



TITLE

TECHNICAL SPECIFICATION  
FOR SEAWORTHY PACKING  
FOR EXPORT JOBS

SPECIFICATION NO. PE-TS-888-100-A001

VOLUME II B

SECTION D

REV. NO. 0 DATE 10/08/2010

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## ARRANGEMENT OF DIAGONAL BRACING AND HORIZONTAL SUPPORT

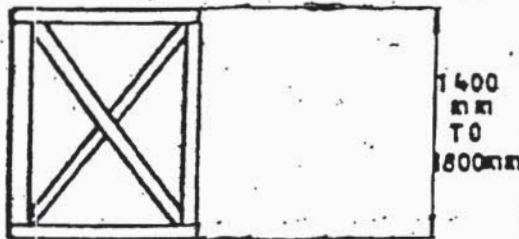


FIG:6

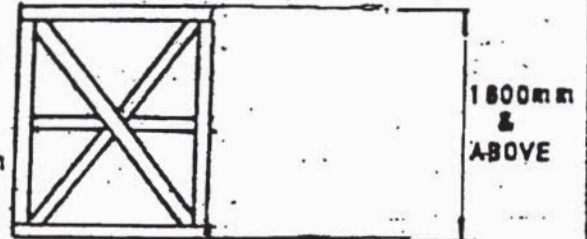


FIG:8

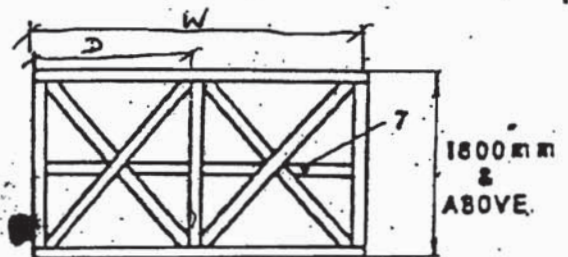


FIG:9

7- Middle Horizontal Support

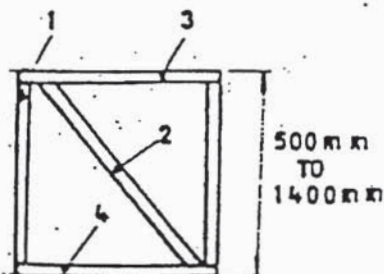


FIG:5

1- Vertical Support

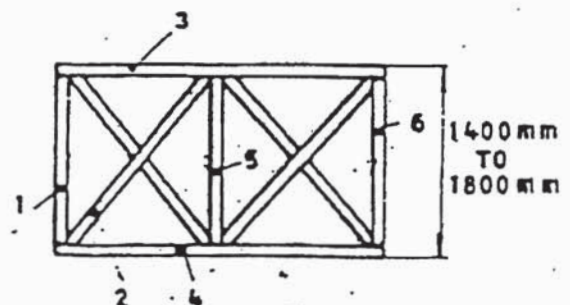


FIG:7

1, 5, 6 - Vertical Support

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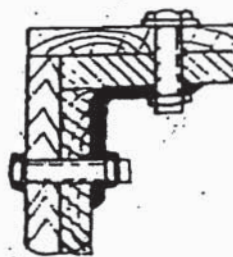
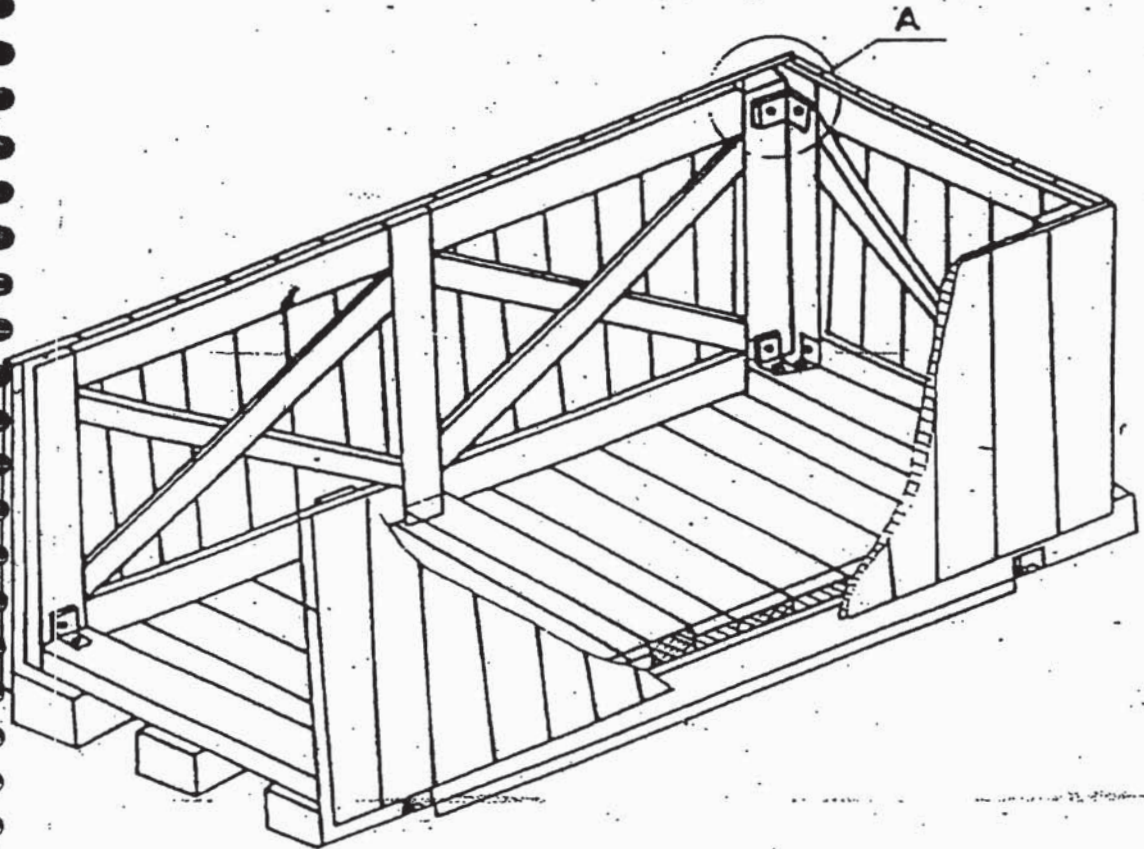
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## ARRANGEMENT OF PACKING CASE



DETAIL-A

HOLE DIAMETER  
MUST CONFORM  
TO BOLT DIA

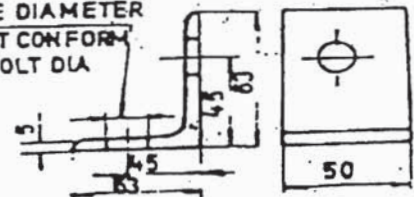


FIG:10

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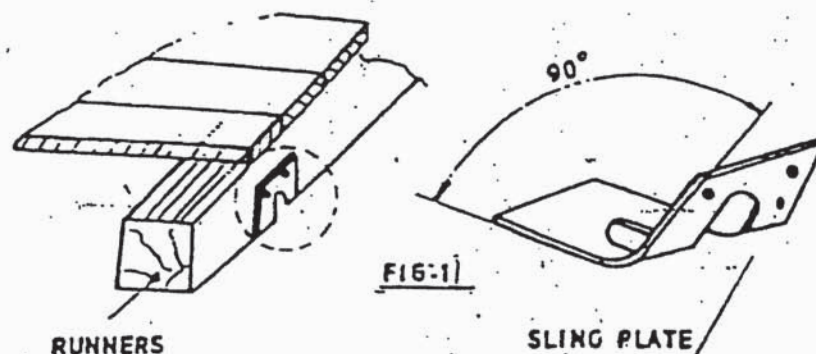
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## ARRANGEMENT OF SLING & PLATE ON CASES



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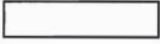
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**TABLE-1**

| LOADS | LENGTHS OF SLIDES      |     |      |      |                                                                                       |      |      |
|-------|------------------------|-----|------|------|---------------------------------------------------------------------------------------|------|------|
|       | 600                    | 800 | 1000 | 1200 | 1300                                                                                  | 1500 | 2000 |
|       | Cross section<br>b x c |     |      |      |  c |      |      |
|       |                        |     |      |      | b                                                                                     |      |      |
| 500   | 50                     | 50  | 50   | 50   | 75                                                                                    | 75   | 100  |
|       | X                      | X   | X    | X    | X                                                                                     | X    | X    |
|       | 100                    | 100 | 100  | 100  | 100                                                                                   | 100  | 100  |
| 800   | 50                     | 50  | 75   | 75   | 75                                                                                    | 75   | 100  |
|       | X                      | X   | X    | X    | X                                                                                     | X    | X    |
|       | 100                    | 100 | 100  | 100  | 100                                                                                   | 100  | 100  |
| 1000  | 75                     | 75  | 75   | 100  | 100                                                                                   | 100  | 100  |
|       | X                      | X   | X    | X    | X                                                                                     | X    | X    |
|       | 100                    | 100 | 100  | 100  | 100                                                                                   | 110  | 150  |
| 1500  | 75                     | 75  | 100  | 100  | 100                                                                                   | 100  | 100  |
|       | X                      | X   | X    | X    | X                                                                                     | X    | X    |
|       | 100                    | 100 | 100  | 100  | 100                                                                                   | 150  | 150  |
| 2000  | 75                     | 100 | 100  | 100  | 100                                                                                   | 100  | 150  |
|       | X                      | X   | X    | X    | X                                                                                     | X    | X    |
|       | 100                    | 100 | 100  | 150  | 150                                                                                   | 150  | 150  |
| 2500  | 75                     | 100 | 100  | 100  | 100                                                                                   | 150  | 150  |
|       | X                      | X   | X    | X    | X                                                                                     | X    | X    |
|       | 100                    | 100 | 150  | 150  | 150                                                                                   | 150  | 150  |
| 3000  | 100                    | 100 | 150  | 150  | 150                                                                                   | 150  | 150  |
|       | X                      | X   | X    | X    | X                                                                                     | X    | X    |
|       | 100                    | 150 | 150  | 150  | 150                                                                                   | 150  | 150  |



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**Table-2**

| End and side panels | Width of the panel "W" | Distance between longitudinal support (Dimension "D") |     |      |      |             |      |      |
|---------------------|------------------------|-------------------------------------------------------|-----|------|------|-------------|------|------|
|                     |                        | 600                                                   | 800 | 1000 | 1200 | 1400        | 1600 | 1800 |
|                     |                        | Cross section<br>b x c                                |     |      |      | Item 1 to 7 |      |      |
| Fig- 5 to Fig-9     | 600 to 1200            | 30                                                    | 30  | 30   | 30   | 30          | 30   | 30   |
|                     |                        | X                                                     | X   | X    | X    | X           | X    | X    |
|                     | 1201 to 1600           | 100                                                   | 100 | 100  | 130  | 130         | 130  | 130  |
|                     |                        | 30                                                    | 30  | 30   | 30   | 30          | 30   | 30   |
|                     | 1601 to 2000           | X                                                     | X   | X    | X    | X           | X    | X    |
|                     |                        | 130                                                   | 130 | 130  | 130  | 130         | 130  | 130  |
|                     | 2001 to 3000           | 30                                                    | 30  | 30   | 30   | 30          | 30   | 30   |
|                     |                        | X                                                     | X   | X    | X    | X           | X    | X    |
|                     | 3001 to 4000           | 130                                                   | 130 | 130  | 130  | 130         | 130  | 150  |
|                     |                        | 40                                                    | 40  | 40   | 40   | 40          | 40   | 40   |
|                     |                        | X                                                     | X   | X    | X    | X           | X    | X    |
|                     |                        | 150                                                   | 150 | 150  | 150  | 150         | 150  | 150  |

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**INDICATION MARKS ON CASES/BOXES/CRATES**

| Designation                               | Symbol                                                                              | Explanation                                                                                                                                                                                                                                                                                                                |
|-------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Fragile, Handle with care                 |    | The symbol should be applied to easily broken cargoes. Cargoes marked with this symbol should be handled carefully and should never be tipped over or slung.                                                                                                                                                               |
| Use no hooks                              |    | Any other kind of point load should also be avoided with cargoes marked with this symbol. The symbol does not automatically prohibit the use of the plate hooks used for handling bagged cargo.                                                                                                                            |
| Top                                       |   | The package must always be transported, handled and stored in such a way that the arrows always point upwards. Rolling, swinging, severe tipping or tumbling or other such handling must be avoided.                                                                                                                       |
| Keep away from heat (solar radiation)     |  | Compliance with the symbol is best achieved if the cargo is kept under the coolest possible conditions. In any event, it must be kept away from additional sources of heat. It may be appropriate to enquire whether prevailing or anticipated temperatures may be harmful.                                                |
| Protect from heat and radioactive sources |  | Stowage as for the preceding symbol. The cargo must additionally be protected from radioactivity.                                                                                                                                                                                                                          |
| Sling here                                |  | The symbol indicates merely where the cargo should be slung, but not the method of lifting. If the symbols are applied equidistant from the middle or center of gravity, the package will hang level if the slings are of identical length. If this is not the case, the slinging equipment must be shortened on one side. |
| Keep dry                                  |  | Cargo bearing this symbol must be protected from excessive humidity and must accordingly be stored under cover. If particularly large or bulky packages cannot be stored in warehouses or sheds, they must be carefully covered with tarpaulins.                                                                           |



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|                                |  |                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Center of gravity              |  | This symbol is intended to provide a clear indication of the position of the center of gravity. To be meaningful, this symbol should only be used where the center of gravity is not central. The meaning is unambiguous if the symbol is applied onto two upright surfaces at right angles to each other.                            |
| No hand truck here             |  | The absence of this symbol on packages amounts to permission to use a hand truck on them.                                                                                                                                                                                                                                             |
| Stacking limitation            |  | The maximum stacking load must be stated as "... kg max.". Since such marking is sensible only on packages with little loading capacity, cargo bearing this symbol should be stowed in the uppermost layer.                                                                                                                           |
| Clamp here                     |  | Stating that the package may be clamped at the indicated point is logically equivalent to a prohibition of clamping anywhere else.                                                                                                                                                                                                    |
| Temperature limitations        |  | According to regulations, the symbol should either be provided with the suffix "...°C" for a specific temperature or, in the case of a temperature range, with an upper ("...°C max.") and lower ("...°C min.") temperature limit. The corresponding temperatures or temperature limits should also be noted on the consignment note. |
| Do not use forklift truck here |  | This symbol should only be applied to the sides where the forklift truck cannot be used. Absence of the symbol on other sides of the package amounts to permission to use forklift trucks on these sides.                                                                                                                             |
| Electrostatic sensitive device |  | Contact with packages bearing this symbol should be avoided at low levels of relative humidity, especially if insulating footwear is being worn or the ground/floor is nonconductive. Low levels of relative humidity must in particular be expected on hot, dry summer days and very cold winter days.                               |

|  |                                                                                                  |                                      |                 |
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|------------------------|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Do not destroy barrier |  | A barrier layer which is (virtually) impermeable to water vapor and contains desiccants for corrosion protection is located beneath the outer packaging. This protection will be ineffective if the barrier layer is damaged. Since the symbol has not yet been approved by the ISO, puncturing of the outer shell must in particular be avoided for any packages bearing the words "Packed with desiccants". |
| Tear off here          |  | This symbol is intended only for the receiver.                                                                                                                                                                                                                                                                                                                                                                |

**FIG-12**



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|                             |                                                            |
|-----------------------------|------------------------------------------------------------|
| BHEL-PEM-DELHI-INDIA        |                                                            |
| CONSIGNEE                   |                                                            |
| MATERIAL                    |                                                            |
| CUSTOMER REF.               | MO. NO.                                                    |
| DESPATCH<br>ADVICE NOTE NO. | CASE NO.                                                   |
| DIMENSIONS(MM)<br>LXBXH     | NET<br>WT -KGS                                             |
|                             | GROSS<br>WT -KGS                                           |
| SPECIAL<br>INSTRUCTIONS     | HANDLE WITH CARE -- KEEP DRY<br>DO NOT DROP -- DO NOT TILT |

FIG-13: MARKING PLATE

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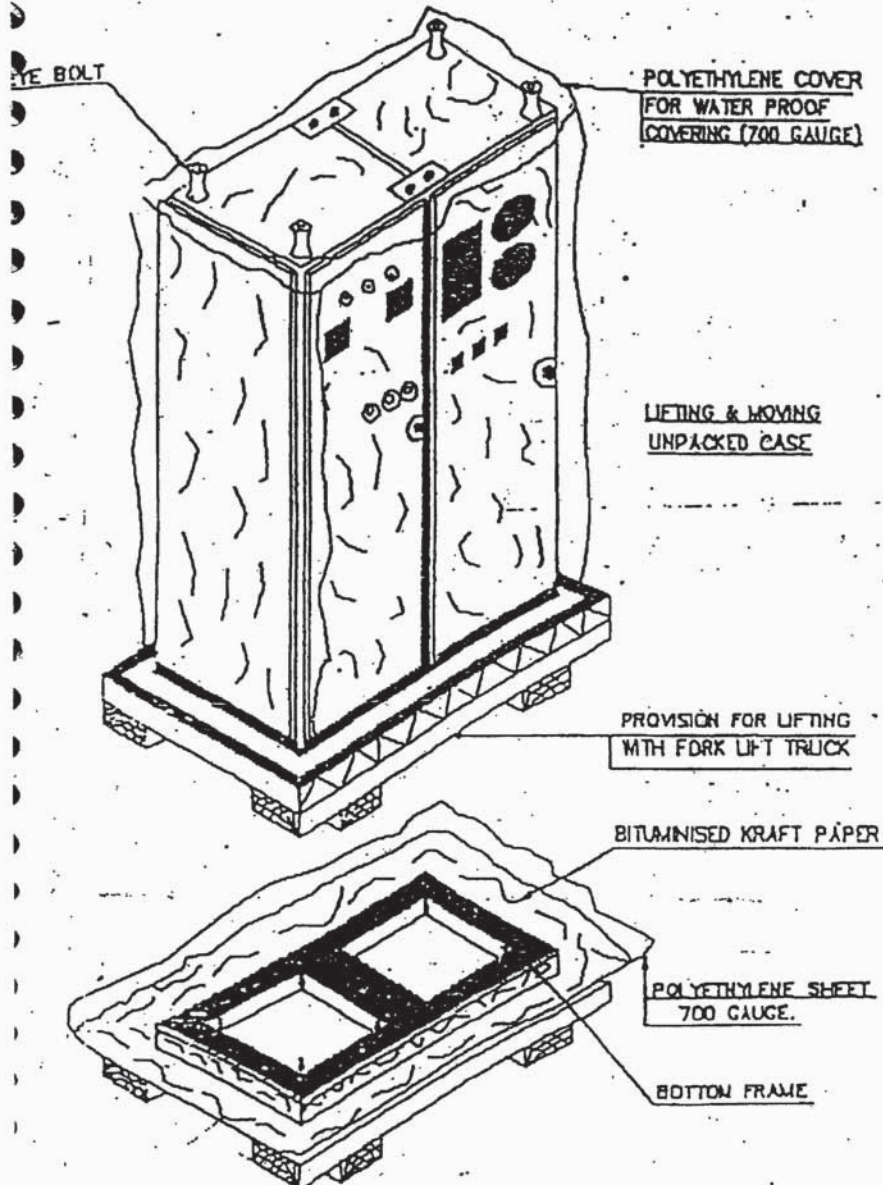


FIGURE-14



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## TECHNICAL SPECIFICATION FOR SEAWORTHY PACKING FOR EXPORT JOBS

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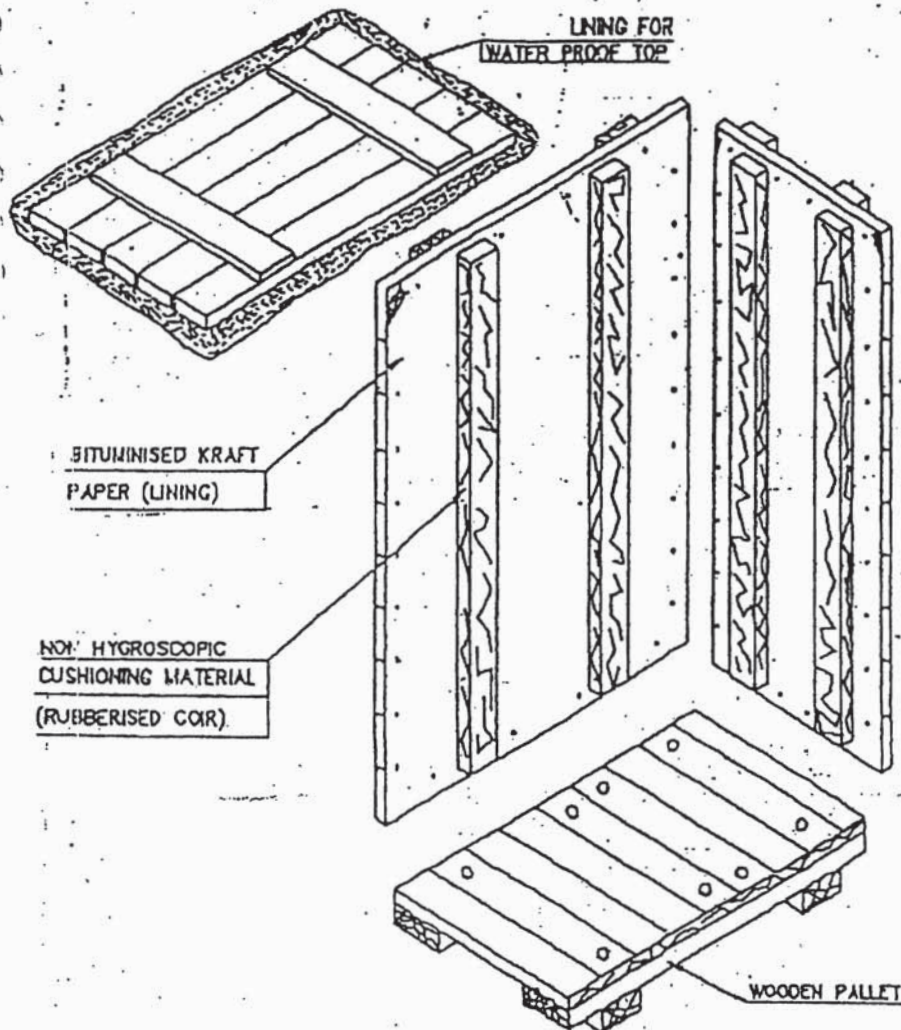


FIGURE-15

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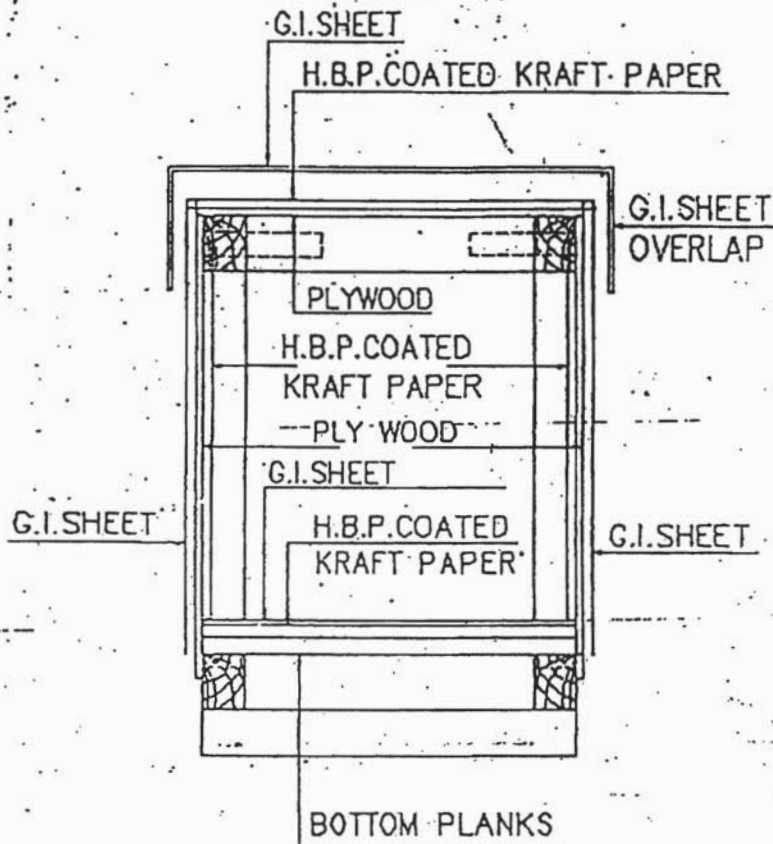


FIG-16 : CLOSED PACKING CASE WITH G.I.SHEET  
SHOWING LAYERS OF PACKING MATERIALS.

|                                                                                  |                                                                                                  |                                             |                 |
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## 10.0 TYPICAL PACKING DETAILS/PROCEDURE FOR MECHANICAL ITEMS

### 10.1 INSULATION MATERIAL (MINERAL WOOL MATTRESSES)

This specification covers the requirements of seaworthy packing and marking for bonded mineral (rock) wool mattresses having metallic hexagonal wire netting as facing on one or both sides.

#### 10.1.1 TYPE OF CONSTRUCTION

Mattress shall be packed in Polythene (of 0.2 mm thickness) all around and sealed to prevent moisture absorption during transit and storage. Further it shall be wrapped with Bitumen coated Polythene bonded/lined Hessian and stitched and then packed in 5 ply DFC carton box.

Silica gel is used for this purpose to protect contents over sufficiently long time from corrosion. Silica gel shall be of indicating type conforming to IS:304-1979 packed in cotton bags placed at different positions inside the packing for absorbing moisture and shall not come into direct contact with the material inside the package. The quantity of silica gel shall be enough for storage period of one year. However, it shall not be less than 4 gms per litre volume of case subject to minimum of 400 gms per case.

Each mattress as well as the packages shall be serial numbered. Also, printed sheets indicating the nominal thickness, density and wire netting details (i.e. material and size) shall be placed below the wire netting.

Following details shall be legibly written on the packages. The details shall also be typed on a sheet of paper & kept in a sealed Polythene cover, inside the packages

- a) Project Name
- b) Purchase Order No.
- c) Sl. No. of package
- d) Size of mattress (Thickness x Length x Width)
- e) Density
- f) Wire netting material and size
- g) Weight of the package

### 10.2 INSULATION MATERIAL (ALUMINIUM COIL)

Heavy Gauge Aluminium Coil Packaging are done by Eye-to-Sky packaging or by Eye to eye packaging as per the proven practice being followed by manufacturer of Aluminium sheets.

#### 10.2.1 Type of construction for Eye to Sky packaging

- a. Strapping of coil with polyester strap around circumference at one place.
- b. Putting paper I. D. Edge protector.
- c. Wrapping the coil with VCI stretch film after putting silica gel bags (4 nos.) Inside the coil.
- d. Wrapping the coil with HDPE film.
- e. Covering the coil including its build up & bore with masonite / particle board.
- f. Putting metallic I. D on coil.
- g. Putting O.D edge protector (paper) on coil.

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- h. Putting circumferential polyester strap (3 nos.) & eye polyester strap ( 4 nos.).
- i. After placing the coil on coil tilter ply wood (10mm thick) of suitable size along with wooden pallet is to be put at the bottom side of the coil.
- j. Coil is to be tilted to eye-to-sky position.
- k. Final strapping with metallic strap to unit coil and skid at 2 places with top cover of plywood.
- l. Fixing the coil with wooden blocks at 4 corners.
- m. Labeling 2 nos.(one metallic & one adhesivetype) For specification, net wt. & gross wt.

**10.2.2 Type of construction for Eye to Eye packaging**

- a. Strapping of coil with polyester strap around circumference at one place.
- b. Putting paper I. D. Edge protector.
- c. Wrapping the coil with VCI stretch film after putting silica gel bags (4 nos.) Inside the coil.
- d. Wrapping the coil with HDPE film.
- e. Covering the coil including its build up & bore with masonite / particle board.
- f. Putting metallic I. D on coil.
- g. Putting O.D edge protector (paper) on coil.
- h. Putting circumferential polyester strap (3 nos.) & eye polyester strap ( 4 nos.).
- i. Placing of coil on wooden skid Coil is to be tilted to eye-to-sky position.
- j. Final strapping of coil and skid at 2 places with steel strap. Fixing the coil with wooden blocks at 4 corners.

Labeling 2 nos.(one metallic & one adhesive type) For specification net wt. & gross wt.

**10.3 Packing Procedure for Online Tube Cleaning System and accessories**

This procedure is applicable for the shipment of Onload Tube Cleaning System and accessories by sea.

**10.3.1 Packing details:**

- The Packing case shall be made of treated rubber wood. The design of the case shall be as per Annexure IIIA & IIIB.
- The Equipments shall be placed on the wooden base of the Packing case and fastened if required to arrest the movement of the same.
- Equipment shall be covered by Polythene sheet and inside wall surfaces of the wooden cases also shall be covered by polythene sheet.
- All Nozzles shall be closed with plywood dummies.
- All electrical components assembled or loose shall be covered with polythene sheets along with silica gel pack.
- Silica gel desiccants shall be kept inside each case in sufficient quantities in order to absorb the moisture.

|                                                                                  |                                                                                                  |                                             |                 |
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- Thermocol packing shall be made for glass items like Ball vessel sight glass, Vpiece sight glass & pressure gauge.
- Silica gel desiccants shall be kept inside of each case to absorb the moisture.
- A Packing list covered in a polythene envelope shall be fixed inside and outside of each packing case.
- Shipping marks and consignee address shall be painted on the outer surface of the case.
- All handling instruction required for the case like top, sling, rain, handle with care etc, shall be marked on the case as per the symbol attached.
- Machined surface will be applied with Anti rust oil and covered by polyurethane sheet to protect from external oxidation.
- All valves will be closed with dummies to protect the internals and placed in the wooden case which will covered by polyurethane sheet.

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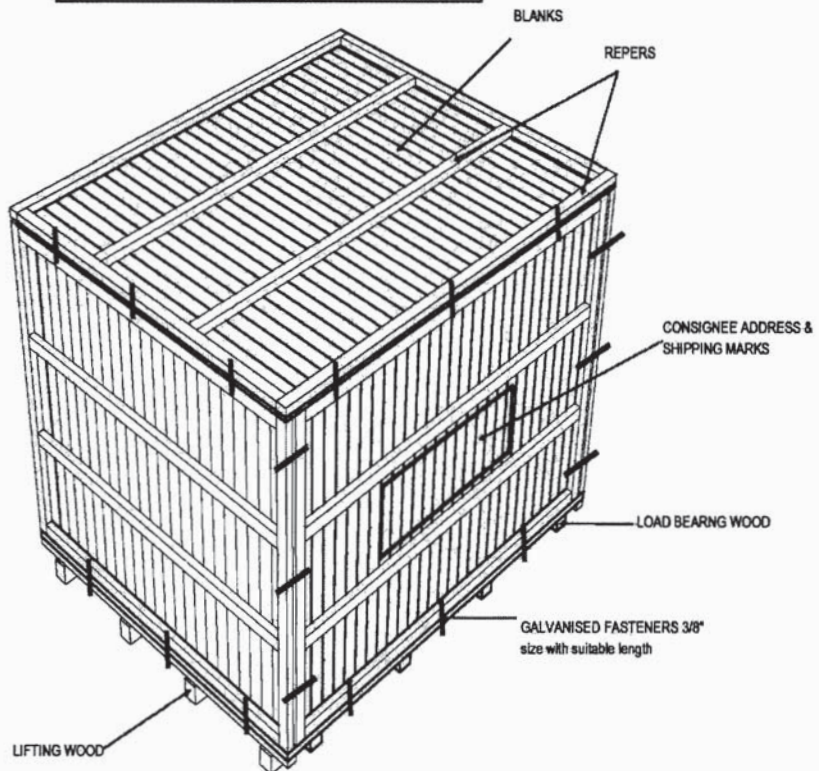
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**MODEL: FASTNERS TYPE (BASE, SIDE & TOP  
ATTACHED WITH BOLT, NUT & WASHER)**

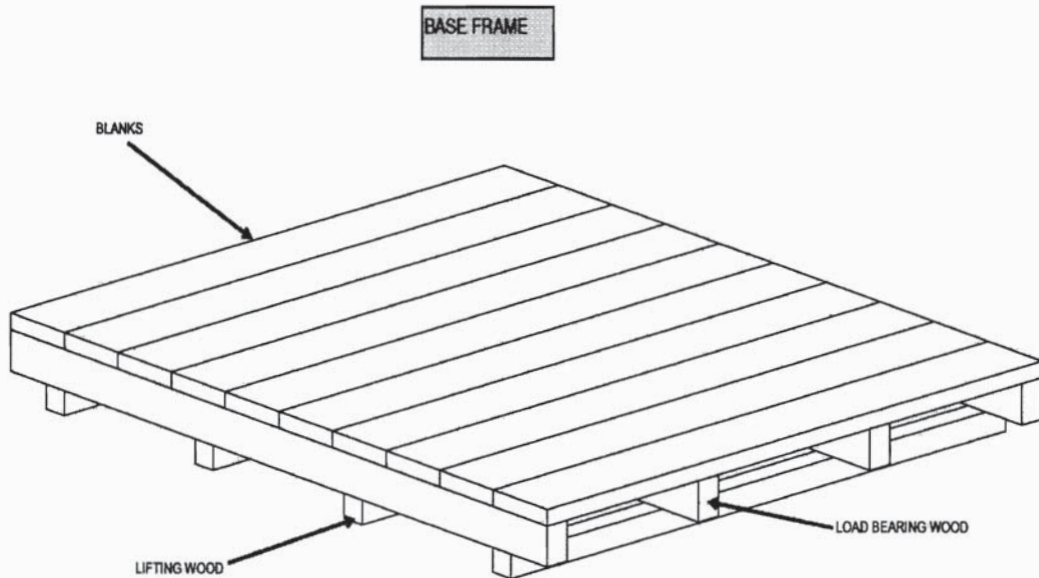
This Type of case to be used for  
following items:

1. BALL SEPARATOR
2. BALL COLECTOR SKID



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MODEL: FASTNERS TYPE - WITHOUT TOP



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MODEL: NAILING TYPE  
(FRAME & INSIDE REEPER NAILED)

- THIS TYPE OF CASE TO BE USED FOR THE FOLLOWING ITEMS:
1. PUMP SKID
  2. CONTROL PANEL
  3. LOOSE ITEMS, TOOLS & TACKLES
  4. DPMS, BRM
  5. SPARES
  6. CLEANING BALLS
  7. CABLES & ACCESSORIES

Shipping marks & Consignee  
Address

BLANKS

LIFTING WOOD

BLANKS

REEPERS

BLANKS

REEPERS

LOAD BEARING WOOD

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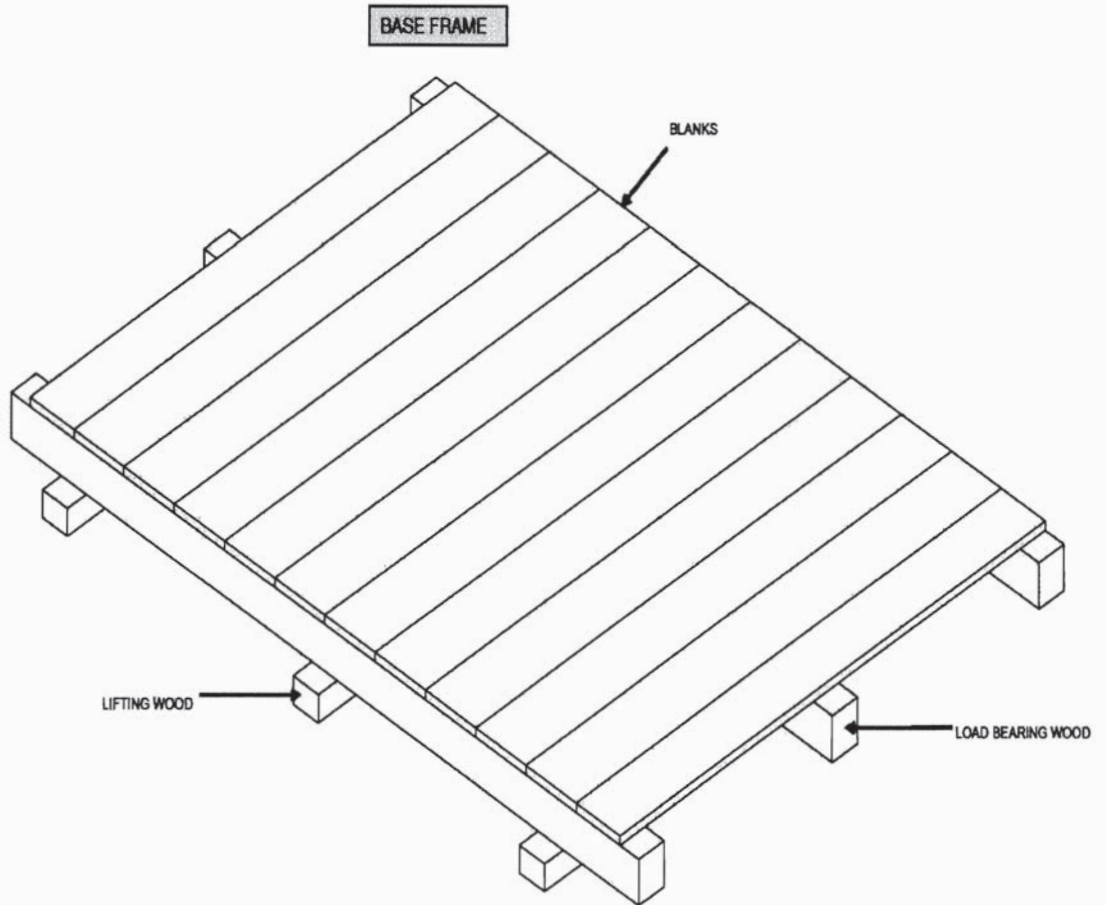
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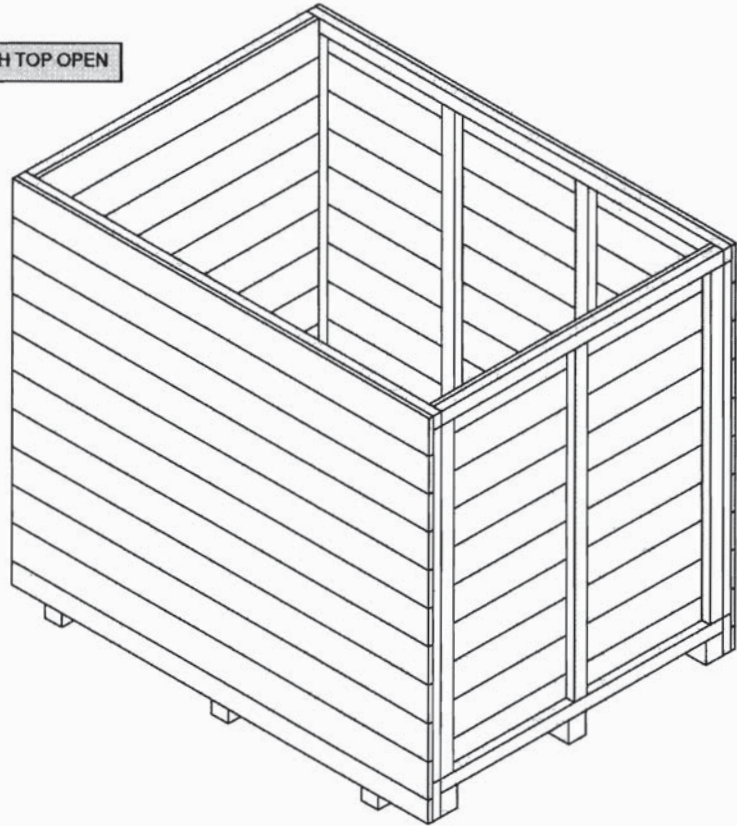
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**NAILING TYPE MODEL WITH TOP OPEN****SHEET 10 of 10**

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#### 10.4 PACKING OF LOOSE ITEMS

Loose mechanical, electrical and C&I items e.g. valves, fittings, pressure/temperature gauges/switches, circuit breakers, relays etc shall be individually wrapped using polyethylene sheets/U foam/ thermocol sheets/air bubble sheets depending upon the items and then packed in wooden boxes. The left out spaces and top of the boxes shall be filled with rubberized coir to get proper cushioning effect, Special attention shall be paid to relays, instruments etc for arresting the movements of their operating mechanism during transportation.

The construction of wooden packing cases shall be as per clause 9.3.1 retaining its all features concerning strength of the box. The construction of wooden packing case for electrical and C&I items shall be as per fig-16.

Inner surface of 6 sides of the box shall be lined with bitumen coated hessian polyethylene kraft paper. Rubberized coir of min. 25mm thickness and 100 mm width shall be nailed to inner surfaces of bottom and 4 sides of the boxes.

#### 11.0 PACKING OF ELECTRICAL ITEMS

##### 11.1 CABLES

###### 11.1.1 **Type of Equipment**

All type of cables..

###### 11.1.2 **Type of Construction**

New or practically new cable drums made of steel and painted with epoxy resin paint are to be used. Cable ends are carefully protected before packing. Over the cables polyethylene sheet shall be wrapped and then sealed properly. Cable drum can be put in wooden crates for ease in transportation and handling. (Wooden cable drum is also acceptable, however vendor to furnish constructional details for approval).



# TITLE

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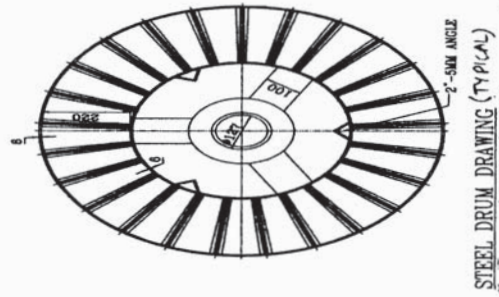
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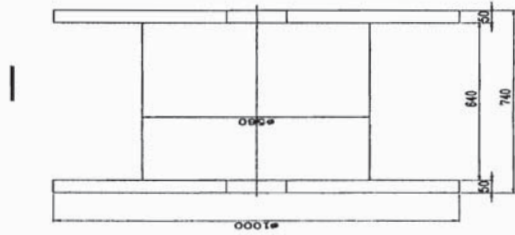
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STEEL DRUM DRAWING (TYPICAL)



Dimension in mm.



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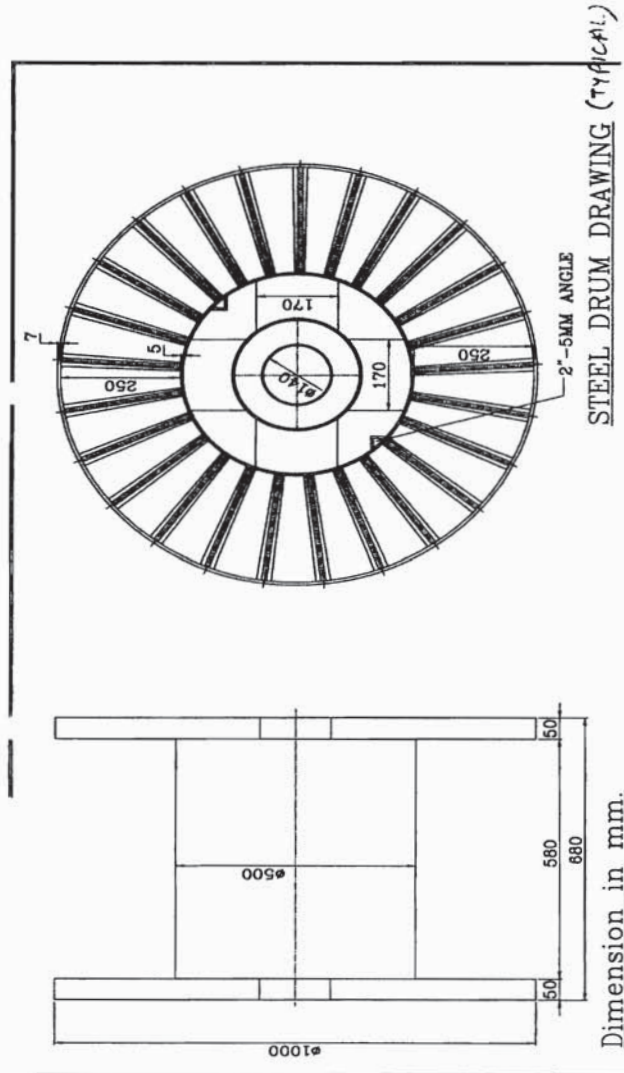
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## 11.2 PACKING OF CABLE TRAYS & ACCESSORIES AND CABLE TRAY SUPPORT MATERIAL

11.2.1 Cable trays can be packed in wooden boxes as per fig 1 to 11 or in steel boxes. Details of steel box construction is as indicated below.

- 1) All Dimensions are in "mm" unless otherwise stated.
- 2) Packing Box shall be fabricated using 50x50x6mm MS Angle, 50x3mm Flat, 2.5 mm thick C Channel, 1mm & 1.6mm Thick sheet.
- 3) Finish of Packing Box Shall be Galvanized.
- 4) Angle & Channel Section forming part of the Main frame shall be welded thoroughly with each other to give a rigid structure.
- 5) Sheet Section and Flat section shall be bolted/ Riveted/ Welded suitably to the Main frame stated in '4' above.

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- 6) Welding Portion on galvanized surfaces shall be painted with Zinc Rich Paint.
- 7) Dispatch details such as consignor/consignee address, contract and case details, 'country of origin, port of delivery, stacking instructions shall be written on one of the side of boxes. An anodized aluminium plate as per details and specifications given in page 3 of 5 shall be provided on the boxes
- 8) One copy of packing slip wrapped in polythylene bag covered with suitable aluminium .packing slip holder to be nailed on the external surface of the box. One more copy 9f the packing Slip wrapped in polythylene bag to be kept inside the box at the prominent place.
- 9) **INDICATION MARKS ON THE BOXES:** Markings shall be provided on the boxes indicating position of Boxes for handling, storage and nature of consignment. For guidelines referred page 4 of 5. The ink issued for this purpose as well as for marking dispatch instruction shall be indelible/non-washable marking ink.
- 10) Each item as mentioned in BOQ shall be packed & supplied as a set comprising of required numbers of associated fasteners & hardware etc

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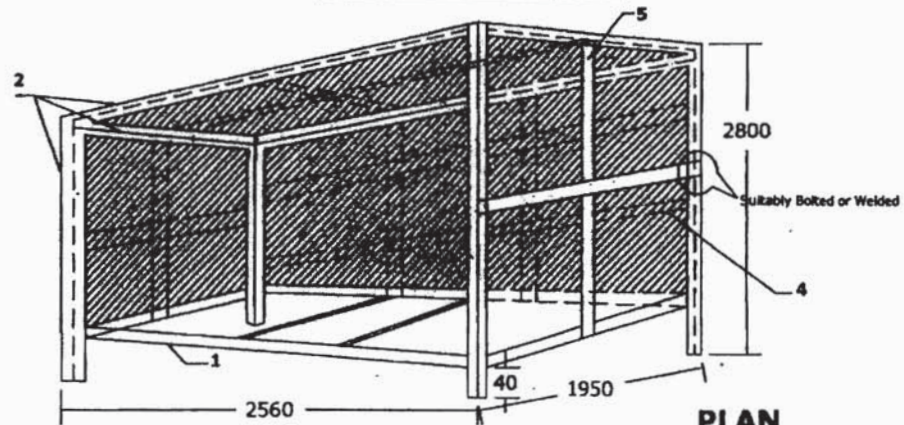
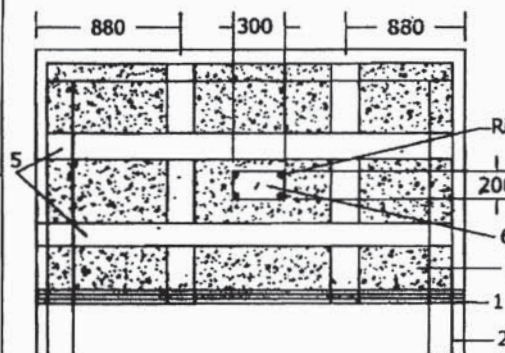
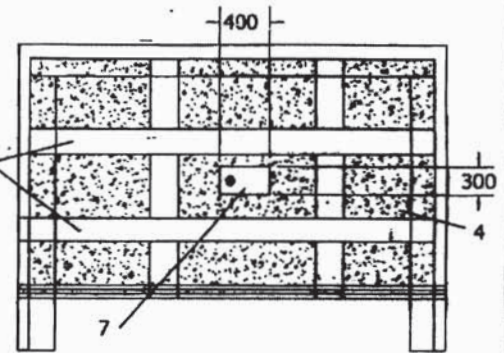
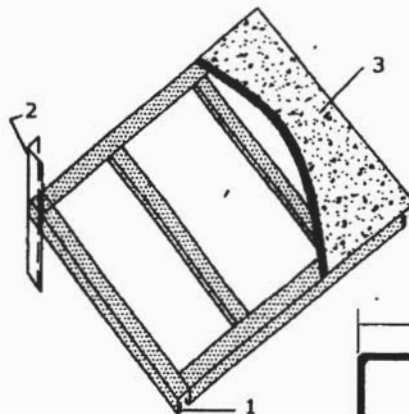
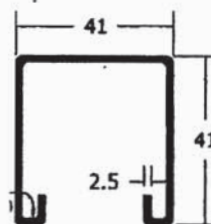
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**STEEL PACKING (TYPICAL DETAILS)****PLAN****FRONT SIDE OF BOX****BACK SIDE OF BOX****BOTTOM FRAME ARRANGEMENT****DETAILS OF "C" CHANNEL****Note:**

1. "C" Channel to be used on Bottom Frame.
2. 50x50x6 Angle to be used Vertically on four sides of the Box and Horizontally on four sides on the top Frame.
3. 1.6mm thick sheet (plain) on Bottom Plate.
4. 1.0mm thick sheet to cover top & four sides of BOX.
5. 50x3 Flat as additional cross members to be used Horizontally & Vertically on top & Four Sides of Box.
6. Anodised Aluminium Plate for Marking.
7. Hinged Inspection Window.

|                                                                                  |                                                                                                  |                                      |                 |
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### 11.3 PACKING FOR STATION LIGHTING SYSTEM

Aspects of packing specific to equipments / items of station lighting system are given here. All other instructions / aspects as per the main specification of export packing which are not covered here shall also be applicable.

#### 11.3.1 For LIGHTING TRANSFORMER, DISTRIBUTION BOARDS, LIGHTING PANELS,

- Construction of packing case for LIGHTING DISTRIBUTION BOARDS, LIGHTING PANELS, TRANSFORMER . shall be EITHER as per FIGURE 1,2,3,5,6,7,8,9,10,11 OR FIGURE 14,15,16.
- Each Panel/Transformer shall be individually covered with double polythene sheet of thickness 175 microns minimum.
- All the 6 inner surfaces of packing shall be nailed with bitumen coated hessian polythene craft paper. Wherever 2 pieces of craft paper are used, the joint shall have minimum overlap of 20mm.

For the top frame it shall be project on all sides by 100mm and shall be nailed on sides .

- The gap between the panels and packing case shall be filled with rubberized coir of thickness 50mm minimum and width 100mm. The distance between two consecutive supports of rubberized coir shall be less than 500mm.
- Silica get packed in cotton bags shall be placed at different positions inside the packing.
- Packing case shall be finally covered with GI sheet of thickness 0.4mm minimum.

#### 11.3.2 For LUMINARIES, RECEPTACLES. EMERGENCY LIGHT, 240/24V TRANSFORMER, CEILING FAN, SWITCH BOARDS, FLEXIBLE CONDUIT, WIRES, EARTH WIRE. JUNCTION BOXES, ERECTION COMMISSIONING SPARES, RECOMMENDED SPARES , ERECTION MATERIAL AND CONSUMABLES

- Construction of packing case for THE ABOVE MATERIAL shall be as per FIGURE 1to11.
- Items placed inside the case shall be covered with double polythene sheet of thickness 175 microns minimum.
- All the 6 inner surfaces of packing shall be nailed with bitumen coated hessian craft paper. wherever 2 pieces of craft paper are used, the joint shall have minimum overlap of 20mm. For the top frame it shall be project on all sides by 100mm and shall be nailed on sides.
- Silica get packed in cotton bags shall be placed at different positions inside the packing.

#### 11.3.3 For CONDUIT PIPE

As per international practice pipes are shipped in open bundles with metal strapping. Packing as per attached figure A shall be provided which is described as following:

- Each bundle shall be wrapped with 2 layers of 175 microns thick polythene sheet.
- Then bundle will be wrapped with bitumen coated hessian craft paper.
- Bundle shall be strapped with steel straps.
- An anodized aluminium packing description plate as per Figure No. 13 shall be provided.

#### 11.3.4 For POLES

Poles will be wrapped with 2 layers of minimum 175 microns thick polythene sheet and then with bitumen coated hessian craft paper, packed as per Figure – C i.e. bundling.

#### 11.3.5 For STRUCTURAL STEEL

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Structural steel will be different sizes and shapes. Hence it will be packed as per Figure No. B and described as following :

- a) Each bundle shall be wrapped with 2 layers of 175 microns thick polythene sheet.
- b) Then bundle will be wrapped with bitumen coated hessian craft paper.
- c) Bundle shall be strapped with steel straps.
- d) An anodized aluminium packing description plate as per Figure No. 13 shall be provided.

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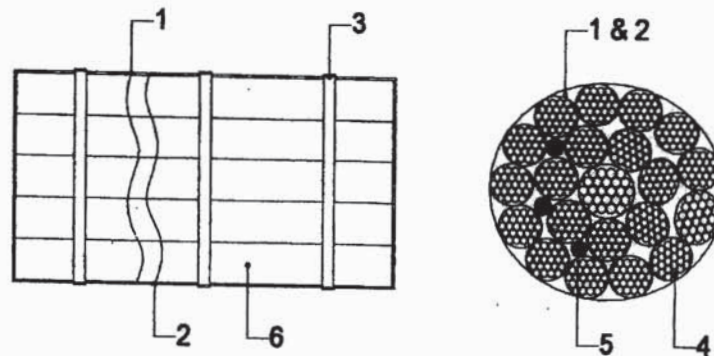
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**PACKING PROCEDURE FOR CONDUIT PIPE****FIGURE "A"**

- 1) LAYER OF BITUMEN COATED HESSIAN KRAFT PAPER.
- 2) LAYER OF POLYTHENE SHEET.
- 3) METAL STRAPPING.
- 4) CONDUIT PIPES.
- 5) SILICA GEL POUCHES.
- 6) BUNDLES OF CONDUIT PIPES.

**TITLE**

**TECHNICAL SPECIFICATION  
FOR SEAWORTHY PACKING  
FOR EXPORT JOBS**

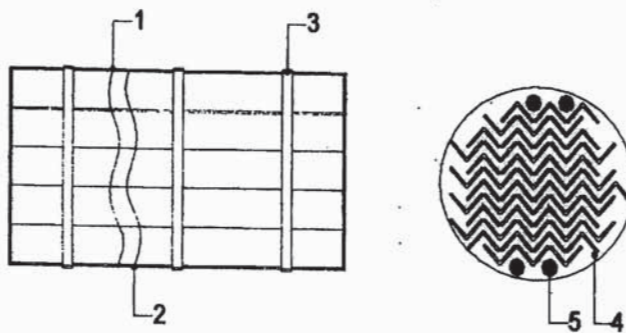
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**PACKING PROCEDURE FOR STRUCTURAL STEEL****FIGURE "B"**

- 1) LAYER OF BITUMEN COATED HESSIAN KRAFT PAPER.
- 2) LAYER OF POLYTHENE SHEET.
- 3) METAL STRAPPING.
- 4) STRUCTURAL STEEL.
- 5) SILICA GEL POUCHES.



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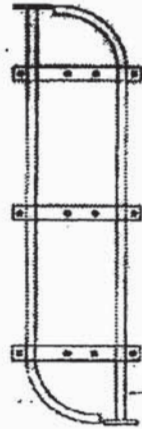
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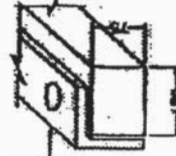
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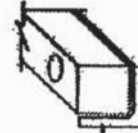
## packing procedure for poles



POLES WRAPPED WITH POLYTHENE SHEET &  
STAINLESS COATED HESSIAN CLOTH



TOP WOODEN BATTEN TO BE  
FIXED WITH L50x60x6 LAM ON TOP  
OF IT FOR TIGHTING THE ROOF  
25 MM DIA



BOTTOM WOODEN BATTEN TO BE  
FIXED ON L50x60x6 LAM ANGLE

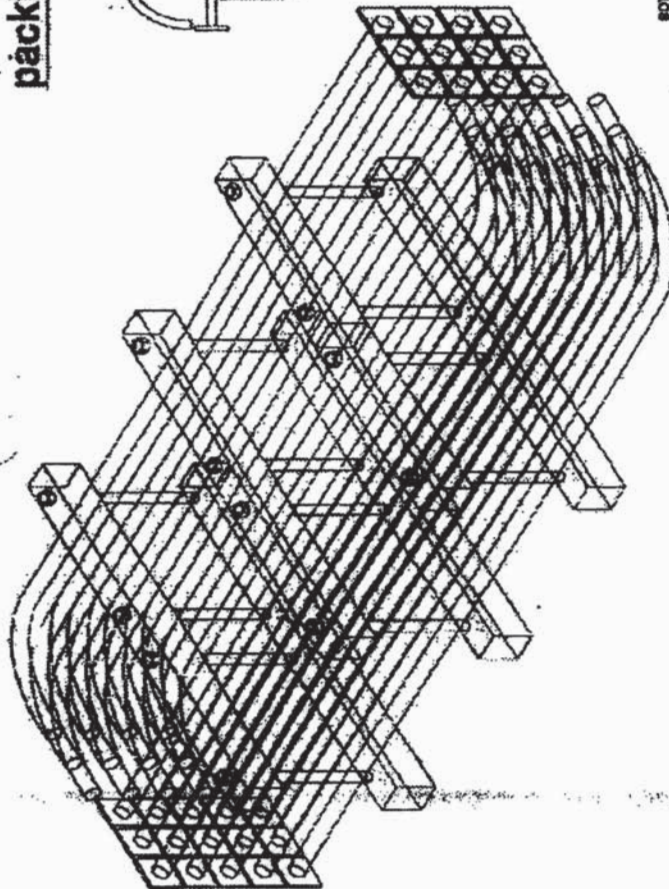


FIGURE "C"

|                                                                                  |                                                                                                  |                                      |                 |
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#### 11.4 PACKING FOR DC BATTERY

The packing procedure for seaworthy packing of DC Battery is defined below, which is capable of withstanding impacts, compression, vibration, toppling, sea water spray, prevention against rust, temperature and extreme atmospheric conditions. Aspects of packing specific to equipments / items of DC Battery are given here. All other instructions / aspects as per the main specification of export packing which are not covered here shall also be applicable.

The packing procedure consists of various stages namely primary packing, cushioning, securing, desiccant, outside packing box, Runners/ sliders/ transverse bars of plywood, etc., provided for each movement.

- a) The packing boxes shall be made up of plywood boxes (thickness 9mm min.) with blocks at the bottom of the box for provision for handling the boxes using the forklift. The packing boxes sizes are generally standardized to half-euro size (capable of handling equipment's weight).
- b) Rubberized coir of 25mm thickness shall be provided as cushioning material at the bottom and thermocole of 20mm shall be provided inside on all four sides. Other than this polyethylene film wrap or cover also will be provided. Left out spaces to be filled with rubberized coir/ thermocol to get cushioning effect.
- c) Silica gel in dust free air permeable cotton/paper bag shall be placed in the packing boxes for storage period of 1 year as per IS 304 (1979)
- d) While packing the cells, transit caps (polypropylene) of red and blue shall be used for big size cells for ensuring that cells does not get damaged during the transport due to vibrations etc.
- e) The battery accessories shall be packed with suitable precautions as follows:
  - i) Copper connectors shall be packed after making bunches with lead wire seals to avoid misplacement.
  - ii) Hardware items shall be packed in polyethylene bags (Thickness  $\geq 0.175\text{mm}$ ) with item slip
  - iii) Battery rack shall be packed in dismantled condition, wrapped with polyethylene sheet
  - iv) For Ni-Cd type battery, electrolyte in solid form for dry cells shall be packed in cans with KOH, LiOH being packed separately.
  - f) Galvanized Steel straps are provided for binding the packing box sides.
  - g) The handling instructions shall be marked in indelible/ non-washable ink, indicating the upright position.

#### 11.5 PACKING OF SERVICE TRANSFORMERS(OIL FILLED) & ACCESSORIES

This instruction is applicable for packing of transformers (oil filled), its accessories and components so as to ensure safe delivery to end user. Aspects of packing specific to equipments / items of transformers(oil filled) are given here. All other instructions / aspects as per the main specification of export packing which are not covered here shall also be applicable.

##### 11.5.01 PACKING DETAILS :

- a) Items shall be packed in case / crates as per the shipping list.
- b) All fragile items and small items shall be packed in cases and to be marked as "Fragile, handle with care Fragile items".
- c) Fragile accessories are to be first packed in their original boxes (VENDOR's packing). Very

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- d small / delicate items such as glass thermometer, door keys shall be packed in separate box.
- d In case original box is found damaged, suitable alternate box or packing method using felt or foam sheet and polythene wrap to be used.
- e These boxes are then placed in identified wooden boxes. Inside of such boxes are lined with a layer of polythene sheet, packing wool / grass and another layer of polythene sheet before placing the boxes. All boxes are then wrapped with this polythene sheet before closing the box. Fragile items shall not be placed loose, one above the other inside the case.
- f All wiring cables, connection flats of non-ferrous materials, CTs, valves bellows shall also be packed.
- g Items like CTs, Oil communicating bushings, insulators, wired equipments and housings such as RTCC Panel, M. Box, Drive Mechanism, thermometers, gauges shall be wrapped in polythene from all around.
- h Buchholz relay and OSR relay openings will be blanked using covers, before putting them in the box
- i Items shall be carefully lowered and arranged inside the crate / case and each item shall be locked from all sides in such a way to avoid its movement in any way. Wooden stoppers and separators shall be provided for this and nailed to the crate / case wood.
- j Wooden planks and batons in contact with fragile items shall be provided with kit foam at the locations of contact.
- k Oil communication bushings shall be packed in separate case on V or U shape wooden felted supports, as in case of condenser bushings.
- l While placing and arranging the items inside the crates / cases, these shall be verified for correctness and then the packing note shall be signed. The cover top of the crate / case shall then be closed.
- m The main equipment like transformer tank shall be packed suitably to prevent any damage during transit / storage. Support structures like frame, header supports etc. shall be crated. Conservator headers shall also be crated. Radiators pipe work and other instruments & components shall be packed in cases. All the cases shall be lined with polythene from inside.

#### **11.6 ALTERNATIVE PACKING CASES FOR CONTROL PANELS AND SWITCH GEARS**

For Control and switch gear panels, construction of wooden packing cases may be provided as per fig 14 & 15 and as detailed below.

Thickness of planks for all sides, binding and jointing battens shall be at least 25 mm. Width of the plank shall be at least 125mm and that of binding and jointing planks shall be at least 100mm.

Top frame shall be suitable so that it does not collapse due to sandwiching between slings while lifting. Longitudinal and traverse bars for the bottom wooden pallet to be suitably selected.

Diagonal bracings shall be as per cl 9.3.1.3 and all other requirements shall be as per clauses 9.3.1.4 to 9.3.1.6.

#### **12.0 Containerization**

As required by BHEL, the VENDOR shall stuff the GOODS into 20 or 40 foot containers (dry, open top, flat racks, etc.).

The maximum inside dimensions of containers are to be considered:

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- 40 foot containers: 11.80 m x 2.20 m x 2.05 m
- 20 foot containers: 5.80 m x 2.20 m x 2.05m
- 

The present definition of containerization is valid for sea containers only. Vendor to check the size of containers before start of packing of equipment.

**12.1 Protection of Cases/Crates**

Since shipping containers are in general not water tight, packing in contact with the floor of the container shall be raised in order to prevent it from being damaged by the accumulation of water.

**12.2 Mechanical Constraints**

The mechanical constraints for "general use" closed containers are of a different nature (height of "stacking" being limited inside the containers), the packing for the GOODS may be of a lighter structure. However, it is necessary that the packing be appropriate so as to protect the GOODS on site during the storage period, as required after discharging of the GOOD'S from the containers.

**Note:**

*It is the responsibility of the VENDOR to ensure that the cases/crates are stowed, secured and fastened inside the container. The VENDOR will take all necessary precautions to conform to the maximum weight allowed and the centre of gravity of the container. The securing and fastening of the cases/ crates can be carried out by nailing timbers on the bottom or on the vertical sides of the container.*

**13.0 Other Services to be provided by Vendor**

In addition to the packing and shipping documents, VENDOR must also carry out the following services, which shall be included in his quotation:

Carriage of VENDOR's sub-contracted equipment and material, which must be re-grouped in VENDOR's or PACKER's workshops, whilst waiting for packaging.

BHEL reserves the right to postpone the shipping of the GOODS. In this event, any storage and insurance costs during the first ninety (90) days shall be borne by the VENDOR.

Loading, including lifting, securing, lashing, and stowing, of all cases, crates, or packages onto means of transportation such as, but not limited to, trailers, containers, etc.

**14.0 Responsibilities and Guarantees**

VENDOR is responsible for the choice of category for packing according to the transport facilities used, and on the basis of the present document. In case of doubt or disagreement regarding the choice, VENDOR must inform BHEL prior to packing and await BHEL's approval. All phases of packaging, marking, loading, etc. will be subject to BHEL inspection.

BHEL reserves the right to reject the packing when the packing does not conform to these instructions and/or when the packing does not ensure perfect protection of the GOODS. VENDOR is responsible for the weights and dimensions declared, and the marking of the packages.

The documents must be in strict conformity with the packing contents.

The packing specified in these "Packing, Marking and Shipping Instructions" is guaranteed for a twelve (12) months storage period after delivery on site.

VENDOR is responsible for providing storage recommendation adapted to the GOODS. According to this guarantee, VENDOR is held responsible in the event of goods becoming

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useless, damaged or broken, as a result of poor packing and/or stowing, or due to corrosion, subsequent to insufficient or inadequate protection. All direct or indirect costs resulting thereof, will be back-charged to VENDOR.



**2x660MW MAITREE SUPER THERMAL  
POWER PROJECT, RAMPAL, BANGLADESH**

**SPECIFICATION No: PE-TS-421-563-A501**

**PACKAGE: HYDRAULIC MOBILE CRANE**

**VOLUME: II B**

**SECTION-I**

**REV. 00**

**SUB-SECTION-IC**

**SHEET :**

**DATE: APR 2018**

**SECTION-I**

**SPECIFIC TECHNICAL REQUIREMENT**

**SUB-SECTION IC**

**DATA SHEET-A**



**2x660MW MAITREE SUPER THERMAL  
POWER PROJECT, RAMPAL, BANGLADESH**

**SPECIFICATION No: PE-TS-421-563-A501**

**PACKAGE: HYDRAULIC MOBILE CRANE**

**VOLUME: II B**

**SECTION-I**

**REV. 00**

**SUB-SECTION-IC**

**SHEET :**

**DATE: APR 2018**

**A.0 TECHNICAL DATA SHEET FOR 100T HYDRAULIC MOBILE CRANE**

| Sl no. | Description                | Specification requirement                                                                                                                                                 |
|--------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | Type                       | Crawler mounted hydraulic mobile crane                                                                                                                                    |
| 2      | Capacity & Quantity        | One (1) no. with max. lifting capacity 100T                                                                                                                               |
| 3      | Codes & Standards followed | EN 13000 / Equivalent International standard (Indian and Chinese standards are not acceptable)                                                                            |
| 4      | Boom length                | 50m                                                                                                                                                                       |
| 5      | Flying Jib                 | 10m                                                                                                                                                                       |
| 6      | Hook                       | Swiveling type. 4 nos.<br>(1 no.- 100T, 1 no.- 50T-70T, 1 no. 25T-35T, 1 no.- 15T)                                                                                        |
| 7      | Swing system               | 360 degree rotation                                                                                                                                                       |
| 8      | Engine                     | Diesel engine providing sufficient power to properly run the mobile crane along carrying the rated load.                                                                  |
| 9      | Brake                      | Yes                                                                                                                                                                       |
| 10     | Counter weight             | Yes                                                                                                                                                                       |
| 11     | Safety Features            | <ul style="list-style-type: none"> <li>• Overload alarm</li> <li>• Signal horn</li> <li>• Load Moment Indicator</li> <li>• Others as per manufacturer standard</li> </ul> |
| 12     | Tool kit                   | Standard tool kit in a tool box                                                                                                                                           |
| 13     | Accessories                | As per manufacturer standard                                                                                                                                              |
| 14     | Emission norms             | Euro III / Equivalent (as applicable in Bangladesh)                                                                                                                       |



**2x660MW MAITREE SUPER THERMAL  
POWER PROJECT, RAMPAL, BANGLADESH**

**SPECIFICATION No: PE-TS-421-563-A501**

**PACKAGE: HYDRAULIC MOBILE CRANE**

**VOLUME: II B**

**SECTION-I**

**REV. 00**

**SUB-SECTION-IC**

**SHEET :**

**DATE: APR 2018**

## **B.0 TECHNICAL DATA SHEET FOR 50T HYDRAULIC MOBILE CRANE**

| <b>Sl no.</b> | <b>Description</b>         | <b>Specification requirement</b>                                                                                                                                          |
|---------------|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1             | Type                       | Crawler mounted hydraulic mobile crane                                                                                                                                    |
| 2             | Capacity & Quantity        | One (1) no. with max. lifting capacity 50T                                                                                                                                |
| 3             | Codes & Standards followed | EN 13000 / Equivalent International standard (Indian and Chinese standards are not acceptable)                                                                            |
| 4             | Boom length                | 40m                                                                                                                                                                       |
| 5             | Flying Jib                 | 10m                                                                                                                                                                       |
| 6             | Hook                       | Swiveling type. 3 nos.<br>(1 no.- 50T, 1 no.- 20T-30T, 1 no.- 12T)                                                                                                        |
| 7             | Swing system               | 360 degree rotation                                                                                                                                                       |
| 8             | Engine                     | Diesel engine providing sufficient power to properly run the mobile crane along carrying the rated load.                                                                  |
| 9             | Brake                      | Yes                                                                                                                                                                       |
| 10            | Counter weight             | Yes                                                                                                                                                                       |
| 11            | Safety Features            | <ul style="list-style-type: none"> <li>• Overload alarm</li> <li>• Signal horn</li> <li>• Load Moment Indicator</li> <li>• Others as per manufacturer standard</li> </ul> |
| 12            | Tool kit                   | Standard tool kit in a tool box                                                                                                                                           |
| 13            | Accessories                | As per manufacturer standard                                                                                                                                              |
| 14            | Emission norms             | Euro III / Equivalent (as applicable in Bangladesh)                                                                                                                       |



**2x660MW MAITREE SUPER THERMAL  
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**SPECIFICATION No: PE-TS-421-563-A501**

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**VOLUME: III**

**REV. 00**

**DATE: APR 2018**

**SHEET :**

**SECTION-III**

**DOCUMENTS TO BE SUBMITTED BY BIDDER**

- |      |                                                     |
|------|-----------------------------------------------------|
| IIIA | LIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH<br>BID |
| IIIB | COMPLIANCE CUM CONFIRMATION CERTIFICATE             |
| IIIC | DEVIATION SCHEDULE                                  |
| IIID | PRE BID CLARIFICATION SCHEDULE                      |



**2x660MW MAITREE SUPER THERMAL  
POWER PROJECT, RAMPAL, BANGLADESH**

**SPECIFICATION No: PE-TS-421-563-A501**

**PACKAGE: HYDRAULIC MOBILE CRANE**

**VOLUME: II B**

**SECTION-III**

**REV. 00**

**SUB-SECTION-IIIA**

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**DRAWINGS / DOCUMENTS TO BE SUBMITTED WITH THE BID:**

Bidder shall submit the following drawings / documents along with their bid

a) Deviation schedule with reference to specific clauses of the specification along with reason for such deviation in the format given under Section-III (if applicable)

Or

No deviation certificate

b) Copy of pre-bid clarifications, if any, duly signed & stamped

c) Signed/ Stamped copy of Compliance cum Confirmation Certificate (Section)

d) Un priced copy of price format indicating quoted/ not quoted against each row/column along with cost of withdrawal / price implication format for deviations.

OFFER WILL BE CONSIDERED AS INCOMPLETE IN ABSENCE OF ANY OF ABOVE DOCUMENTS. DOCUMENT OTHER THAN ABOVE, IF ANY, SUBMITTED WITH THE OFFER WILL NOT FORM PART OF CONTRACT AND ACCORDINGLY WILL NOT BE CONSIDERED FOR BID EVALUATION.

|                                                                                   |                                                                            |                                             |                         |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------|-------------------------|
|  | <b>2x660MW MAITREE SUPER THERMAL<br/>POWER PROJECT, RAMPAL, BANGLADESH</b> | <b>SPECIFICATION No: PE-TS-421-563-A501</b> |                         |
|                                                                                   |                                                                            | <b>PACKAGE: HYDRAULIC MOBILE CRANE</b>      |                         |
|                                                                                   |                                                                            | <b>VOLUME: II B</b>                         | <b>SECTION-III</b>      |
|                                                                                   |                                                                            | <b>REV. 00</b>                              | <b>SUB-SECTION-IIIB</b> |
|                                                                                   |                                                                            | <b>SHEET :</b>                              | <b>DATE: APR 2018</b>   |

**COMPLIANCE CUM CONFIRMATION CERTIFICATE**

The bidder shall confirm compliance with following by signing/ stamping this compliance certificate (every sheet) and furnish same with the offer.

- a) The scope of supply, technical details, construction features, design parameters etc. shall be as per technical specification & there are no exclusions other than those mentioned under "exclusion" in section C and those resolved as per 'Schedule of Deviations', if applicable, with regard to same.
- b) There are no other deviations w.r.t. specifications other than those furnished in the 'Schedule of Deviations'. Any other deviation, stated or implied, taken elsewhere in the offer stands withdrawn unless specifically brought out in the 'Schedule of Deviations'.
- c) Bidder shall submit QP in the event of order based on the guidelines given in the specification & QP enclosed therein. QP will be subject to BHEL/ CUSTOMER approval & customer hold points for inspection/ testing shall be marked in the QP at the contract stage. Inspection/ testing shall be witnessed as per same apart from review of various test certificates/ Inspection records etc. This shall be within the contracted price with no extra implications to BHEL after award of the contract.
- d) All drawings/ data-sheets/ calculations etc. submitted along with the offer shall be considered for reference only, same shall be subject to BHEL/ CUSTOMER approval in the event of order.
- e) The offered materials shall be either equivalent or superior to those specified in the specification & shall meet the specified/ intended duty requirements. In case the material specified in the specifications is not compatible for intended duty requirements then same shall be resolved by the bidder with BHEL during the pre - bid discussions, otherwise BHEL/ Customer's decision shall be binding on the bidder whenever the deficiency is pointed out.

For components where materials are not specified, same shall be suitable for intended duty, all materials shall be subject to approval in the event of order.

- f) The commissioning spares shall be supplied on 'As Required Basis' & prices for same included in the base price itself.
- g) All sub vendors shall be subject to BHEL/ CUSTOMER approval in the event of order.
- h) Guarantee for plant /equipment shall be as per relevant clause of GCC /SCC /Other Commercial Terms & Conditions.
- i) In the event of order, all the material required for completing the job at site shall be supplied by the bidder within the ordered price and within purview of the tender specification even if the same are additional to approved billing break up, approved drawing or approved Bill of quantities.
- j) Schedule of drawings submissions, comment incorporations & approval shall be as stipulated in the specifications. The successful bidder shall depute his design personnel to BHEL's/

|                                                                                   |                                                                            |                                             |                         |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------|---------------------------------------------|-------------------------|
|  | <b>2x660MW MAITREE SUPER THERMAL<br/>POWER PROJECT, RAMPAL, BANGLADESH</b> | <b>SPECIFICATION No: PE-TS-421-563-A501</b> |                         |
|                                                                                   |                                                                            | <b>PACKAGE: HYDRAULIC MOBILE CRANE</b>      |                         |
|                                                                                   |                                                                            | <b>VOLUME: II B</b>                         | <b>SECTION-III</b>      |
|                                                                                   |                                                                            | <b>REV. 00</b>                              | <b>SUB-SECTION-IIIB</b> |
|                                                                                   |                                                                            | <b>SHEET :</b>                              | <b>DATE: APR 2018</b>   |

Customer's/ Consultant's office for across the table resolution of issues and to get documents approved in the stipulated time.

- k) As built drawings shall be submitted as and when required during the project execution.
- l) The bidder has not tempered with this compliance cum confirmation certificate and if at any stage any tempering in the signed copy of this document is noticed then same shall be treated as breach of contract and suitable actions shall be taken against the bidder.
- m) Regarding commercial documents / deviations, BHEL clarified that commercial documents / deviations shall not be considered during technical evaluation. However if any issue in the commercial documents / deviation related to technical requirements needs to be highlighted and resolve in technical evaluation only.  
No aspect of commercial issues needs to be highlighted / resolved in technical evaluation and their offer is strictly in compliance with technical specification. BHEL also clarified to the bidder any technical deviations (e.g. related to MDL, required documentation etc. for completion of the project) raised by them in commercial deviation either explicit or implicit shall be considered null and void even if agreed by BHEL during commercial evaluation stage. Bidder agreed to confirm and compliance with technical specification and subsequent clarification on bids during pre- award discussion.



**2x660MW MAITREE SUPER THERMAL  
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**SPECIFICATION No: PE-TS-421-563-A501**

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**SUB-SECTION-IIIC**

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**SUB SECTION-IIIC  
DEVIATION SCHEDULE**

**(REFER DEVIATION SCHEDULE-COST OF WITHDRAWAL  
FORMAT ENCLOSED IN GCC)**



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**SUB-SECTION-IIID**

**SHEET :**

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**PRE-BID CLARIFICATION SCHEDULE**

| S. No. | Section/Clause<br>/Page No. | Statement of the referred<br>clause | Clarification Required |
|--------|-----------------------------|-------------------------------------|------------------------|
|        |                             |                                     |                        |
|        |                             |                                     |                        |
|        |                             |                                     |                        |
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|        |                             |                                     |                        |
|        |                             |                                     |                        |
|        |                             |                                     |                        |
|        |                             |                                     |                        |

The bidder hereby certifies that above mentioned are the only clarifications required on the technical specification for the subject package.

SIGNATURE:

\_\_\_\_\_

NAME:

\_\_\_\_\_

DESIGNATION:

\_\_\_\_\_

COMPANY:

\_\_\_\_\_

DATE:

\_\_\_\_\_

COMPANY SEAL