

**EXECUTION**

**FABRICATION**

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

**CASTINGS**

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

**ZINC**

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

**BATH COMPOSITION**

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

COATING PROPERTIES

Table 1 – Minimum Average Coating Thickness Grade by Material Category

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

COATING THICKNESS

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

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

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

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

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

## FINISH

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

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

1. Each area subject to renovation shall be 25mm (1 in.) or less in its narrowest dimension.
2. The total area subject to renovation on each article shall be no more than  $\frac{1}{2}$  of 1% of the accessible surface area to be coated on that article, or 22,500mm<sup>2</sup> (36 in.<sup>2</sup>) per ton of piece weight, whichever is less. Inaccessible surface areas are those which cannot be reached for appropriate surface preparation and application of repair materials as described in ASTM Practice A 780.
3. The thickness of renovation shall be that is required by the thickness grade for the appropriate material category and thickness range in Table 1 in accordance with the coating thickness requirements, except that for renovation using zinc paints, the thickness of renovation shall be 50% higher than that required by table 1, but not greater than 0.0254mm (4.0 mils).
4. When areas requiring renovation exceed the criteria previously provide, or are inaccessible for repair, the coating shall be rejected.

## THREADED COMPONENTS IN ASSEMBLIES

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

## APPEARANCE

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

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

## ADHERENCE

The zinc coating shall withstand handling consistent with the nature and thickness of the coating and

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

SAMPLING

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

1. For testing at a galvanizer’s facility, a lot is one or more articles of the same type and size comprising a single order or a single delivery load, whichever is smaller, or any number of articles identified as a lot by the galvanizer, when these have been galvanized within a single production shift and in the same bath.
2. For test by the purchaser after delivery, the lot consists of the single order or the single delivery load, whichever is smaller, unless the lot identify, established in accordance with the above, is maintained and clearly indicated in the shipment by the galvanizer.

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

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

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

TEST REQUIREMENTS

Magnetic Thickness Measurements:

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

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

material thickness within the requirements for each specimen of the test article

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

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

Stripping Method

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

Table 2 – Coating Thickness Grade <sup>A</sup>

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

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

Weighing Before or After Galvanizing

The average of coating may be determined by weighing articles before and after galvanizing, subtracting the first weigh from the second and dividing the result by the surface area. The

first weigh shall be determined after pickling and drying, and the second after cooling to ambient temperature. The weight of coating per unit area thus determined is converted to equivalent coating thickness values according to Table 2 (rounding up or down as appropriate). The thickness of coating thus obtained is the test article coating thickness.

### Microscopy

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

### Adhesion

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

### Embrittlement

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

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

### Inspection, Rejection and Retest

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

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

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

### Transport and Storage

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

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

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



**ITEM 11 : CONSTRUCTION JOINTS**

**SCOPE OF WORK**

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

**MATERIAL REQUIREMENTS**

1. All construction joints / expansion joints shall be hot-dipped galvanized inside and out in accordance with international standards for galvanizing BS EN1460.
2. Painted finish shall be rejected.
3. All steel gratings and angle bars for construction joints / expansion joints shall be hot-dipped galvanized except for the nuts, washers and bolts which shall be stainless steel.
4. Welding shall be in accordance with the AWS Code and as herein specified or any other welding standard, approved by the Engineer.

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

**EXECUTION**

**DELIVERY, STORAGE AND INSTALLATION**

1. Upon delivery at site, the hot-dipped galvanized construction joints / expansion joints shall not be subjected to the following activities:
  - a. Re-fabrication
  - b. Cutting
  - c. Grinding
  - d. Welding
  - e. Sawing
  - f. Any hot works or similar activities
2. Stainless steel nuts and bolts may be tack welded using stainless steel welding rods.
3. The construction joints / expansion joints shall not be exposed to sea water and other corrosive chemicals or substances prior to installation.

## ITEM 12 : PAINTING

### GENERAL

General Requirements," contain provisions and requirements essential to these Specifications; and apply to this section, whether or not referred to herein.

### SCOPE OF WORK

This Section covers the surface preparation, coating materials and application of coatings systems required for the Works.

The work shall consist of furnishing of all labor, materials, equipment and other incidentals necessary for the supply of painting materials and the complete painting of surfaces as shown on the drawings in accordance with this Specification and as directed by the Engineer.

The term paint as hereinafter used includes emulsion paints, varnishes, oils, pigments, thinner and dryers.

All exposed metal surfaces, except metal surfaces embedded in concrete, shall be painted unless otherwise specified.

### STANDARD

The following publications listed below, but referred to thereafter by basic designation only, forms a part of these Specifications to the extent indicated by the reference thereto:

Steel Structures Painting Council (SSPC) U.S. Specification JIS K 5628 Red-lead Zinc Chromate Anti-Corrosive Paint.

### SUBMITTAL

1. The Contractor shall submit work method statements with lists of materials to the Engineer for approval twenty-eight days before the starting of works. This statement shall include following items:
  - a. Type of paint and manufacturer
  - b. Manufacturer's specifications
  - c. Storage and delivery of materials
  - d. Surface preparation
  - e. Finish painting and drying
  - f. Touch-up painting, if any
  - g. Equipment
2. The Contractor, before placing order for the painting materials, shall submit to the Engineer for approval samples of materials. No placing of orders for material shall be made without his approval.

### STORAGE AND DELIVERY

1. The Contractor shall deliver all material to the site in the original labeled sealed cans and containers, with labels intact and seal unbroken.
  - a. Seals shall remain unbroken until after inspection and acceptance of material by the Engineer.

- b.

The Contractor shall deliver materials in ample quantities sufficiently in advance of the need to avoid any delay or interruptions in the works.
2. Paint in thinner shall be stored in accordance with the approved manufacturer's instructions.

a.

All regulations required for storage of paint shall be observed and all necessary safety signs required by governing codes shall be posted.

b.

Any damage caused by failure to exercise proper precautions in paint storage shall be repaired.

MATERIAL REQUIREMENTS

PAINT

Paints for the protective coating system shall be the product of a manufacturer approved by the Engineer.

Paints for exterior finish must be with tile like durability and elegance, fast drying, solvent-based acrylic, highly suitable for coastal or polluted areas with excellent anti-fungus properties and alkali resistance.

An all-purpose synthetic quick dry paint for all types of metal surfaces. It has high gloss, good color retention and outstanding durability.

For galvanized and ungalvanized ferrous metal, use 100% acrylic gloss paint, has excellent resistance to ultraviolet rays and resist chalking, cracking and color fading, dries fast and environmentally friendly.

SCHEDULE OF PAINTING

Masonry Fence	2-coats latex or as indicated in the scheduled finish
Unprimed Ferrous Metal	First Coat: rust inhibitive ferrous primer Second Coat: Exterior enamel
Galvanized Ferrous Metal	Primer – one coat Finish – one coat

EXECUTION

SURFACE PREPARATION OF STEEL

1. Steel surfaces shall be cleaned as follows:

a.

All round welds, burrs and sharp surface projections shall be ground smooth and all weld splatter shall be removed prior to blast cleaning.

b.

Sand abrasives, if used, shall be clean, and free from salt and extraneous matter. The sand shall pass through a 2.0 mm test sieve and be substantially retained on a 0.18 mm test sieve, with at least 25 percent retained on a 0.355 mm test sieve.

c.

Metallic abrasive, if used, shall be sharp, hard and free from dust, and shall pass through a 1.8 mm test sieve.

- d. Blast cleaning operations shall not be conducted on surfaces that will be wet after blasting and before coating, or when the surfaces are less than 10°C above degree points, or when the relative humidity of the air is greater than 95 percent.
- e. Any oil, grease, soil, dust or other foreign matter deposited on the cleaned surfaces shall be removed prior to painting. In the event that rusting occurs after completion of the surface preparation, the surfaces shall be cleaned again in accordance with the specified method.
- f. Particular care shall be taken to prevent the contamination of other corrosive chemicals before the application of the paint. Such contamination shall be removed from the cleaned surface by flash blasting and the paint applied immediately.
- g. Care shall be taken to prevent contamination of cleaned and painted surfaces by cleaning operations in an adjacent area.
- h. Surfaces not to be painted shall be suitably protected from the effects of cleaning and painting operations.

#### **SURFACE PREPARATION OF CONCRETE AND PLASTER**

Concrete and cement plaster surfaces to be painted shall be prepared by removing efflorescence, dust, dirt, grease, oil, asphalt, tar, excessive mortar and mortar dropping and by roughening to remove glaze. A zinc sulfate solution shall be applied before prime coat.

#### **ADDITIONAL REQUIREMENTS FOR PREPARATION OF SURFACES WITH EXISTING COATINGS**

Before application of coatings, perform the following on surfaces covered by soundly-adhered coatings, defined as those which cannot be removed with a putty knife:

- 1. Wipe previously painted surfaces to receive solvent-based coatings, except stucco and similarly rough surfaces clean with a clean, dry cloth saturated with mineral spirits, ASTM D 235. Allow surface to dry. Wiping shall immediately precede the application of the first coat of any coating, unless specified otherwise.
- 2. Sand existing glossy surfaces to be painted to reduce gloss. Brush, and wipe clean with a damp cloth to remove dust.
- 3. The requirements specified are minima. Comply also with the application instructions of the paint manufacturer.
- 4. Previously painted surfaces, specified to be repainted or damaged during construction shall be thoroughly cleaned of all grease, dirt, dust or other foreign matter.
- 5. Blistering, cracking, flaking and peeling or other deteriorated coatings shall be removed.
- 6. Chalk shall be removed so that when tested in accordance with ASTM D 4214, the chalk resistance rating is no less than 8.
- 7. Slick surfaces shall be roughened. Damaged areas such as, but not limited to, nail holes, cracks, chips, and spalls shall be repaired with suitable material to match adjacent undamaged areas.
- 8. Edges of chipped paint shall be feather edged and sanded smooth.

9. Rusty metal surfaces shall be cleaned as per SSPC requirements. Solvent, mechanical, or chemical cleaning methods shall be used to provide surfaces suitable for painting.
10. New proposed coatings shall be compatible with existing coatings.

#### EXISTING COATED SURFACES WITH MINOR DEFECTS

Sand, spackle, and treat minor defects to render them smooth. Minor defects are defined as scratches, nicks, cracks, gouges, spalls, alligatoring, chalking, and irregularities due to partial peeling of previous coatings. Remove chalking by sanding so that when tested in accordance with ASTM D 4214.

#### REMOVAL OF EXISTING COATINGS

Remove existing coatings from the following surfaces:

1. Surfaces containing large areas of minor defects;
2. Surfaces containing more than 20 percent peeling area; and
3. Surfaces designated by the Engineer, such as surfaces where rust shows through existing coatings.

#### SUBSTRATE REPAIR

1. Repair substrate surface damaged during coating removal;
2. Sand edges of adjacent soundly adhered existing coatings so they are tapered as smooth as practical to areas involved with coating removal; and
3. Clean and prime the substrate as specified.

#### SURFACE PREPARATION FOR CONCRETE AND MASONRY – FOR OLD OR PREVIOUSLY PAINTED SURFACES

1. Scrape off loose, scaling and peeling old paints. Sand the whole surfaces including those where old paint still adheres very well.
2. For areas with extreme chalking problems, steel brush, blow air from a compressor or wipe with a clean rag pre-wetted with water. Let dry, then apply one (1) coat of concrete scaler. Dry for at least 4 hours before applying subsequent coats.
3. For areas affected by molds and mildew, wash the whole surface with water or with hypochlorite washing solution. Scrub using a stiff nylon brush, then rinse with water. Apply fungicidal washing compound. Leave overnight.
4. For areas with mapping problems, properly prepare the surface then apply concrete sealer. Dry for at least 4 hours.
5. Putty hairlines cracks.

#### MIXING AND THINNING

Mixing and thinning of paint shall be done in accordance with the approved manufacturer's printed instructions. The pot life of each paint as stated by the manufacturer shall not be exceeded.

## WEATHER CONDITION

The paint shall not be applied when the relative humidity is above 85 percent. The paint shall not be applied in rain, wind, fog, dust or mist.

## APPLICATION

Workmanship shall be first class in every respect. All work shall be done in a workmanship manner so that the finished surfaces shall be free from runs, chop, ridges, waves, laps and unnecessary brush marks. All coats shall be applied in such manner as to produce an even film of uniform thickness. Edges, corners, crevices, welds and rivets shall receive special attention to ensure that they receive an adequate thickness of paint.

All painting shall be done by thoroughly experienced workmen.

Safety regulations shall be adhered to at all times, including the wearing of respirators by persons engaged on assisting in spray painting. Adjacent areas and installation shall be protected by the use of cloths or other approved precautionary measures.

Plain enamel and varnish shall be applied carefully with good clean brushes or approved spraying equipment, except that the initial coat on any surface shall be applied with brush. Sufficient time shall be allowed between coats to assure thorough drying and each coat shall be in proper condition before receiving the next coat.

Sanding and dusting as required shall be performed between coats in varnishing work. Finish coat shall be smooth and free from runs, sags, and other defects. Exterior paint shall not be applied during rainy days.

All paint when applied shall provide a satisfactory film and smooth, even surface. Paint shall be thoroughly stirred and kept at a uniform consistency during application. Powdered metallic pigments added at the time of use shall be mixed by adding the powder in small increments to about one-third of the base paint or vehicle, with thorough mixing to obtain a smooth paste. The remainder of the base paint shall then be thoroughly stirred in.

Different brands of emulsion paints shall not be mixed prior to application of the materials.

Where necessary to suit conditions of surface temperature, weather and method of application, the package paint may be thinned immediately prior to application in accordance with the approved manufacturer's directions, but not in excess of 125 cc of suitable thinner per liter (one pint per gallon). Before using, the paint shall be mixed to a uniform consistency and shall be stirred frequently during application.

Paints other than water-thinned paints shall be applied only to surfaces which are completely free of moisture as determined by sight or touch and only such combinations of humidity to be painted as will cause evaporation rather than condensation.

Surfaces which have been cleaned, pretreated and/or otherwise been prepared for painting shall be primed or painted with one coat of finish paint as soon as practicable after such preparation has been completed, but in any event prior to any deterioration of the prepared surfaces.

The first coat of paint on all exterior surfaces shall be applied by brush. Interior prime coats and all other subsequent coats on either exterior or interior surfaces may be applied by brush or spray. Whenever spraying is permitted all areas inaccessible to spray painting shall be coated by brushing or other suitable means. Brushes to be used for application of water-emulsions shall be soaked in water for a period of 2 hours prior to use.

All cloths and cotton waste which might constitute a fire hazard shall be placed in closed metal containers or destroyed at the end of each day.

Upon completion of the work, all staging, scaffolding, and containers shall be removed from the site or destroyed in a manner approved by the Engineer. Paint spots, or stains upon adjacent surfaces shall be removed and the entire job left clean and acceptable to the Engineer.

No smoking shall be permitted in the vicinity where painting is going on.

#### TOUCH-UP PAINTING

Touch-up painting shall be done with the same paint as used for the original coat. The resulting minimum dry film shall be the same as for the original coat.

Touch-up painting shall include cleaning and painting of field connections, welds and all damaged or defective paint and rusted areas.

During touch-up painting, only loose, cracked, brittle or non-adherent paint shall be removed during cleaning. All exposed edges shall be feathered. Touch-up painting shall be performed in a manner which will minimize damage to sound paint. Rust spots shall be thoroughly cleaned and edges of the existing paint shall be scraped back to sound material.

#### DRYING

1. No primer or paint shall be forced to be dried under conditions which will cause cracking, wrinkling, blistering, formation of pores which would detrimentally affect the condition of the paint.
2. No drier shall be added to the paint unless specified in the approved manufacturer's instructions.
3. Painted surfaces shall be protected from dust, dirt, and the elements of the weather until dry to the fullest extent practicable.
4. After drying, any areas of paint damaged from any cause shall be removed, the surface again prepared and then touched-up with the same paint and to the same thickness as the undamaged areas as specified in sub-section 4.14.3.7 above.

#### HANDLING

1. Precautions shall be taken to minimize damage to paint films resulting from stacking for drying.
2. Paint which is damaged in handling shall be scraped off and touched up with the same paint and in the same thickness as was previously applied to the damaged area at Contractor's expense.

#### INSPECTION

1. All works and materials supplied under this Specification shall be subject to inspection by the Engineer.
2. The Contractor shall correct such works or replace such materials found defective under these Specifications at his own expense.

**ITEM 13 : PROJECT BILLBOARD****SPECIFICATION**

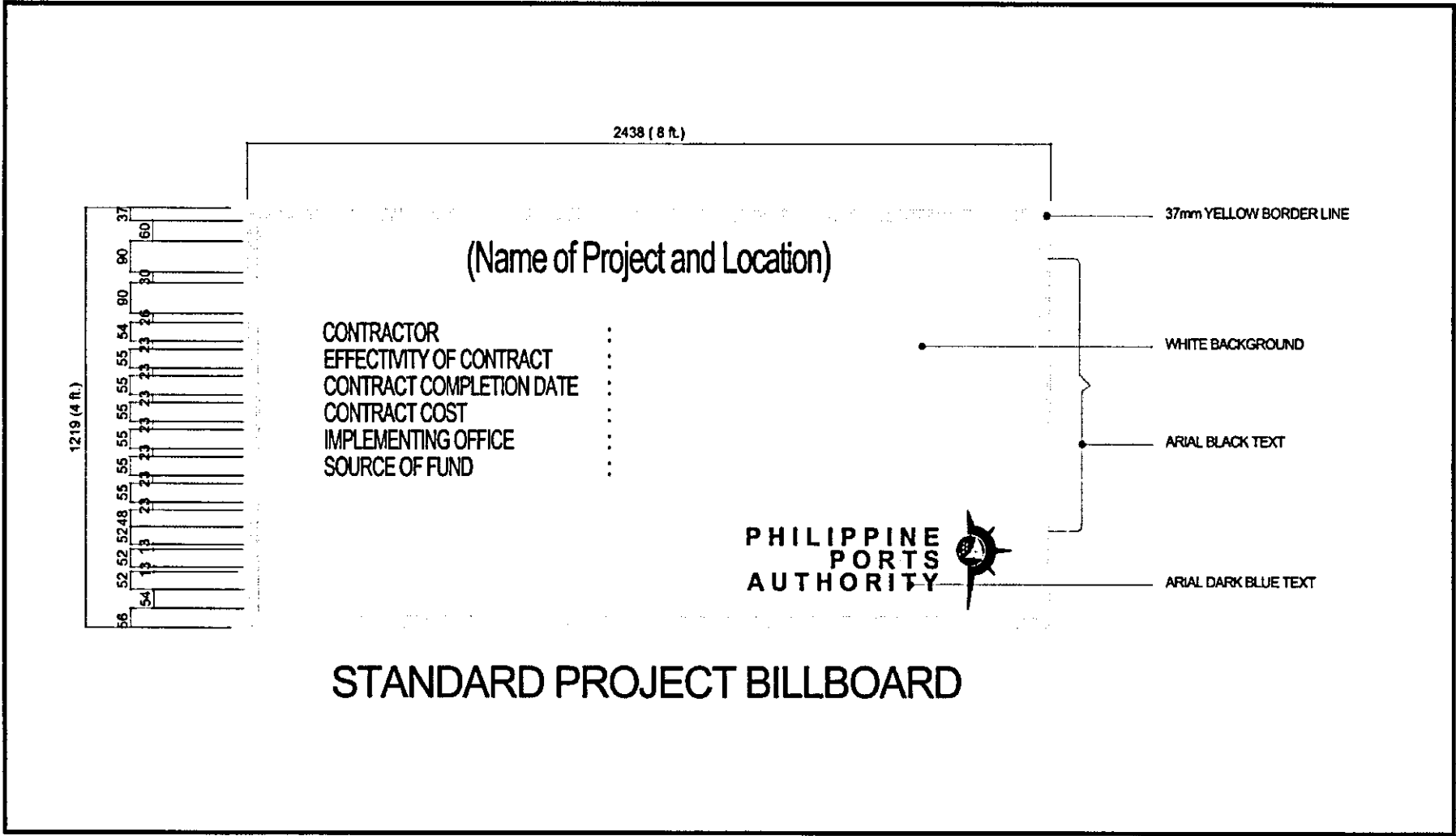
The Project Billboard shall be installed at location(s) designated by the Engineer.

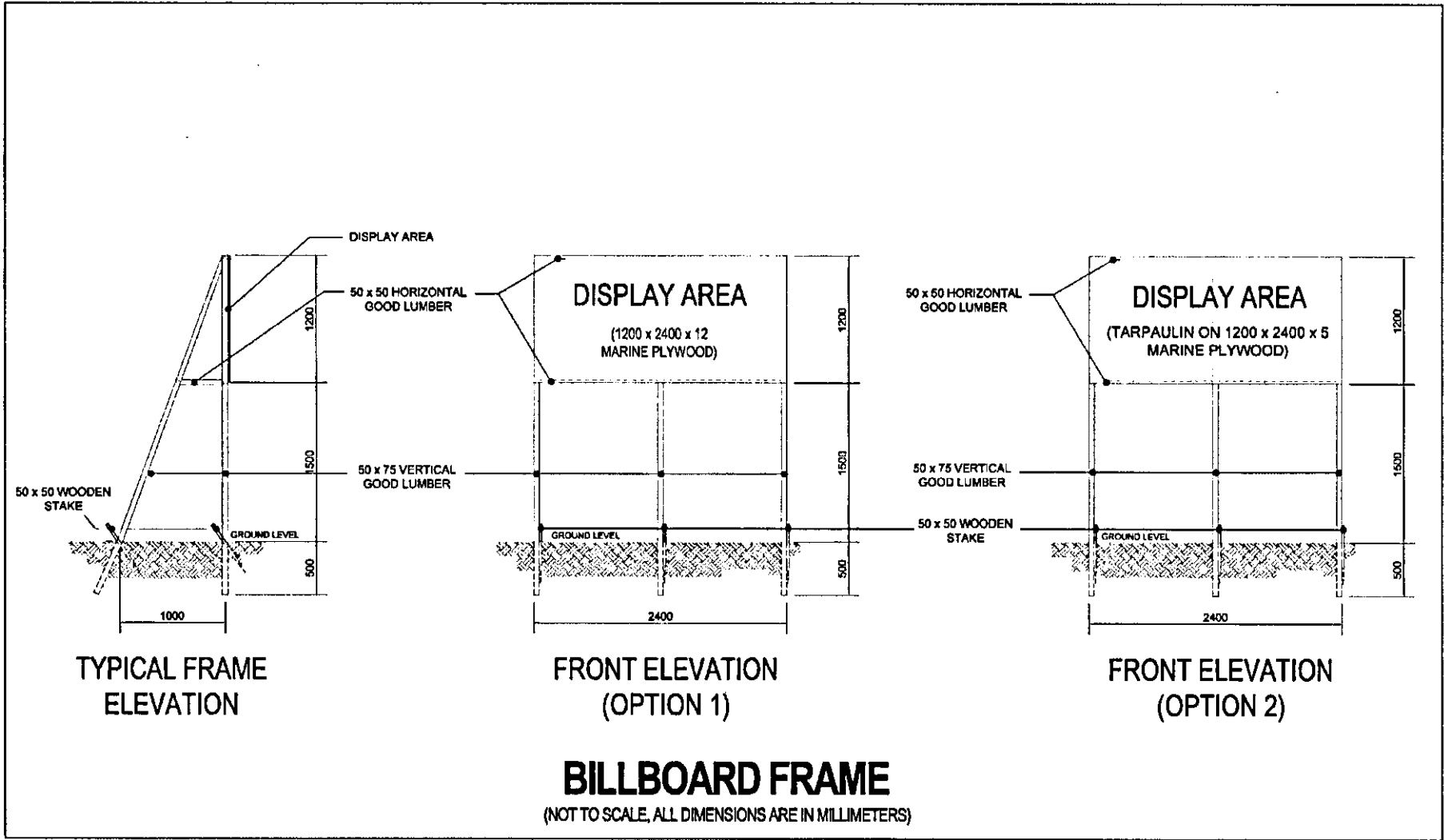
The size and specifications of materials for the standard billboard shall be 4ft. x 8ft. (1,200mm x 2,400mm) using ½ inch (12mm) marine plywood or tarpaulin poster on 3/16 inch (5mm) marine plywood.

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 14 : 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.

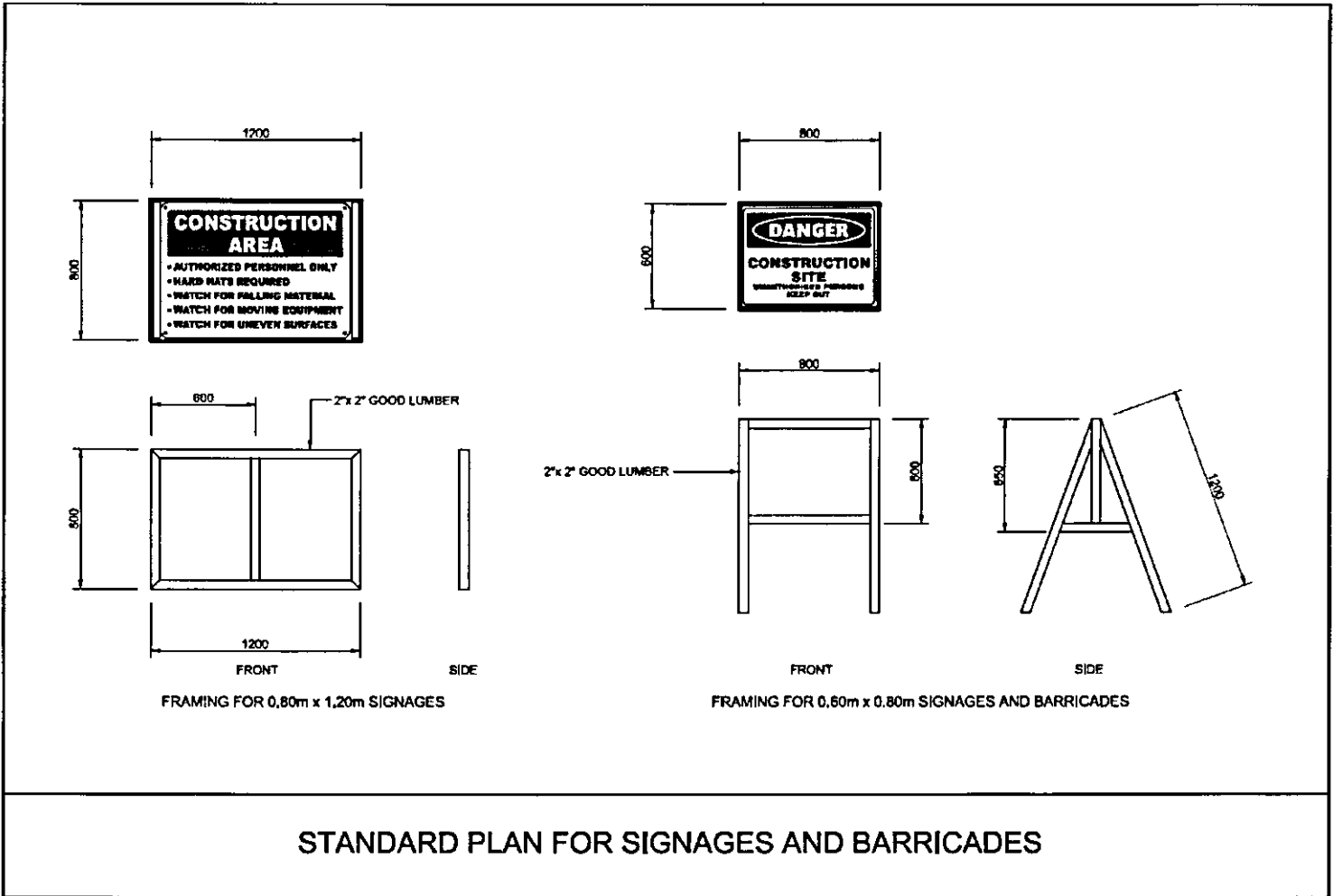
SPECIFICATION

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.



*SECTION VII*

*DRAWINGS*  
*(APPROVED PLANS)*

# SECTION VII

## DRAWINGS AND APPROVED PLANS

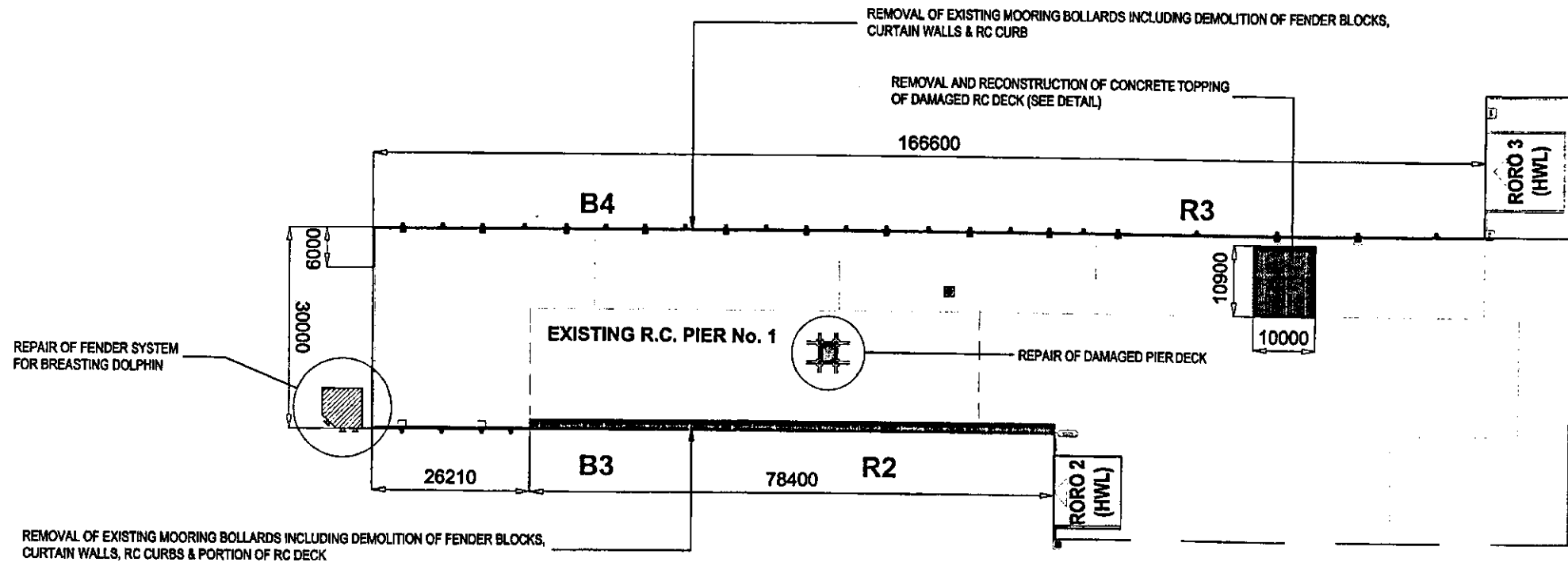
(SEE ISSUED APPROVED PLANS)

**LIST OF DRAWINGS:**

- 1 of 34 - Development Plan, Vicinity Map
- 2 of 34 - Demolition Plan
- 3 of 34 - Layout Plan of Rubber Dock Fenders
- 4 of 34 - Detail for Restoration of RC Curbs, Curtain Walls & Fendering System (Front Elevation)
- 5 of 34 - Detail for Restoration of RC Curbs, Curtain Walls & Fendering System (South Elevation)
- 6 of 34 - Detail for Restoration of RC Curbs, Curtain Walls (East Elevation, South Elevation)
- 7 of 34 - Detail Installation of Rubber Dock Fenders (M-Type) (North Elevation)
- 8 of 34 - Detail Installation of Rubber Dock Fenders (M-Type) (North Elevation)
- 9 of 34 - Detail Installation of Rubber Dock Fenders (M-Type) (South Elevation, East Elevation)
- 10 of 34 - Typical Reinforcement Detail of Curtain Wall & RC Curb
- 11 of 34 - Typical Reinforcement Detail of Curtain Wall
- 12 of 34 - Typical Reinforcement Detail of Fender Block
- 13 of 34 - Typical Detail for Installation of Anchor Bolts for RDF
- 14 of 34 - Typical Detail for Installation of Anchor Bolts for RDF
- 15 of 34 - Typical Detail for Attachment of Anchor Bolts for RDF (M600H x 1000L)

- 16 of 34 - Detail for restoration of RC Deck  
(Typical Slab Reinforcement Detail)
- 17 of 34 - Typical Slab Reinforcement Detail  
(Typical Slab Reinforcement Detail)
- 18 of 34 - Plan for Restoration of Damaged Concrete Topping of RC Deck of Pier 1
- 19 of 34 - Typical Detail of Pile Built-up/Jacket
- 20 of 34 - Plan for Installation of Steel Protection
- 21 of 34 - Typical Detail of Steel protection for Edge of Pier Deck
- 22 of 34 - Detail of Catch Drain Manhole Cover, Detail of Drainage Canal
- 23 of 34 - Detail for Restoration of Scoured Portion of Reclamation Area  
(Typical Section, Location Plan)
- 24 of 34 - Detail for Restoration of Scoured Portion of Reclamation Area  
(Plan, Section Z-Z)
- 25 of 34 - Plan for Repainting of Existing Perimeter Fence
- 26 of 34 - Repainting of Existing Barbed Wires Above Perimeter fence  
(Perimeter Fence Layout Plan)
- 27 of 34 - Repainting of Existing Perimeter Fence at reclamation Area  
(Elevation 1, Elevation 2, Sectional Elevation 1, Sectional Elevation 2)
- 28 of 34 - Drainage Layout Plan
- 29 of 34 - Drainage Manhole Covers Detail, Spot Detail
- 30 of 34 - Drainage Manhole Covers Detail, Spot Detail
- 31 of 34 - Angular Frame Details
- 32 of 34 - Repair of Super Cell Fenders at Breasting Dolphin
- 33 of 34 - Isometric View
- 34 of 34 - Detail of M-Type RDF (600H x 1000L and 600H x 2000L))






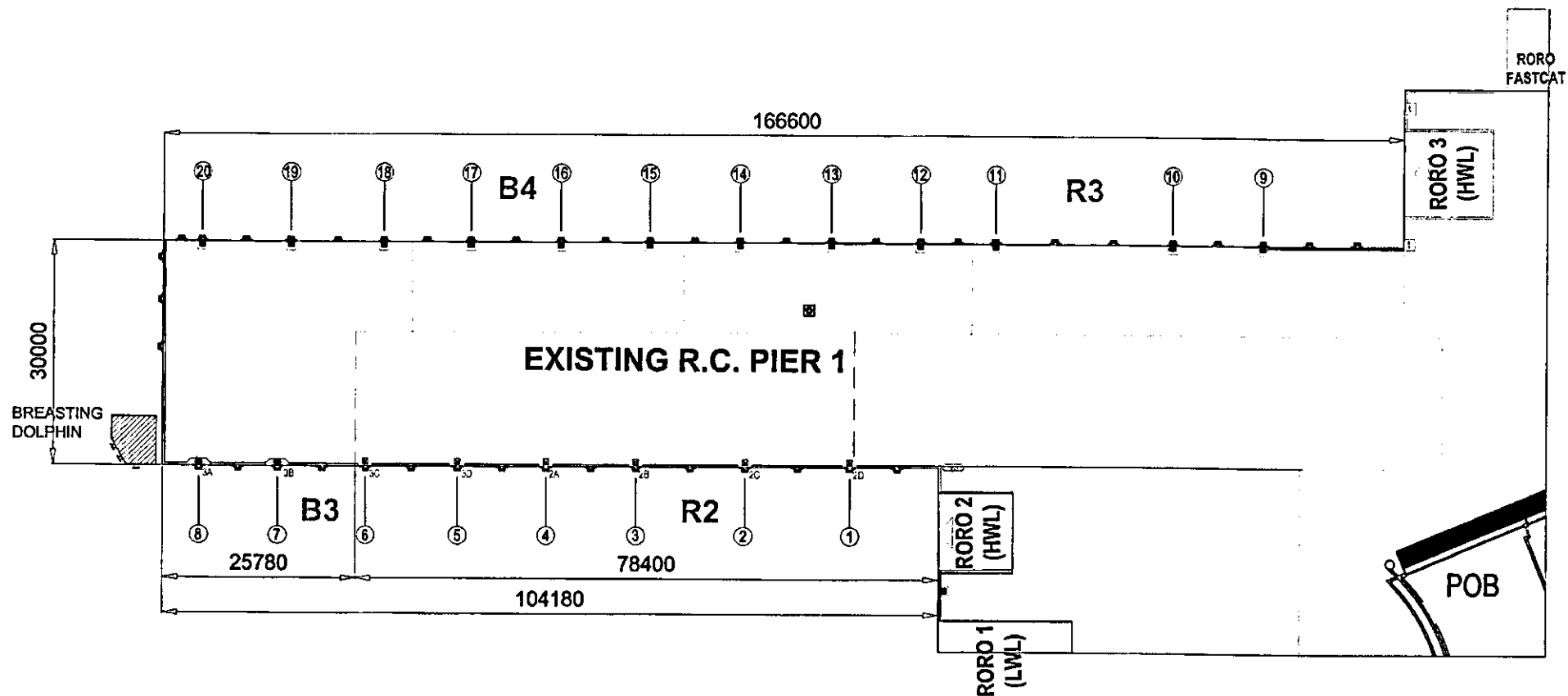
## DEMOLITION PLAN

SCALE: 1 : 100 MTS.

**PLAN FOR DEMOLITION OF CURTAIN WALLS , RC CURBS, FENDER/MOORING BLOCKS  
& PORTION DAMAGED RC DECK**

 PMO - NEGROS ORIENTAL / SIQUIJOR	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	AS SHOWN	ROLANDO C. AMORES	HUBERT P. MITMIT	SARAH R. MIJARES	REYNAND C. PARAFINA	JAMES J. GANTALAO	2
	DUMAGUETE CITY, NEGROS ORIENTAL		Construction Foreman A	ESD Manager	Port Manager	Manager, Port Planning and Design Dept.	AGM For Engineering	34



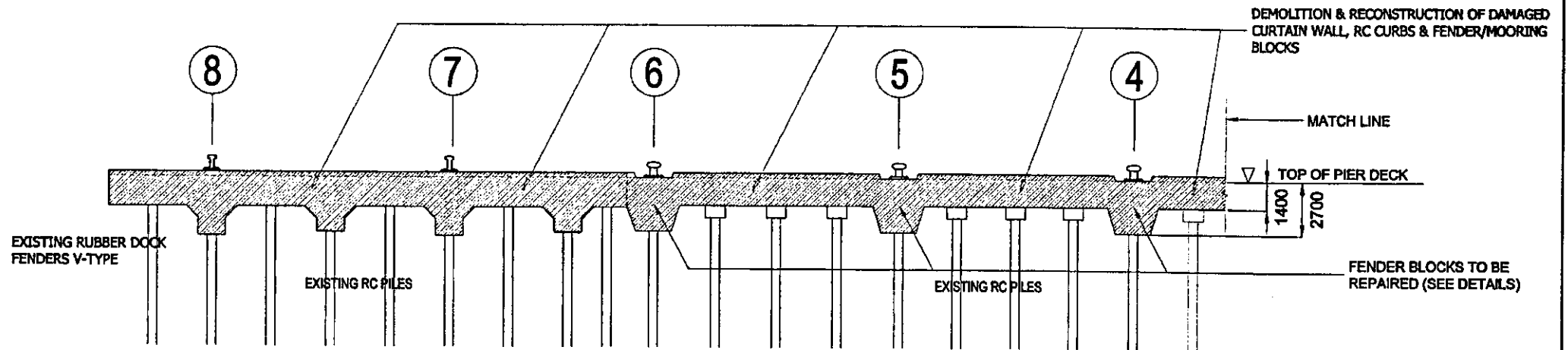


## LAYOUT PLAN OF RUBBER DOCK FENDERS

SCALE: 1 : 400 MTS.

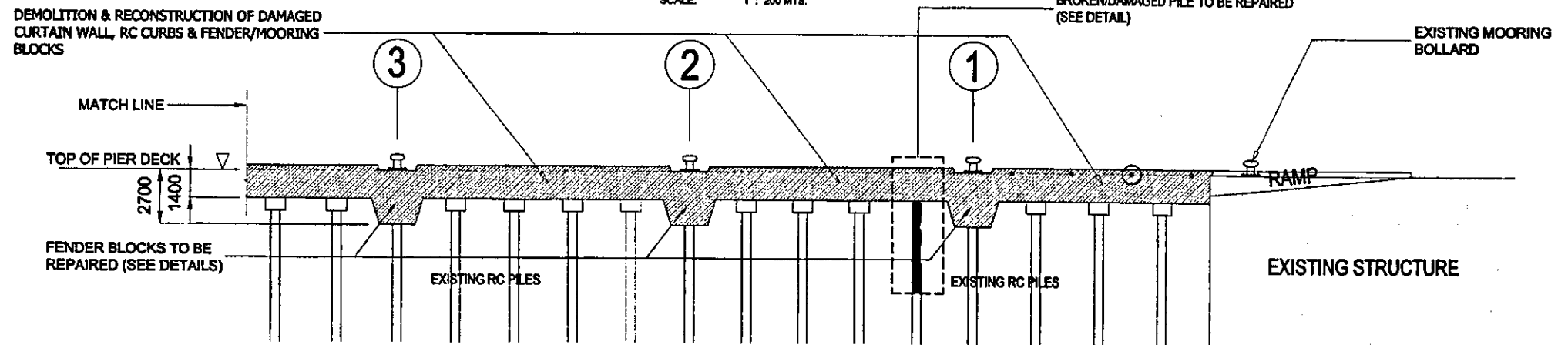
### DETAIL INSTALLATION OF RUBBER DOCK FENDERS M-TYPE

	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	AS SHOWN	ROLANDO C. AMORES Construction Foreman A	HUBERT P. MITMIT ESD Manager	SARAH R. MIJARES Port Manager	REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	JAMES J. GANTALAO AGM For Engineering	3 34



FRONT ELEVATION


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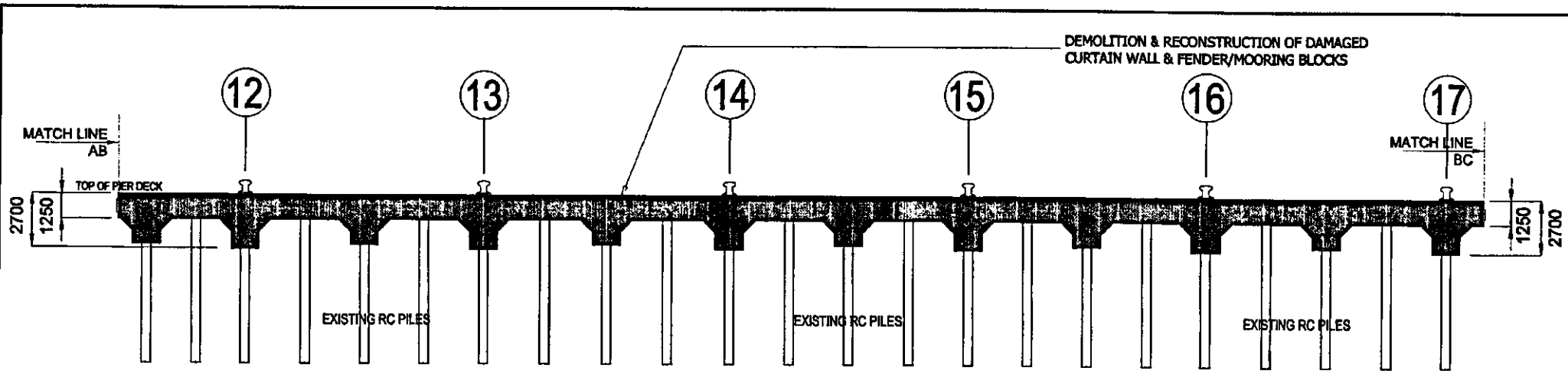


FRONT ELEVATION

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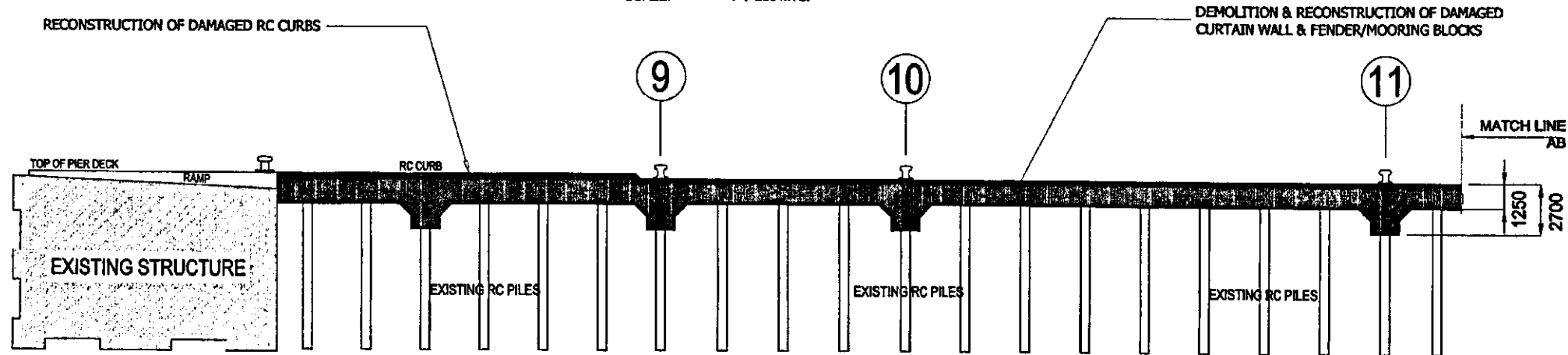
DETAIL FOR RESTORATION OF RC CURBS, CURTAIN WALLS & FENDER/MOORING BLOCKS

	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTER:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	AS SHOWN	ROLANDO C. AMORES Construction Foreman A	HUBERT P. MITMIT ESD Manager	SARAH R. MIJARES Port Manager	REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	JAMES J. GANTALAO AGM For Engineering	4 34



**SOUTH ELEVATION**

SCALE: 1 : 200 MTS.



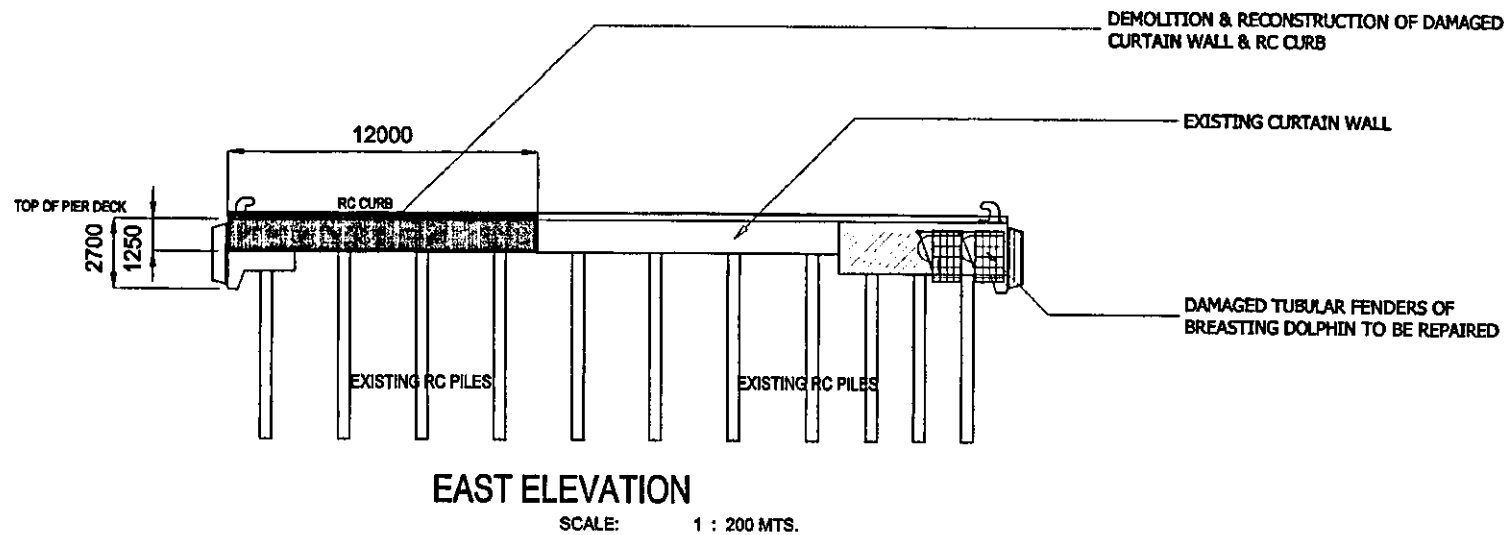
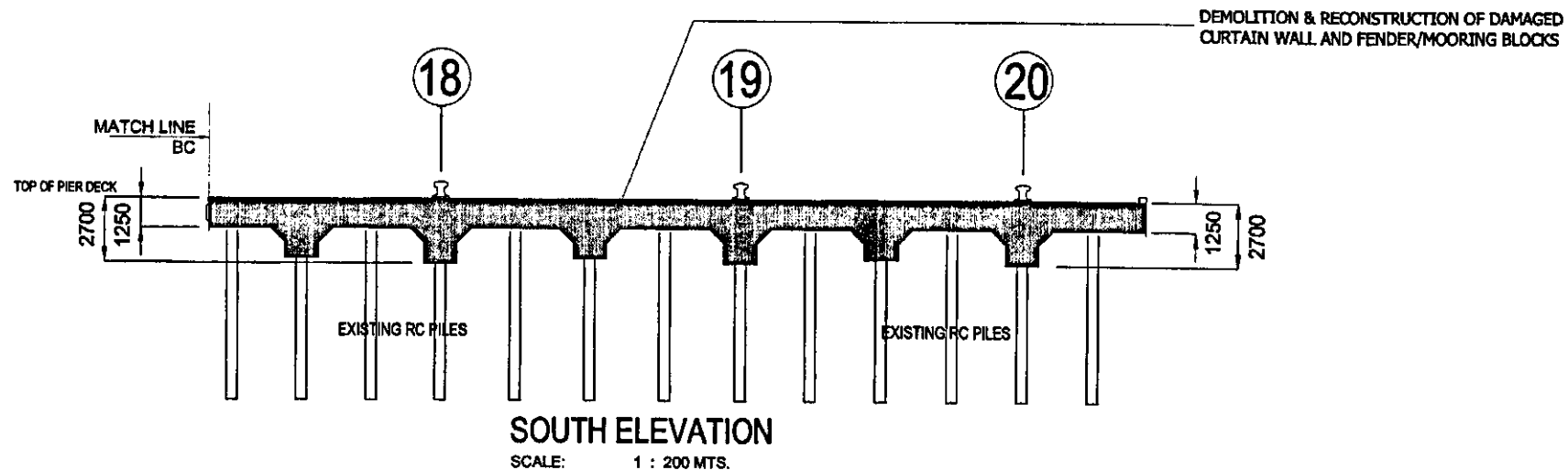
**SOUTH ELEVATION**

SCALE: 1 : 200 MTS.

○ **DETAIL FOR RESTORATION OF RC CURBS, CURTAIN WALLS & FENDER/MOORING BLOCKS**


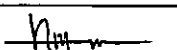
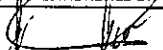

**NOTE:**  
EXISTING MOORING BOLLARDS TO BE REMOVED & REINSTALLED

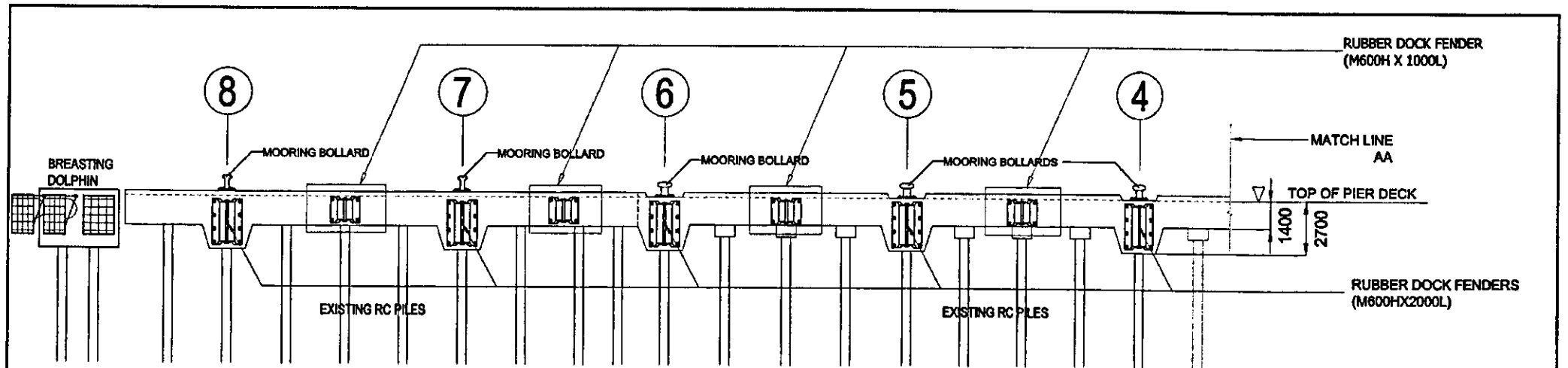
	<b>PROJECT TITLE:</b> UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	<b>SHEET CONTENTS:</b> AS SHOWN	<b>PREPARED BY:</b> ROLANDO C. AMORES Construction Foreman A	<b>CHECKED/REVIEWED BY:</b> HUBERT P. MITMIT ESD Manager	<b>SUBMITTED BY:</b> SARAH K. MIJARES Port Manager	<b>RECOMMENDING APPROVAL:</b> REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	<b>APPROVED:</b> JAMES J. GANTALAO AGM For Engineering	<b>SHEET NO.:</b> 5 34
	DUMAGUETE CITY, NEGROS ORIENTAL							



○ **DETAIL FOR RESTORATION OF RC CURBS, CURTAIN WALL**

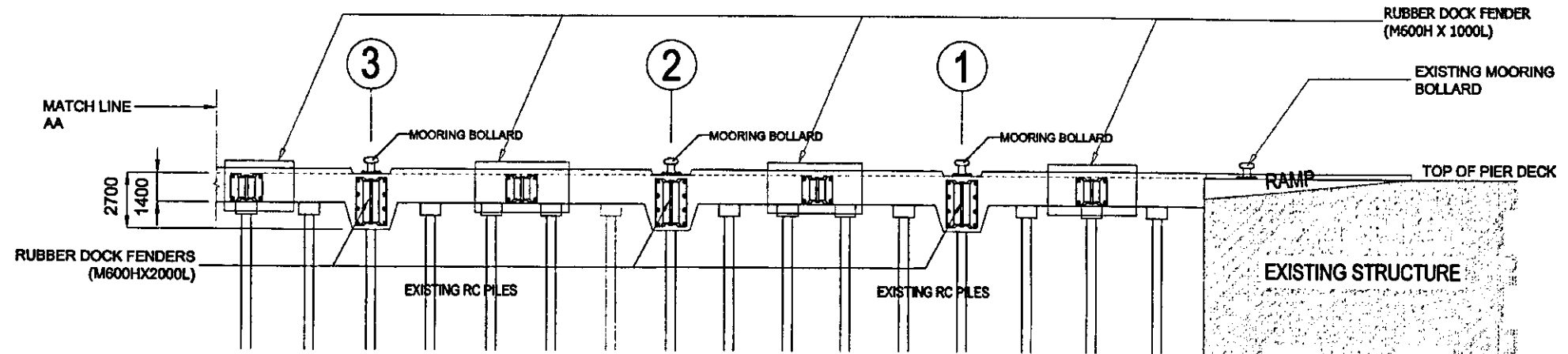
**NOTE:**  
EXISTING MOORING BOLLARDS TO BE REMOVED  
& REINSTALLED

 PMO - NEGROS ORIENTAL / SIQUIJOR	<b>PROJECT TITLE:</b> UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	<b>SHEET CONTENTS:</b> AS SHOWN	<b>PREPARED BY:</b>  <b>ROLANDO C. AMORES</b> Construction Foreman A	<b>CHECKED/REVIEWED BY:</b>  <b>HUBERT P. MITMIT</b> ESD Manager	<b>SUBMITTED BY:</b>  <b>SARAH R. MIJARES</b> Port Manager	<b>RECOMMENDING APPROVAL:</b> <b>REYNAND C. PARAFINA</b> Manager, Port Planning and Design Dept.	<b>APPROVED:</b> <b>JAMES J. GANTALAO</b> AGM For Engineering	<b>SHEET NO.:</b> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> <div style="text-align: center;">6 34</div> </div>



**NORTH ELEVATION**

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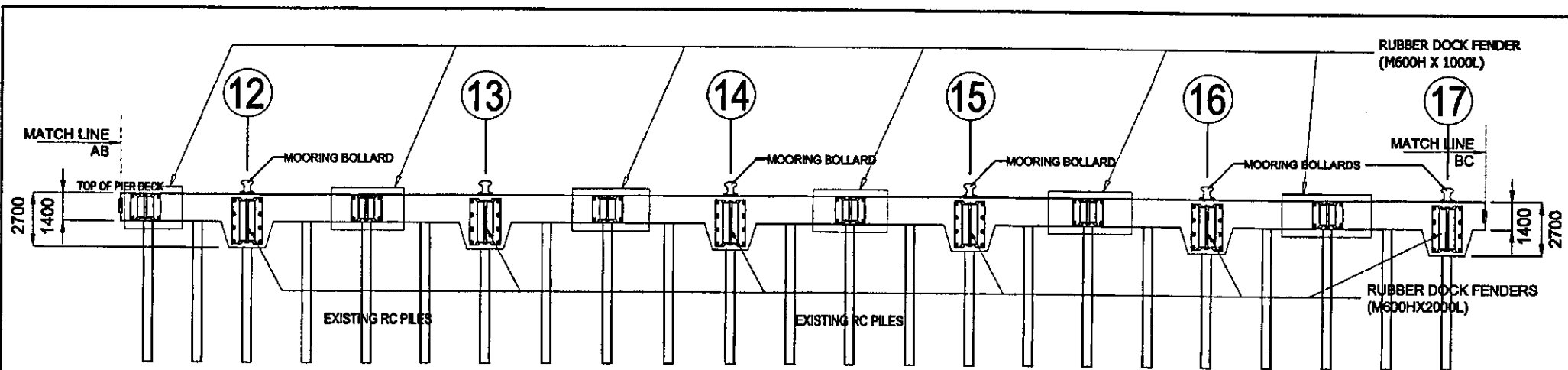


**NORTH ELEVATION**

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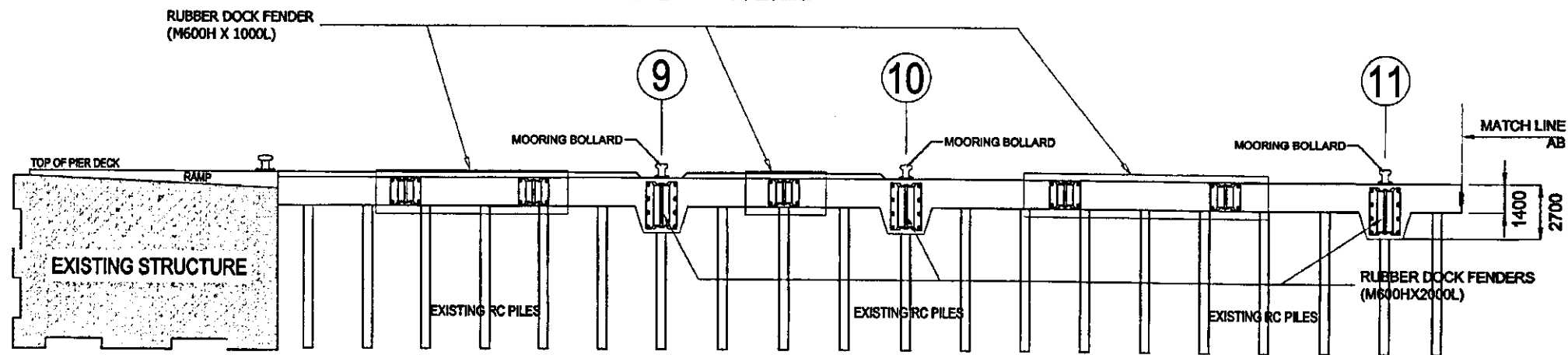
**DETAIL INSTALLATION OF RUBBER DOCK FENDERS M-TYPE**

 PMO - NEGROS ORIENTAL / SIQUIJOR	<b>PROJECT TITLE:</b> UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	<b>SHEET CONTENTS:</b> AS SHOWN	<b>PREPARED BY:</b>  ROLANDO C. AMORES Construction Foreman A	<b>CHECKED/REVIEWED BY:</b>  HUBERT J. MITMIT ESB Manager	<b>SUBMITTED BY:</b>  SARAH R. MIJARES Port Manager	<b>RECOMMENDING APPROVAL:</b> REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	<b>APPROVED:</b> JAMES J. GANTALAO AGM For Engineering	<b>SHEET NO.:</b> <div style="border: 1px solid black; border-radius: 50%; width: 40px; height: 40px; display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">7</div> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; display: flex; align-items: center; justify-content: center;">34</div> </div>



**SOUTH ELEVATION**

SCALE: 1 : 200 MTS.



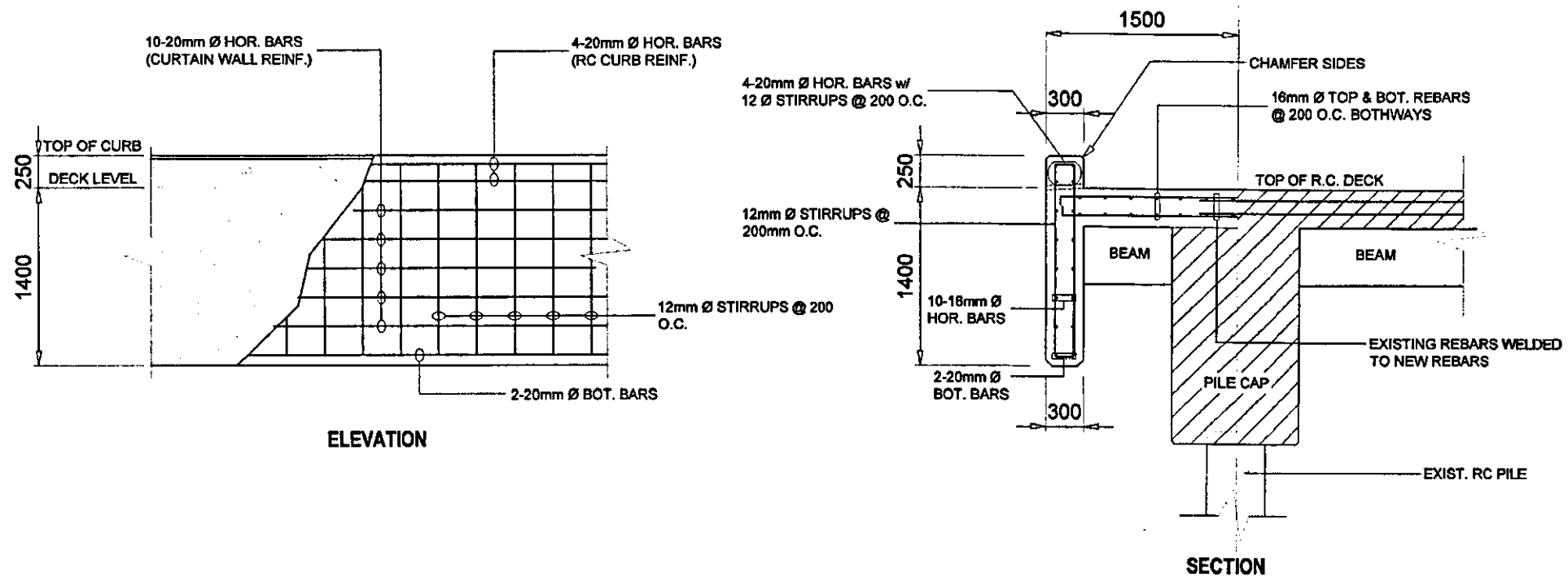
**SOUTH ELEVATION**

SCALE: 1 : 200 MTS.

**DETAIL FOR INSTALLATION OF M-TYPE RUBBER DOCK FENDERS**


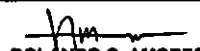


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	DUMAGUETE CITY, NEGROS ORIENTAL							



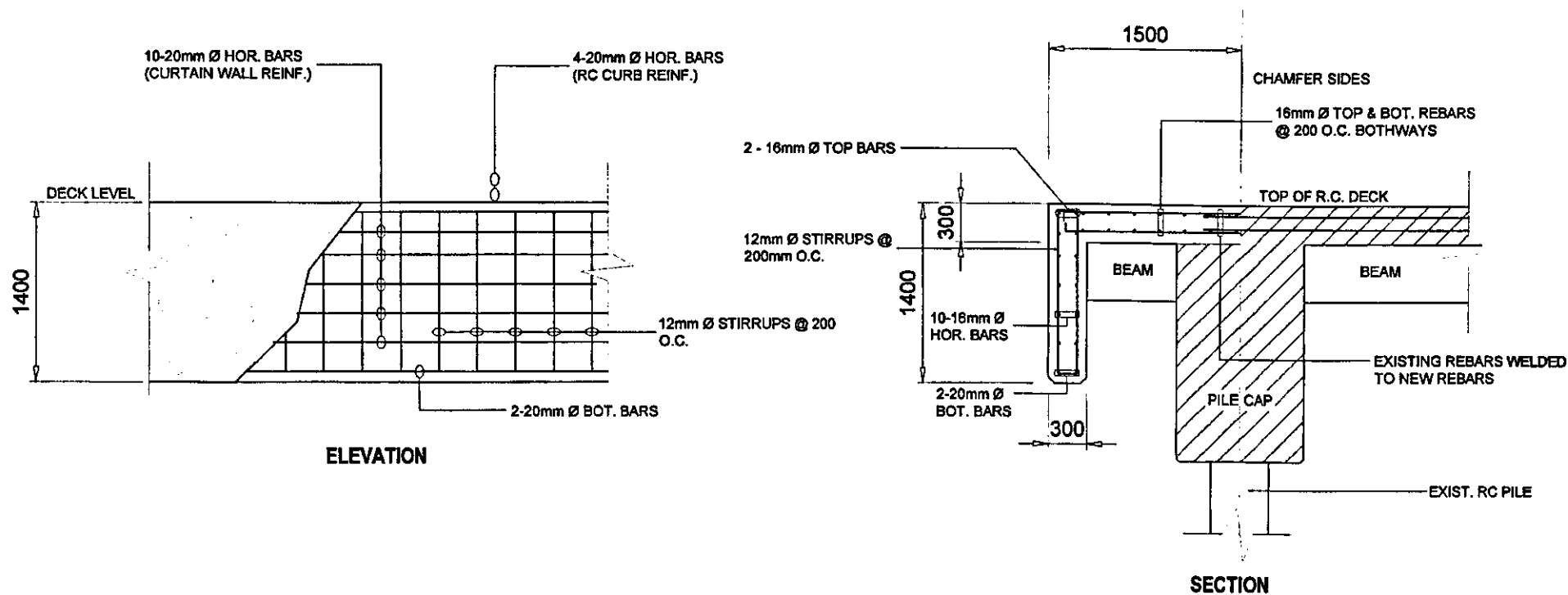


**TYPICAL REINFORCEMENT DETAIL OF CURTAIN WALL & R.C. CURB**  
SCALE: 1 : 50

**PLAN FOR RESTORATION OF CURTAIN WALLS & RC CURBS FOR BERTH R2 & BERTH 3 OF PIER 1**


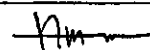



 PMO - NEGROS ORIENTAL / SIQUIJOR	<b>PROJECT TITLE:</b> UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	<b>SHEET CONTENTS:</b> AS SHOWN	<b>PREPARED BY:</b>  ROLANDO C. AMORES Construction Foreman A	<b>CHECKED/REVIEWED BY:</b>  HUBERT A. MITMIT ESD Manager	<b>SUBMITTED BY:</b>  SARAH R. MIJARES Port Manager	<b>RECOMMENDING APPROVAL:</b> REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	<b>APPROVED:</b> JAMES J. GANTALAO AGM For Engineering	<b>SHEET NO.:</b> 10 34
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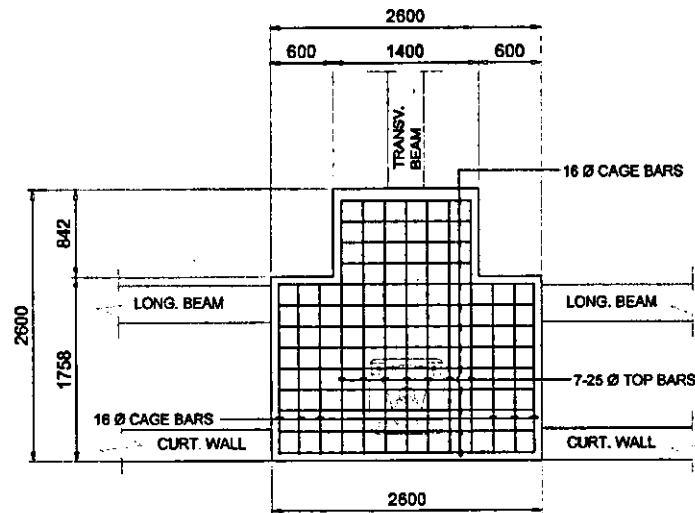




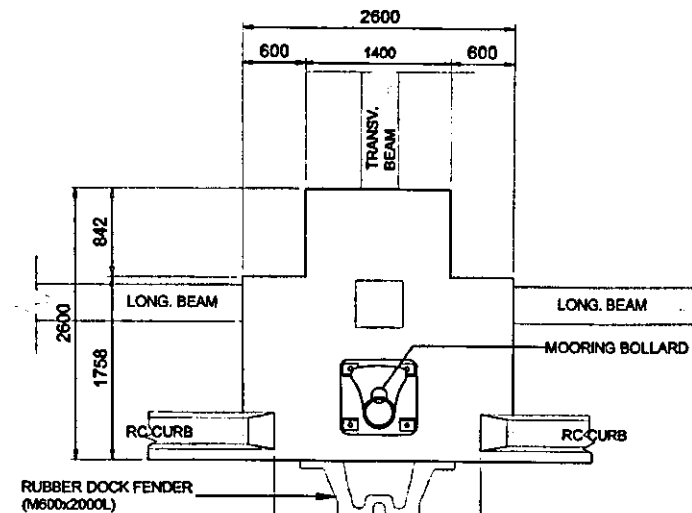
 **TYPICAL REINFORCEMENT DETAIL OF CURTAIN WALL**  
SCALE: 1 : 30

 **PLAN FOR RESTORATION OF CURTAIN WALLS FOR BERTH 4 & BERTH R3 OF PIER 1**

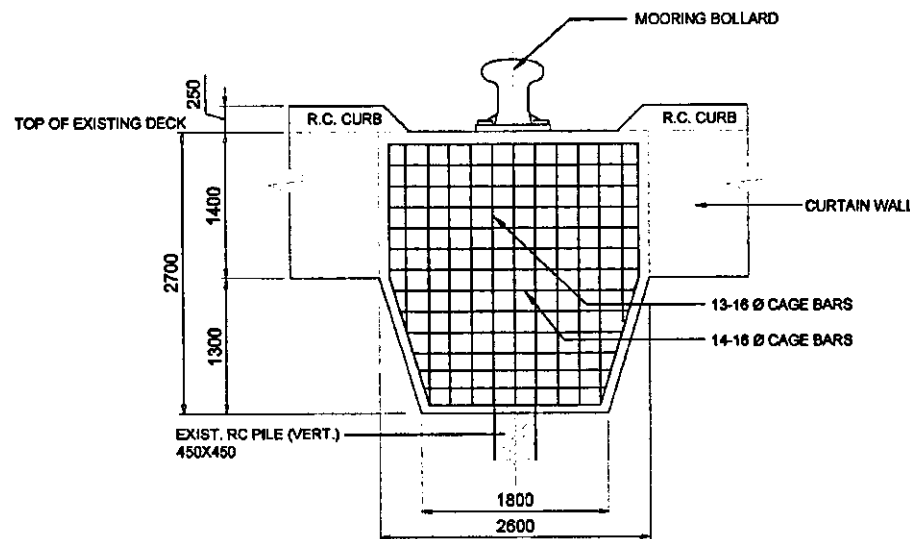
 PMO - NEGROS ORIENTAL / SIQUIJOR	PROJECT TITLE: UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	SHEET CONTENTS: AS SHOWN	PREPARED BY:  ROLANDO C. AMORES Construction Foreman A	CHECKED/REVIEWED BY:  HUBERT P. MITMIT ESD Manager	SUBMITTED BY:  SARAH R. MIJARES Port Manager	RECOMMENDING APPROVAL: REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	APPROVED: JAMES J. GANTALAO AGM For Engineering	SHEET NO.: 
	DUMAGUETE CITY, NEGROS ORIENTAL							



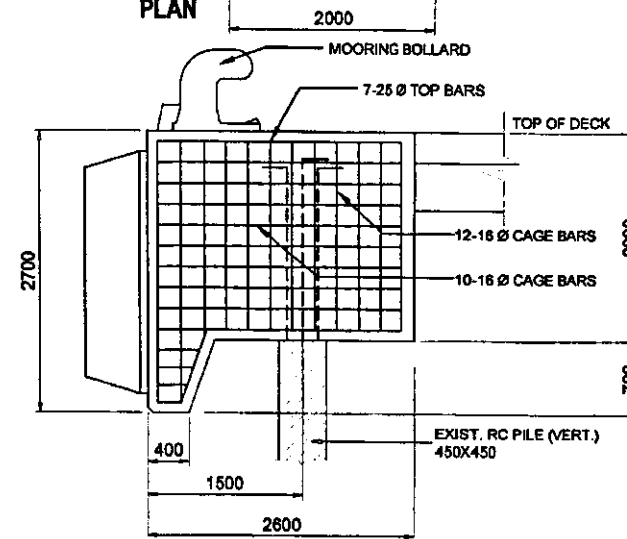
PLAN



PLAN



FRONT ELEV.


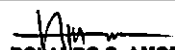




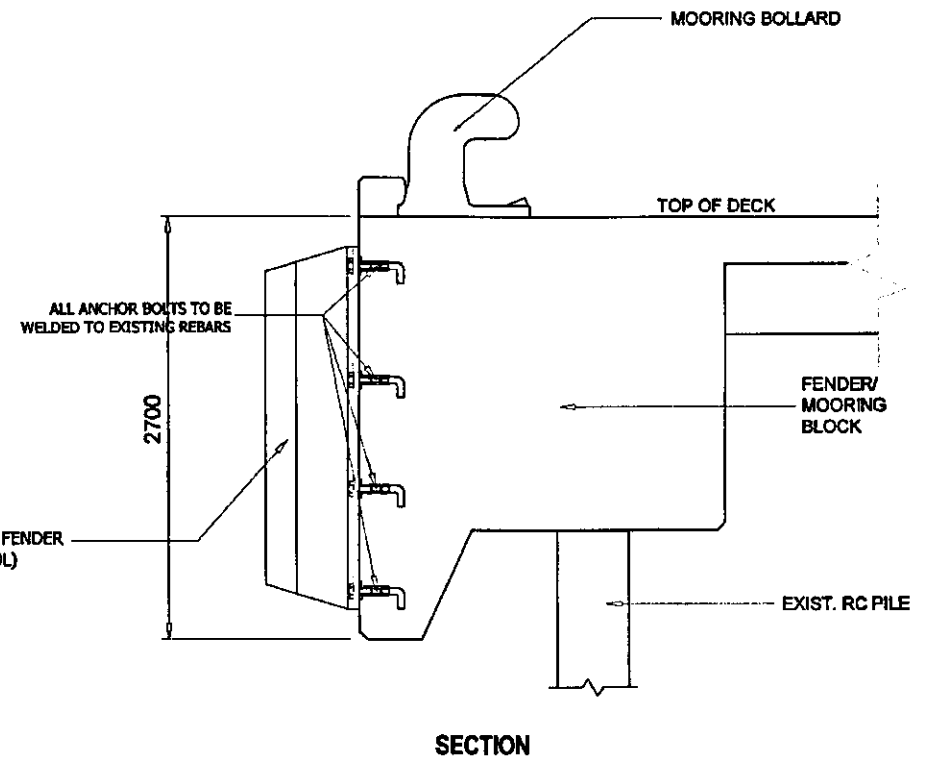
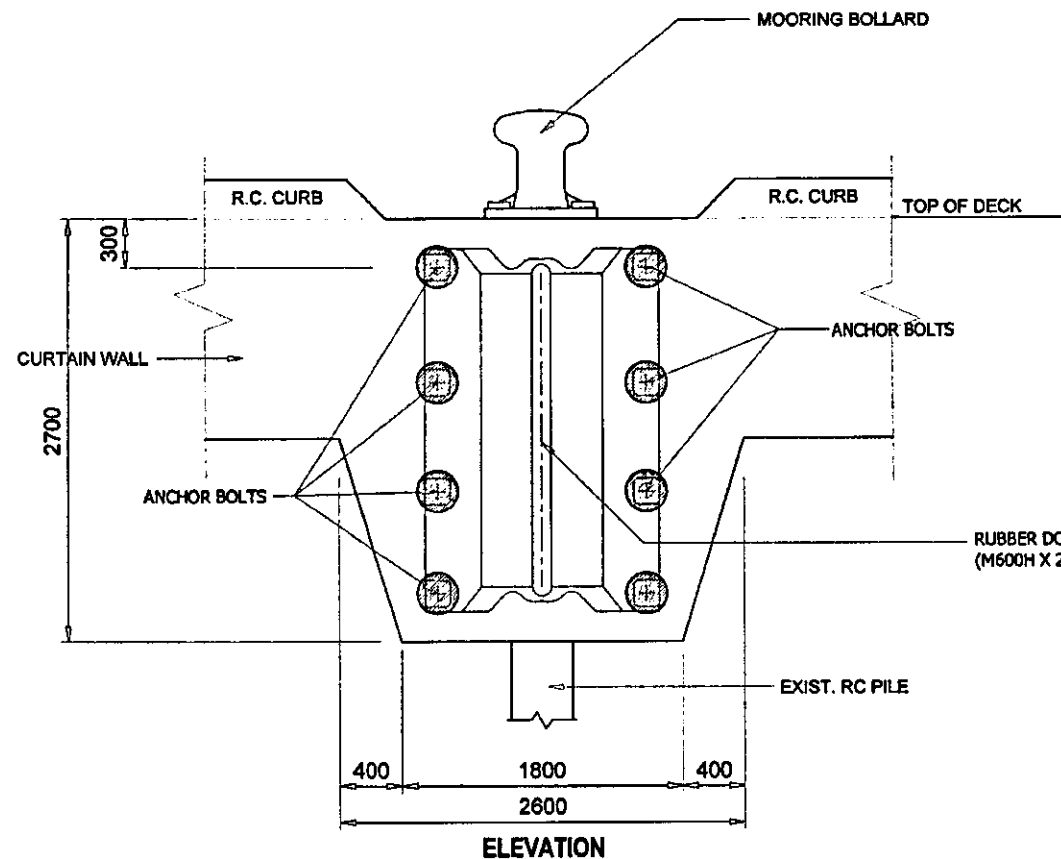
SECTION/ELEV.



TYPICAL REINFORCEMENT DET. OF FENDER BLOCK

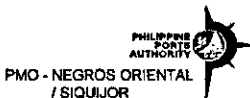
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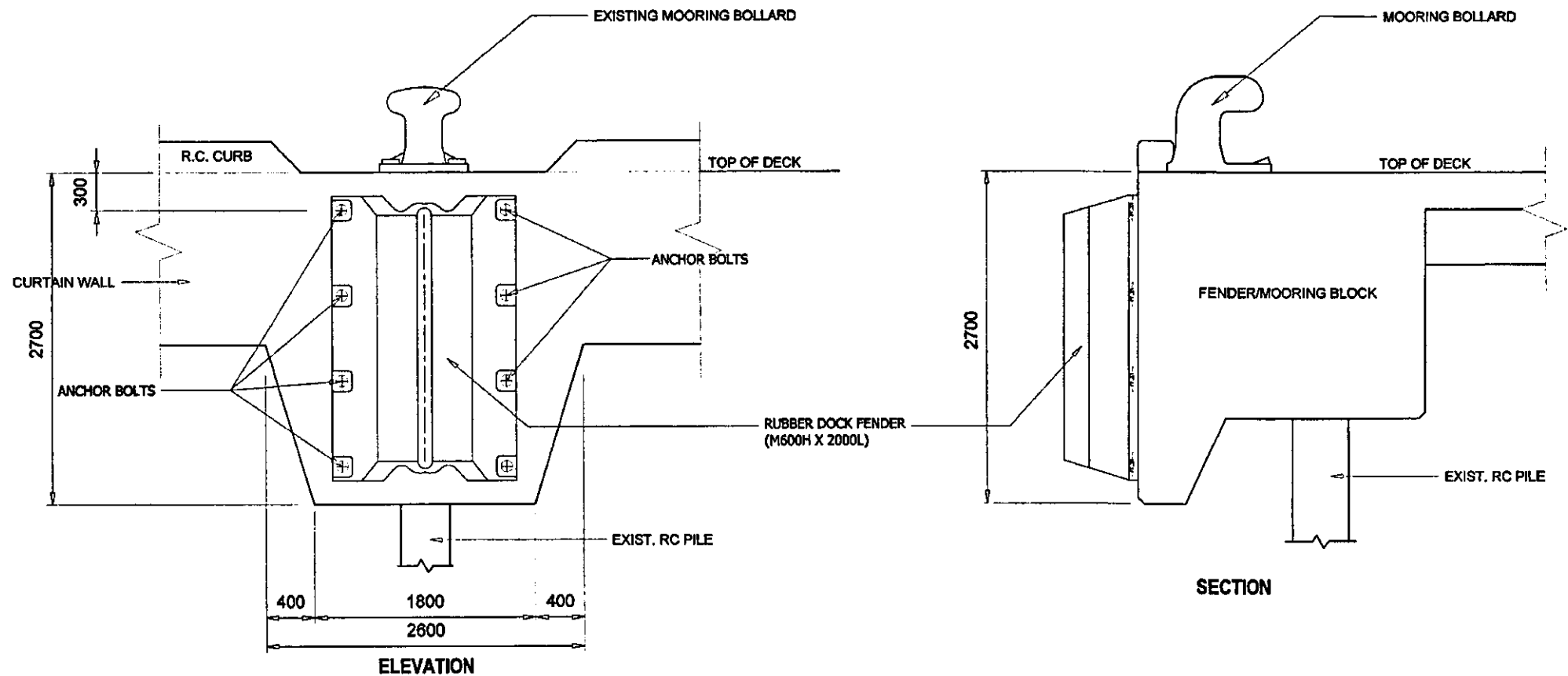
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 **TYPICAL DETAIL FOR INSTALLATION OF ANCHOR BOLTS FOR RDF**  
SCALE : 1 : 30 MTS.

 **DETAIL INSTALLATION OF RUBBER DOCK FENDERS M-TYPE**

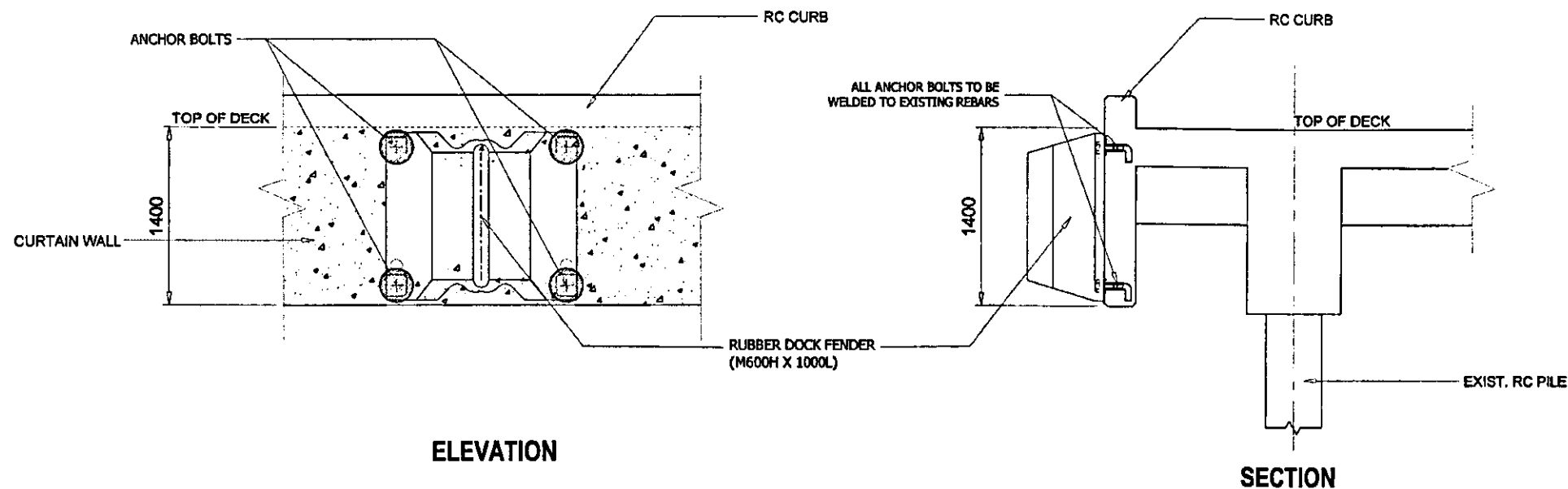
	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	AS SHOWN	ROLANDO C. AMORES Construction Foreman A	HUBERT P. MITMIT ESD Manager	SARAH C. MIJARES Port Manager	REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	JAMES J. GANTALAO AGM For Engineering	13 34



○ **TYPICAL DETAIL FOR INSTALLATION OF ANCHOR BOLTS FOR RDF**  
 SCALE : 1 : 30 MTS.

○ **DETAIL INSTALLATION OF RUBBER DOCK FENDERS M-TYPE**

	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	AS SHOWN	ROLANDO C. AMORES	HUBERT P. MITMIT	SARAH R. MIJARES	REYNAND C. PARAFINA	JAMES J. GANTALAO	14
	DUMAGUETE CITY, NEGROS ORIENTAL		Construction Foreman A	ESD Manager	Port Manager	Manager, Port Planning and Design Dept.	AGM For Engineering	34

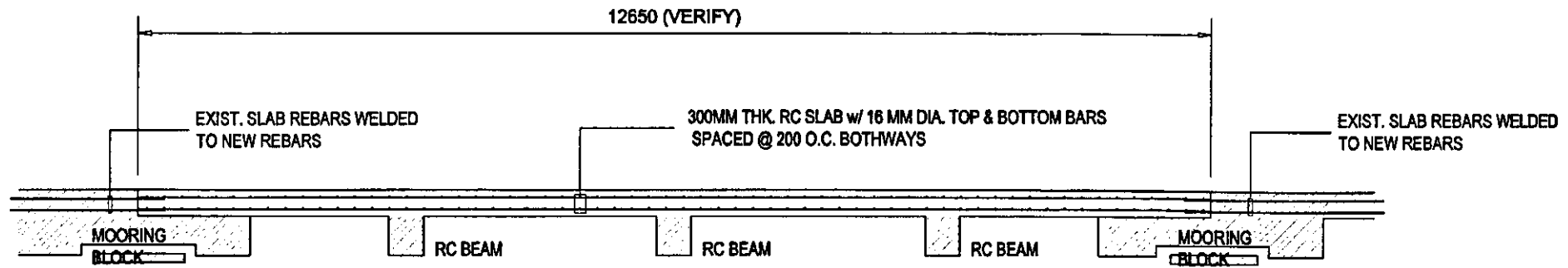


○ **TYPICAL DETAIL FOR ATTACHMENT OF ANCHOR BOLTS FOR R.D.F. ( M600Hx1000L )**

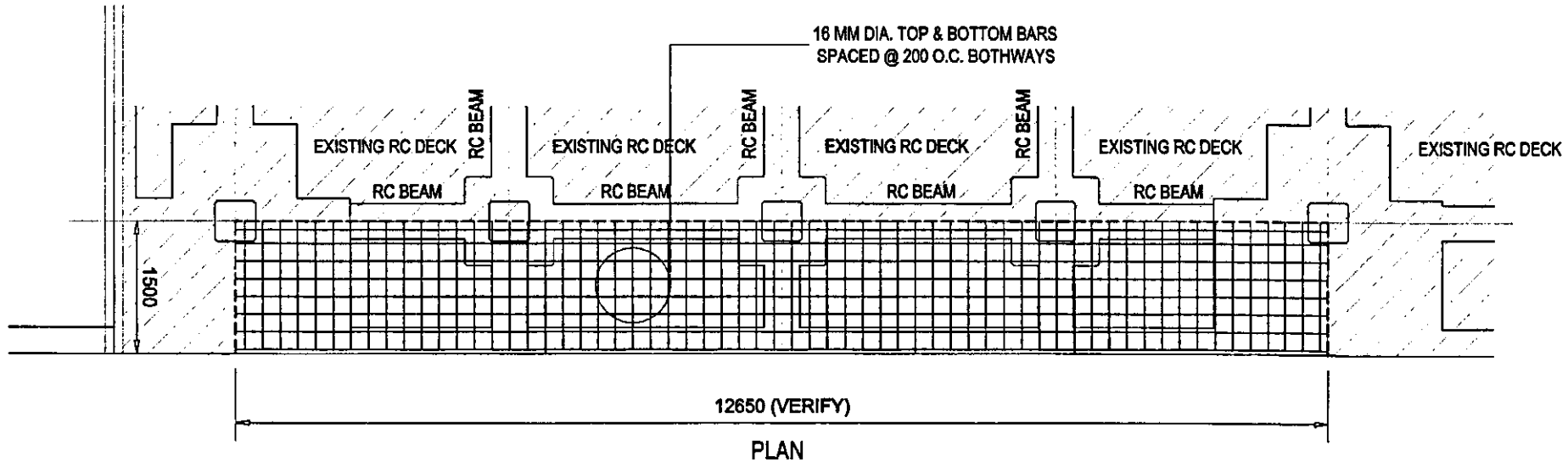
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○ **DETAIL INSTALLATION OF RUBBER DOCK FENDERS M-TYPE**

	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	AS SHOWN	ROLANDO C. AMORES Construction Foreman A	HUBERT P. MITMIT ESD Manager	SARAH R. MIJARES Port Manager	REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	JAMES J. GANTALAO AGM For Engineering	15 34



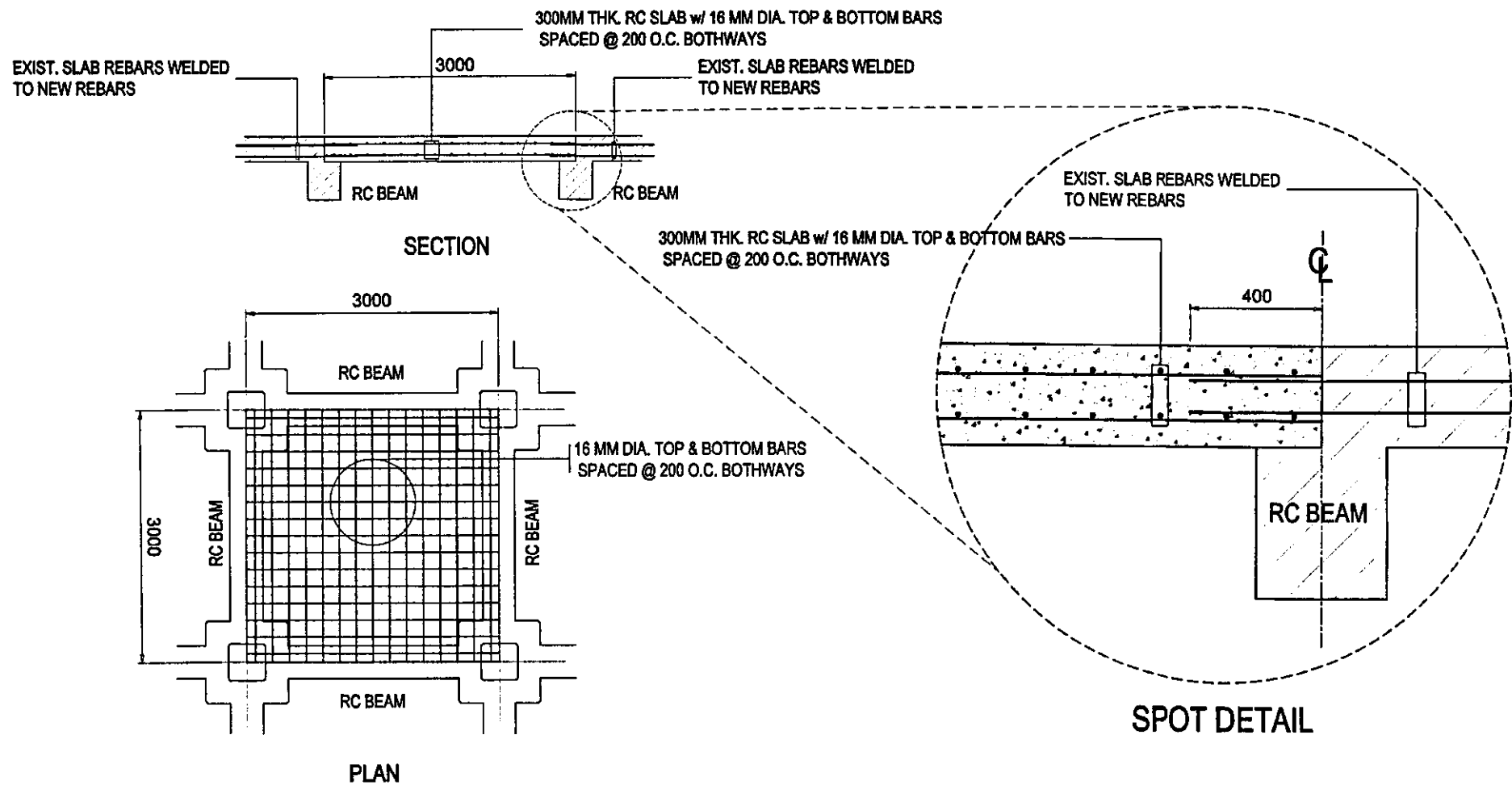
LONGITUDINAL SECTION



○ TYPICAL SLAB REINFORCEMENT DETAIL


○ DETAIL FOR RESTORATION OF DAMAGED RC DECK

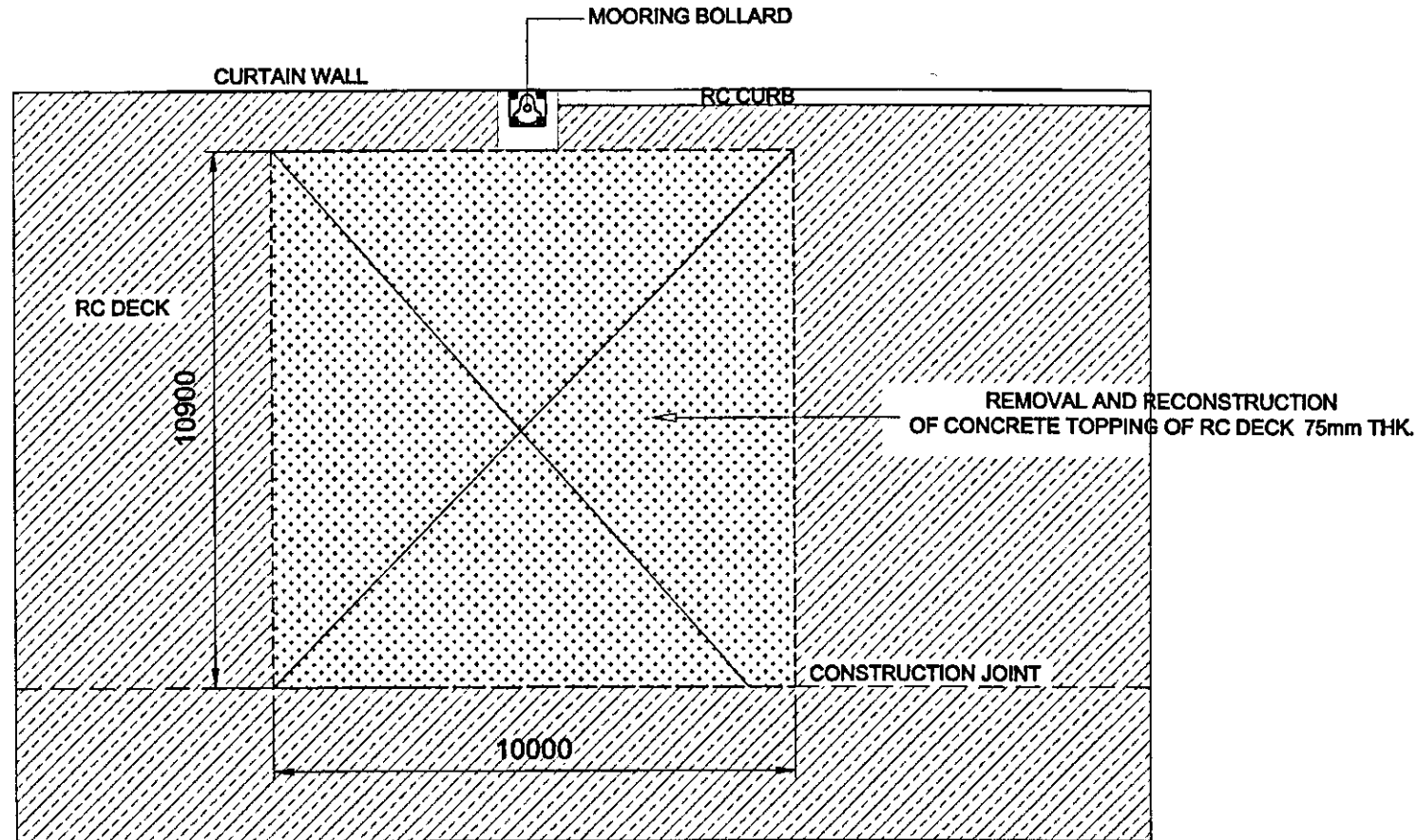
<p>PMO - NEGROS ORIENTAL / SIQUIJOR</p>	<p>PROJECT TITLE:</p> <p>UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA &amp; PORT ROAD, PORT OF DUMAGUETE</p> <p>DUMAGUETE CITY, NEGROS ORIENTAL</p>	<p>SHEET CONTENTS:</p> <p>AS SHOWN</p>	<p>PREPARED BY:</p> <p>ROLANDO C. AMORES</p> <p>Construction Foreman A</p>	<p>CHECKED/REVIEWED BY:</p> <p>HUBERT F. MITMIT</p> <p>ESD Manager</p>	<p>SUBMITTED BY:</p> <p>SARAH R. MUJARES</p> <p>Port Manager</p>	<p>RECOMMENDING APPROVAL:</p> <p>REYNAND C. PARAFINA</p> <p>Manager, Port Planning and Design Dept.</p>	<p>APPROVED:</p> <p>JAMES J. GANTALAO</p> <p>AGM For Engineering</p>	<p>SHEET NO.:</p> <p>16 34</p>



○ TYPICAL SLAB REINFORCEMENT DETAIL


○ DETAIL FOR RESTORATION OF DAMAGED RC DECK

 <p>PMO - NEGROS ORIENTAL / SQUIJOR</p>	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	AS SHOWN	ROLANDO C. AMORES Construction Foreman A	HUBERT P. MITMIT ESO Manager	SARANTH. MIJARES Port Manager	REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	JAMES J. GANTALAO AGM For Engineering	17 34

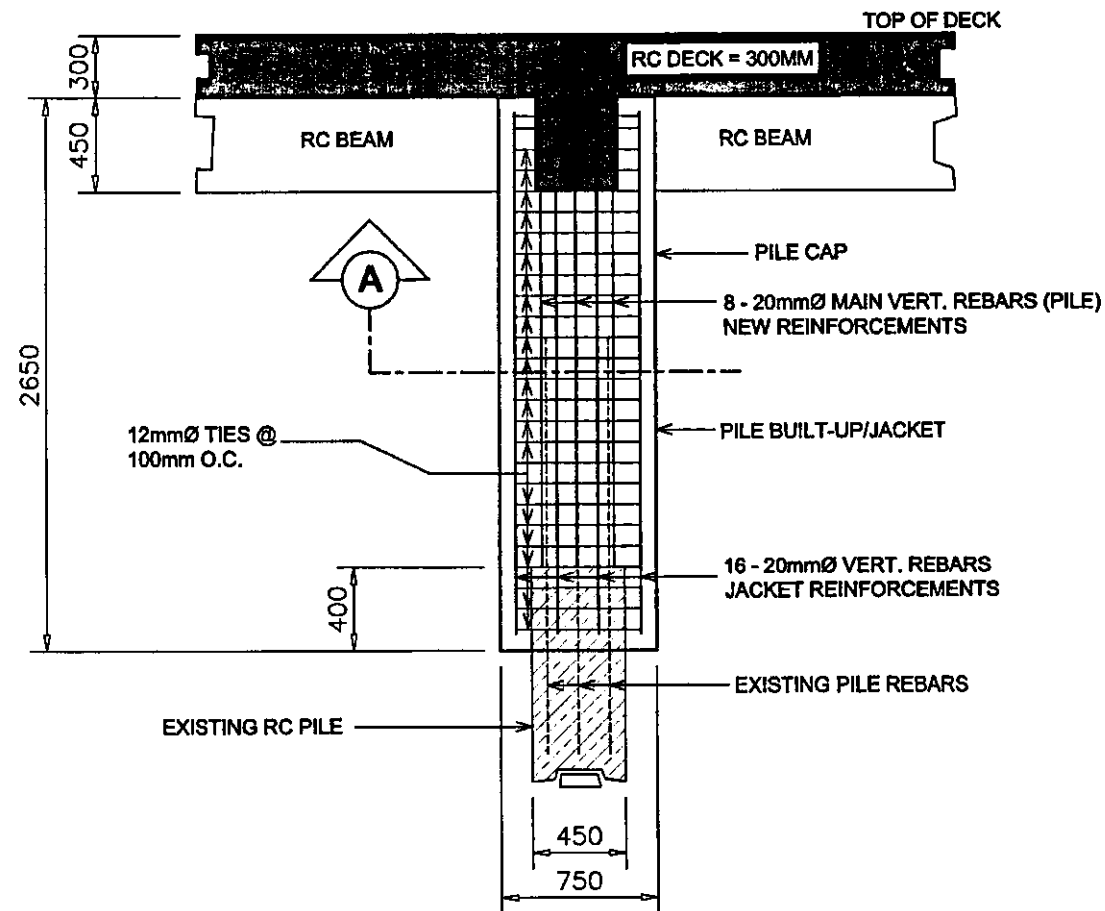


**PART PLAN**

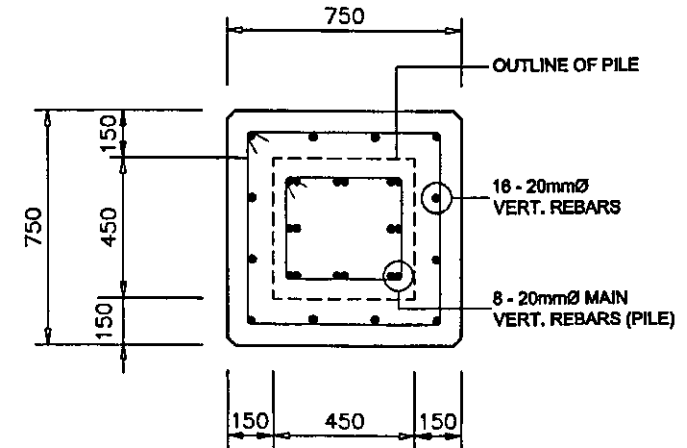
**PLAN FOR RESTORATION OF DAMAGED CONCRETE TOPPING OF RC DECK OF PIER 1**

	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAQUETE DUMAQUETE CITY, NEGROS ORIENTAL	AS SHOWN	ROLANDO C. AMORES Construction Foreman A	HUBERT P. MITMIT ESD Manager	SARAH C. MIJARES Port Manager	REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	JAMES J. GANTALAO AGM For Engineering	18 34





SECT./ELEV.



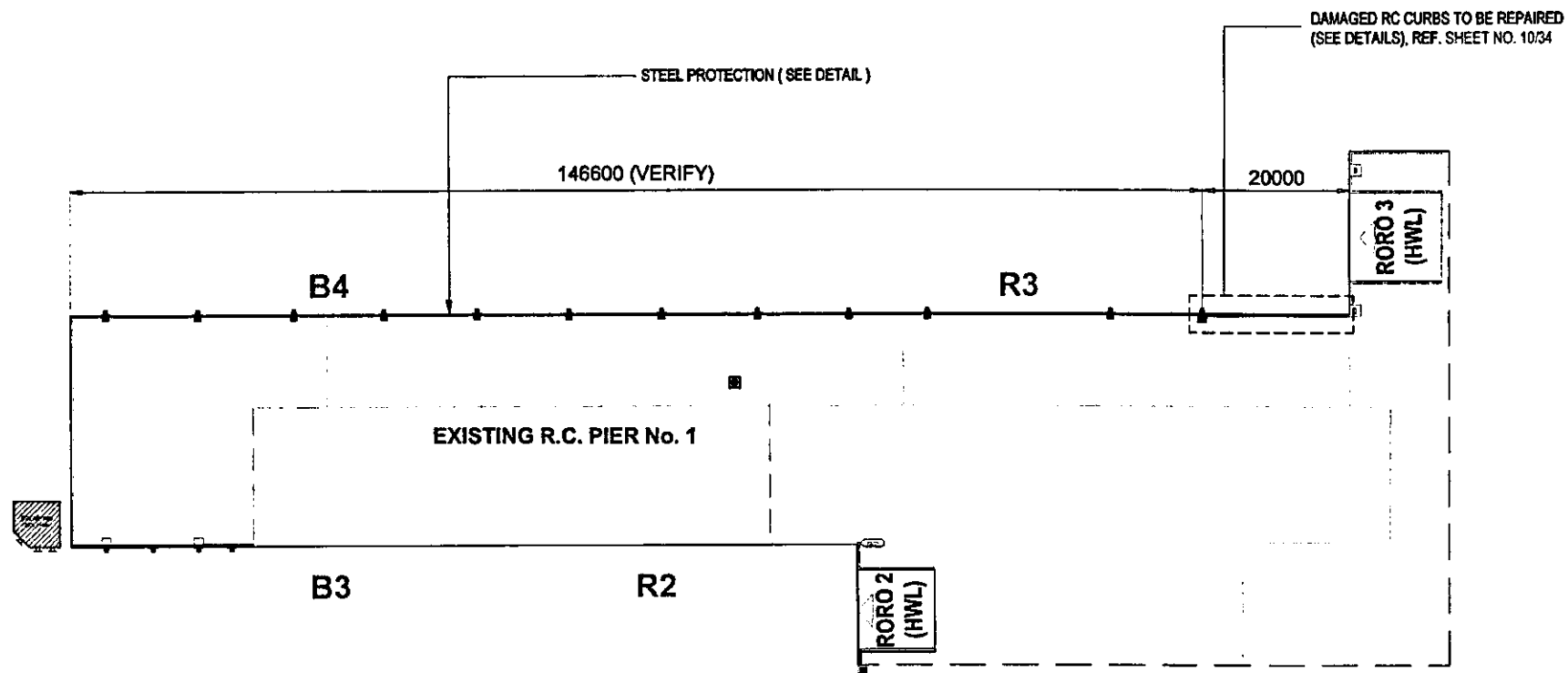
SECTION @ A



TYPICAL DETAIL OF PILE BUILT-UP/JACKET

PLAN FOR BUILT-UP/JACKETING OF DAMAGED RC PILE  
AT RC PIER NO. 3


<p>PMO - NEGROS ORIENTAL / SIQUIJOR</p>	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE, DUMAGUETE CITY, NEGROS ORIENTAL	AS SHOWN	ROLANDO C. AMORES Construction Foreman A	HUBERT F. MITMIT ESD Manager	SARAH R. MIJARES Port Manager	REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	JAMES J. GANTALAO AGM For Engineering	19 34

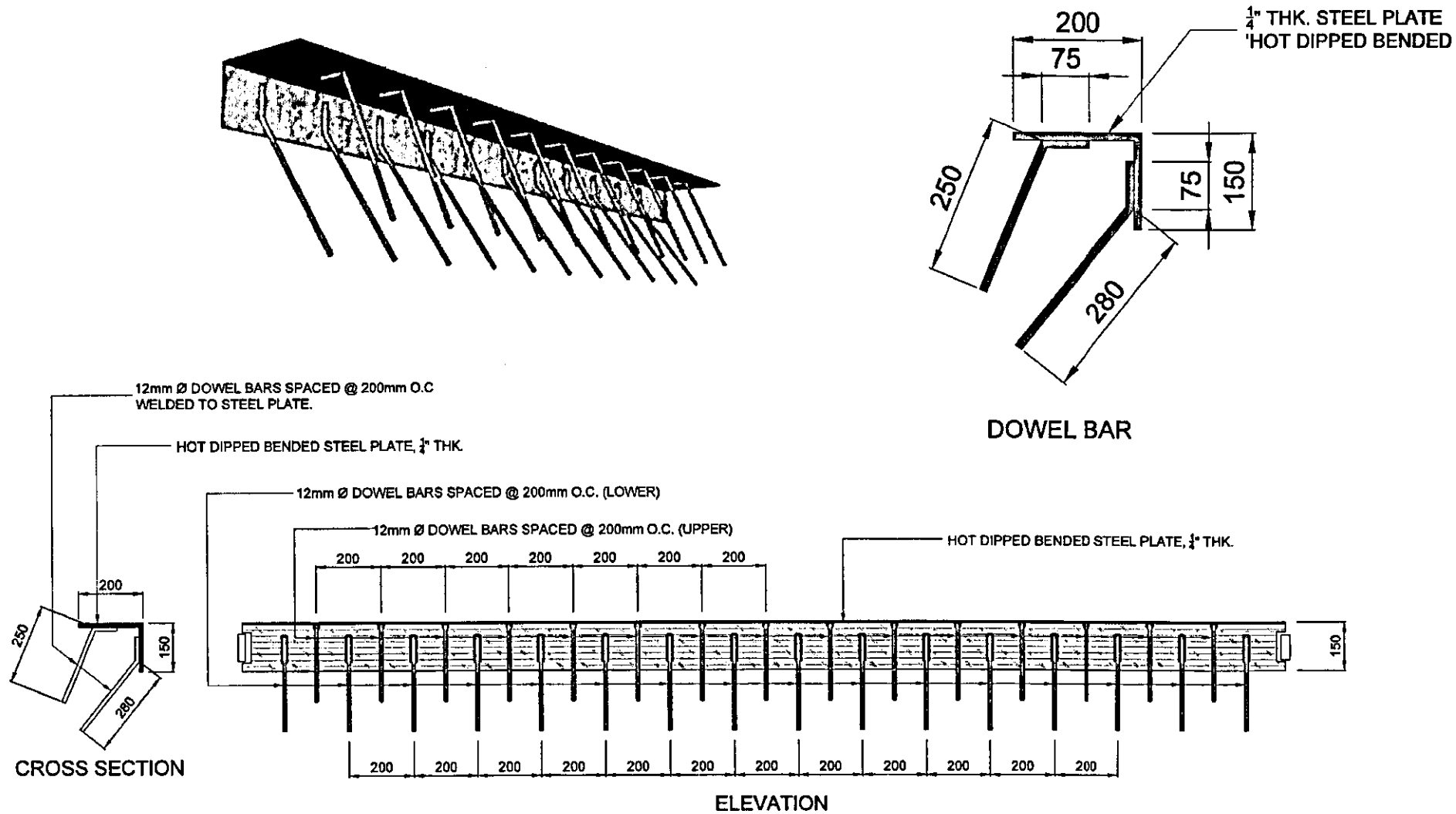


# STEEL PROTECTION LAYOUT PLAN

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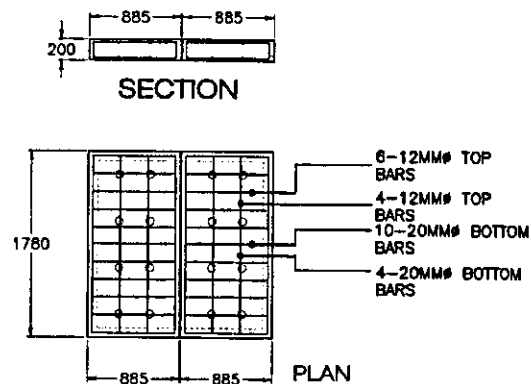
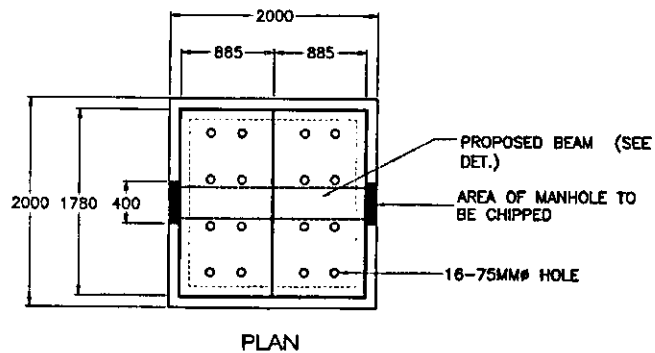
## PLAN FOR INSTALLATION OF STEEL PROTECTION

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	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	AS SHOWN	ROLANDO C. AMORES	HUBERT A. MITMIT	SARAH R. MIJARES	REYNAND C. PARAFINA	JAMES J. GANTALAO	20
	DUMAGUETE CITY, NEGROS ORIENTAL		Construction Foreman A	ESD Manager	Port Manager	Manager, Port Planning and Design Dept.	AGM For Engineering	34

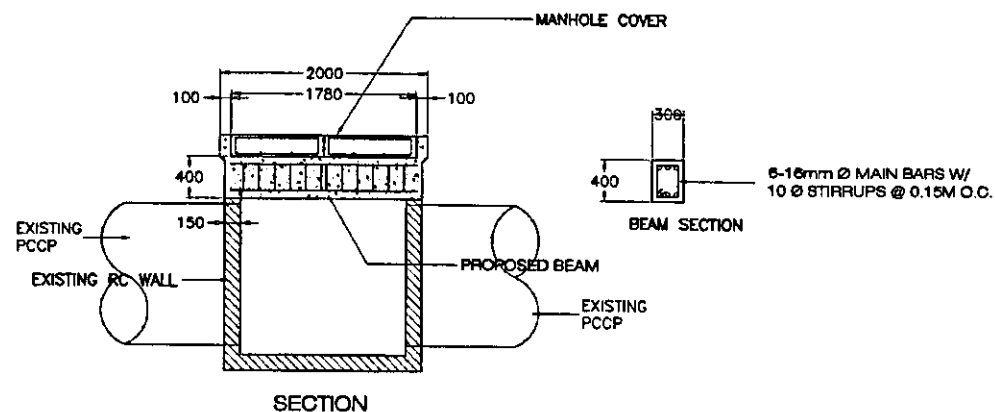
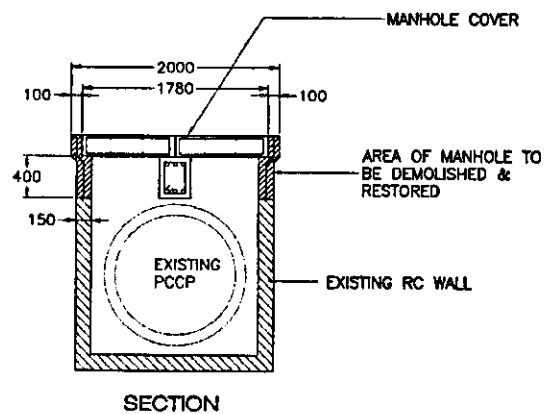


TYPICAL DETAIL OF STEEL PROTECTION FOR EDGE OF PIER DECK

	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	AS SHOWN	ROLANDO C. AMORES Construction Foreman A	HUBERT P. MITMIT ESD Manager	SARAH R. MIJARES Port Manager	REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	JAMES J. GANTALAO AGM For Engineering	21 34



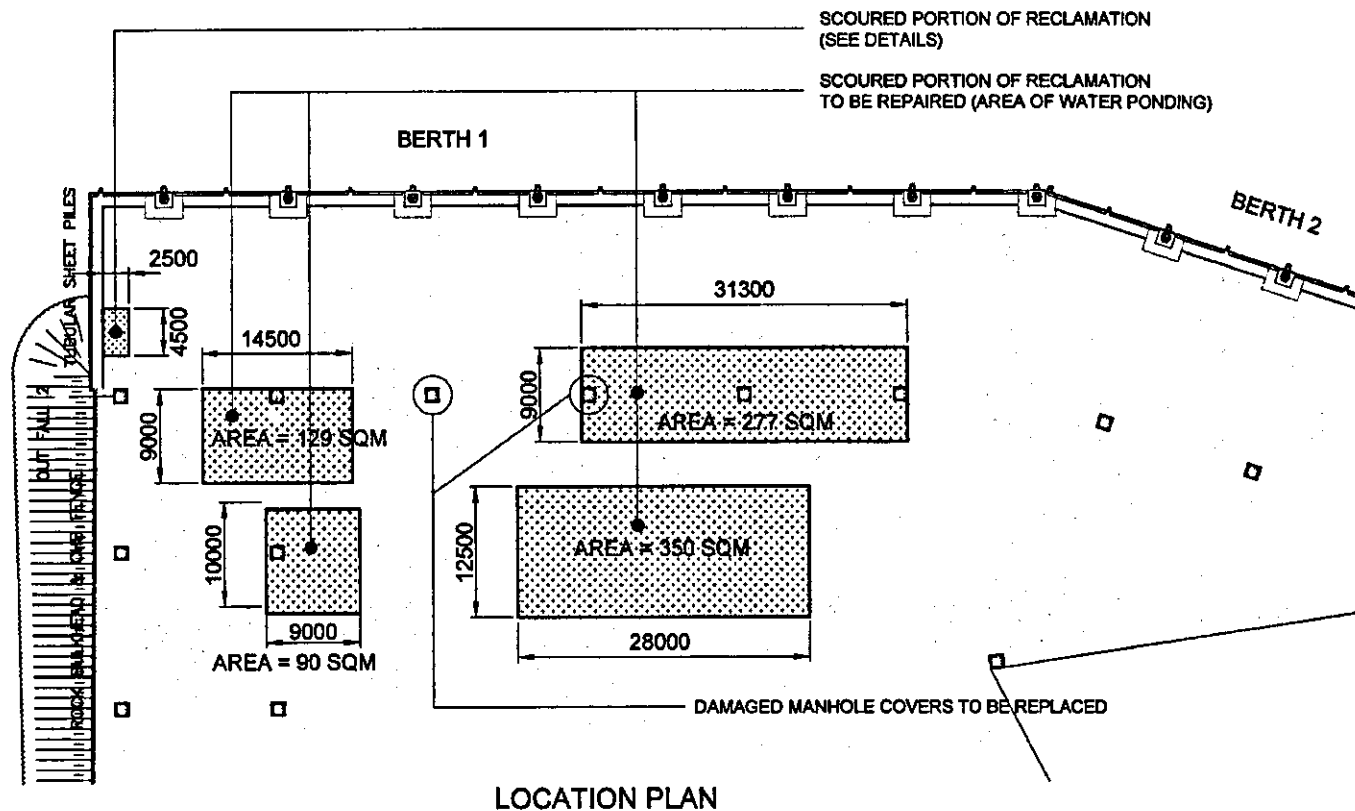
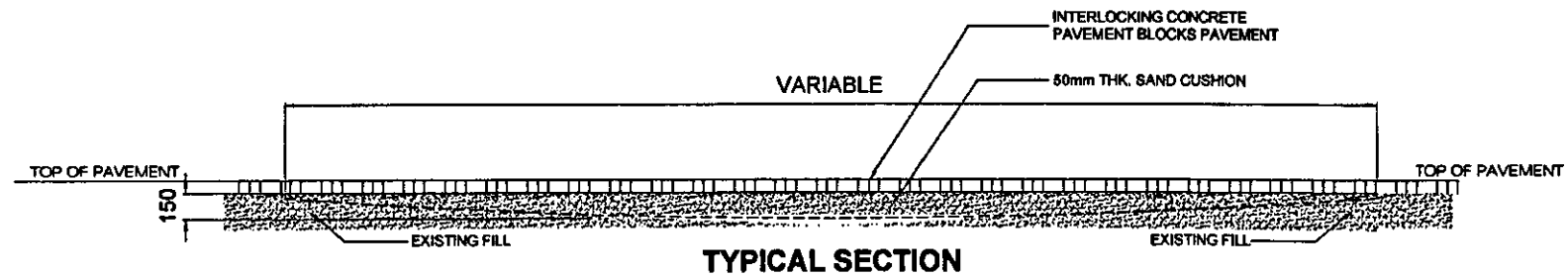
DETAIL OF CATCH DRAIN MANHOLE COVER



DETAIL OF DRAINAGE CANAL  
SCALE: 1 : 50

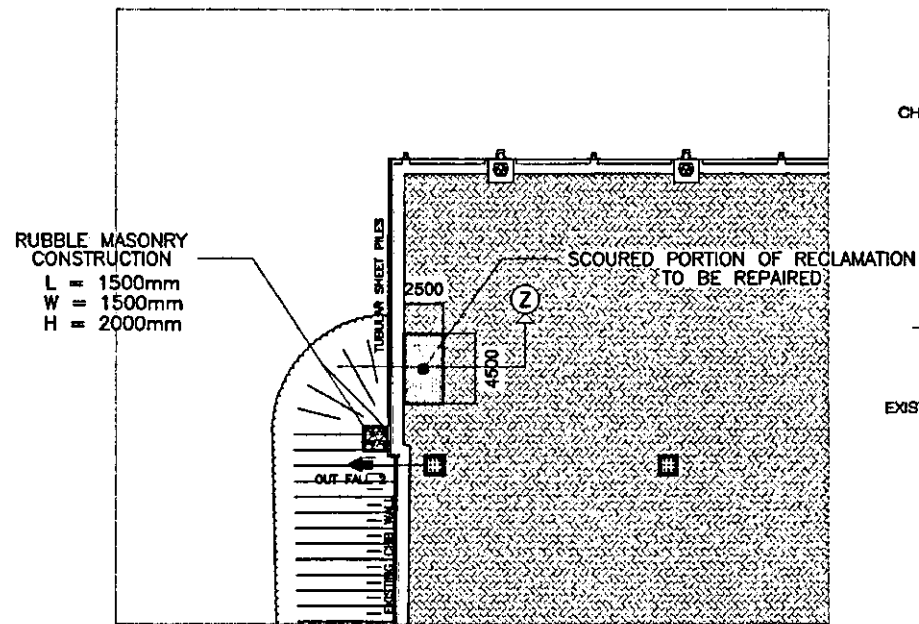
DETAIL FOR RESTORATION OF DAMAGED MANHOLE COVERS AT RECLAMATION AREA

	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	AS SHOWN	ROLANDO C. AMORES	HUBERT F. MITMIT	SARAH R. MIJARES	REYNAND C. PARAFINA	JAMES J. GANTALAO	22
	DUMAGUETE CITY, NEGROS ORIENTAL		Construction Management A		Port Manager	Manager, Port Planning and Design Dept.	AGM For Engineering	34

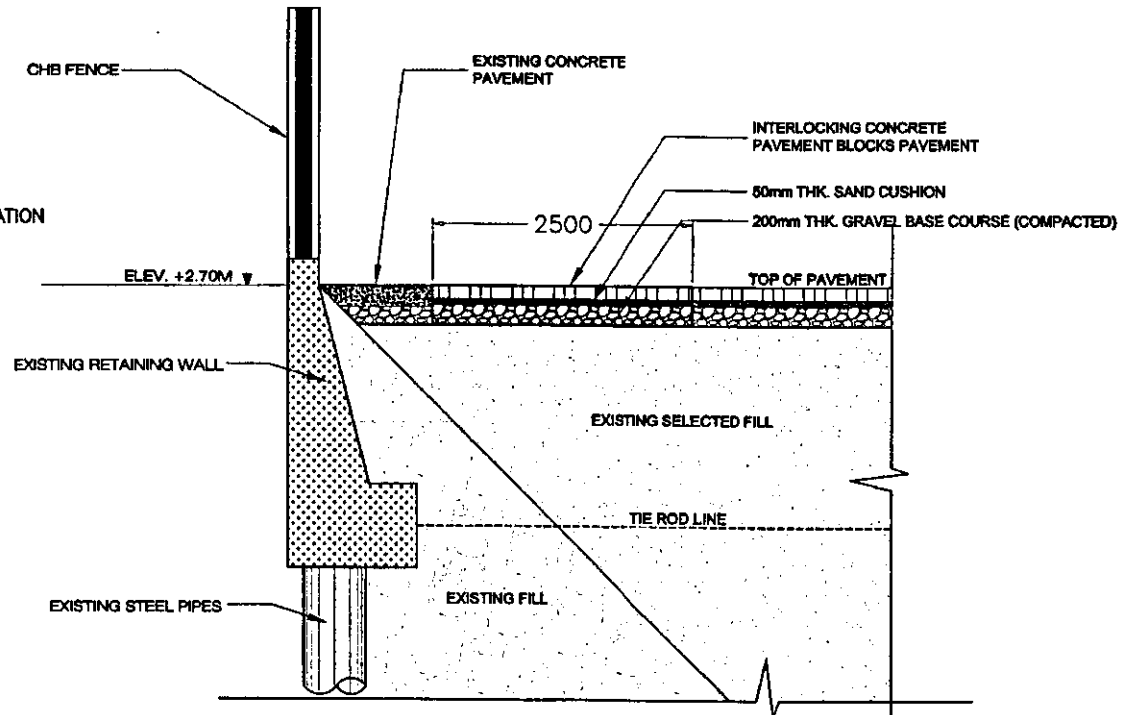


**DETAIL FOR RESTORATION OF SCoured PORTION OF RECLAMATION AREA**

	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	AS SHOWN	ROLANDO C. AMORES	HUBERT P. MITMIT	SARAH M. MJARES	REYNAND C. PARAFINA	JAMES J. GANTALAO	23
	DUMAGUETE CITY, NEGROS ORIENTAL		Construction Foreman A	ESD Manager	Port Manager	Manager, Port Planning and Design Dept.	AGM For Engineering	34



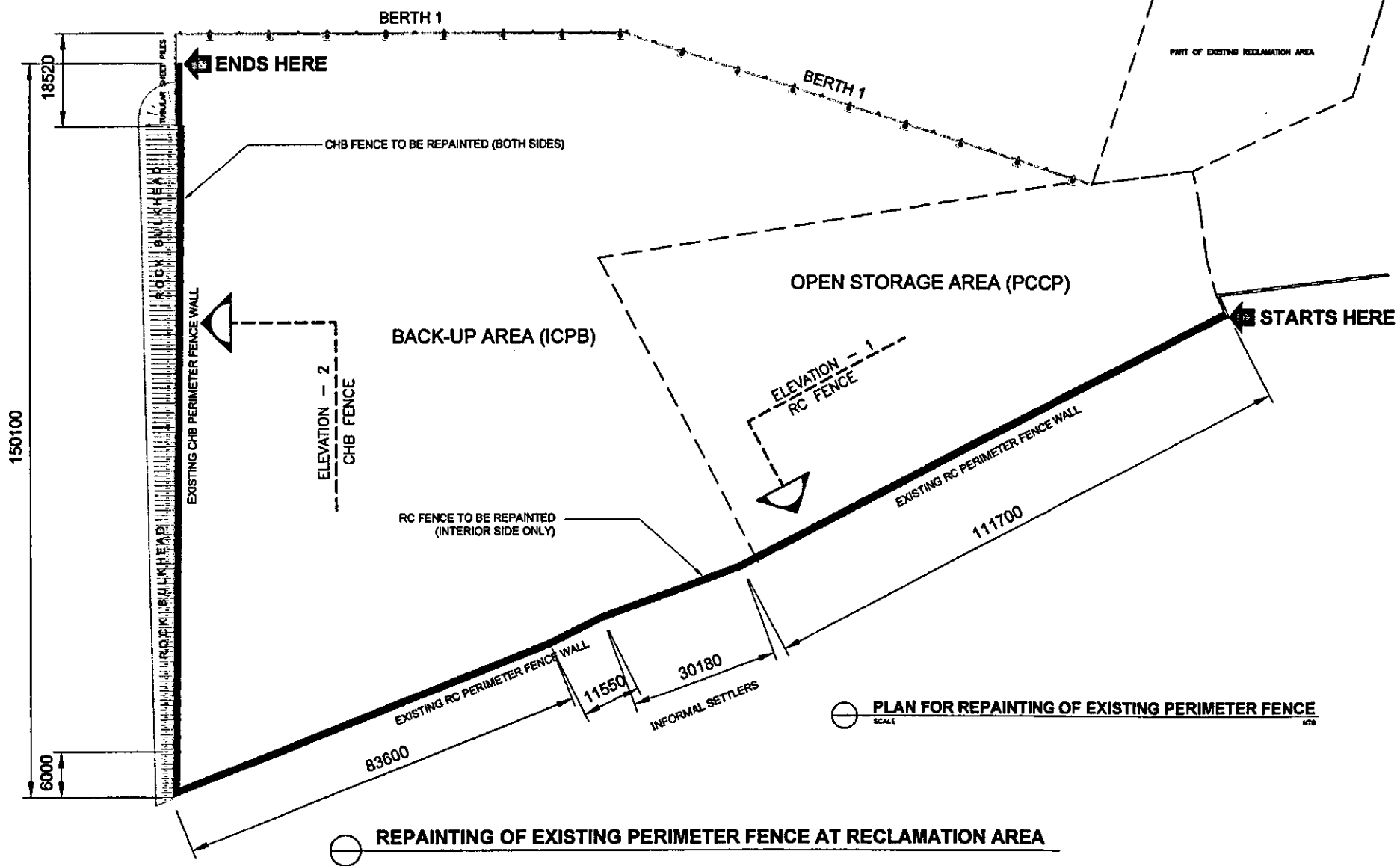
PLAN



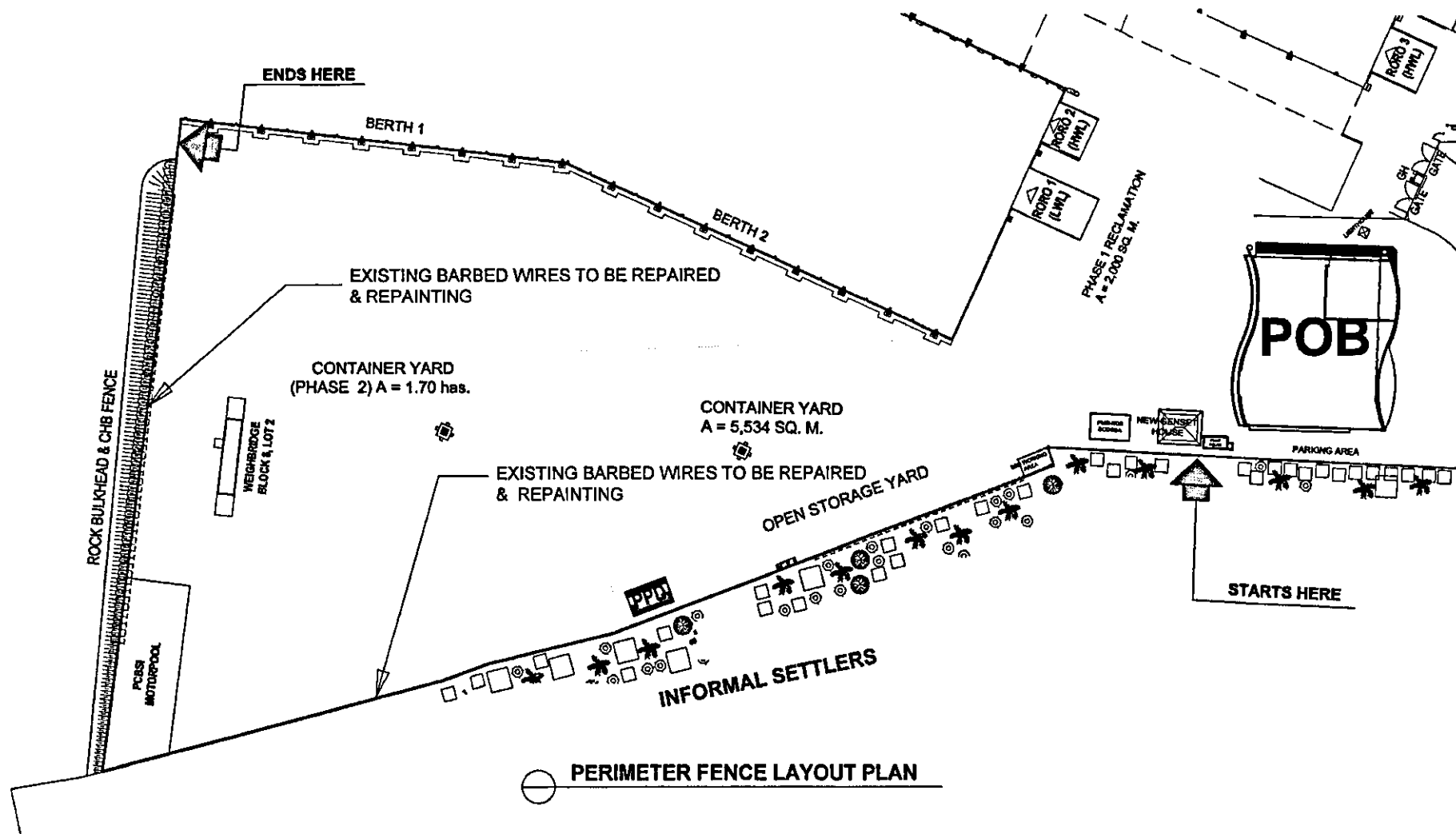
SECTION 'Z-Z'  
SCALE: 1 : 50

DETAIL FOR RESTORATION OF SCOURED PORTION AT RECLAMATION AREA


	<b>PROJECT TITLE:</b> UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	<b>SHEET CONTENTS:</b> AS SHOWN	<b>PREPARED BY:</b> ROLANDO C. AMORES Construction Foreman A	<b>CHECKED/REVIEWED BY:</b> HUBERT P. MITMIT ESD Manager	<b>SUBMITTED BY:</b> SARAH R. MIJARES Port Manager	<b>RECOMMENDING APPROVAL:</b> REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	<b>APPROVED:</b> JAMES J. GANTALAO AGM For Engineering	<b>SHEET NO.:</b> 24 34



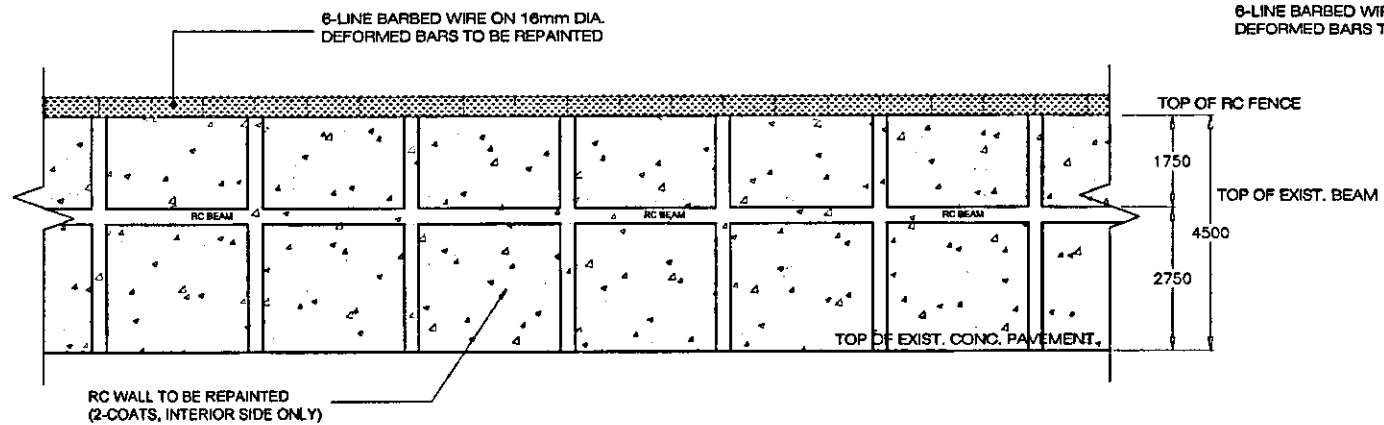
	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	AS SHOWN	ROLANDO C. AMORES	HUBERT F. MITMIT	SARAH R. MIJARES	REYNAND C. PARAFINA	JAMES J. GANTALAO	25
	DUMAGUETE CITY, NEGROS ORIENTAL		Construction Foreman A	ESD Manager	Port Manager	Manager, Port Planning and Design Dept.	AGM For Engineering	34



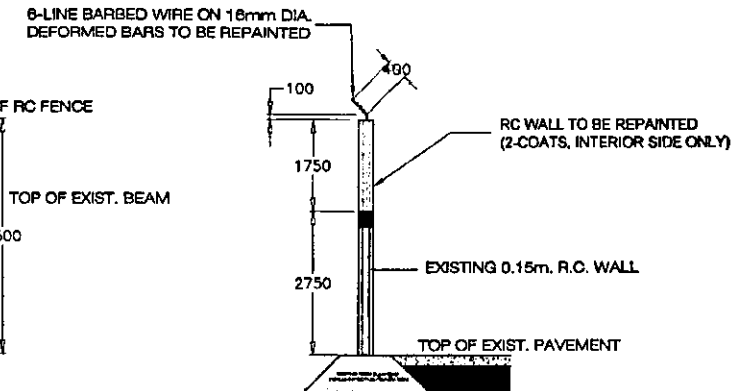
○ REPAINTING OF EXISTING BARBED WIRES ABOVE PERIMETER FENCE

	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	AS SHOWN	ROLANDO C. AMORES	HUBERT MITMIT	SARAH R. MIJARES	REYNAND C. PARAFINA	JAMES J. GANTALAO	26
	DUMAGUETE CITY, NEGROS ORIENTAL		Construction Foreman A	ESD Manager	Port Manager	Manager, Port Planning and Design Dept.	AGM For Engineering	34

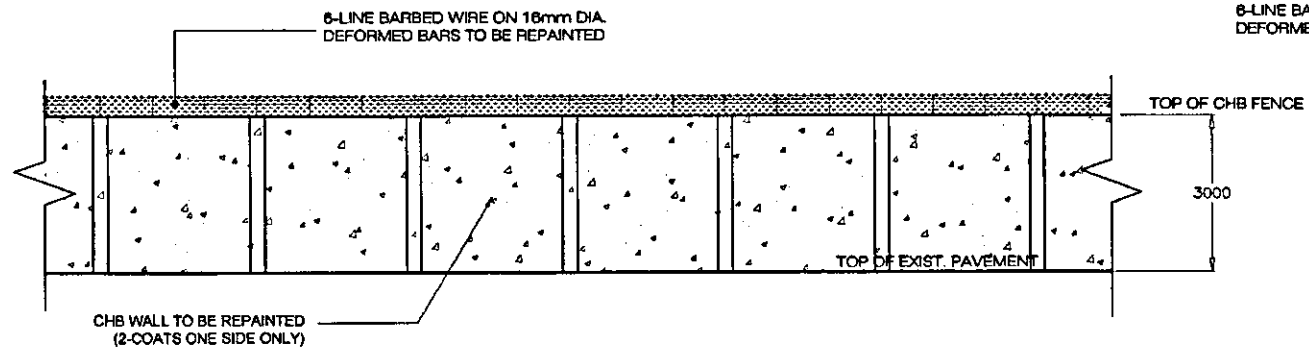




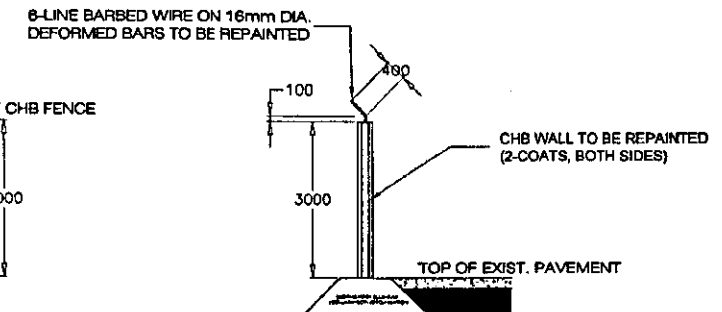
**ELEVATION - 1 ( TYP. )**  
SCALE: 1 : 100  
( TOTAL LENGHT = 237030 METERS )



**SECTIONAL ELEVATION - 1**  
SCALE: 1 : 100



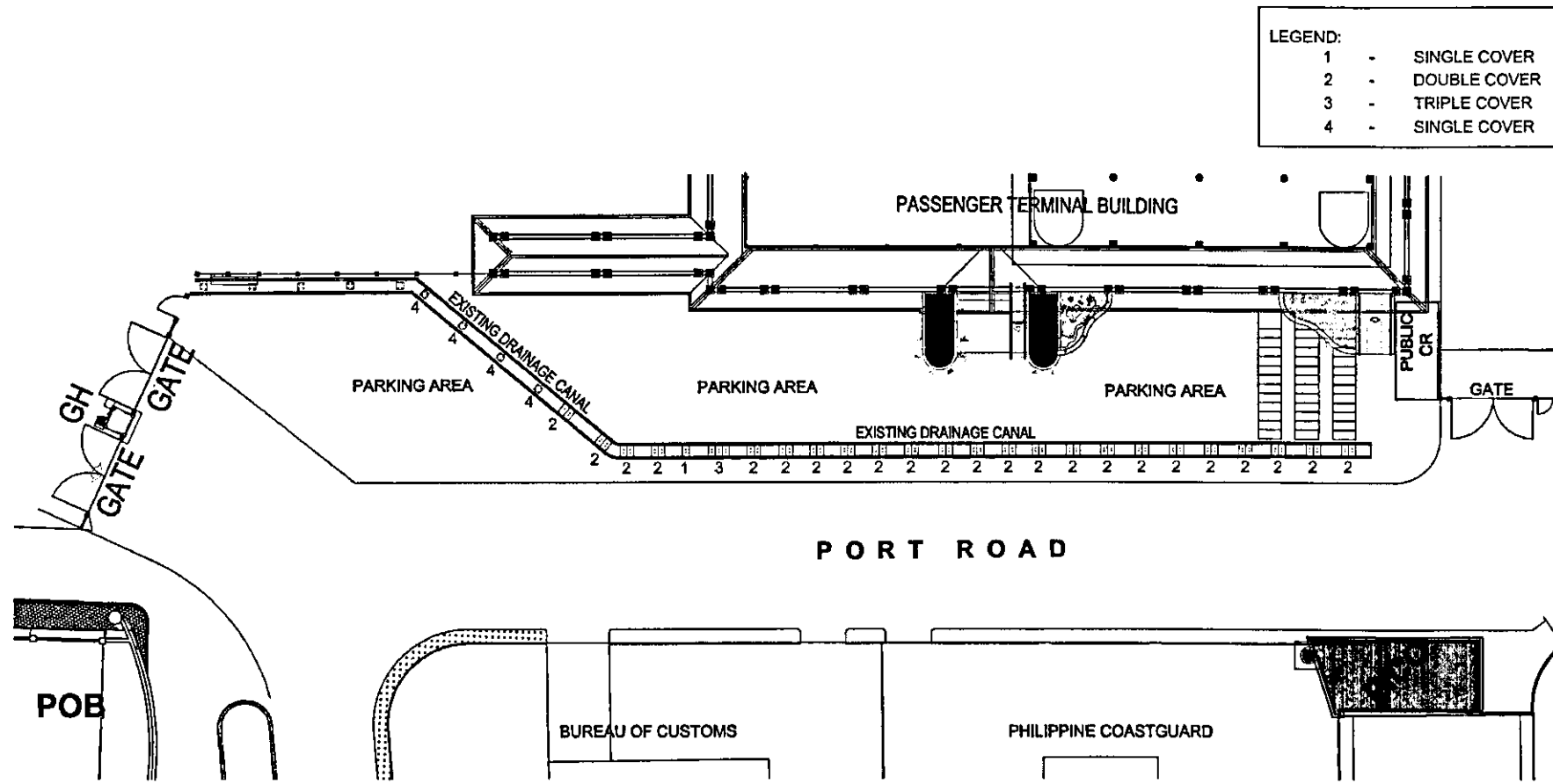
**ELEVATION - 2 ( TYP. )**  
SCALE: 1 : 100  
( TOTAL LENGHT = 150100 METERS )



**SECTIONAL ELEVATION - 2**  
SCALE: 1 : 100

**REPAINTING OF EXISTING PERIMETER FENCE AT RECLAMATION AREA**

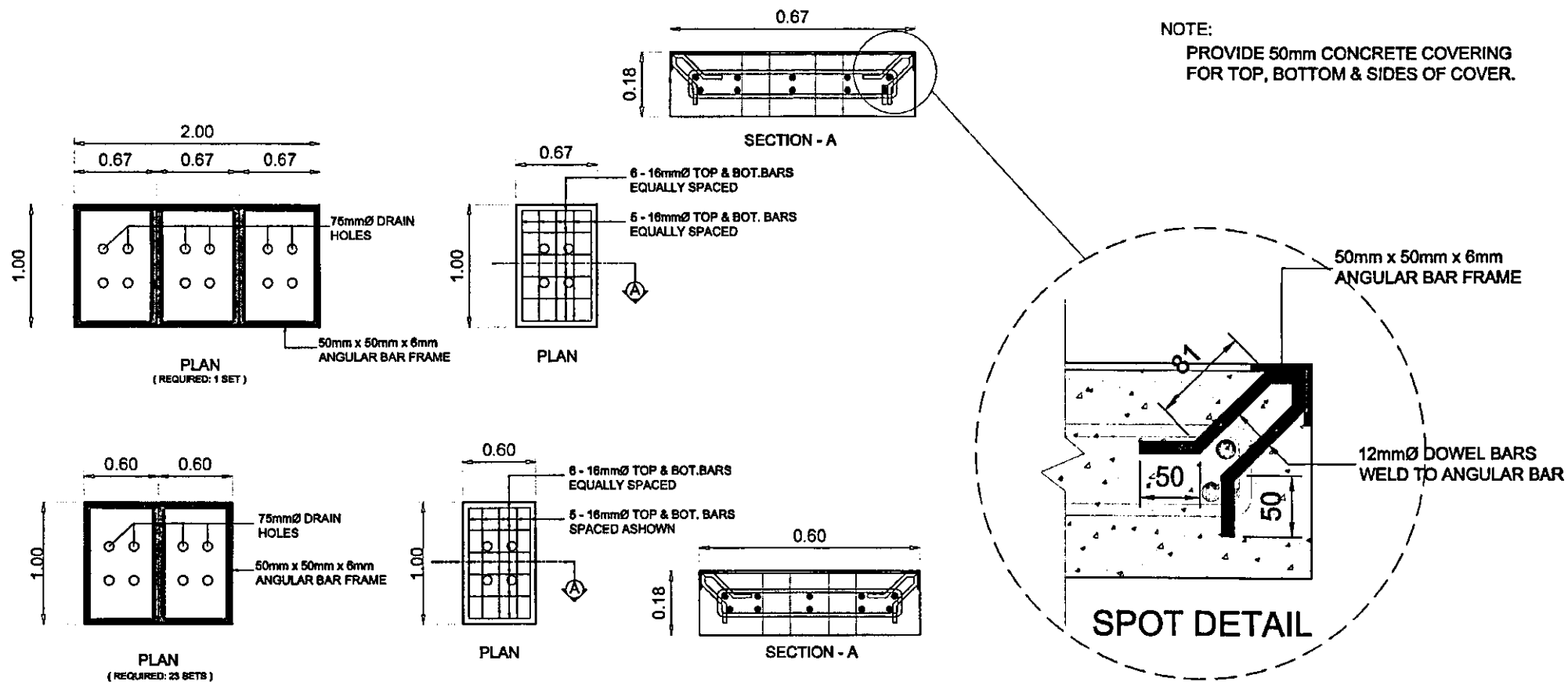
	<b>PROJECT TITLE:</b> UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	<b>SHEET CONTENTS:</b> AS SHOWN	<b>PREPARED BY:</b> ROLANDO C. AMORES Construction Foreman A	<b>CHECKED/REVIEWED BY:</b> HUBERT P. MITMIT ESD Manager	<b>SUBMITTED BY:</b> SARAH R. MIJARES Port Manager	<b>RECOMMENDING APPROVAL:</b> REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	<b>APPROVED:</b> JAMES J. GANTALAO AGM For Engineering	<b>SHEET NO.:</b> 27 34



## **DRAINAGE LAYOUT PLAN**

### **PLAN FOR RESTORATION OF DAMAGED DRAINAGE COVERS**

<p>PHILIPPINE PORTS AUTHORITY</p> <p>PMO - NEGROS ORIENTAL / SIQUIJOR</p>	<p><b>PROJECT TITLE:</b></p> <p>UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA &amp; PORT ROAD, PORT OF DUMAGUETE</p> <p>DUMAGUETE CITY, NEGROS ORIENTAL</p>	<p><b>SHEET CONTENTS:</b></p> <p>AS SHOWN</p>	<p><b>PREPARED BY:</b></p> <p>ROLANDO C. AMORES</p>	<p><b>CHECKED/REVIEWED BY:</b></p> <p>HUBERT P. MITMIT</p>	<p><b>SUBMITTED BY:</b></p> <p>SARAH R. MIJARES</p>	<p><b>RECOMMENDING APPROVAL:</b></p> <p>REYNAND C. PARAFINA</p>	<p><b>APPROVED:</b></p> <p>JAMES J. GANTALAO</p>	<p><b>SHEET NO.:</b></p> <p>28</p>
			<p>Construction Foreman A</p>	<p>ESD Manager</p>	<p>Port Manager</p>	<p>Manager, Port Planning and Design Dept.</p>	<p>AGM For Engineering</p>	<p>34</p>

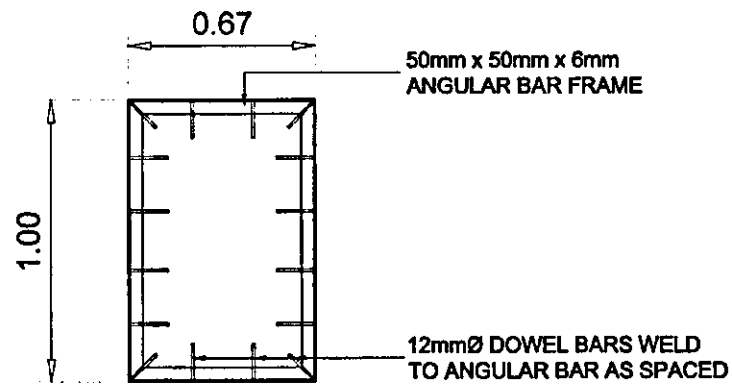


## — DRAINAGE MANHOLE COVER DETAILS

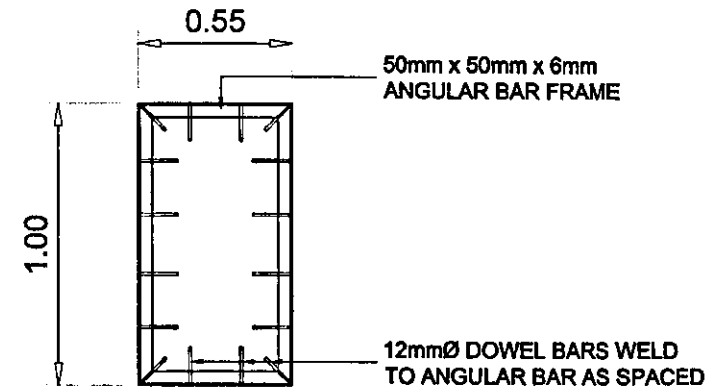
## — PLAN FOR RESTORATION OF DAMAGED DRAINAGE MANHOLE COVERS ALONG THE PORT ROAD FRONTING THE PTB

<p>PMO - NEGROS ORIENTAL / SIQUIJOR</p>	<p>PROJECT TITLE: UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA &amp; PORT ROAD, PORT OF DUMAGUETE</p>	<p>SHEET CONTENTS: AS SHOWN</p>	<p>PREPARED BY:</p>	<p>CHECKED/REVIEWED BY:</p>	<p>SUBMITTED BY:</p>	<p>RECOMMENDING APPROVAL:</p>	<p>APPROVED:</p>	<p>SHEET NO.:</p>
			<p>ROLANDO C. AMORES Construction Foreman A</p>	<p>HUBERT P. MITMIT ESD Manager</p>	<p>SARAH R. MIJARES Port Manager</p>	<p>REYNAND C. PARAFINA Manager, Port Planning and Design Dept.</p>	<p>JAMES J. GANTALAO AGM For Engineering</p>	<p>29 34</p>

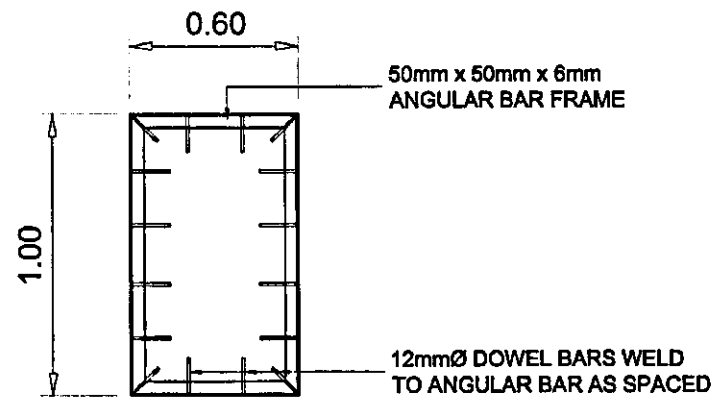




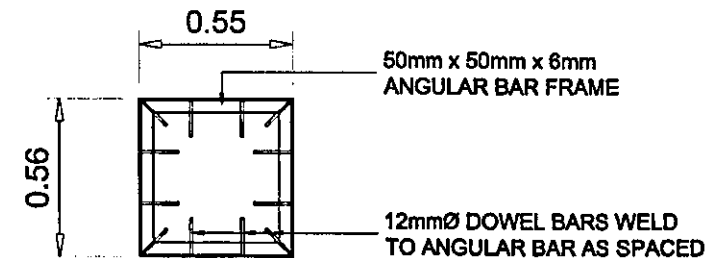
PLAN



PLAN




PLAN

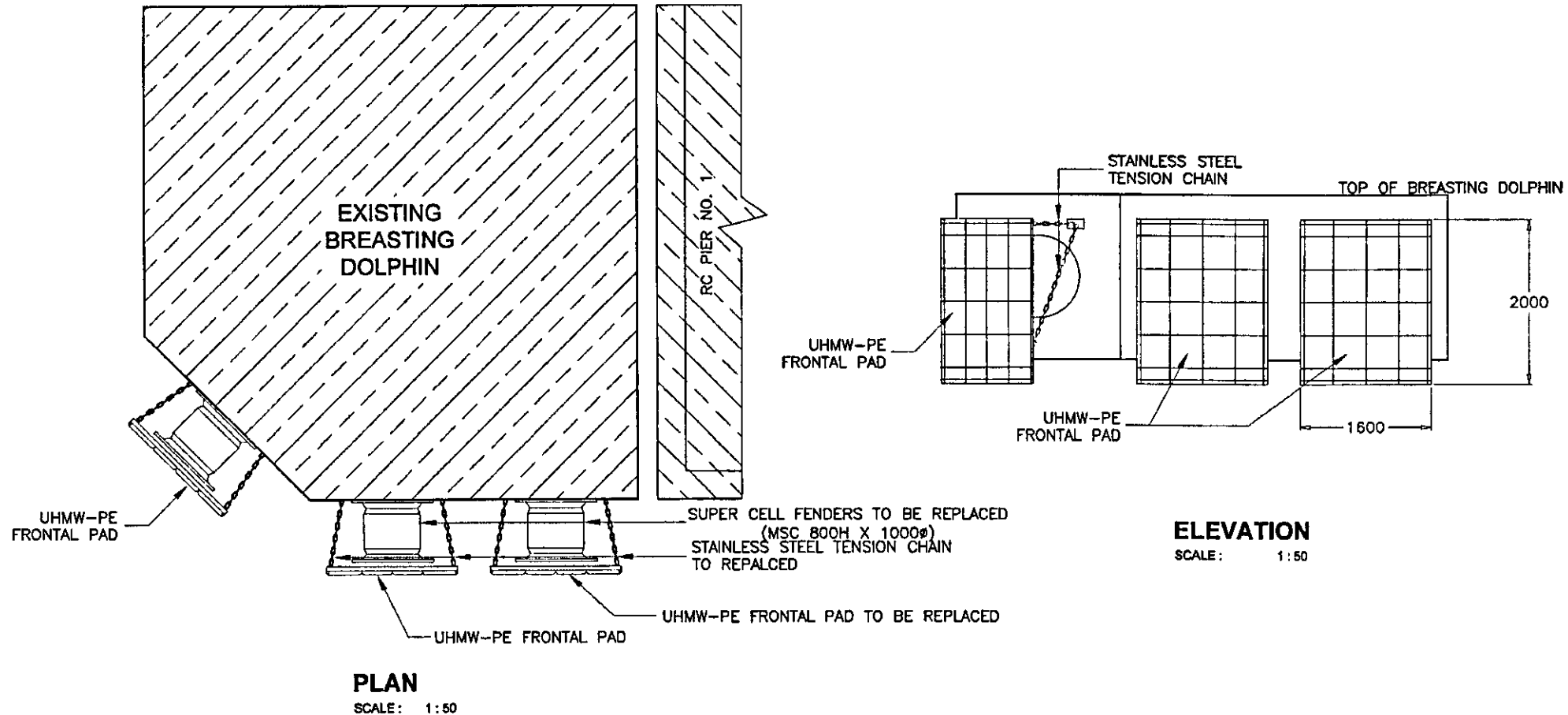


PLAN

○ ANGULAR FRAME DETAILS

○ PLAN FOR RESTORATION OF DAMAGED DRAINAGE MANHOLE COVERS  
ALONG THE PORT ROAD FRONTING THE PTB

 <p>PMO - NEGROS ORIENTAL / SIQUIJOR</p>	PROJECT TITLE:		SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE		AS SHOWN	ROLANDO C. AMORES	HUBERT X. MITMIT	SARAH R. MIJARES	REYNAND C. PARAFINA	JAMES J. GANTALAO	31
	DUMAGUETE CITY, NEGROS ORIENTAL			Construction Foreman A	ESD Manager	Port Manager	Manager, Port Planning and Design Dept	AGM For Engineering	34



## REPAIR OF SUPER CELL FENDERS AT BREASTING DOLPHIN

REPLACEMENT OF TWO (2) SETS SUPER CELL FENDERS INCLUDING ACCESSORIES

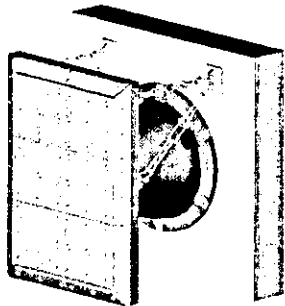
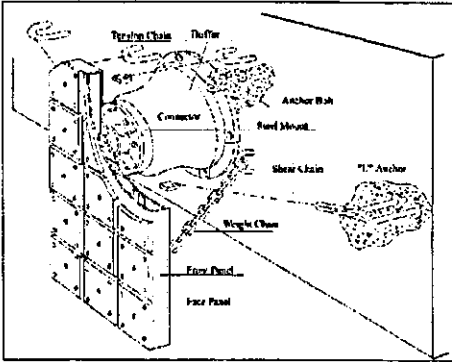
<p>PMO - NEGROS ORIENTAL / SQUIJOR</p>	PROJECT TITLE:	SHEET CONTENTS:	PREPARED BY:	CHECKED/REVIEWED BY:	SUBMITTED BY:	RECOMMENDING APPROVAL:	APPROVED:	SHEET NO.:
	UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE DUMAGUETE CITY, NEGROS ORIENTAL	AS SHOWN	ROLANDO C. AMORES Construction Foreman A	HUBERT P. MITMIT ESO Manager	SARAH R. MIJARES Port Manager	REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	JAMES J. GANTALAO AGM For Engineering	32 34

PERFORMANCE CHARACTERISTIC  
OF MSC-TYPE (800H X 1000Ø) SUPER CELL FENDER


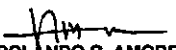


RATED DEFLECTION 52.50%		PERFORMANCE TOLERANCE (%)
REACTION FORCE (KN)	ENERGY ABSORPTION (KN – M)	
281.00	97.6.00	± 10

PERFORMANCE CHARACTERISTIC  
OF UHMW-PE FOR SUPER CELL FENDER

		INDEX
IMPULSE STRENGTH	KJ/m²	≥140
WATER ABSORPTION	%	≤0.01
COMPRESSIVE STRENGTH	MPa	≥30
BALL INDENTATION HARDNESS	N/mm²	≥28
FLEXURAL STRENGTH	MPa	≥30
WATER LOSS	g/cm²	≤0.0036
DENSITY	Kg/m³	930



ISOMETRIC VIEW  
SCALE : NTS

 PMO - NEGROS ORIENTAL / SIQUIJOR	PROJECT TITLE: UPGRADING OF FENDERING SYSTEM AT PIER 1 INCLUDING RESTORATION OF DAMAGED CURTAIN WALL, DRAINAGE SYSTEM AT BACK-UP AREA & PORT ROAD, PORT OF DUMAGUETE	SHEET CONTENTS: AS SHOWN	PREPARED BY:  ROLANDO C. AMORES Construction Foreman A	CHECKED/REVIEWED BY:  HUBERT P. MITMIT ESD Manager	SUBMITTED BY:  SARAH R. MJARES Port Manager	RECOMMENDING APPROVAL: REYNAND C. PARAFINA Manager, Port Planning and Design Dept.	APPROVED: JAMES J. GANTALAO AGM For Engineering	SHEET NO.: 33 34
	DUMAGUETE CITY, NEGROS ORIENTAL							