

# Annexure-12

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## PACKING DETAILS

**PROJECT:** 1X370 MW YELAHANKA COMBINED  
CYCLE POWER PLANT

## ANNEX-XII PACKING DETAILS`

### LIST OF ENCLOSURES

| Sl. No. | Description                                       | Document No.                     |
|---------|---|----------------------------------|
| 1.      | PACKING CASE FOR MISCELLANEOUS ITEMS TYPE         | Drawing No. 2-CPDC-0019/s Rev.03 |
| 2       | NON-CONIFEROUS TIMBER FOR GENERAL PACKING PURPOSE | HY 51463                         |
| 3       | SEAWORTHY PACKING FOR EXPORT ORDERS               | HY0490569 Rev.05                 |
| 4       | Format for Packing List                           | -----                            |





## PLANT PURCHASING SPECIFICATION HYDERABAD

**HY51463**

**REV. NO: 00**

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### NON-CONIFEROUS TIMBER FOR GENERAL PACKING PURPOSES

#### 1. GENERAL:

This specification governs the quality of non-coniferous timber supplied in the form of planks, battens, beams and sleepers. This specification supersedes PS:40101/A.

#### 2. APPLICATION:

Used for the manufacture of packing cases/crates.

#### 3. COMPLIANCE WITH NATIONAL STANDARDS:

Assistance has been derived from the following Indian Standards in preparing this specification.

IS: 399 – 1963 : Classification of commercial timber and their zonal distribution.

IS: 1326 – 1976 : Specification for non-coniferous sawn timber (Baulks and Scantlings) (Amendment 1).

IS: 5966 – 1993 : Specification for non-coniferous timber in converted form for general purposes.

IS: 6662 – 1993 : Specification for timber species suitable for wooden packaging. (Groups I & II)

#### 4. TERMINOLOGY:

For the purpose of this specification, the definitions given in IS: 707 (Glossary of terms applicable to timber and timber products) shall apply except for the beam which is defined as below.

Beam is defined as converted timber whose cross-sectional dimensions exceed 50 mm in both directions.

#### 5. SPECIES:

The species of non-coniferous timber shall be as per annexure I.

|                   |                  |                |  |  |   |
|-------------------|------------------|----------------|--|--|---|
| <b>Revisions:</b> |                  |                | <b>Issued :</b><br><b>STANDARDS ENGINEERING DEPARTMENT</b> |  |   |
| <b>Rev.No.</b>    | <b>Rev. Date</b> | <b>Revised</b> | <b>Prepared:</b><br><b>VNR</b>                             | <b>Approved:</b><br><b>DGM(E&amp;CC)</b> | <b>Dt of 1<sup>st</sup> issue</b><br><b>MAY. 90</b> |

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## 6. DIMENSIONS AND TOLERANCES:

**6.1 Sizes:** Width, thickness and length of timber shall be clearly stated on the order/drawing.

### 6.2 Tolerance:

#### 6.2.1 Width:

| Width, mm | Tolerance, mm |
|-----------|---------------|
|-----------|---------------|

|                         |   |
|-------------------------|---|
| 50, 75, 100             | + 3   |
| 125, 150, 200, 225, 250 | $\left\{ \begin{array}{l} + 6 \\ - 3 \end{array} \right.$ |

#### 6.2.2 Thickness:

| <u>Thickness, mm</u> | <u>Tolerance, mm</u> |
|----------------------|----------------------|
|----------------------|----------------------|

|                    |     |
|--------------------|-----|
| 20, 25, 35, 40, 50 | + 3 |
|--------------------|-----|

|                                  |   |
|----------------------------------|---|
| 75, 100, 125, 150, 175, 200, 250 | $\left\{ \begin{array}{l} + 6 \\ - 3 \end{array} \right.$ |
|----------------------------------|---|

#### 6.2.3 Length:

Standard length:

1 to 12 metres in multiples of 0.5 metre.

Tolerance:

$\pm 2\%$  or  $\pm 50$  mm whichever is less.

Note: The minus tolerances for width, thickness and length shall not be permitted in more than 10% of the timber supplied.

## 7. SEASONING AND MOISTURE CONTENT:

### 7.1 Timber for packing purpose other than export orders:

The timber shall have a moisture content of 30% maximum for planks and battens and 35% maximum for beams within a depth of 15 mm from the surface excluding a length of 30 cm from each end, at the time of inspection any time in the year. The moisture content will be determined in accordance with appendix-A of IS:287. This does not apply to timber procured in sleeper form for further conversion.

### 7.2 Timber for packing purpose for export orders:

The moisture content shall not exceed the maximum of 18%.



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**7.3** The moisture content % shall be specified in the order.

**7.4** If it is not possible to procure wood with moisture content 18% maximum limit, the procured wood shall be seasoned internally/externally so as to limit the moisture content.

### **8. FREEDOM FROM DEFECTS:**

Timber shall be free from the following defects:

Brashness, splits across the grain, shakes, cup, spring, twist insect attack, any kind of decay (rot) visible infection, open centre heart, centre heart on planks and any other defect.

The extent to which defects are permitted are given in Annexure II.

### **9. END COATING:**

Timber shall be coated with any of the following effective compositions, upto a distance of 80 mm from each end or 20 mm more than the longest split.

**9.1** Thick coal tar or bituminous paint.

**9.2** Resin and lamp black (10:1), melted, mixed and applied hot.

**9.3** Hardened gloss oil.

**9.4** Paraffin wax.

**9.5** Molasses and lime (3:1).

### **10. END STRAPPING:**

Timber above 200 mm x 200 mm cross section or as and when required shall be strapped with steel clamps to prevent end splitting.

### **11. CERTIFICATES:**

The supplier shall furnish a certificate with each lot/consignment in support of the type of species, treatment (Fumigation/Chemical), if any, and moisture content.

### **12. MARKING:**

The timber shall be marked/painted in order to identify the source of supply in accordance with out instructions.

# PLANT PURCHASING SPECIFICATION HYDERABAD



## ANNEXURE - I

## SPECIES OF NON-CONFEROUS TIMBER RECOMMENDED FOR HEAVY PACKING CASES/CRATES

| Sl. No. | Botanical Name             | Standard Trade Name | Local Names  | Abbreviated Symbol |
|---------|----------------------------|---------------------|--|--------------------|
| 1.      | <u>Fagara burdrunga</u>    | MULLILAM            | MUTTILAM (Tamil), RHETSA (Telugu); BEPULI (Udu)  | MUY                |
| 2.      | Careya arborea             | KUMBI               | KUMBHI (Assam & Bengali), KAMBI (Hindi)  | KUM                |
| 3.      | Syzygium Cumini            | JAMAN               | JAMUN (Hindi & MP); JAMUK (Assam); JAM (Bengali); KUDA (Koli); JAMU (Oriya); JAMBU (Gujarati); NERLU, NERULA (Kannada); JAMBUL (Marathi); NAVAL (Malayalam & Tamil); NEREDU (Telugu)   | JAM                |
| 4.      | Apha – namixis Polystachya | PITRAJ              | BOGA, AMARI (Assam); LOCHUNI, LOSHUNE (Bengali); RAKTATOHIDA (Marathi), MULLUMUTTAGA (Kannada); KARAGIL (Malayalam), VEKKALI, VELLAKONGU (TAMIL)   | PIT                |
| 5.      | Albizzia procera           | SAFID-SIRIS         | SAFED- SIRIS (Hindi); SIT (Andamans); KOROI (Assam & Bengali); TENTHRA (Koli); DHALASIRISH (Oriya); KINHAI, KILAI (Marathi); GURER (MP); KARANGRO (Gujarati); BELLATI, SALVAGAI (Kannada); VELLAVAKA (Malayalam); VELVAGAI (Tamil); TELLACHINDUGA (Telugu) | SSI                |
| 6.      | Terminalia bellirica       | BAHERA              | BAHERA (Hindi & Marathi); BHAIRA (Punjabi); BHOMARA (Assam); LUMPUNG (Koli); BAHADA (Oriya); BAHETA (Gujarati); THARE, TARE, TARI (Kannada); BAHELA (Marathi); THANNI (Malayalam ); TANI (Tamil & Telugu)  | BAH                |
| 7.      | Logerstroemia parviflora   | LENDI               | ASIDH, DHAURI'SIDA (Hindi); MECHI (Assam); SIDHA (Bengali & Oriya); GARASEKRE (Koli); BURI – DHAMERO (Nepali); LENDIA – SENHA (Marathi); KALIASAJA, LENDI (MP) BONDARO (Gujarati); NANAGU (Malayalam); PEIKADUKKAI (Tamil); CHENNANGI (Kannada & Telugu)   | LEN                |



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| Sl. No. | Botanical Name            | Standard Trade Name | Local Names   | Abbreviated Symbol |
|---------|---------------------------|---------------------|---|--------------------|
| 8.      | Acrocarpus Fraxini folius | MUNDANI             | MANDANE (Nepali); BELANJI (Kannada); KURANYAN, MALAVEPPU (Malayalam); MALAMKOMAI (Tamil)  | MUN                |
| 9.      | Dysoxylum Mala baricum    | WHITE CEDAR         | BILIDEVADARI (Kannada); VELLA – GIL (Malayalam & Tamil)   | WCE                |
| 10.     | Mangi fera India          | MANGO               | AM (Hindi & Assam); AMB (Punjabi); ULI (Koli); AMBA (Oriya & Marathi); MAVU (Kannada) MAMARAM (Tamil); MAMIDI (Telugu)  | MAN                |
| 11.     | Lagerstroemia Speciosa    | JARUL               | AJHAR (Assam); GARASEKRE (Koli); PUNIPATULI (Oriya); NIRMARUTHU (Malayalam); POOMARUTHU, PUMARUDU (Tamil)   | JAR                |
| 12.     | Adina Corodifolia         | HALDU               | HALDU, KARAM (Hindi); TARAK COPA (Assam); RANGKAT (Bengali) KUMBHA (Koli); KURUMA (Oriya); HALDU, HEDU (Marathi); KARAM (MP); HALWDWAR, HALDWAN (Gujarathi); HEDDI, YETAGAL, YETTAGA (Kannada); BIMBU (Malayalam); KADAMBERI, MANJAKADAMBAI (Tamil); HALDAWA (Urdu); BANDARU (Telugu) | HAL                |
| 13.     | Dipterocarpus Indicus     | GURUJAN             | GARJAN (Assam); YENNEMARA (Coorg); KALPAYINI, KALPINE (Malayalam); ENNEY, VELLAYINI (Tamil); KALPINE (Kannada); GURGAL (Urdu).  | GUR                |
| 14.     | Lagerstroemia Lonceolata  | BENTEAK             | Nana (Gujarati & Marathi); NANDI, BENDEKU (Kannada); VENTEAK (Malayalam); BETHEKKU, VENTHEKHU (Tamil); BILLINANDI, BOLULTAR (Telugu)  | BEN                |
| 15.     | Dipterocarpus macrocarpus | HOLLONG             | HOLLONG (Assam)   | HON                |
| 16.     | Mitragyna Parvifolia      | KAIM                | GURI, KALAM, PHALDU (Hindi); HAMSABETI (Koli); MITUKUNIA (Oriya)  | KAM                |



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| Sl. No. | Botanical Name                    | Standard Trade Name | Local Names  | Abbreviated Symbol |
|---------|-----------------------------------|---------------------|--|--------------------|
| 17.     | Terminalia procera                | WHITE BOMBWEE       | DADAM (Andaman)  | WBO                |
| 18.     | Artocarpus hirsuta                | AINI                | HEBBALASU, HEBHULSINA (Kannada); PATHPHANAS (Marathi); AINIPILAVU (Malayalam); AINIPILA ANJILI (Tamil)   | ANI                |
| 19.     | Terminalia Myriocarpa             | HOLLOCK             | PANISAG (Nepali)   | HOL                |
| 20.     | Protium Serratum; Bursera Serreta | MURTENGA            | ERRA KARRA (Telugu)  | MUR                |
| 21.     | Grewia- Ti Lifolia                | DHAMAN              | TADA (Telugu); DADSAL, THADSAL (Kannada); CHADACHI (Malayalam) THADACHI (Tamil); PEDDA JANA (Telugu)   | DHA                |
| 22.     | Albizziabbebeck                   | KOKKO               | SIRIS (Hindi & Oriya); SARIN, SHRIN (Punjabi); HIRIH (Assam); SIRISH (Bengali); CHICHOLA (Marathi); BAGE (Kannada); VAKA (Malayalam); VAGAI (Tamil); DIRISINAM (Telugu)                      | KOK                |
| 23.     | Holoptelea- Intergrifolia         | KANJU               | KANJU, PAPRI (Hindi); KUMKAR, RAJAIN (Punjabi); ANJAN (Bengali); CHIBIL, DHAURANJO (Oriya); PAPARA (Marathi); CHILWAL, CHIROL, KARANJI (MP) THAPSI (Kannada); AVAL (Malayalam) AYILI (Tamil) | KAJ                |
| 24.     | Schimawallichi Choisy             | CHILAUNI            | GOGRA, MAKRISAL (Assam)  | CHL                |
| 25.     | Xyliaxylocarpa                    | IRUL                | KONGRA, TANGAN (Oriya); SURIA (Marathi); SAURIYA (MP) JAMBE (Kannada); IRUL (Tamil), KONDATANGEDU (Telugu)   | IRU                |
| 26.     | Hopea                             | HOPEA               | BOGIMAR (Kannada); IRUMBOGAM (Malayalam); VELLAI – GONGU (Tamil)   | HOP                |
| 27.     | Teriminalia- tomentosa            | LAUREL              | ASNA, SAIN (Hindi); AISAN (Punjabi); HATANA (Koli); PUCCASAJ (Nepali); SAHAJA (Oriya); AIN, SADAR, SAJ (MP) KARUMARUDU (Malayalam); KARIMARUDU, MATTI (Tamil); NALLAMADDI (Telugu)           | LAU                |



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| Sl. No. | Botanical Name       | Standard Trade Name | Local Names   | Abbreviated Symbol |
|---------|----------------------|---------------------|---|--------------------|
| 28.     | Shorearobusta        | SAL                 | SAKHU, SAL, SAKHUA (Hindi); SARJAM (Koli); RAIGAL –A SARGI (Oriya)  | SAL                |
| 29.     | Mesuaferrea          | MESUA               | GANGANE (Andaman); NAHOR(Assam); NAGESWAR, NAGKESAR (Bengali); NAGESWAR (Oriya); NAGASAMPIGI (Kannada); CHURULI (Malayalam); NANGAL, NANGU (Tamil); NAGAKESARI (Telugu) | MES                |
| 30.     | Terminaliapaniculata | KINDAL              | HONAL, HONAGALU (Kannada); KINDAL (Marathi); PILLAMARUDU (Malayalam & Tamil); NALLAPULAGA (Telugu)  | KIN                |
| 31.     | Grevillea robusta    | A CUNN              | SILVER OAK  | SOA                |

**ANNEXURE –I I**

**PERMISSIBLE DEFECTS**

| Sl. No. | Defects                              | Extent Permissible   |
|---------|--------------------------------------|--|
| 1.      | BOW                                  | Shall be permissible upto a maximum of 2 mm for 300 mm length of the piece.  |
| 2.      | CUP                                  | Shall not be permissible.  |
| 3.      | END SPLITS                           | The longest end split at each end shall be measured and the lengths added together. The total length of the longest end split shall not exceed 60 mm per metre of the length of the piece.   |
| 4.      | KNOTS                                | Live knots measuring from 20 to 35 mm in diameter and dead knots measuring upto 15 mm in diameter shall be permissible provided they are not so numerous or so grouped or located as to affect unduly the strength of the pieces.  |
| 5.      | BORER HOLE                           | Borer holes (dead infestation) shall be permissible, on one face only provided such holes are not deeper than 10 mm and are well scattered   |
| 6.      | (DAED INFE-STATION)<br>SAP WOOD WANE | Shall be permissible.  |
| 7.      | WANE                                 | Wane shall be permissible upto 1/5 of the width on a broad face, subject to a maximum of 60 mm and upto 1/3 of the width on the narrow face provided that one broad face and one narrow face is completely free from this defect. Wane shall not be present in more than 30% of the total number of pieces accepted at any one time. |
| 8.      | CROSS GRAIN                          | Shall be permissible upto a maximum deviation of 1 in 10.  |
| 9.      | SURFACE CRACK                        | Depth of the deepest crack on any one face (excluding the ends) shall be permissible upto a maximum of 2 mm in case of planks and beams upto 50 mm thick, 3 mm for beams above 50mm and upto 100mm thick and 6mm for beams above 100mm thick. A continuous crack of any depth, all along the length, is not permissible.             |
| 10.     | CENTRE HEART                         | Centre heart shall be permissible provided it is not farther than 25mm from the nearest edge and is sound and boxed.   |

|   |               |                             |              |   |      |
|---|---------------|-----------------------------|--------------|---|------|
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|   |               |                             | PAGE         | 1 | OF 5 |

SEAWORTHY PACKING FOR EXPORT ORDERS

1.0 SCOPE:

This standard specifies the seaworthy packing methods for export orders.

2.0 PACKING WOOD:

2.1 The timber used shall be of non-coniferous type as per specification HY51463 for Beams & Runners.

2.2 Ply Wood planks as per specification IS:303 Gr. “MR” Type A,B are used for the Sides, Top & Bottom of the Packing Cases.

3.0 The packing cases are covered with GI sheet on outside for sides and top; inside for bottom as per the Sketch-I.

4.0 PACKING CASES:

4.1 Categorisation of Packing Cases:

The packing cases are categorised as follows:

4.1.1 Open packed consignment. Packing subjected to BHEL approval.

4.1.2 Closed packing cases:

a) All the export seaworthy packing of the items shall be covered with GI sheet covering as per the sketch – I enclosed.

b) Any other special or export seaworthy packing (improvement or equivalent to the above) shall be subjected to BHEL Engg & QC approval).

4.2 Packing procedure for closed packing cases:

4.2.1 Inner surfaces of the sides & bottoms, outer surfaces of top of all the categories of closed packing cases shall be covered with hessain bitumen coated polyethylene kraft paper/HDPE Tarpaulin 150 GSM weight (refer sketch 1).

4.2.2 Adequate battens (lined with water proof bitumenised paper/HDPE Tarpaulin 150 GSM together with rubber sheet) shall be provided at appropriate places to prevent the movement of equipment/component inside the packing cases.

|  |         |            |  |            |                             |
|--|---------|------------|--|------------|-----------------------------|
| Revisions :<br>Revised Clauses 2.2, 8.01 and Sketch - I.<br>Deleted Clause 8.10. |         |            | Issued :<br>STANDARDS ENGINEERING DEPARTMENT |            |                             |
| Rev.No. 05   | Amd.No. | Reaffirmed | Prepared                                     | Approved   | Dt.of 1 <sup>st</sup> Issue |
| Dt.APR.2001  | Dt.     | Year :     | VNR, KSN                                     | DGM (E&CC) | DEC.1989                    |

|              |               |                             |   |
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#### 4.3 Sealed Packing:

- 4.3.1 Components, sub-assemblies and assemblies sensitive to climatic conditions shall be packed seal tight wherever required.

All the openings of the sensitive components, sub-assemblies and assemblies shall be blanketed to prevent the ingress of dust and moisture wherever required.

- 4.3.2 The components, sub-assemblies and assemblies are completely covered with 2 layers of polyethylene sheet. All sharp corners and edges are to be protected by rubber mats to prevent the polyethylene sheet from damage. Excelsior, corrugated cardboard, felt or other hygroscopic materials shall not be used. The top surface of the case shall be free from dents to prevent rain water pockets.

**Note:** Seal tight packing case shall not be opened during transportation till destination. Therefore customs authorities and shipping agents shall be informed in advance of the arrival of item. Suitable arrangements shall be made with the authorities for customs clearance.

- 4.3.3 Certain special precautions are required for sealtight packing of Turbogenerator rotor and the same are specified in product standard no. TG 55507.

- 5.0 Turbogenerator stator is a special open consignment and the same shall be packed in accordance with product standard TG 55506 for compliance.

#### 6.0 DESICCANT:

- 6.1 Desiccant (silicagel to spec IS:3401) is filled into dust free, air permeable linean bags. Silicagel bags inside the packing consignments such as boxes with or without sealed polyethylene sheets excluding Turbogenerator rotor and and stator need not be arranged in any particular way. However, these silicagel bags shall be arranged in a particular way as specified in the respective product standards/drawings for Turbogenerator rotor and stator.

#### 6.2 Desiccant Quantity for Components:

The desiccant quantity depends on the dimensions of the polyethylene sheet as well as transit and storage time.



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**T A B L E - 1**

Desiccant Quantity in units of TROCKEN EINHEITN (TEH)  
(Drying Effectiveness Unit) (1 TEH = 35g)

| Transit &<br>Storage time   | Upto 1<br>month   | Upto 3<br>months | Upto 6<br>months   | Upto 12<br>months  |
|---|-------------------|------------------|--------------------|--------------------|
| Parameters  |                   |                  |                    |                    |
| i) Sealed packages  |                   |                  |                    |                    |
| a) For 1m <sup>2</sup> surface area of sealed polyethylene sheet for Turbogenerator rotor.                      | 14 TEH<br>(450 g) | -                | 42 TEH<br>(1470 g) | -                  |
| b) For 1m <sup>2</sup> surface area of sealed polyethylene sheet for other components.                          | -                 | 9 TEH<br>(315 g) | 18 TEH<br>(630 g)  | 36 TEH<br>(1260 g) |
| c) For each kg of wood within sealed polyethylene sheet.  | 8 TEH<br>(260 g)  |                  |                    |                    |
| d) For each kg of foam rubber or other padding material within sealed polyethylene sheet.                       | 1 TEH<br>(35 g)   |                  |                    |                    |
| e) For 1m <sup>3</sup> of air within the case.  | 15 TEH<br>(525 g) |                  |                    |                    |
| ii) For closed packing cases without sealtight packing and special open consignment like Turbogenerator stator. |                   |                  |                    |                    |
| a) For 1m <sup>3</sup> of air within the case.  | 15 TEH<br>(525 g) |                  |                    |                    |

6.3 Humidity indicators shall be fixed wherever specified in product standards, packing drawings.

## 7.0 SURFACE PROTECTION:

### 7.1 Volatile Corrosion Inhibitor (VCI) Paper:

Un-protected surfaces of steel and cast iron components, tools, bearings, shaft seals etc., are covered with VCI paper. VCI paper has been impregnated with corrosion inhibitors which by evaporation and chemical conversion, protect metals in an enclosed area against corrosion.

7 m<sup>2</sup> VCI paper is necessary for 1m<sup>3</sup> of packed item approximately.

|                     |                |                                     |   |
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7.1.1 Application limitations:

VCI paper shall not be used for components made aluminium, aluminium alloys as well as zinc, copper, brass, cadmium and silver.

7.2 VCI powder is sprinkled inside the piping components and ends shall be protected with end covers as specified in plant standards, drawings.

**8.0 GENERAL INSTRUCTIONS:**

8.01 For packing and despatch of components, plant standard No. HY 0490572 – ‘Code of practice for storage, handling, packing and despatch of components’ shall be applicable.

8.02 For storage of different products and their components, plant standard no. HY 0490564 – ‘Code of practice for storage of different products and their components’ shall be applicable.

8.03 For handling, storage and preservation, plant standard no. HY 0490570 – ‘Instructions on handling, storage, preservation, represervation and transport of export order components at works and site, shall be applicable.

8.04 For nitrogen blanketing of heat exchangers, plant standard no. HY 0490562 – Preservation of heat exchangers prior to shipment’ shall be applicable.

8.05 All openings of components shall be blanketed to prevent the ingress of dust and moisture.

8.06 All packing cases shall contain a packing list inside a waterproof envelope. In addition, a copy of packing list will be kept in a metallic pocket outside the case.

8.07 All markings on the case shall be made of waterproof materials to prevent obliteration during transit.

8.08 All concerned designers shall identify the packing cases including direct despatch (DD) items as per the categories of packing indicated in clause 4. Components requiring special packing not included in this standard shall be covered by product standards.

Suitable instructions for packing of DD items shall be incorporated in the purchase orders as per relevant product standards.

8.09 The details of packing materials are indicated in Sketch-I.

8.10 The following details shall be marked on the packing case:

- a) W.O. No.
- b) Case No.
- c) Net weight
- d) Gross weight
- e) Dimensions of box
- f) Markings showing:
  - i) Upright position.
  - ii) Sling position
  - iii) Storage position (P, Q, R, S)
  - iv) Fragile components
  - v) Any other special markings required by the customer



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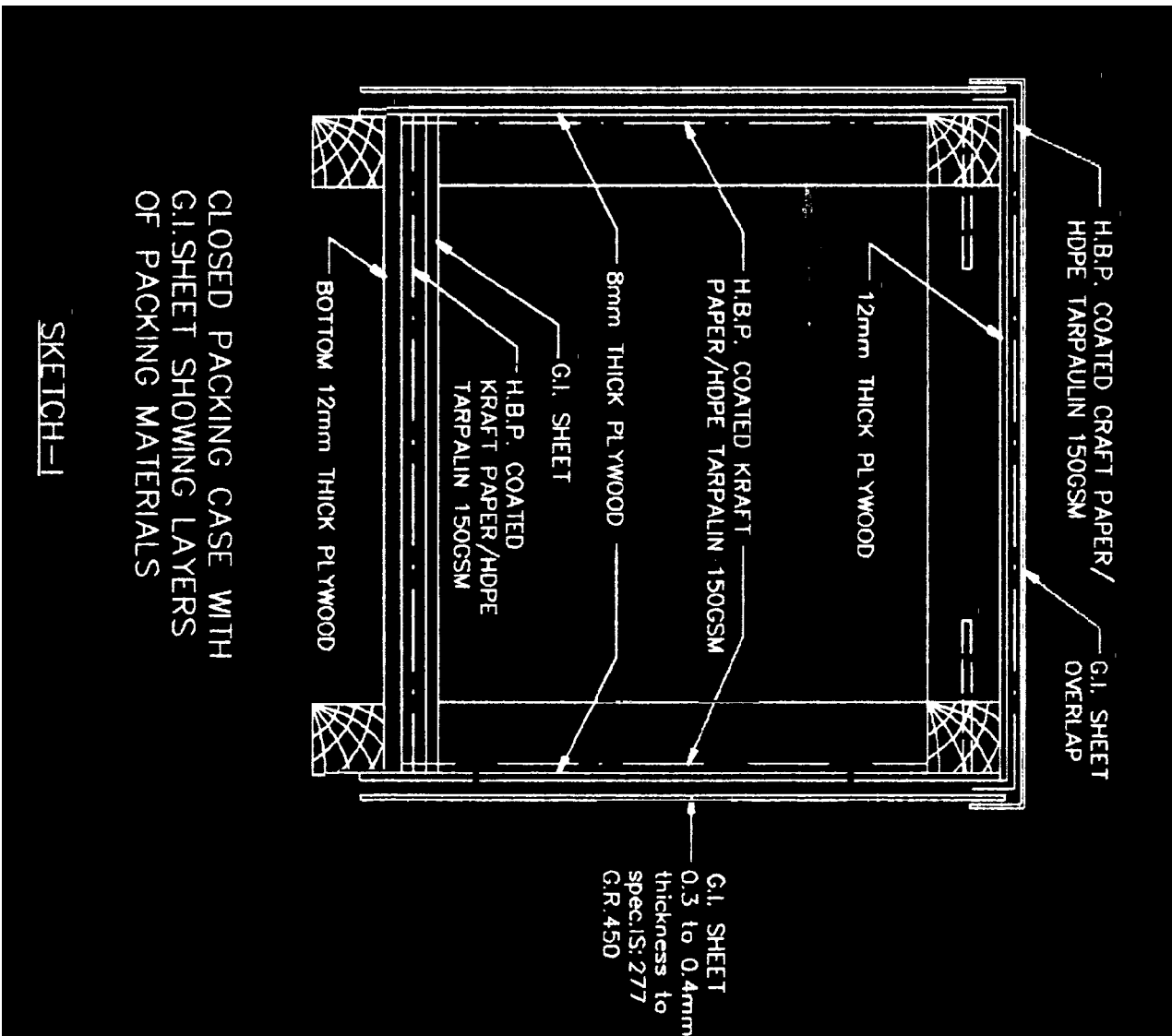
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# **FORMAT FOR PACKING LIST**

## **LATER**

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