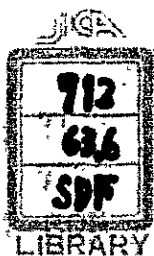
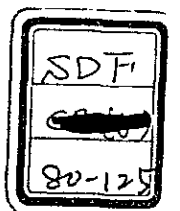


**STUDY REPORT
FOR
THE DESIGN ON CARGO HANDLING
TRAINING EQUIPMENTS
IN
THE REPUBLIC OF VENEZUELA**

JULY 1980



JAPAN INTERNATIONAL COOPERATION AGENCY



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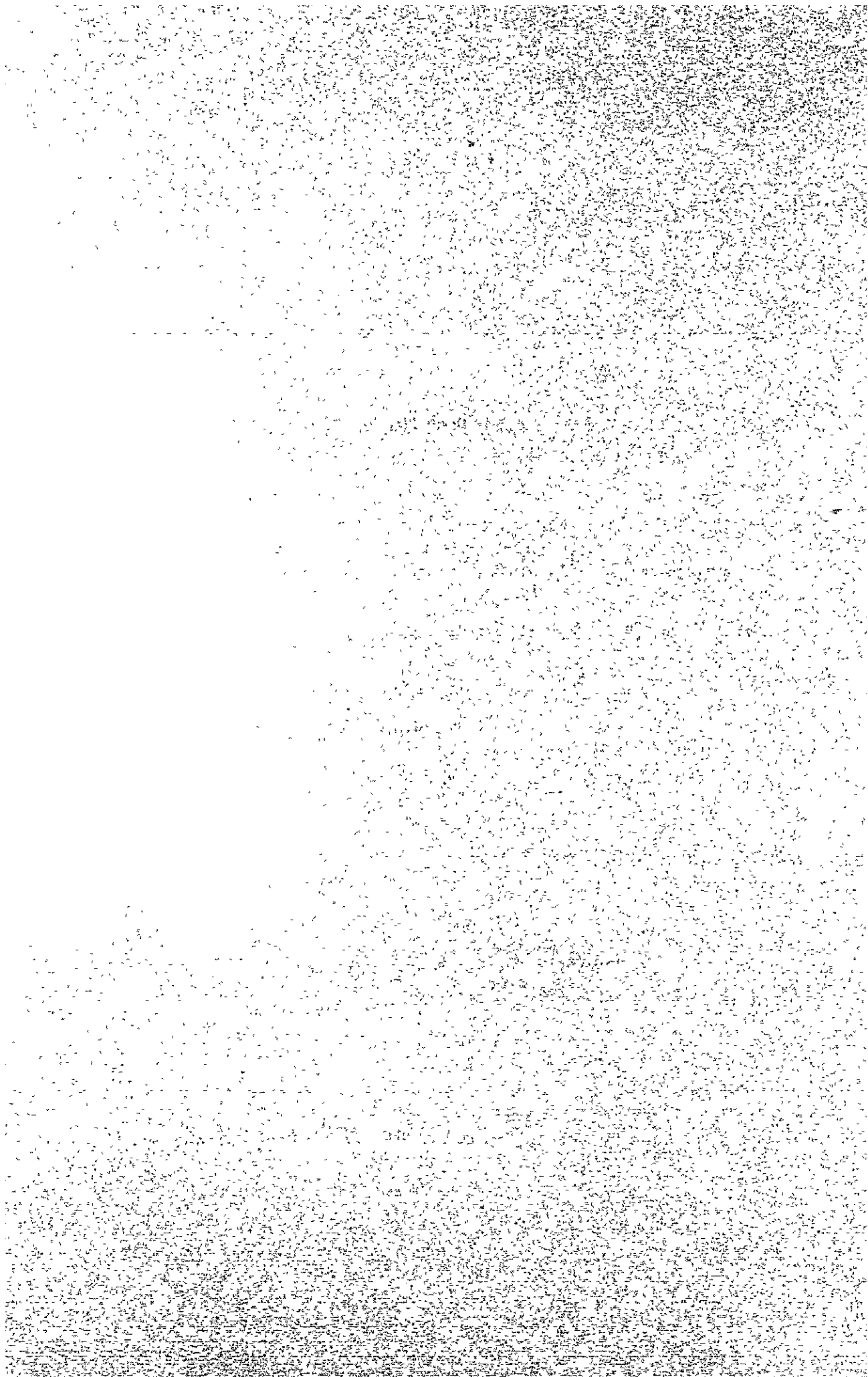
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1. Basic Plan



1. Basic plan

1-1 General plan

This plan relates to the deck crane for training to be installed in the harbor training center in Port of Cabello, aiming at skill training and technical instruction of the harbor labors in Venezuela.

1-2 Training substance

- a) Preliminary training of burtoning system, counter weight system and swing boom system by simulator.
- b) Training of preparatory works of cargo handling on board, burtoning system, counter weight system and swing boom system by derrick crane.
- c) Training of hoisting, slewing and derricking with jib crane.

1-3 Hull size

Hull size is made actual scale of 8,000 DWT class around hatch. Hull depth is made compatible to the training.

Major dimensions

Length	26.5m
Width	18.0m
Depth	6.0m
Hatch	12.0m X 7.0m
Deck	1 floor

Side plate will be installed down to the bottom only on such part as corresponding to the hatch longitudinal length. The bottom of other portions is made open.

Deck and ship bottom consist respectively of steel and concrete. Side plate comprises steel.

All the constructional parts shall be transported under semi-assembled condition to facilitate site installation. For the site assembly of the constructional members, bolts shall be used in general. However, welding shall be applied to the seams of deck and side plate sealing.

Base shall consist of concrete pile foundation.

1-4 Derrick crane

A platform is provided on one end of hull hatch and, thereon mounted are two sets of 5t derrick cranes and three sets of operating winches, etc. Major specifications of the derrick crane are as follows.

Maximum hoisting load	
Burtoning system	2.5 ton (sling angle 120°)
Counter weight system	3 ton
Swing boom system	5 ton
Hoisting speed	3 kinds
Hoisting speed	
Boom length	17m
Drive	Motor drive
Power supply	AC 220V, 3φ, 60Hz

1-5 Jib crane

One set of 5t jib crane is installed on the opposite side of the hull derrick crane installation. Major specifications of the jib crane are as follows.

Maximum hoisting load	5 ton
Hoisting speed	3 kinds
Slewing speed of jib	2 kinds
Boom hoisting speed	2 kinds
Boom length	19.0m
Drive	Motor drive
Power supply	AC 220V, 3φ, 60Hz

1-6 Simulator

Simulator is provided for supporting actual machine training. Simulator shall be about 1/8 scale machine having approximately same functions as those of derrick crane.

Type	1 pair of 2 derrick cranes, steel, indoor use
Operation	Burtoning system, counter weight system, swing boom system
Hoisting load	10 kg

1-7 Safety device

a) Derrick crane

Stopping device for emergency. Limiting device for hoist. Angle gauge.

b) Jib crane

Stopping device for emergency. Limiting device for hoist. Interlocker for slewing. Angle gauge. Safety against overloading.

**2. Specification for Construction of the
Cargo Handling Training Equipments**

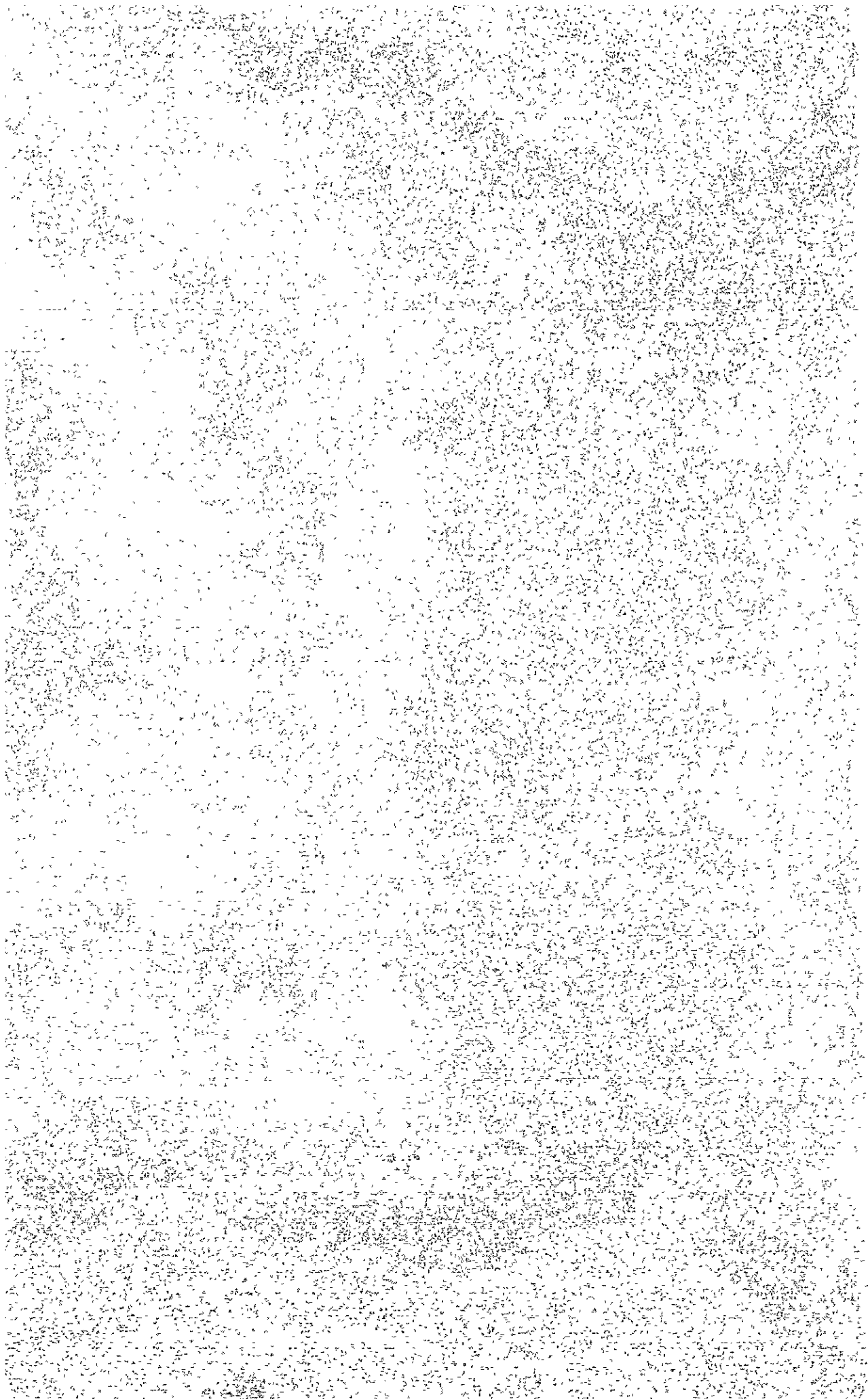


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I. General

1. This specification applies to the foundations and installation of the simulated cargo handling equipment system on ship to be built at Puerto Cabello.
2. Reference to ASTM Standards in this specification is intended to indicate the acceptable technical standards, and not to prevent the use of any other standards of internationally known institution with equivalent or higher authority.
3. All the works are to be carried out strictly in accordance with this specification and the drawings attached hereto.
4. The Contractor is to refer to the Supervisor any commission or question found in this specification and the drawings, and comply with the instructions issued by the Supervisor.
5. Before the commencement of any work, the Contractor is to submit a working program to the Client for his approval.
6. The Contractor is to submit any proposal for minor modifications to the Supervisor for his approval.
7. The drawings attached hereto are listed as follows:

II. Preliminaries

1. The Contractor is to provide all stores, sheds, covers, etc. necessary to prevent damage or loss by weather or other cause to materials delivered to the site.
2. The Contractor is to provide watchmen, lighting, temporary fencing as necessary or as required by the Supervisor to prevent damage or loss of the material or the work and injury to all persons including the workpeople and the public.
3. Temporary drainage channels are to be cut on the site to prevent the accumulation of water.
4. The Contractor is to set out the work and seek approval of the Supervisor before any further work is commenced.
5. The whole of the work is to be kept clean, perfect and in good order on completion. All plants and surplus materials are to be cleared away on completion and all debris is to be cleared as it arises and on completion.
6. The Contractor is to be responsible for the cost of all temporary electricity, water and other services for the works.

III. Piling

1. Piles are to be prestressed precast concrete piles.
2. The manufacturers of the piles are to be those regularly engaged in the production of prestressed concrete piles or other prestressed concrete products for a period of not less than three years.
3. Cement, aggregate, water, and admixtures to be used for the production of piles are to be those specified for concrete work.
4. The minimum quantity of cement to be used is to be 350 kg per unit cubic meters of concrete.
5. The 28-day strength of concrete is to be more than 400 kg/cm².
6. The prestressing wires are to comply to the Grade 250 of ASTM A416 specifications. (Breaking strength of strand of 7/16 in. is 120.1 KN.)
7. The effective prestress after all losses is to be from 50 kg/cm² to 85 kg/cm².
8. In case of steam curing, the piles are to be covered and kept damp for 3 to 4 hours, then the temperature is to be raised 1/2°C per minute to 65°C and held for 10 hours. After releasing prestress, the temperature is to be allowed to fall at 1/2 deg. C per minute to the ambient temperature.
9. The tolerances of the produced piles are as follows:

Length	: ±2.5mm
Diameter	: -6mm, +10mm
Head out of square	: 1/100
Deviation from axis	: 1/1,000
Position of spirals	: ±20mm
Position of wires	: 6mm
10. The prestressing wires are to be cut flush with the end of the pile and no projection of the prestressing wire is to be admitted.
11. In storage and handling, the piles are to be supported to insure no excessive loads are induced and the points at which piles are to be lifted or supported are to be clearly marked. Hauling is to be made using trailers suitable for the length and weight of the piles in such a manner as to give as least vibration as possible to the piles.

12. In driving, the driving stress is to be reduced through the use of adequate cushioning material, heavy ram with a short stroke of hammer. The driving head is to fit loosely around the piles so that the pile may rotate easily within the driving head.
13. The positioning of piles is to be set right and aligned plumb. The hammer blow is to be delivered essentially axially once the driving starts and the head and mid-length are to be supported to prevent sway and buckling of piles.
14. After driving piles to the specified depth, the head is to be cut at the level shown in the drawing in a manner not causing damage to the pile. The prestressing wires are to be exposed and cut away leaving the necessary anchor length.
15. The sets, rebounds, heights of strokes of the hammer are to be measured in the final stage of driving for each pile. The load carrying capacity of pile is to be ascertained using adequate engineering formula.
16. The prestressing wires are to be cut off flush with the pile head. The pile with exposed wires is not to be allowed.
17. The pile is to be driven to reach the load bearing layer.

IV. Earthwork

1. Any surplus excavated material not required for filling is to be removed from the site and disposed of as directed by the Supervisor.
2. The Contractor is to give notice to the Supervisor when the excavation is ready to receive foundation. The foundation is not to be laid until the excavation is approved.
3. The side of the excavation is to be strutted or shored up as necessary. The strutting or shore up materials are to be removed and cleared away on completion.
4. No water is to be allowed to accumulate in the excavations which are to be kept dry by pumping or other means and to be protected against flooding.
5. Return and fill in selected excavated material around foundations up to original ground level or as required. Filling is to be carried out in layers not exceeding 20 cm thick before consolidation, each layer well rammed and consolidated with the addition of water if required. No filling is to be carried out until the foundations have been inspected and approved.
6. Broken stones are to be approved hand, dry crushed stones broken to pass 10 cm ring, graded sufficiently for adequate consolidation and free from dust. Broken stones are to be laid and consolidated as described for filling and the surface is to be levelled or graded as required and blinded with sand.

V. Concrete Work

1. This section is to apply to the concrete work for foundations and pavement slab.
2. Cement is to be Portland cement (ASTM C150), admixtures are to be air-entraining admixtures (ASTM C260), and aggregates are to comply with ASTM C33. Mixing water for concrete is to be clean and free from oil, acid, alkali, saline, organic matter or other deleterious substance in suspension or in solution.
3. Reinforcement is to conform to either one of the specifications for Deformed Billet-Steel Bars (ASTM A615), Rail-Steel Deformed Bars (ASTM A616) and Axle-Steel Deformed Bars (ASTM A617). The grade is to be grade 60 (Tensile Strength 620 MPa).
4. The 28-day strength of concrete is to be 210 kg/cm².
5. In order to prevent the increase of concrete temperature in hot weather, cooled aggregates and water are to be used when mixing is carried out, and sun shade is to be provided for delivery of concrete. Placed concrete is to be cured with spraying or being covered to prevent rapid dehydration. In hot weather, placing concrete in the late hours of afternoon is advisable.
6. The concrete work is to be executed in general in accordance with Specifications for Structural Concrete for Buildings (ACI 301) and Hot Weather Concreting (ACI Committee 305 Report).

VI. Plaster Work

1. The top surfaces of the column base concrete are to be plastered with 1:3 cement mortar in the approximate thickness of 3 cm. After the surfaces are chipped and any laitance completely removed, cement paste is to be applied immediately followed by cement mortar plaster.
2. The pavement slab is to be finished with floated finish. Floating shall begin when the water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation. During or after the first floating, planeness of surface shall be checked with a 3 m straightedge applied at not less than two different angles. All high spots are to be cut down and all low spots filled during this procedure to produce a surface within 1/500 tolerance throughout. The slab shall then be refloated immediately to a uniform sandy texture.

VII. Anchor Bolts Fixing

1. After the steel structures are delivered to the site, measurement is to be made, in the presence of the Japanese Engineer, to determine the exact locations of the anchor bolts to be embedded in the base concrete so as to avoid any excessive deviation from the correct alignment and elevation of the steel structures. The holes for anchor bolts are to be drilled vertically at the exact location using steel plate or any other suitable template. The tolerance of the position of the holes is to be ± 2 mm, depth to be ± 5 mm.
2. After drilling, the dust in the hole is to be removed and anchor bolts are to be erected and fixed with proprietary adhesives following strictly the manufacturer's instructions.
3. Anchor bolts and adhesives are to be provided by the Client but provision of pneumatic drill or any other necessary plants, tools and labor are to be the Contractor's responsibility.

VIII. Steel Structure Fabrication

Steel structure is to be fabricated in accordance with the specification and/or drawings separately furnished.

IX. Installation of Machinery and Equipment

Machinery and equipment are to be installed in accordance with the specification and/or drawings separately furnished.

X. Installation of Simulator

Simulator is to be installed in accordance with the specification and/or drawings separately furnished.

XI. Finishing Paintwork

1. After the steel structure fabrication is completed, all dirt, oil, grease and moisture are to be removed from the surfaces. The prepared surfaces are to receive one undercoat of phthalic acid red lead primer or red oxide primer and two finishing coats of phthalic acid synthetic resin based paint.
2. For the surfaces of steelwork which were welded at site or suffered damage to anti-corrosive paintwork during storage, delivery and fabrication, all oil, grease, dirt and moisture are to be removed, and then all rust or scale is to be thoroughly cleared away. This is to be followed by two under coats of either anti-corrosive zinc chromate primer, phthalic acid red lead primer or red oxide primer and two finishing coats of phthalic acid synthetic resin based paint.
3. Primers and paint are to be supplied from Japan.

XII. Electrical Work

Electrical work is to be carried out in accordance with the specification and/or drawings separately furnished.

XIII. Trial and Adjustment

Trial and adjustment are to be carried out in accordance with the specification and/or drawings separately furnished.

XIV. List of Drawings Attached Hereto

Drawing Title

1. Plan & Elevation
2. Plan & Section Details
3. Section Details
4. Framing Plan
5. Framing Section
6. Frame Joint Details
7. Ladder, Handrail & Other Details
8. Boom Rest, Sun Shade & Other Details
9. Door, Store Room & Other Details
10. Hatch Cover, Boom & Accessories Details
11. Rigging Diagram & Accessories
12. Foundation & Pavement Slab Details
13. Pile & Foundation Details
14. Anchor Bolts Details
15. Electrical Specification & Connecting Diagram
16. Power Wiring
17. Lighting Wiring
18. Lightning Arrester
19. Simulator Plan & Elevation
20. Simulator Details
21. Simulator Electrical Wiring
22. Sounding Data No. 1
23. Sounding Data No. 2

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