

**Specification for 16 Metres High Mast Tower lighting**  
**(based on Specification No. SCR/EL/HMTL/2009-04)**

**1.0.** The scope of this Specification covers Design, Supply, Manufacture, Installation, Testing and Commissioning of the High mast towers of 16 meters height including design, supply of foundation material, casting RCC foundation to suit the parent soil at the site for erection of the High mast tower including all components & accessories. However, all items required for the safe and efficient operation and maintenance of the lighting system whether explicitly stated in the following pages or not, shall be provided by the contractor.

**2.0. Codes and Standards:**

Design, Manufacture and Performance of the mast shall comply with all currently applicable statutory regulations and safety codes and standards in the locality where the equipment will be installed and generally in accordance to the following: -

- 2.1. IS: 875(part-III) 1987 or latest -- Code and practice for wind load.
- 2.2. PLG 07 : 2013 or latest -- Specification for High Mast and Foundation
- 2.3. PLG 07 : 2013 or latest – Structural design.
- 2.4. BSEN : 10025 (2019).
- 2.5. BSEN : 10025 (2019) or latest – Base plate, Top plate and accessories.
- 2.6. BS: 5135 and IS : 9595 or latest – Welding.
- 2.7. BSEN ISO 1461 or latest – Galvanizing.

**3.0. General Constructional features:**

- 3.1. The mast shaft and material construction shall be made of best steel grade in compliance with BSEN-10025 or BS-4360 or latest.
- 3.2. All holding bolts shall be hot single dip galvanized to BSEN ISO 1461 or latest.

**4.0. Mast Design Criteria:**

- 4.1. The high mast and the lowering system with the required number of flood lights and lamp control gears etc., in place shall be capable of withstanding a sustained basic wind speed of 180 km/h as per IS: 875 part-III, 1987 or latest.
- 4.2. The design shall be such that the high mast with accessories is capable of withstanding external forces exerted by wind pressure and should have a maximum wind load factor of 1.25 and material factor of 1.15. Design life of mast should be minimum 25 years.

**5.0. Mast structure and construction:**

- 5.1. Each mast to be delivered at site shall be in two sections (Top Section & Bottom Section). The mast thus delivered to site should withstand a wind pressure of 50m/s (180 Kmph) and should be able to carry the weight equivalent to 16 Nos LED flood light fittings i.e. (minimum weight of 400 Kgs) in addition to the weight of lantern carriage assembly along with associated equipment. However technical requirements of high mast are more elaborately furnished in *Annexure 'A'*.

The Top section & bottom section of the mast shall be slip jointed. The minimum overlap distance should be 1.5 times of dia at penetration. The section shall not be circumferential welded through slip joint of multiple short sections. The high mast shall be continuously tapered polygonal cross section of at least 20 sided, presenting a good appearance and shall

be based on proven in tension design conforming to the standards to give an assured performance and reliable service. The mast shall be hot dip galvanized internally and externally and shall have a uniform thickness for different sections.

- 5.2. The top section shall have a flange plate for bolted connection to the head frame. The base shall have a flange plate for fixing the high mast on to the concrete foundation by anchor bolts.
- 5.3. The mast shall be fabricated and butt-welded longitudinally to form a tapered section with telescopic friction slip joints.
- 5.4
  - a. Full penetration between plates of all thickness.
  - b. No fissures.
  - c. No under cutting.
  - d. No blowholes, porosity or spherical inclusions beyond 5% of the minimum thickness.
  - e. No detectable angular inclusions.
- 5.5. Longitudinal welds along the mast shaft shall have:
  - a. 60% minimum penetration between plates.
  - b. No fissure on the inside and outside surface.
  - c. No under cutting on the outside surface.
  - d. No blowholes.
- 5.6. Ultrasonic testing procedure shall be considered as the minimum permissible testing method.
- 5.7. The wall thickness of each section shall be designed to withstand the loads to which the high mast will be subjected to but shall not be less than 3 mm at the top section & 4 mm at the bottom section.
- 5.8. Unless otherwise specified, connection between the various sections shall be achieved by telescopic slip joints, the overlapping length shall be of 1.5 times of diaat penetration. Slip joint assembly shall be performed at site. Shaft section shall not be joined by circumferential weld or bolting.
- 5.9. The base plate shall be free from lamination and shall be single flange constructed with holes jig drilled for anchor bolts passage. The bottom of the base mast section shall be securely welded to the base plate by complete penetration butt-welding or fillet welding. The welded connection of the base plate to the mast section shall fully develop the strength of the section.
- 5.10. All mast sections and components shall be hot dip galvanized in accordance with BSEN ISO 1461 or latest. The galvanization shall be done by hot dip method for uniform thickness and better aesthetic appearance. The opening shall be made by providing thick steel door frame for proper closing of door without any entry of moisture & water.
- 5.11. Galvanizing shall be Inspected for:
  - a. Adhesion.

- b. Mass of zinc coating.
- c. Uniformity.
- d. Average thickness of galvanization: as per BSEN ISO 1461

5.12 Welding of two or more anchor rods of shorter lengths to achieve the design length shall not be permitted. No welding shall be allowed on the anchor rod body.

5.13. Earthing terminal shall be provided with in the access door area of each high mast.

## **6.0 Door Opening :**

An adequate door opening shall be provided at the base of the mast and the opening shall be such that it permits clear access to equipment like winches, cable, plug & socket etc., and also facilitate easy removal of the winch. The door opening shall be complete with a close fitting, vandal resistant, weather proof door, provided with a heavy duty double inter lock with special paddle key.

## **7.0. Foundation:**

The High mast shall be erected as per the following details

- |                              |  |
|------------------------------|--|
| a. Type of foundation        | : Open pedestal type with reinforcement  |
| b. Size of foundation design | : As per the high mast manufacturer's design to suit the parent soil at location. However, depth of foundation shall be changed as decided by railway if required based on actual condition of soil at site proposed for erection of highmast. |
| c. Considered wind speed     | : 50 m/sec (180 Km/Hr)   |
| d. Design safety factor      | : as per IS 456  |

## **8.0. Lantern Carriage:**

8.1. The mobile luminaires carriage ring shall be of steel construction of "B" grade ASTM A500 / MS pipe with galvanization with size 50 NB with an internal diameter of minimum 600 mm or more and manufactured in two segments. The unit shall be joined by bolted flanges. All mobile components of the system shall be located on the mobile part in order to allow visual inspection during each operation. Luminaries carriage ring shall be provided with 08 Support arms (each arm capable of holding 02 luminaries) for fixing the luminaries and for maintenance.

8.2. The mobile luminaries carriage shall be designed to carry 16 number of luminaries (minimum weight of 400 Kgs) and shall be evenly balanced. Nylon paddle guide ring shall be incorporated as a buffer arrangement between mobile luminaries carriages and mast shaft. This is to prevent damage to mast surface during raising and lowering operation of mobile luminaries carriage.

8.3. The complete mobile components shall be hot dip galvanized in accordance to BSEN ISO 1461 or latest.

- 8.4. The steel grades used for construction of the head frame assembly and mobile part shall be in compliance with BSEN 10025.

#### **9.0 Junction box :**

Weather proof junction box made of Cast Aluminium shall be provided on the carriage assembly as required, from which the inter-connections to the designed number of Luminaries with associated control gears to be fixed on the carriage shall be made.

#### **10.0. Raising and Lowering Mechanism:**

For installation and maintenance of luminaries and lamps, it shall be necessary to lower and raise the mobile luminaries carriage by means of suitable winching arrangements at the base of the mast. The speed of the raising and lowering of lantern carriage ring shall be  $\geq 2.0$  m per minute.

#### **11.0. Winch:**

- 11.1. Each mast shall be provided with a double drum winch (self-lubricating type) suitable for raising and lowering the luminaries carriage ring with 1.5 HP single phase AC motor along with drive mechanism to suit raising & lowering operations shall be provided inside the mast with easy access to operate the winch and for maintenance. Also, a handle shall be provided for the manual operation of the winch externally in case of problems with the motor drive.
- 11.2. For safety reasons and final precision looking of lantern carriage ring to the head frame, the drive motor must have a provision to operate manually by using external crank device without removing the motor drive from the winch unit.
- 11.3. The winch must be of robust design and completely fully sustainable type without the need for brake shoe, springs or clutches. It can be removed from the mast for maintenance if the need arises in future. The reduction gear of the winch shall be of endless work gear operating in an oil bath (SAE 90 or SAE 140) and gear shall be made up of high carbon steel/phosphor bronze.
- 11.4. The capacity and operating speed of the winch shall be clearly marked on each winch on an indelible label together with the specification of the recommended lubricant.
- 11.5. A minimum 6 turns of wire rope shall be on the grooved drum when the mobile luminaries ring is fully lowered to rest on the luminaries supporting arms.
- 11.6. The winch shall be independent pulley sustaining type under all normal circumstances and it is not dependent on the brake or restraining device that uncontrolled or dangerous runaway speeds will occur in the event of the total failure of this device. Slip test on the winch is to be carried out by the manufacturer. OEM Test certificate and report shall be submitted with the equipment.
- 11.7. OEM Test certificate in support of the safe working limit shall be provided.

#### **12.0. Head Frame:**

- 12.1. The Head Frame shall include a 03 pulley system to accommodate 2 stainless steel hoisting wire rope and separate 01 pulley for the passage of electrical cables. The pulleys shall be of non-corrosive material and shall run on self-lubricating bearings with stain less steel axles.
- 12.2. The complete head frame chassis shall be hot dip galvanized.

#### **13.0. Hoisting and suspension wire ropes:**

- 13.1. The High mast shall be fitted with 6 mm dia flexible standard stain less steel hoisting wire ropes of 7x19 construction with a minimum breaking strength of  $\geq 2350$  Kgs. The combine

lifting capacity of hoisting wire rope shall have a factor of safety not less than 7 times of safe working load (SWL) of the winch and shall be entirely suitable for the design application. Centre core material shall be conforming to DIN 3060.

13.2. A transition plate shall be confirmed to:

- a. Connect the two suspension wire ropes to the stainless steel winch.
- b. Allow fixing of electrical cables.
- c. Ensure even distribution of loads between the stainless steel winch by means of equalizer and necessary thimbles and terminals are to be provided for the steel wire ropes.

#### **14.0. Electrical cable:**

Electrical cable shall be anti-twisting round flexible copper cable, Core identification in accordance with VDC 0293 or equivalent. The cable shall be highly flexible for optimum design life approved for hoist applications, suitable to carry the maximum current of the fittings provided.

#### **15.0. Control Panel:**

15.1. Control of raising and lowering operation shall be carried out from the mast base by means of portable control panel. The control panel shall be usable on all mast and shall consist of:

- a. A power supply and control cable of 5 meter length.
- b. A pendant type control panel equipped with push button for raising and lowering of the mobile part. The push buttons shall operate on the “dead man” principle i.e., action shall cease as soon as the button is released.
- c. Emergency stop button.
- d. Steel sheet iron control panel of suitable size shall be of built in type and is to be fixed in the High mast at suitable height. All the MCB's and multiple plug sockets shall be used only from the approved list of the materials mentioned along with the tender booklet.

The panel board shall consist of the following switches:

1 x 63A TPN MCB switch for incoming (approved Make & model: 408683 of Legrand or equivalent in Schneider / ABB / Siemens)

1 No of multiple plug socket

2 x 20A automatic timer switches. (approved makes :Selec / L&T / Havells)

#### **16.0 Torque limiter:**

In view of overall safety of the system a separate adjustable torque limiting device shall be provided with a minimum lifting capacity of 500 kgs. To protect the wire ropes from over stretching. It shall be mechanical with suitable load adjusting device. The torque limiter shall trip the load when it exceeds the adjusted limits.

#### **17.0 Lightning Finial:**

A lightning finial of heavy duty hot dip galvanized fabricated out of ERW tube shall be provided at the centre of the head frame which shall be solidly fixed to the head frame to make a direct conducting path to the earth through the mast as per OEM.

#### **18.0 Aviation Obstruction Lights:**

A suitable aviation obstruction light of reliable design shall be on the top of the mast fixed on the lantern carriage. Approved makes: Bajaj / Binay / Halonix

**19.0. Statement of compliance:**

The base offer shall comply with the specification. The tender shall confirm each and every paragraph of the technical specifications that the tender is able to meet the specified requirements. The statement shall be in accordance to the numbering reference adopted in the technical specifications.

**20.0 Guarantee:**

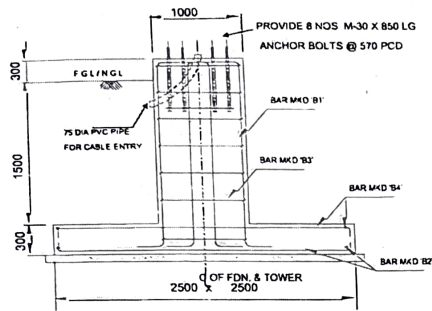
**The supplier/contractor shall guarantee satisfactory performance of the High mast and allied equipments over a period of 36 months in actual service from the date of handing over of the installation to the Railway in normal working conditions. During the guarantee period the Supplier/Contractor shall rectify free of cost of all defects which may develop due to faulty design, material failure and bad workmanship inclusive of free replacement of defective parts. The guarantee will get automatically extended corresponding to the periods during which the equipment is not in use. On every occasion when the equipment goes out of service, the duration between the date of intimation of the failure of equipment to the contractor and the date of handling over of the equipment after repairs in good working condition duly tested and commissioned in the presence of Railway's representative, will be counted for the extension of the guarantee period till the equipment completes actual service for a total period of 36 months. During the guarantee period, the parts of the equipments requiring repairs or replacements will be handed over to the contractor at site and the parts after repairs shall be fitted in the equipment at site by the contractor. All expenses involved in fulfilling the above guarantee obligations shall be borne by the contractor.**

## TECHNICAL REQUIREMENTS OF HIGH MAST

S.No	Item	16 metre
	<b><i>HIGH Mast System</i></b>	
1	No.of sections	2
2	Dia. Of section	
a	Top	150 mm
b	Bottom	≥ 400 mm
3	Plate thickness	
a	Top (section)	≥ 3 mm
b	Middle(section 2)	NA
c	Middle(section 1)	NA
d	Bottom (section)	≥ 4 mm
4	Dia. of Base plate	≥ 670 mm
5	Thickness of Base plate	≥ 25 mm
6	Size of door opening at Base plate	1200 mm x 250 mm
	<b><i>Details of Foundation bolts</i></b>	
13	No. of Fdn. Bolts	8 Nos
14	PCD of Fdn. Bolts	as per design of OEM
15	Dia. of Fdn. Bolts	30 mm
16	Length of Fdn. Bolts	850 mm (150 mm threaded portion)
17	Type of Fdn. Bolts	M30
	<b><i>Luminaries carriage</i></b>	
18	Dia. Of carriage ring	≥ 600 mm
19	Construction	8 arms, welded, 2 sections
20	Load carrying capacity	≥ 400 kgs
	<b><i>Trailing cable</i></b>	
21	Size	5 core 2.5 sq.mm copper
22	No.of cores	5
23	Conductor	Cu
24	Insulation	EPR & PCP sheathed (Polychloroprene)
25	No. of Circuits	one
	<b><i>Winch with drive motor</i></b>	
26	Winch type	Double drum
27	SWL	Min 750 kgs.
28	Method of operation	Integral motor
29	Motor capacity	1.5 HP
30	No. of speeds	6 pole, single speed
31	Torque limiter	With mechanical tripping facility
	<b><i>Stainless steel wire rope</i></b>	
32	Construction	7/19 construction
33	No. of ropes	2 continuous
34	Dia. of ropes	6 mm
35	Breaking load capacity (Minimum)	≥ 2350 kgs per rope
36	Conformity for Steel	AISI : 316

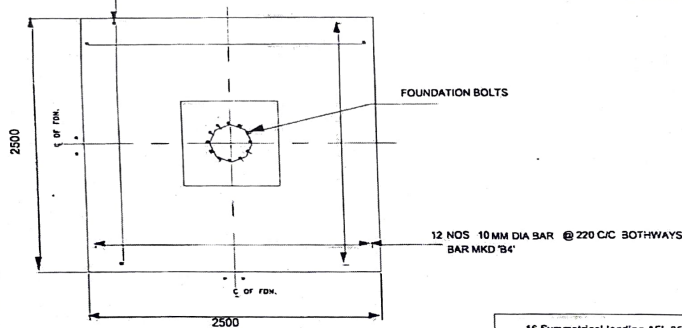
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# GANT DIVISION - GOODS SHED - CHITRALA, MIRYALAGUDA - HIGHMAST FOUNDATION



ELEVATION

12 NOS 10 MM DIA BAR @ 220 C/C BOTHWAYS  
BAR MKD 'B7'

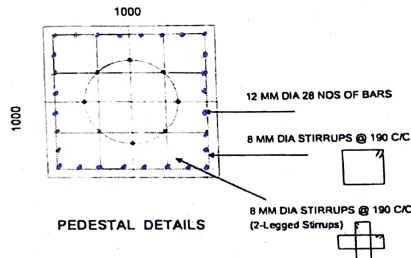


FOUNDATION PLAN

BEFORE CASTING THE FOUNDATION, VERIFY THE DIMENSIONS OF FOUNDATION BOLTS LIKE DIA, QTY & P.C.D AND ANCHOR PLATE, WITH RESPECT TO THE DIMENSIONS MENTIONED IN THIS DRAWING.

## SCHEDULE OF QUANTITIES

EXCAVATION	14.90	CU.M
P.C.C	0.73	CU.M
R.C.C	3.68	CU.M
STEEL	179.5	Kg



PEDESTAL DETAILS

## FOUNDATION LOADINGS AT THE BASE OF MAST

WIND SPEED	M/SEC	50
BENDING MOMENT	Kn-M	77.1
HORIZONTAL SHEAR	Kn	7.43
VERTICAL LOAD	Kn	9.1
S.B.C OF SOIL	T/SQM	10.0

## SCHEDULE OF REINFORCEMENT

MARK	DIA	SHAPE	NOS	LENGTH
B1	12		28	2370
B2	10		24	2600
B3	8		11	3792
B4	10		24	2600
B3a	8		22	2312

## GENERAL NOTES

1. ALL DIMENSIONS ARE IN MM & LEVELS ARE IN METER
2. CONCRETE GRADE SHALL BE M-30 & REINFORCEMENT SHALL BE OF Fe-500
3. FOR P.C.C CONC MIX SHALL BE 1:4:8 (100 MM THICK)
4. MIN CLEAR COVER FOR CONCRETE SHALL BE 75MM FOR PEDESTAL AND FOUNDATION RAFT.
5. MINIMUM LAP LENGTH OF BARS SHALL BE 50 X DIA, UNLESS OTHERWISE STATED
6. FOUNDATION SHOULD REST ON FIRM SOIL. IF SAID S.B.C IS NOT AVAILABLE AT SPECIFIED FOUNDATION LEVEL, IT SHOULD BE TAKEN DEEPER
7. THE MAST FLANGE HAS TO BE GROUTED, MIN: 4 NOS OF 25MM DIA DUCTS SHALL BE PLACED AROUND IT TO ALLOW DRAINAGE & VENTILATION
8. FOUNDATION IS DESIGNED CONSIDERING S.B.C - 10T/SQM AT 1.8M DEPTH
9. PLEASE VERIFY THE BOLT DETAILS BEFORE CASTING THE FOUNDATION
10. CHAIR BARS FOR REINFORCEMENT ARRANGEMENT ARE NOT INCLUDED IN THE STEEL BBS.

TRANSRAIL

Transrail Lighting Limited

CLIENT

RISE POWER GANTUR

TITLE

FOUNDATION DRG FOR 16M HIGH MAST SYSTEM

FILE PATH

Y:\TLL DESIGN\DESIGN 2022-23\HIGH MAST\160-RISE POWER GANTUR-16M.H

DWG NO

IGH MAST\160-RISE POWER GANTUR-16M.HM\160-TLL-RISE POWER GANTU

DRAWN BY

AUTO

CHECKED BY

YA

DATE

11-10-2023

Sheet No

Rev No

DESIGN BY

HK

APPD BY

CA

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REV	DATE	REVISION	DRWN	CHK	APPD	This is a property of Transrail Lighting Ltd it can not be copied used for any purpose without the permission of appropriate authority. It is a liability as confidential information in connection with enquiry, tender & must be returned on request. It is not to be used for any other purpose or order.

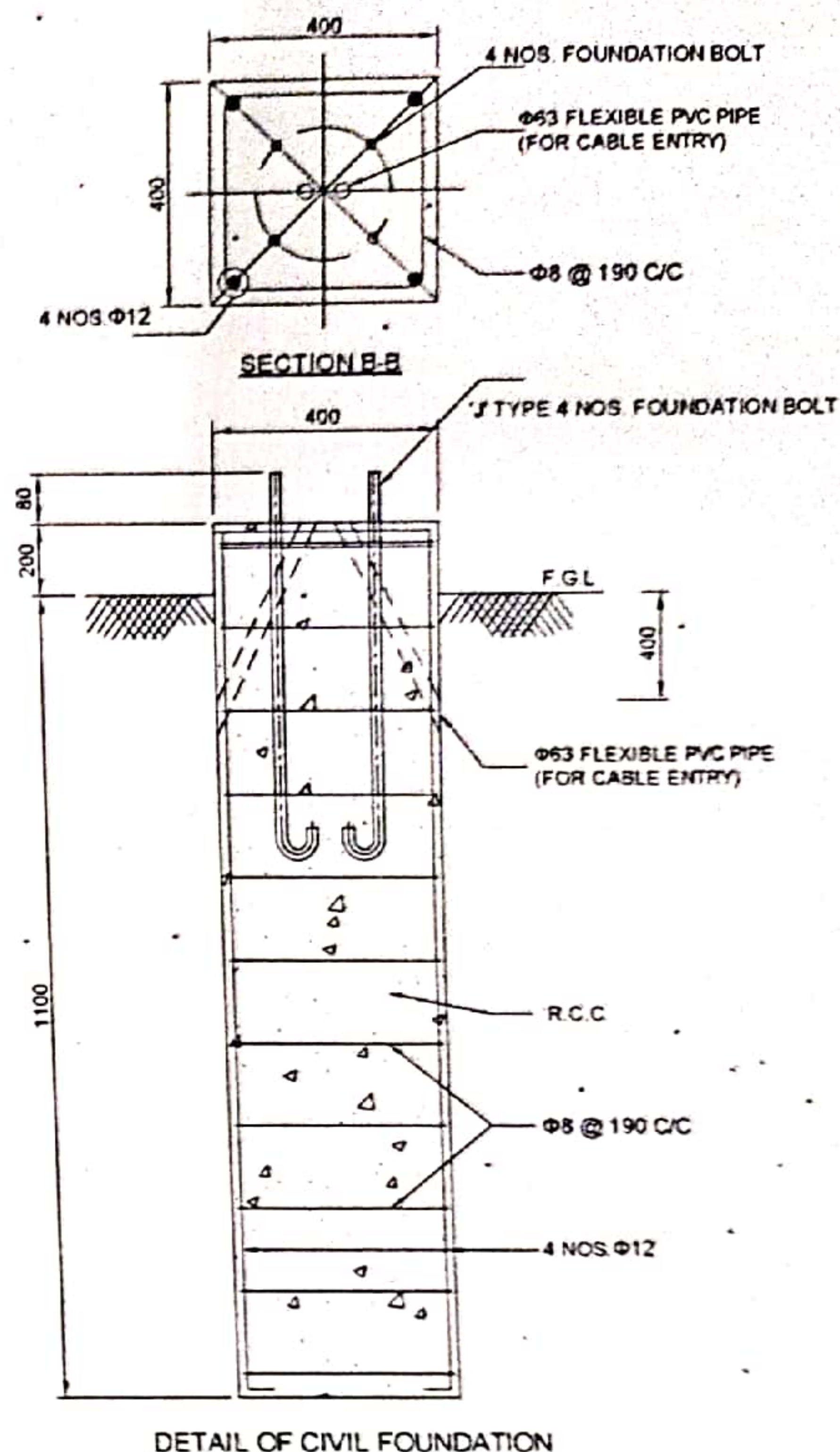
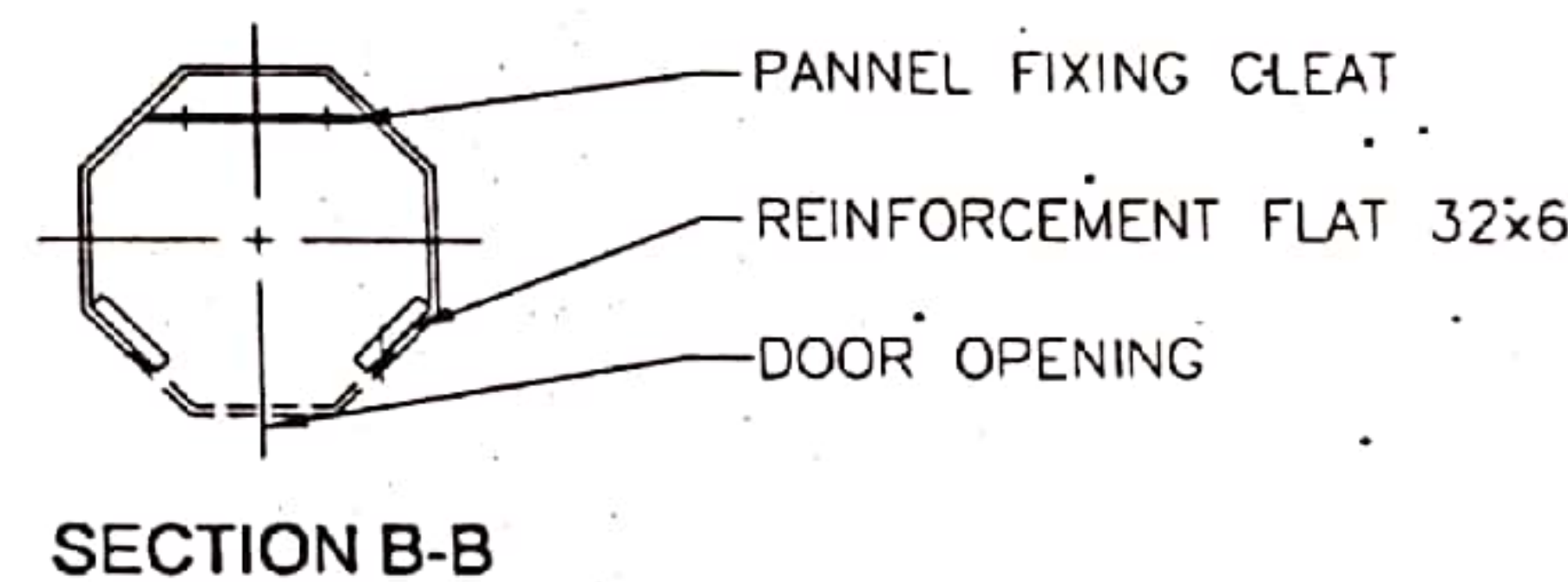
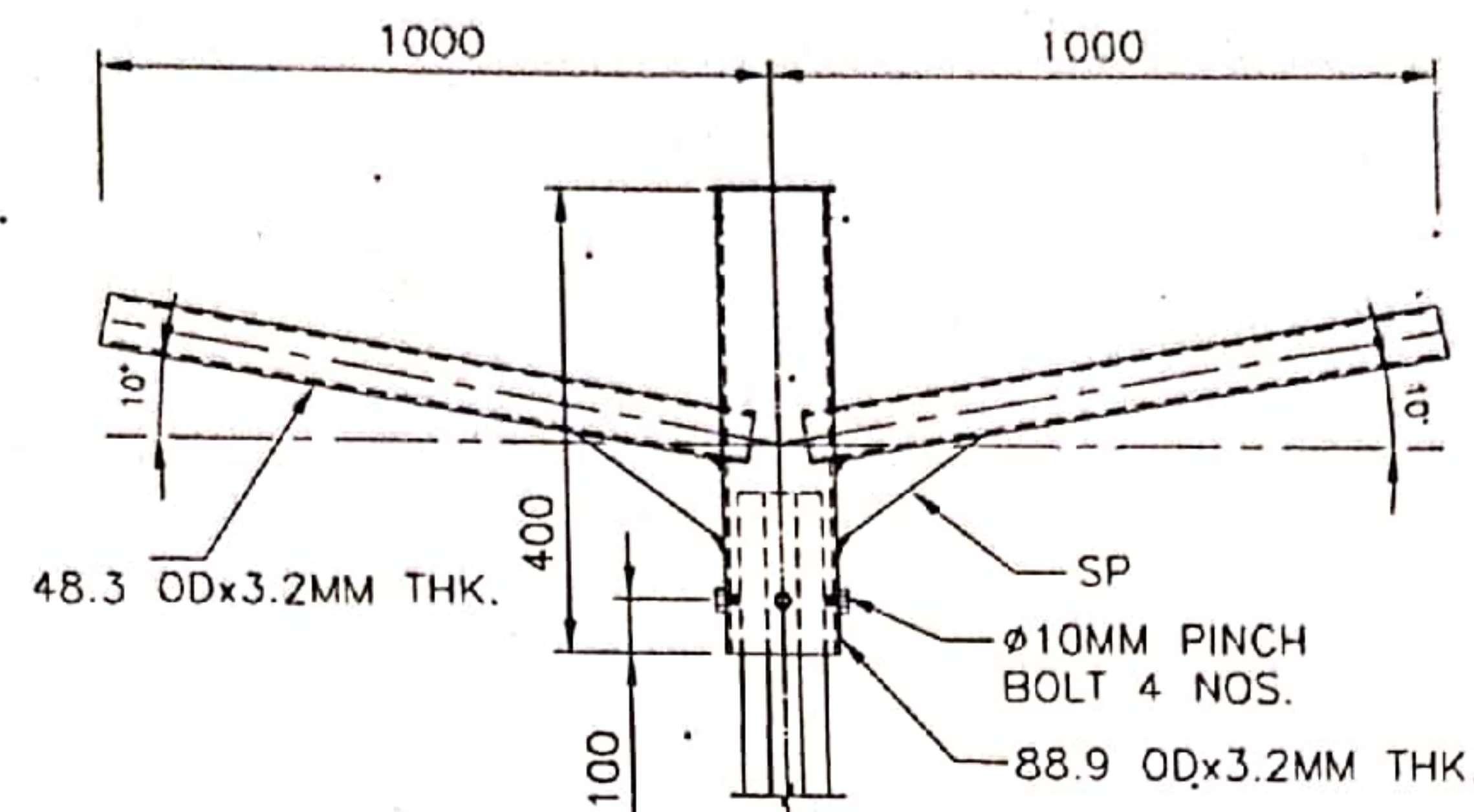
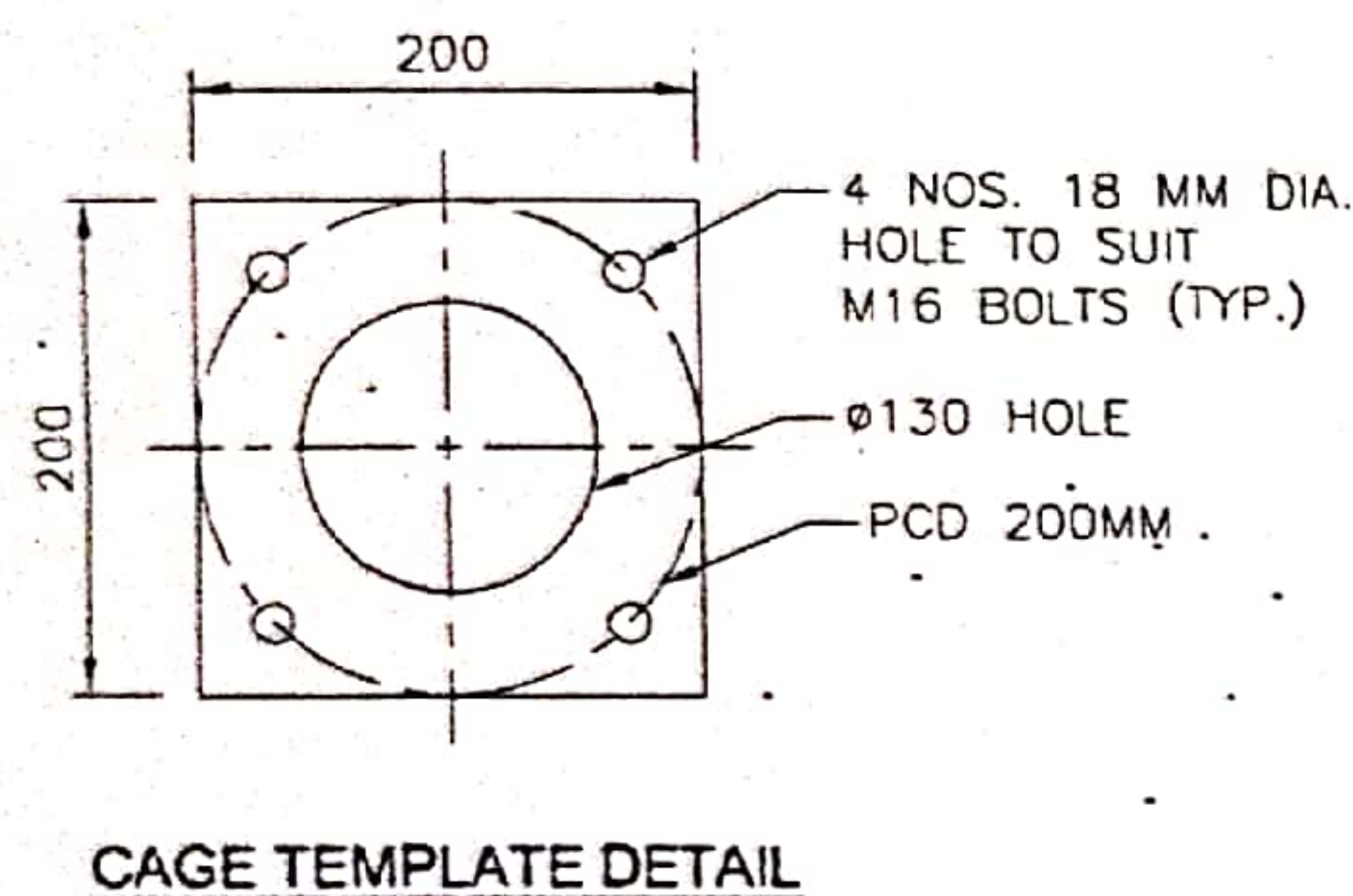
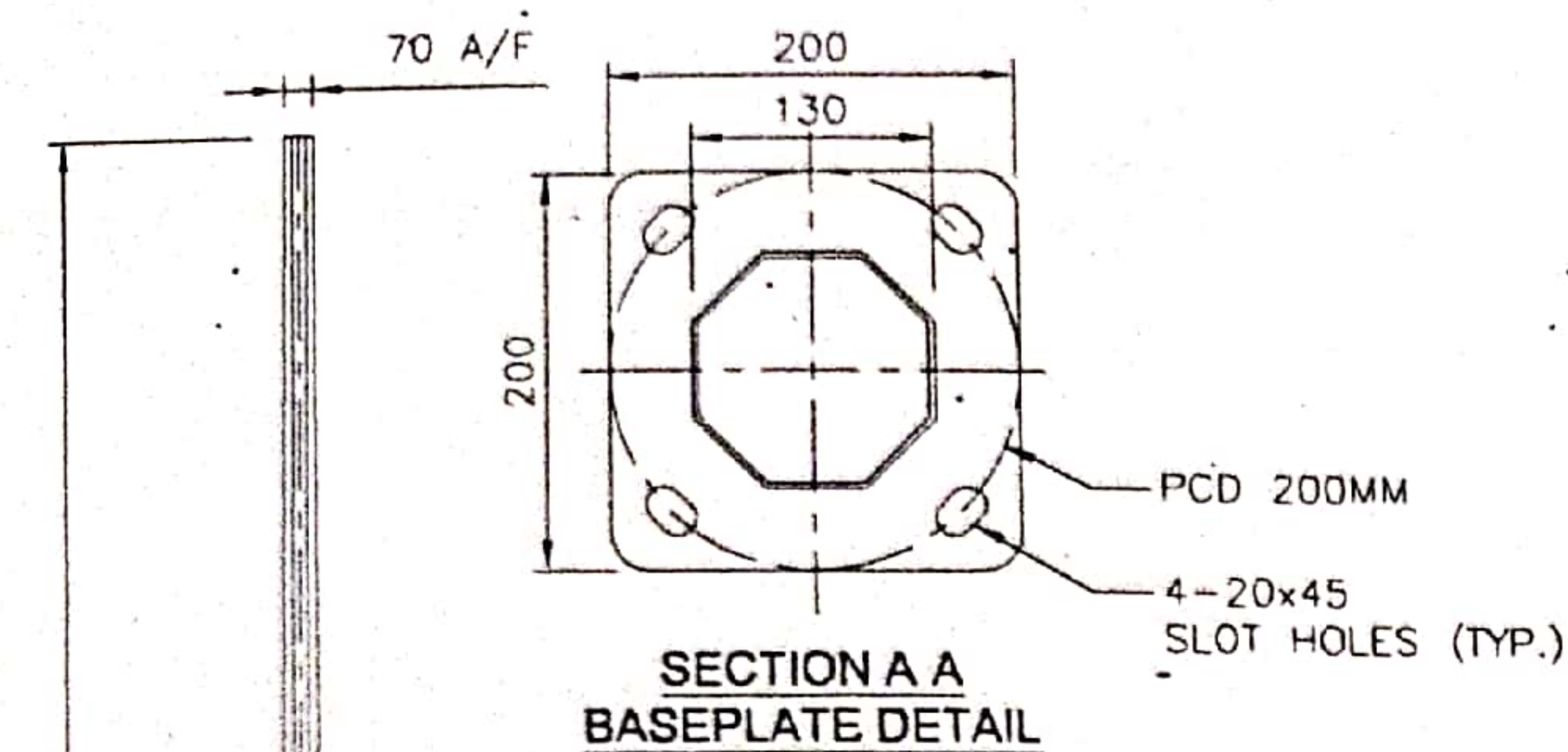
For PAVAN ELECTRICALS

A. S. Srinivas Babu

PROPRIETOR

Page 1  
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रिफ्ट मंडल विद्युत इंजीनियर / अनु





NOTE: SUITABLE CONCRETE PLINTH AS PER OEM'S RECOMMENDATION

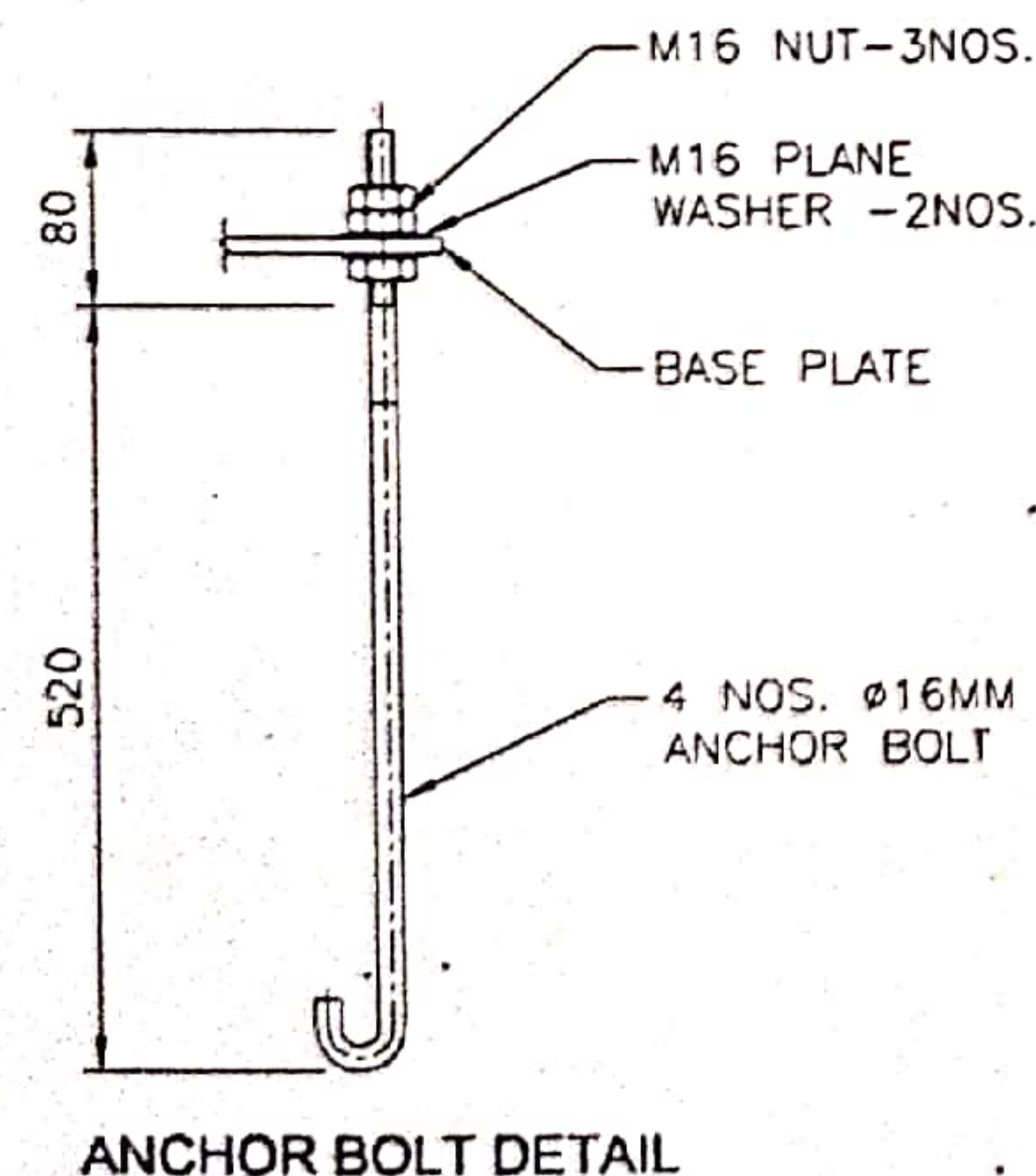
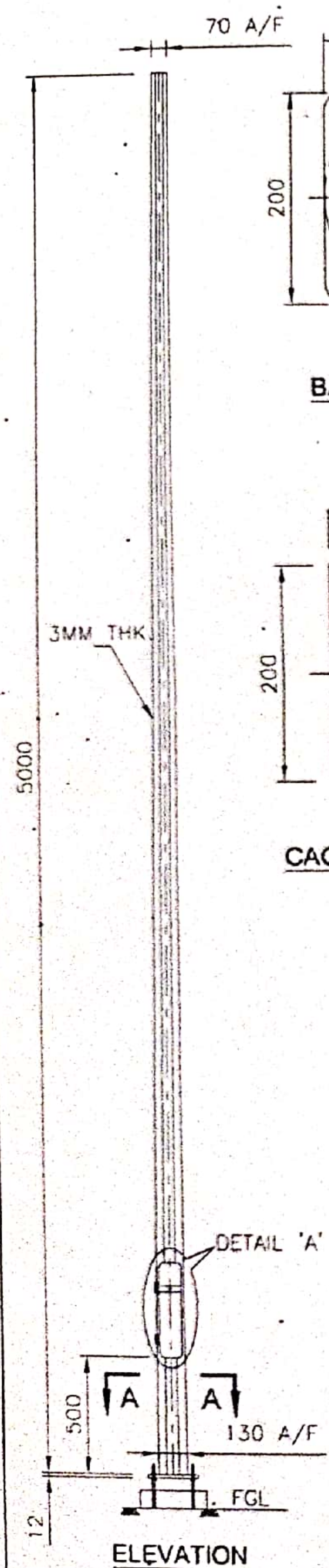
- ALL THE DIMENSIONS ARE IN MM MILLIMETERS.
- DESIGN STANDARD BS5649
- DESIGN CRITERIA-
  - BASIC WIND SPEED 50 m/sec
  - DESIGN LIFE IS 25 YEARS
  - TOPOGRAPHY IS CONSIDERED AS FLAT
- LOADING DETAILS: POLE SUITABLE FOR,
  - 2 NOS. LUMINAIRES WITH EACH PROJECTED AREA 0.11 SQ.M & WEIGHT 12 KG.
  - 1.0 M DOUBLE ARM BRACKET.
- MATERIALS -
  - SHAFT: ASTM A572-50/S355 AS PER BSEN 10025/EQUIVALENT
  - BASE PLATE: A36/ ASTM A572-50/EQUIVALENT
  - ANCHOR BOLTS : EN8 GRADE (4#16x600lg)
- FINISHING : HOT DIP GALVANISED TO ASTM A123/BSEN ISO 1461/EQUIVALENT.
- MINIMUM ANCHOR BOLT CAGE TEMPLATES SHOULD BE SUPPLIED 10% OF THE QUANTITY OF POLES.

DRG.NO GNT/E/M/02/2019  
GENERAL ARRANGEMENT FOR  
5M OCTAGONAL STREET LIGHT POLE  
WITH 1.0M DA CAP TYPE BRACKET

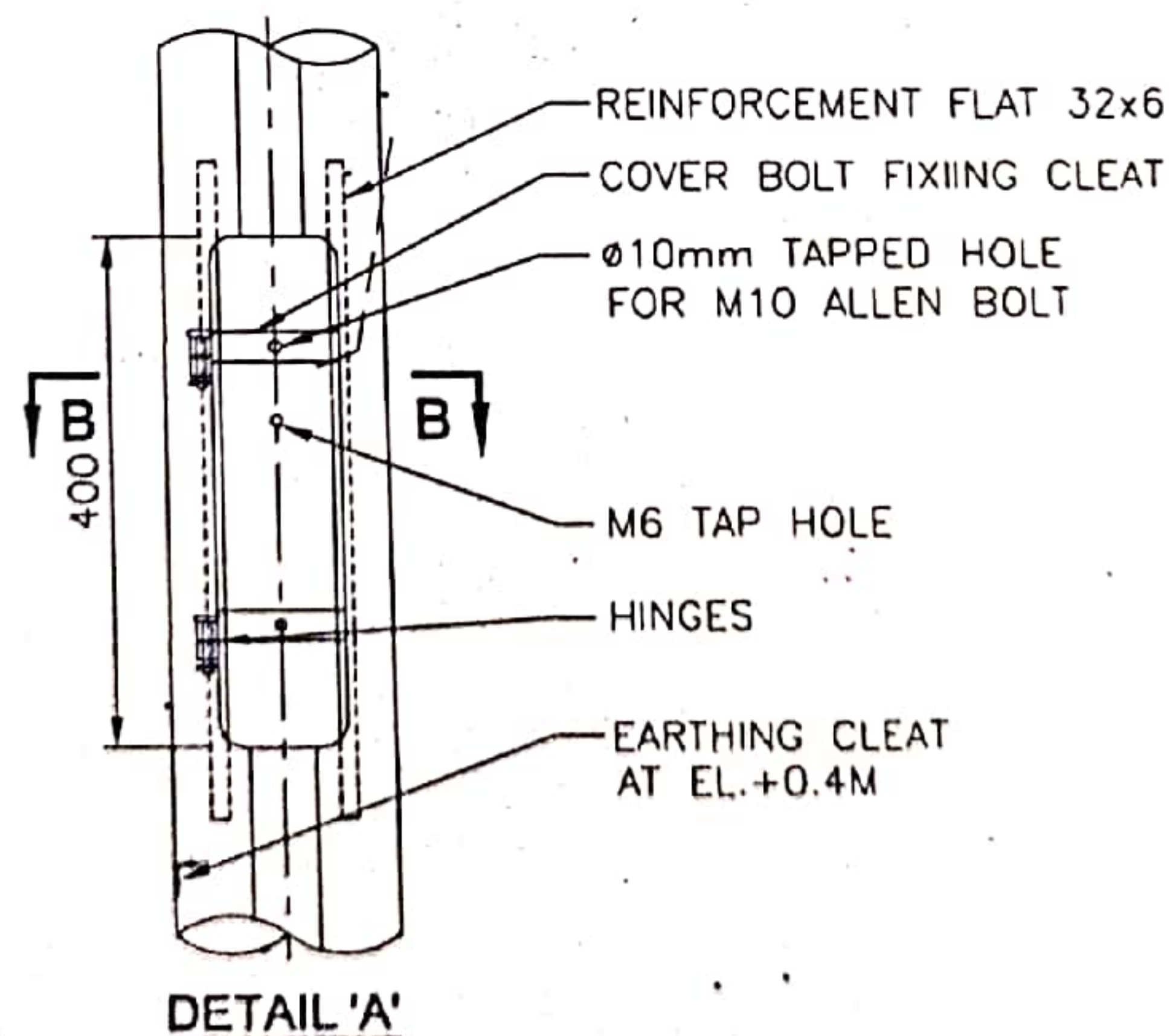
Sr.DEP/M/GNT

ADEE/M/GNT

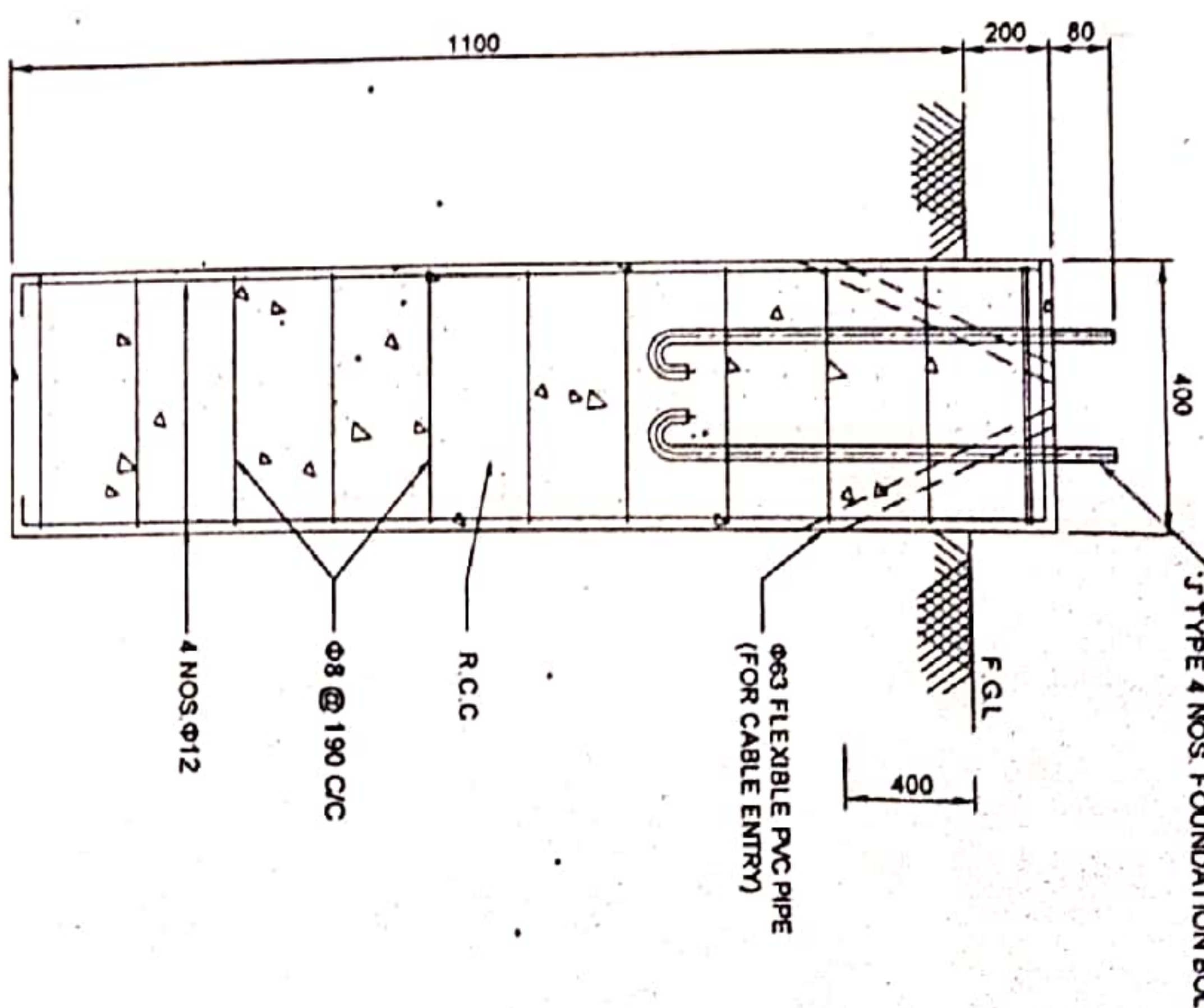
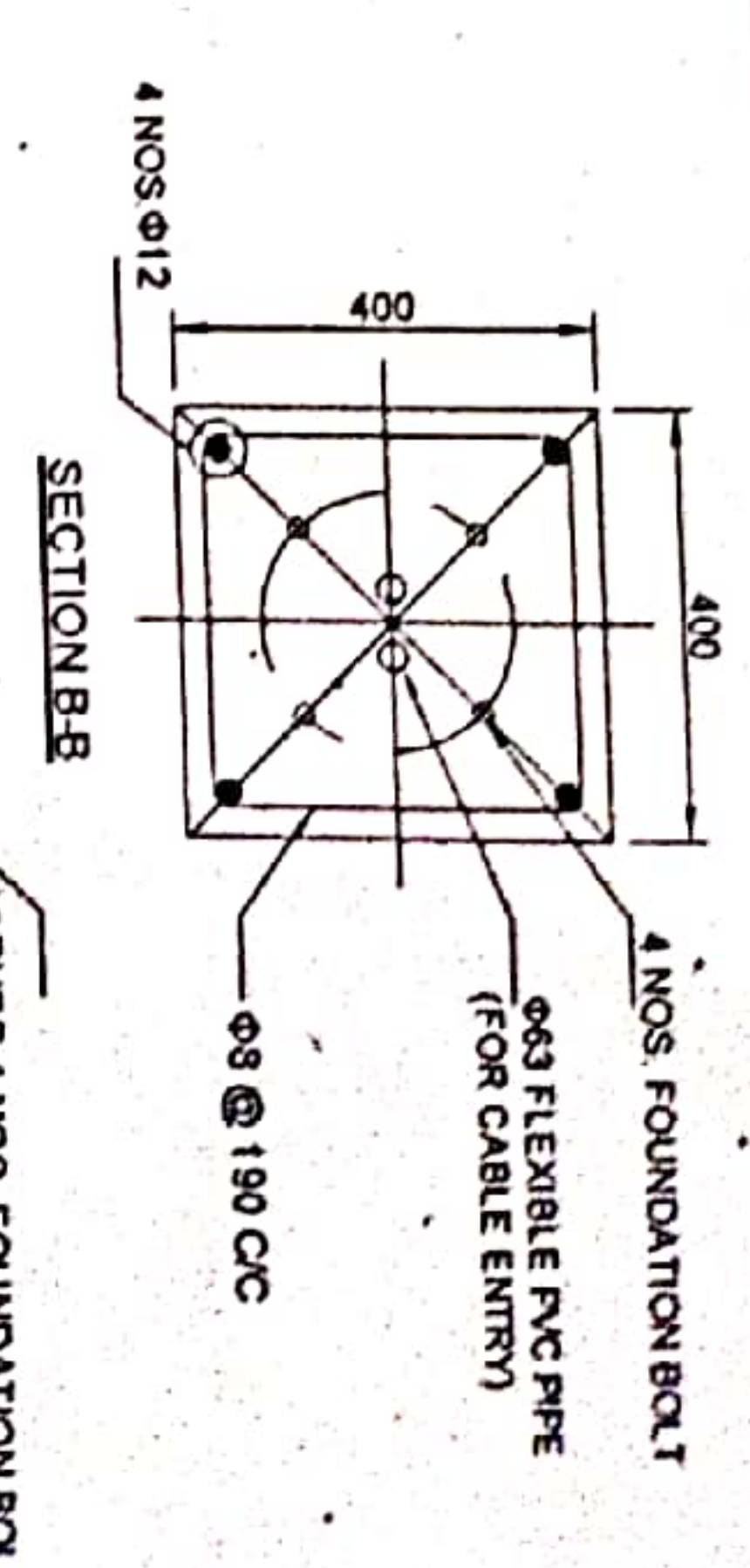
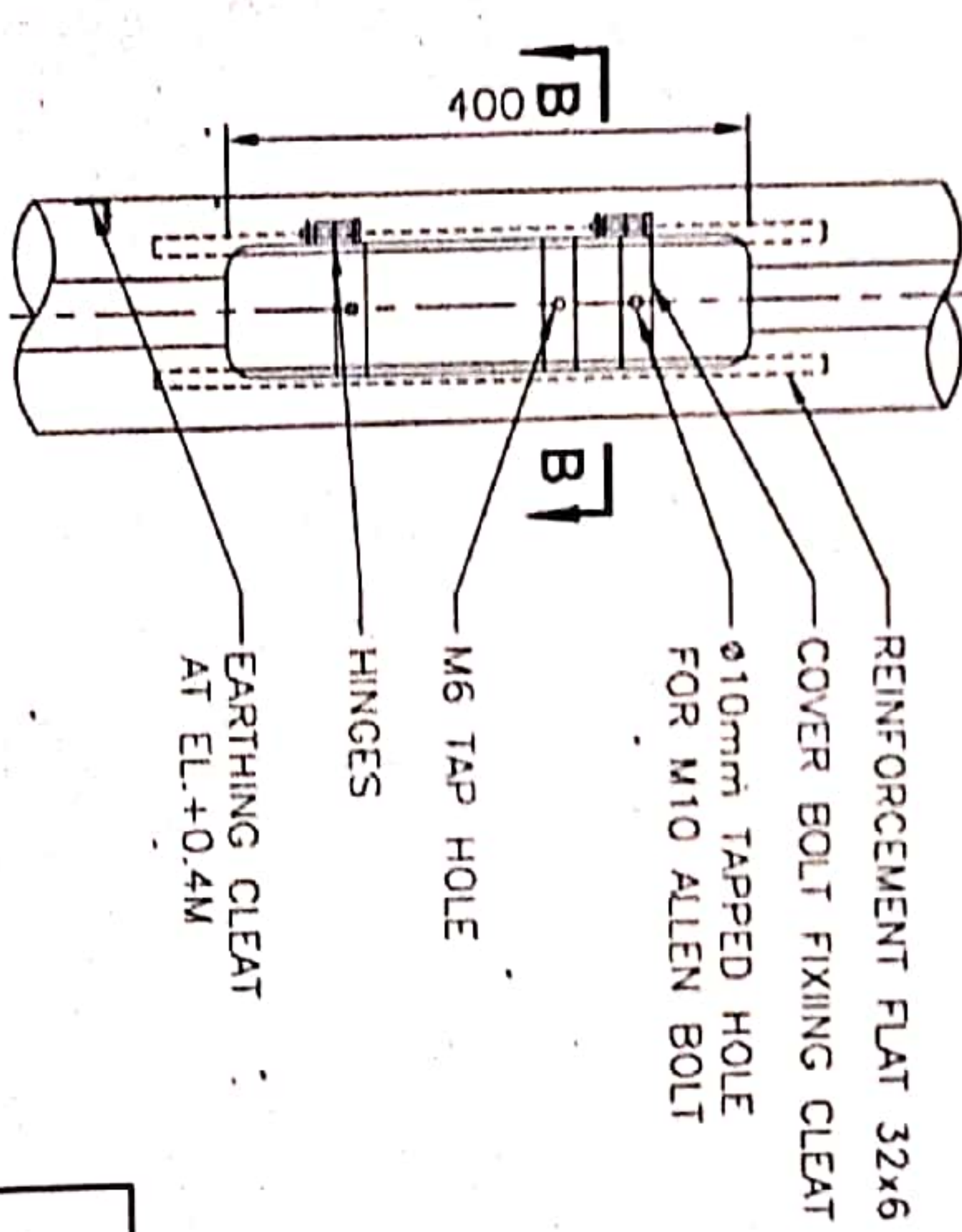
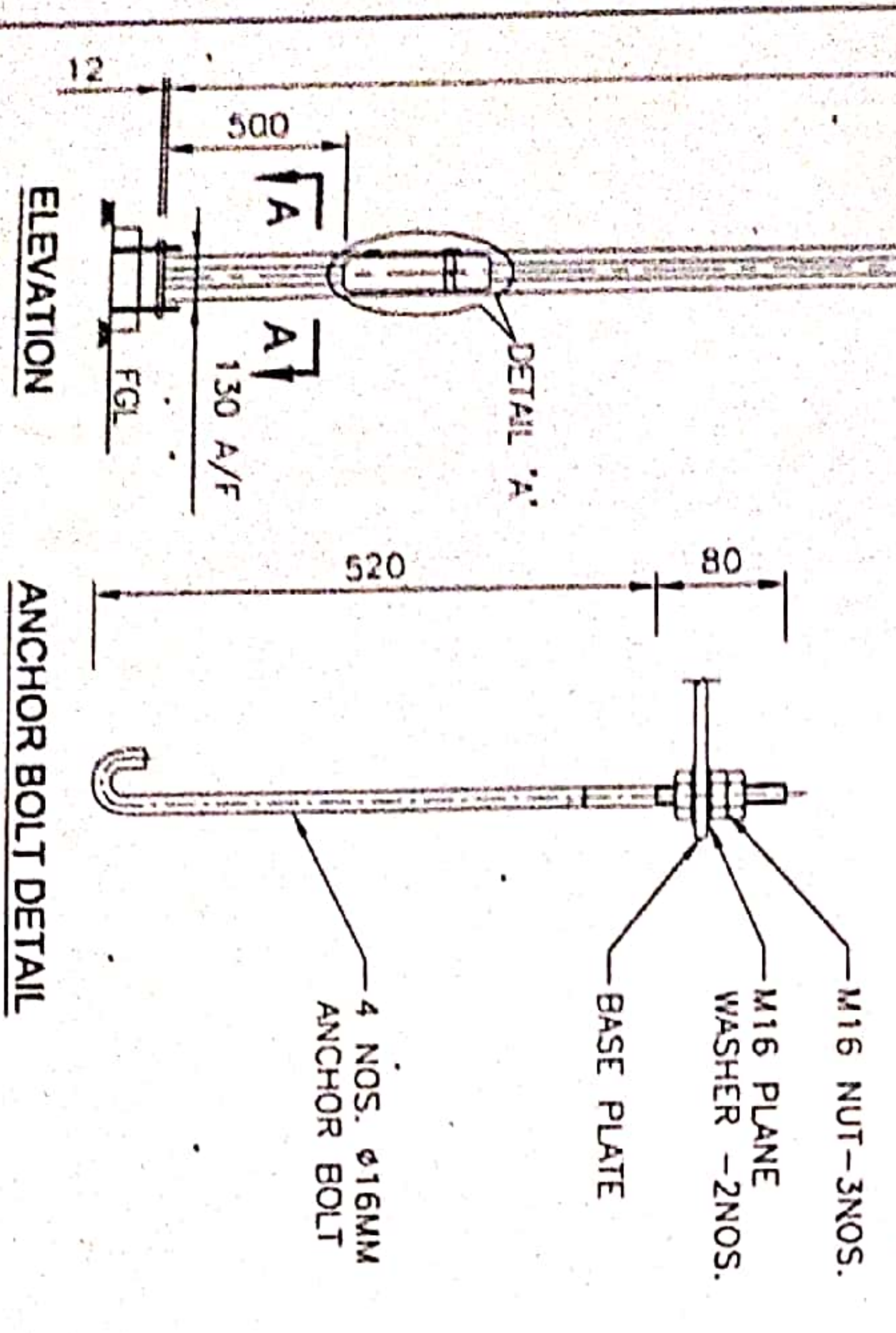
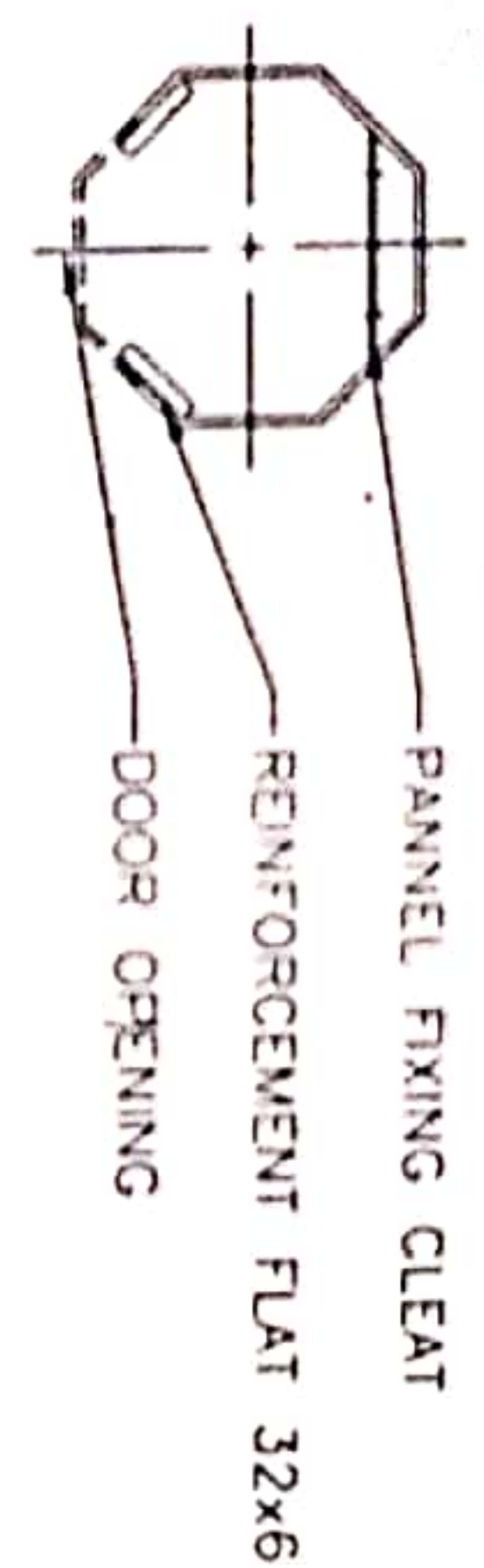
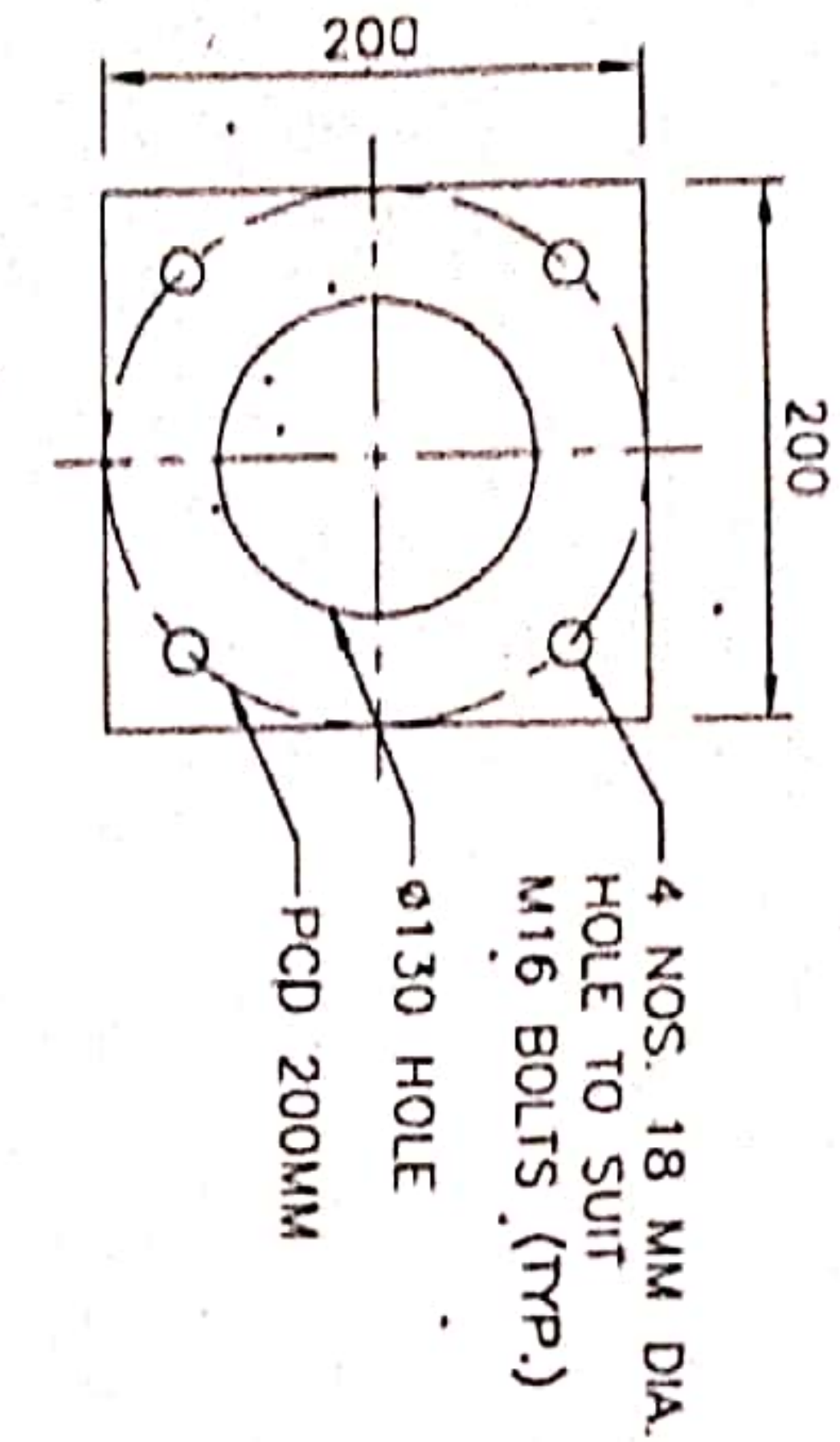
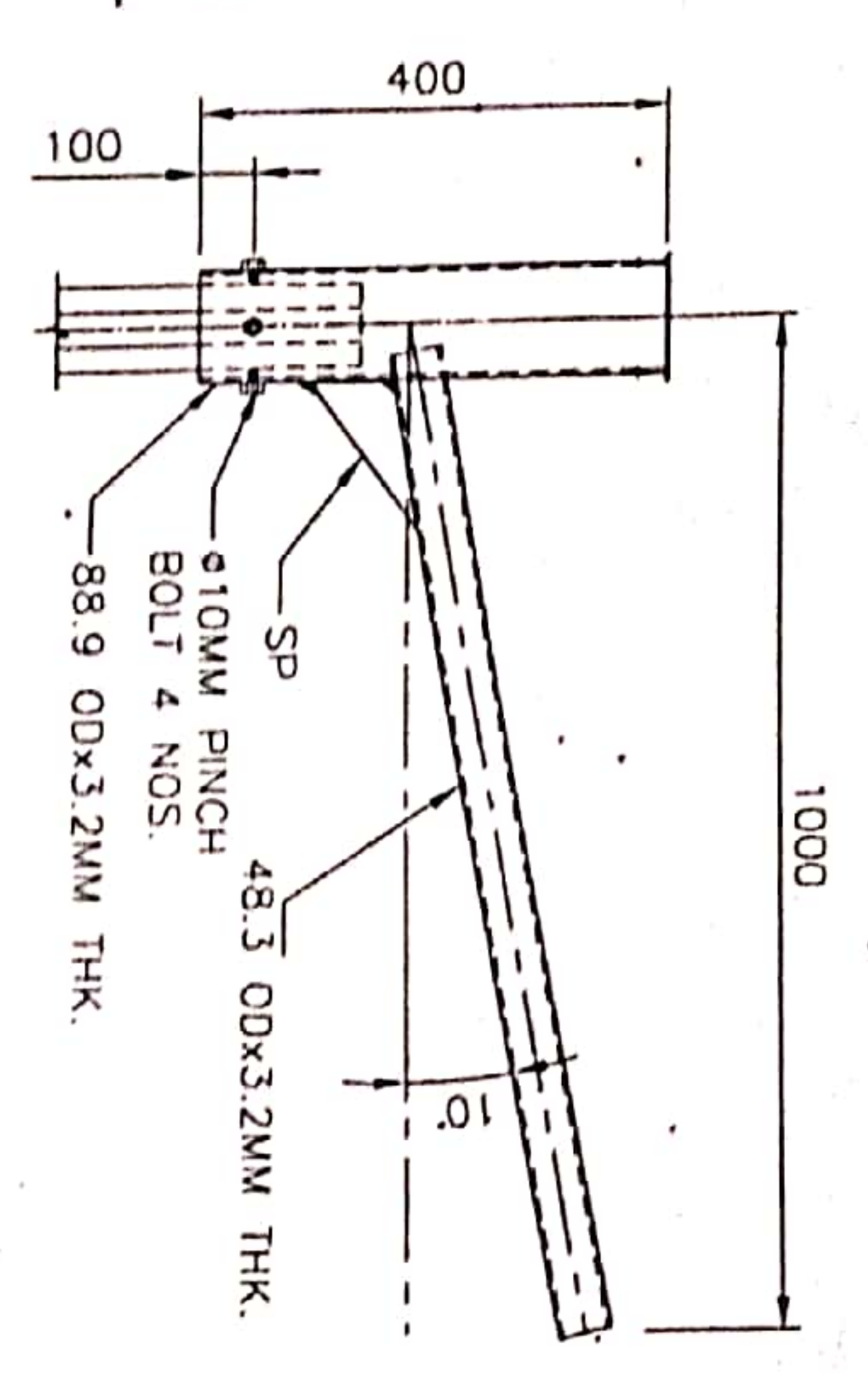
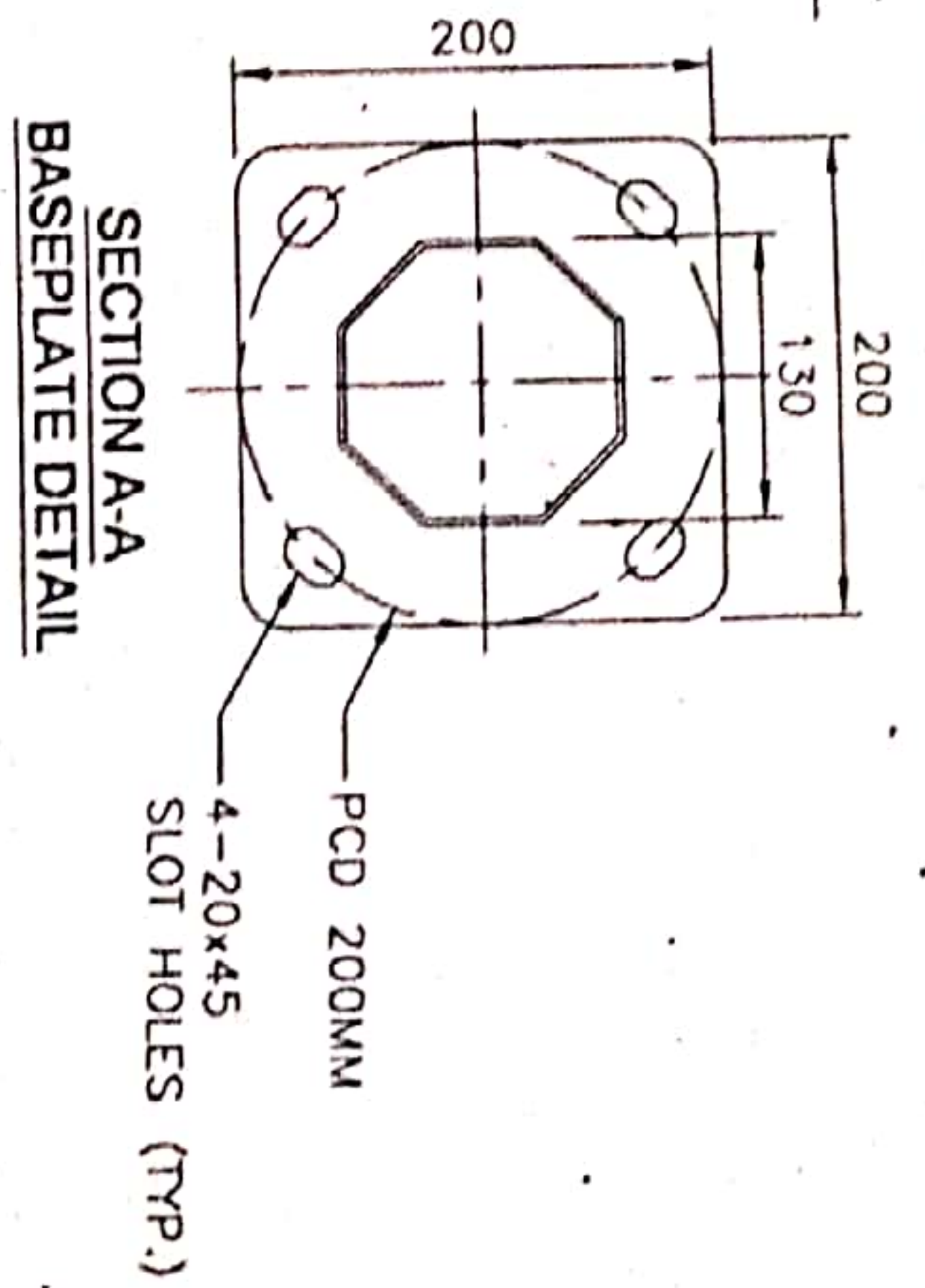
SSE/DRG/GNT



Note: Total Length of Bolt including 'J' - 600 MM







**NOTE: SUITABLE CONCRETE PLINTH AS PER OEM'S RECOMMENDATION**

1. ALL THE DIMENSIONS ARE IN MM MILLIMETERS.
2. DESIGN STANDARD BS5649
3. DESIGN CRITERIA-
  - 3.1 BASIC WIND SPEED 50 m/sec
  - 3.2 DESIGN LIFE IS 25 YEARS
  - 3.3 TOPOGRAPHY IS CONSIDERED AS FLAT
4. LOADING DETAILS: POLE SUITABLE FOR
  - 4.1 1 NO. LUMINAIRES WITH EACH PROTECTED AREA 0.11 SQM & WEIGHT 12 KG.
  - 4.2 10 M SINGLE ARM BRACKET.
5. MATERIALS -
  - 5.1 SHAFT: ASTM A572-50/S355 AS PER BSEN 10025/EQUIVALENT
  - 5.2 BASE PLATE: A36/ ASTM A572-50/EQUIVALENT
  - 5.3 ANCHOR BOLTS: EN8 GRADE (4#16x600Lg)
6. FINISHING: HOT DIP GALVANISED TO ASTM A123/BSEN ISO 1461/EQUIVALENT.
7. MINIMUM ANCHOR BOLT CAGE TEMPLATES SHOULD BE SUPPLIED 10% OF THE QUANTITY OF POLES.

DRG. NO GNT/E/M/01/2019  
GENERAL ARRANGEMENT FOR  
5M OCTAGONAL STREET LIGHT POLE  
WITH 1.0M 9A CAP TYPE BRACKET

S.D/E/M/GNT  
A.D/E/M/GNT  
SSE/DRG/GNT



# Technical specification of for the octagonal pole

Sl.No	description / parameters	Technical data for
		5m octagonal pole with single/double arm bracket
<b>I</b>	<b>POLE SHAFT</b>	
1	Material & Grade	a) Pole shaft - ASTM A572 -50/S355 as per BSEN 10025 b) Base plate - A572-50
2	Height (Mtr)	5
3	Pole Section (Single / Multiple)	Single
4	Top Dimension Of Pole (mm)	70
5	Bottom Dimension Of Pole (mm)	130
6	Sheet Thickness (mm)	3
7	Base Plate Size & Thickness (mm)	200 SQ. & 12 Thk.
8	Foundation Bolt Hole Diameter (mm)	16
9	Pitch Circle Diameter (mm)	200
10	Average Galvanization Thickness (Micron)	70
11	Hop Dip Galvanizing (Single Dip/ Double Dip)	Single dip
12	Utility Window	Vandal resistant & Weatherproof
13	Wind Speed	50m/s
<b>II</b>	<b>BRACKET ARM</b>	
1	Material & Grade	Mild steel (YS:240Mpa)
2	Bracket Arm (mm)	Single/ Double
3	Span Of Bracket Arm (mm)	1000
4	Diameter & Thk. Of Bracket Arm (mm)	48.3 or 38 mm dia as per site requirement with 3.2 thick.
5	Height Of Bracket Spigot (mm)	400
6	Diameter & Thk. Of Spigot (mm)	88.9 dia & 3.2 thk.
7	Average Galvanization Thickness (Micron)	70
<b>III</b>	<b>FOUNDATION BOLT</b>	
1	Type & Grade Of Bolts	J type & EN08
2	No. Of Bolts / Pole	4
3	Bolt Diameter (mm)	16
4	Total Length Of Bolt (mm) including 'J'	600
5	Threaded Length (Galvanised)	80
6	Grouting Length (Red Oxide Primer Coated) including 'J'	520
7	Nos. Of Nuts & Washers (Galvanised)	3 Nuts & 2 Washers
<b>IV</b>	<b>FOUNDATION PLINTH</b>	Suitable concrete plinth as per OEM's recommendation.



1- Scope of the tender:

Tenderers are invited to submit their offers for the supply of poles (7 m, 10 m, 12m and 15 m) octagonal galvanized steel, base plated poles for the street lighting of major traffic routes completed with anchor bolts and connection box with supporting plates through locked door.

2- General information:

The poles will be used for street lighting of minor and secondary roads of urban and rural areas intended for traffic and social safety purposes.

3- General requirements:

3-1 Ambient temperature:

Highest max. (In the shade)	55 deg.C <sup>0</sup> for about 6 hours a day
Lowest (min) .....	-10 deg. C <sup>0</sup>
Max yearly average .....	+30 deg .C <sup>0</sup>
Max daily average .....	+40 deg.C <sup>0</sup>

3-2 Sun temp.

Black object under direct sun shine may attain a temp of +80 deg. C<sup>0</sup>

3-3 Air humidity:

max .....	92% at 40 deg.C <sup>0</sup>
min .....	12%
yearly average .....	44%
max wind velocity	125 km/hr

3-4 Altitudes:

From sea level up to	1000m
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3- 5 Sand storms:

The poles are subjected to strong and frequent sand storms, adequate precaution must be taken to deal with, for suitable degree of protection.

3-6 Wind Velocity:

Max velocity (for design purpose) (140 KM/ HR).

3-7 Composition of Soil:

The soil consists mainly of hard clay containing deposit gravel.



#### 4- Technical requirements :

##### 4-1 System data:

<b>a.11 KV System</b>	
Nominal voltage	11000 volts
Highest system voltage	12000 volts
System	3-phase, 3wire neutral earthed through resistance of 21.1 Ohm limiting the earth fault current to 300A
Short circuit breaking current	25 KA R.M.S at 11000 volts

<b>b. 0.4 kV system</b>	
Nominal voltage	400 Volts
System	3phases, 4 wires with neutral solidly grounded.
Frequency	50 Hz

##### 4-2 Standards:

All equipment and accessories shall be with the latest issue of the international electro - technical commission (I.E.C) specifications, where there specifications are incomplete or not yet published, then national standards of tenderers country shall be considered subject to our approval. EN10025 or NFEN 10/49 for steel grades (for high yield strength steels). NFP 22- 470, 22-471 and 22-473 for welding. ASTMA 123, BS729, NF A 91-121 for galvanization.

##### 4-3 Deviations:

The tenderer shall particularly mention in his tender all deviations of his offer from the specification described in these tender documents.

##### 4-4 Types of poles:

Four types of poles are required, 7, 10, 12 and 15 meter height.

#### 5- General specifications:

The street lighting poles shall be manufactured from steel sheets and having the following features.

##### 5-1 Shaft:

5-1-a 7, 10 meter height galvanized steel shaft octagonal cross section and tapered from bottom to top, and made of one piece.

5-2-b 12, 15 meter height galvanized steel shaft with octagonal cross section and tapered from bottom to top, and made from two pieces joined together by slip joint method, the slip joint overlap must be at least 1.5 times the largest inside diam. of the female section.

5-3-c For all types, the thickness of the shaft wall will be 4mm minimum.



#### 5-4 Inspection door:

For all types, the shaft may be equipped with inspection door, it may have a triangle key that forces the door out when opening, the door may be at 500 mm above ground level and its dimensions do not exceed 400 mm.

#### 5-5 Base plate :

All types may have a base plate welded to the lower part of the shaft from outside and inside to serve for fixing the shaft to concrete foundation by means of four bolts, thickness of the plate shall not be less than 25 mm, and its dimensions are 400x400 mm with a center distance 300x300 mm between holes, the shapes of holes are oval.

#### 5-6 Anchor bolts :

For all types, 4 anchor bolts with j-shaped made of steel grade at least equivalent to the grade of the steel used for the shaft, each bolt provided with a washer and 3 nuts, for 10m pole dimension of the bolt may be 24 mm diam, 500mm length, and for 15m, 27mm diam, 700 mm length.

#### 5-7 Mini brackets :

All types may be fitted by single or double bracket made of galvanized steel tube with arm outreach=800mm and angle of tilt =15°. The arm mounted on the top of the shaft and able to support single or doubled lanterns of 60mm side entry, the arm shall hold in its position by headless screws.

#### 5-8 connection box:

All types may have a connection box made from fiber glass reinforced polyester used as connector for supply cable and fitted by 10 amp m.c.b, the main cable should be 4x (16-25)mm<sup>2</sup> copper.

#### 5-9 Supporting plate :

All types may have supporting plate made from galvanized steel used for mounting inside the shaft and supporting cable connection box, details of fixing arrangement shall be given to the successful tenderer.

#### 5-10 Earthing connection:

For all types an earthing connection point may be provided inside the shaft near the door opening without reducing the space of electrical gear.

#### 5-11 Galvanization :

All components of street lighting poles may be hot-dip galvanized, all component must be well protected against corrosion, minimum thickness of zinc coatings is 85 µm and min density 500 gm/m<sup>2</sup> on both inside and outside surfaces.

#### 6- Drawings and documents :

The tenderer may specify the following clearly:

##### 6-1 Thickness of galvanization.



6-2 Operational sequence of the galvanization procedure.

6-3 Dimension of the foundation for the following soil bearing capacities:

- 0.5 kgm/ sqcm
- 1.0 kgm/ sqcm
- 1.5 kgm/ sqcm
- 2.0 kgm/ sqcm

6-4 Total area subjected to wind pressure and loading.

6-5 The poles may be used with lanterns weight appr.30kg. The manufacturer may give guarantee that poles can support such weight, all calculations must be submitted.

6- 6 Dimension of pole at top and bottom and dimensions of base plate.

6-7 Shaft wall thickness.

6-8 Max weight (kg)

6-9 Foundation volume ( m<sup>3</sup> )

6-10 Max. Bending moment. (m.kg)

6-11 Max shear stress (kg)

6-12 Foundation plan and elevation.

6-13 Detail drawings for the poles.

6-14 The standard at which the poles are manufactured and welding and galvanization standards must be stated and shall be an internationally acceptable standards.

6-15 Dimensions, details and drawings of mini-brackets with arms.

## **7- Tests:**

### **A- Type test:**

Type test certificates to prove the general design of the poles must be submitted , the certificates are for test have been carried out on identical equipment and detailed in the relevant I.E.C which pertain to the equipment being tested .

### **B- Routine test:**

The tests shall be carried out on our behalf by our inspector (international inspection bureau) witnessed by our engineers.

- Mechanical, impact and deformation tests.
- Visual inspection and dimensional checks.
- Any other tests given by the relevant I.E.C recommendation.



**8- Spare Parts:**

- Necessary and recommended spare parts.

**9 - Samples:**

The following items should be submitted with the offer (offers without sample will be rejected).

- A. Cable terminals M.C.BS box.
- B. Anchor bolt with nuts and washers.

**Schedule of material**

1- Complete pole include (shaft with hinged door, welded base plate.) for:

- A: 7 m pole
- B: 10 m pole
- C: 12 m pole (two-pieces).
- D: 15 m pole (two-pieces).
- E: others

2- Supporting plate with cable terminal M.C.BS box suitable for cable 4x (16-25) mm<sup>2</sup> copper.

3-Anchor bolts, complete set (4 anchor bolts with 12 nuts and 4 spring washers).

4- Mini – bracket with arm:

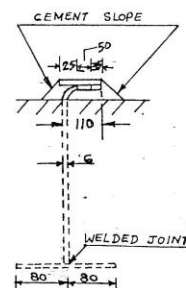
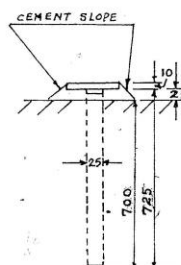
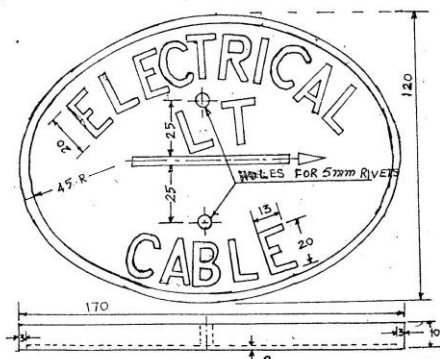
- A: For single lantern.
- B: For double lantern.

5- Accessories:

All necessary accessories:

- A: Arm supporting screws.
- B: Triangle keys.



**DRAWING NO. DEE/CN/BZA/2001/23****DRAWING FOR CABLE ROUTE INDIACTORS****NOTE:**

1. CABLE MARKERS AND STEMS SHOULD BE DIPPED IN HOT TAR AND ALLOWED TO DRY.
2. TABLETS ON ELECTRICAL CABLE MARKERS TO BE PAINTED RED.
3. ALL DIMENSIONS ARE IN MM.
4. THIS DRAWING HOLDS GOOD FOR HT POWER CABLE ALSO THE LETTERING SHOULD BE SUITABALLY MODIFIED.

SOUTH CENTRAL RAILWAY	
ELECTRICAL CABLE MARKER	
DRG. NO. DEE/CN/BZA/2001/23	
SCALE	NTS
DATE	21-11-2001
DRAWN	B. P. L. G. G.

DEE/CYB:

Technical Specification of the 4 feet 20W LED Batten Light		
S No	Parameters	Specification
1	LED Make	OSRAM / NICHIA / CREE / SAMSUNG / SEOUL / LUMILEDS / PHILIPS / SYSKA / LUMENMAX / EVERLIGHT / EDISON / BRIDGELUX / NATIONSTAR / REFOND/APT or any other LED with LM-80 certified by National/International Accredited Certifying Agencies
2	LED type	SMD LED Chip
3	Lamp/ System Efficacy	100 Lumens/Watt
4	LED Life	Minimum 50,000 Burning Hours
5	Lumen Maintenance	L <sub>70</sub>
6	Beam Angle	> / = 120°
7	Rated Voltage	220 to 240V, 50 Hz
8	Input Operating Voltage	100 to 300V, 50 Hz
9	Driver Type	In built Constant Current Driver with Short Circuit Protection
10	Surge Protection	Up to 2.5 KV
11	Insulation Class	CLASS-II
12	THD	≤ 15%
13	Efficiency Of Driver Electronic	> / = 85%
14	Correlated Colour temperature (CCT)	6500K
15	Color Rendering Index	>/=70
16	Power Factor	≥ 0.90
17	Lamp Cover	Polycarbonate diffusers
18	Length	1150+/- 5 mm
19	Construction of Housing	Aluminium Powder Coated
20	Ingress Protection	≥ IP 20
21	Warranty	5 YEAR

**Note:** 1. Firm shall submit BIS CRS compliance as per IS 10322 (Part 5 sec 1 2012: latest)  
2. Firm shall submit photo-biological safety certificate of LEDs as per IS:16108/2012/IEC:62471:2006

3. Firm shall submit ISO Certification: ISO: 9001:2015

4. Firm shall submit LM 79/ IS: 16106 test reports for luminaire from NABL accredited laboratory and LM-80/IS: 16105 test reports for LEDs should be from accredited National/International Certifying agencies. LM79 report with wattage variation up to ±5% of the specified rating is acceptable.

5. Firm shall submit warranty (for free replacement) certificate for 5 years along with supply.

Technical Specification of the LED BULB		
S No	Parameters	Specifications
1	LED Make	OSRAM / NICHIA / CREE / SAMSUNG / SEOUL / LUMILEDS / PHILIPS / SYSKA / LUMENMAX / EVERLIGHT / EDISON / BRIDGELUX / NATIONSTAR/ REFOND/APT or any other LED with LM-80 certified by National/International Accredited Certifying Agencies
2	Type of LED	SMD chip
3	Lumen Output / Efficacy of the System	$\geq 100$ Lumens/W
4	LED Bulb Life	$\geq 25,000$ Burning Hours
5	Nominal Voltage	220-240V, 50 Hz
6	Input Operating Voltage	90-300V, 50 Hz
7	Cap Base	B22
8	Main Housing / Heat Sink Material	Aluminium Inserted Thermo Plastic
9	Bulb Cover	UV Stabilized Poly carbonate
10	Beam Angle	$>140^\circ$
11	Correlated Colour temperature (CCT)	6500 K
12	Color Rendering Index (CRI)	$>75$
13	Power Factor (PF)	$\geq 0.90$
14	Ingress Protection (IP)	IP 20
15	Surge Voltage/Protection	To Withstand 2.5 kV
16	Driver Efficiency	$\geq 85\%$
17	Total Harmonics Distortion	$\leq 15\%$
18	Lumen Maintenance	25000 hours @ L70
19	Warranty	3 year

- Note:**
1. Firm shall submit BIS CRS compliance as per IS 10322 (Part 5 sec 1 2012: latest)
  2. Firm shall submit LM-80/ IS: 16105 test reports for LEDs should be from accredited National/ International Certifying agencies.
  3. Firm shall submit LM-79/ IS: 16102 Part-I test reports for LEDs should be from accredited National/ International Certifying agencies.
  4. Firm shall submit warranty (for free replcement) certificate for 3 years along with supply.

Technical Specification of the LED Panel Lights		
S No	Parameters	Specification
1	LED Make	OSRAM / NICHIA / CREE / SAMSUNG / SEOUL /LUMILEDS / PHILIPS / SYSKA / LUMENMAX /EVERLIGHT / EDISON / BRIDGELUX / NATIONSTAR/ REFOND/APT or any other LED with LM-80 certified by National/International Accredited Certifying Agencies
2	Type LED	SMD on chip
3	System/ Lamp Efficacy	100 Lum/W
4	LED Life	>25000 Hrs
5	Lumen Maintenance	L <sub>70</sub>
6	Rated Voltage	220-240V, 50 Hz
7	Input Operating Voltage	90V-300V, 50 HZ
8	Driver Type	SELV Class-II driver with constant current output , short circuit protection with in built high & low voltage cutoff.
9	Surge Protection	Upto 2.5KV
10	Insulation Class	CLASS-II
11	THD	≤ 15%
12	Efficiency Of Driver Electronics	≥ 85%
13	Correlated Colour temperature (CCT)	6500 K( +/-500k)
14	Color Rendering Index	>80
15	Beam Angle	≥120°
16	Power Factor	≥ 0.90
17	Construction of Housing	CRCA powder coated white after phosphochromate treatement/ Pressure Die cast aluminium
18	Optics	High Transmittance opal diffuser /Polycarbonate Diffuser
19	Mounting	Surface/ Recessed
20	Ingress Protection	IP 20
21	Warranty	5 years

- Note:**
1. Availability of BIS CRS compliance as per IS 10322 (Part 5 sec 1 2012: latest)
  2. Photo biological safety of LEDs as per IS:16108/2012/IEC:62471:2006
  3. ISO Certification: ISO: 9001:2015
  4. Firm shall submit LM 79/ IS: 16106 test reports for luminaire from NABL accredited laboratory and LM- 80/IS: 16105 test reports for LEDs should be from accredited National/International Certifying agencies. LM79 report with wattage variation up to ±5% of the specified rating is acceptable.
  5. Firm shall submit warranty (for free replacement) certificate for 5 years along with supply.

Technical Specification of the 4 feet 40W LED Batten Light		
S No	Parameters	Specification
1	LED Make	OSRAM / NICHIA / CREE / SAMSUNG / SEOUL / LUMILEDS / PHILIPS / SYSKA / LUMENMAX / EVERLIGHT / EDISON / BRIDGELUX / NATIONSTAR/ REFOND/APT or any other LED with LM-80 certified by National/International Accredited Certifying Agencies
2	LED type	SMD LED Chip
3	Lamp Efficacy	100 Lumens/W
4	wattage	40 W
5	LED Life	50000 Hrs
6	Lumen Maintenance	L <sub>70</sub>
7	Beam Angle	> / = 120°
8	Rated Voltage	220-240V, 50 Hz
9	Input Operating Voltage	140 to 270V, 50 Hz
10	Driver Type	Constant Current Driver with Short Circuit Protection
11	Surge Protection	Up to 4 KV
12	Driver Components	Industrial Grade Only
13	Insulation Class	Class-II
14	THD	≤ 15%
15	Efficiency Of Driver Electronic	> / = 85
16	Correlated Colour temperature (CCT)	5700K-6500K
17	Color Rendering Index	80
18	Power Factor	≥ 0.90
19	Lamp Cover	UV stabilized Polycarbonate
20	Length	1150+/- 5mm
21	Construction of Housing	Aluminium Powder Coated
22	Ingress Protection	≥ IP 20
23	Warranty	5 YEARS

- Note:**
1. Firm shall submit BIS CRS compliance as per IS 10322 (Part 5 sec 1 2012: latest)
  2. Firm shall submit Photo biological safety of LEDs as per IS:16108/2012/IEC:62471:2006
  3. Firm shall submit ISO Certification: ISO: 9001:2015
  4. Firm shall submit LM 79/ IS: 16106 test reports for luminaire from NABL accredited laboratory and LM- 80/IS: 16105 test reports for LEDs should be from accredited National/International Certifying agencies. LM79 report with wattage variation up to ±5% of the specified rating is acceptable.
  5. Firm shall submit warranty (for free replacement) certificate for 5 years along with supply.

Technical Specification of the High Bay Light		
S No	Parameters	GTL SPEC
1	LED Make	OSRAM / NICHIA / CREE / SAMSUNG / SEOUL / LUMILEDS / PHILIPS / SYSKA / LUMENMAX / EVERLIGHT / EDISON / BRIDGELUX / NATIONSTAR/ REFOND/APT or any other LED with LM-80 certified by National/International Accredited Certifying Agencies
2	LED type	SMD LED Chip
3	Lamp Efficacy	120 Lumens/W
4	LED Life	Minimum 50,000 Burning Hours
5	Lumen Maintenance	L <sub>70</sub>
6	Beam Angle	> / = 120°
7	Rated Voltage	220 to 240V, 50 Hz
8	Input Operating Voltage	140 to 270 V, 50 Hz
9	Higher Cut off Voltage	300V, 50 Hz
10	Driver Type	Constant current
11	Surge Protection internal	Up to 5 KV
12	Surge Protection external	Up to 10 KV
12	Other protections	Output Short Circuit Protection, Output Overload Protection, Input Over Voltage Protection, Input and Output Reverse Polarity and as per IS10322/Part 5/Section 3
13	Insulation resistance between earth and current carrying part - Minimum (in	100 Mega Ohm
13	THD	≤ 10%
14	Efficiency Of Driver Electronic	> / = 85%
15	Correlated Colour temperature (CCT)	5500K-6500K
16	Color Rendering Index	> / = 70
17	Power Factor	≥ 0.95 at full load
18	Driver components	Industrial grade.
19	Optical Lens material	Poly carbonate Lense (UV stabilized)
20	Housing of Luminaire	Epoxy powder coated Pressure die casted aluminium alloy with higher thermal conductivity, Material of the fasteners: Stainless steel (Grade - 304),
21	Heat Sink	Heat sink: The heat sink provided with die-cast aluminium along with sufficient heat sink fins to dissipate heat effectively,
22	Lamp (Luminaire) cover:	Heat Resistant Toughened UV Glass/Clear Polycarbonate
23	PCB:	MCPCB provided with FR4 grade minimum 0.8 to 1.0 mm thick or more
24	Shape of Luminaire	Round
25	Provision of luminaire connecting wire along with the supply of material	25 cm (ISI marked)
26	Marking	As per IS 10322 ( Part I) - 1982 or latest amendments
27	Ingress Protection	IP 65
28	Impact Resistnace	IK 07
29	Warranty	5 year

- Note:**
1. Firm shall submit Availability of BIS CRS compliance as per IS 10322 (Part 5 2012: latest)
  2. Firm shall submit ISO Certification: ISO: 9001:2015
  3. Firm shall submit LM 79/ IS: 16106 test reports for luminaire from NABL accredited laboratory and LM- 80/IS: 16105 test reports for LEDs should be from accredited National/International Certifying agencies. LM79 report with wattage variation up to ±5% of the specified rating is acceptable.
  4. Firm shall submit warranty (for free replacement) certificate for 5 years along with supply.

Technical Specification of the Flood Light.		
S No	Parameters	Specifications
1	LED Make	OSRAM / NICHIA / CREE / SAMSUNG / SEOUL / LUMILEDS / PHILIPS / SYSKA / LUMENMAX / EVERLIGHT / EDISON / BRIDGELUX / NATIONSTAR/ REFOND/APT or any other LED with LM-80 certified by National/International Accredited Certifying Agencies
2	LED type	SMD LED Chip
3	Lamp/ System Efficacy	100
4	LED Life	Minimum 50,000 Burning Hours
5	Lumen Maintenance	L <sub>70</sub>
6	Type of LED Luminaire as per the IS 16107(Part 2/Section 1	Type B
7	Types of LED Modules [as per the IS 16103 (Part 2)]	Type 3
8	Beam Angle	> / = 120°
9	Rated Voltage	220 to 240V
10	Input Operating Voltage	140 to 270 volt
11	Higher Cut off Voltage	300V
12	Driver standard	IS 15885 (Part 2/Section 13)
13	Surge Protection internal	Up to 5 KV
14	Surge Protection external	Up to 10 KV
15	Other protections	Output Short Circuit Protection, Output Overload Protection, Input Over Voltage Protection, Input and Output Reverse Polarity and as per IS 10322/Part 5/Section 3
16	High Voltage Test	To be Passed for 1.5 KV for one minute between supply terminals and body of the unit
17	Insulation resistance between earth and current carrying part - Minimum	100 Mega Ohm
18	THD	≤ 10%
19	Efficiency Of Driver Electronic	> / = 85%
20	Correlated Colour temperature (CCT)	5500K-6500K
21	Color Rendering Index	> / = 70
22	Power Factor	≥ 0.95
23	Driver components	Industrial grade,
24	Optical Lens material	Poly carbonate Lense (UV stabilized)
25	Housing of Luminaire	Corrosion resistant powder coated Pressure die casted aluminium alloy with higher thermal conductivity, Material of the fasteners: Stainless steel (Grade - 304),
26	Heat Sink	Heat sink: The heat sink provided with die-cast aluminium along with sufficient heat sink fins to dissipate heat effectively,
27	Lamp (Luminaire) cover:	Heat Resistant Toughened UV Glass/Clear Polycarbonate
28	PCB:	MCPCB provided with FR4 grade minimum 0.8 to 1.0 mm thick or more
29	Construction of Luminaire Body	Moulded / Extruded silicon loop gasket provided in the luminaire body to ensure a weatherproof seal between the UV Glass cover and the metal housing to exclude the entry of dust, water, insects, etc., and the
30	Provision of luminaire connecting wire along with the supply of material	50 cm (ISI marked)
31	Marking	As per IS 10322 (Part I) - 1982 or latest amendments
32	Ingress Protection	IP 66
33	Warranty	5 year

- Note:**
1. Firm shall submit BIS CRS compliance as per IS 10322 (Part 5 sec 5 2012: latest)
  2. Firm shall submit ISO Certification: ISO: 9001:2015
  3. Firm shall submit LM 79/ IS: 16106 test reports for luminaire from NABL accredited laboratory and LM-
  4. Firm shall submit warranty (for free replacement) certificate for 5 years along with supply.

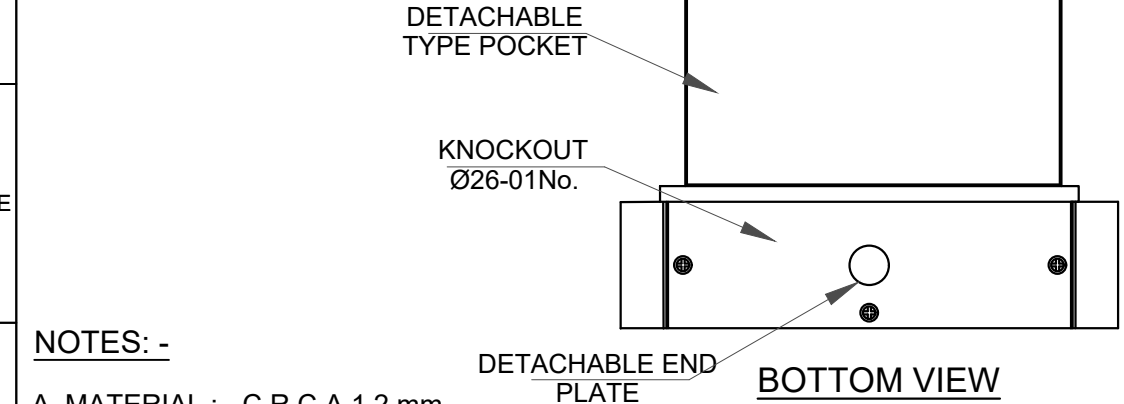
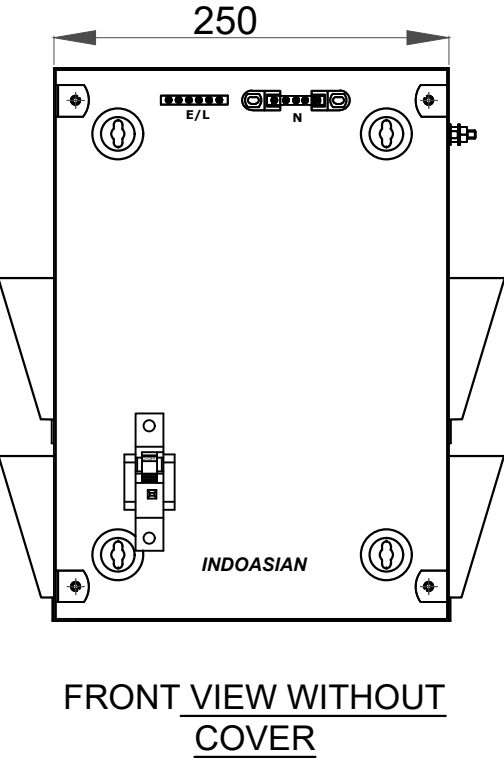
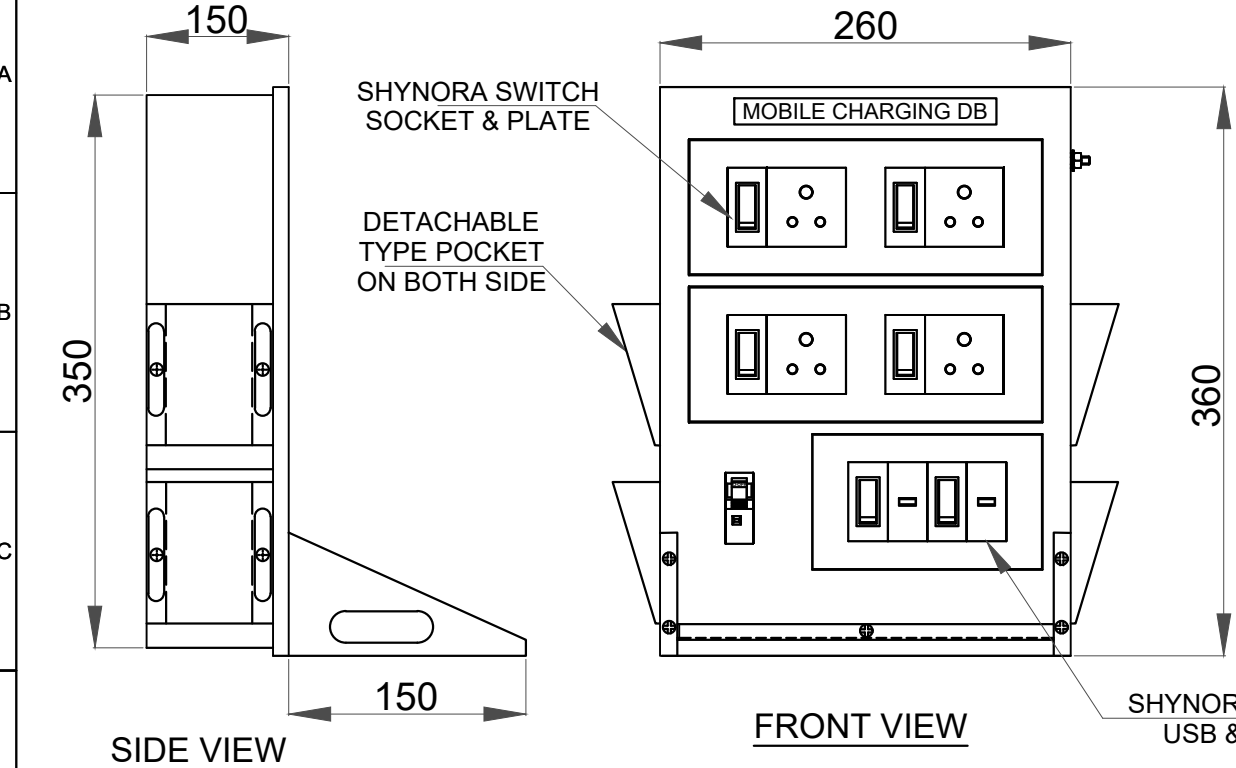
Technical Specification of the Street Light		
S No	Parameters	Specification
1	LED Make	OSRAM / NICHIA / CREE / SAMSUNG / SEOUL / LUMILEDS / PHILIPS / SYSKA / LUMENMAX / EVERLIGHT / EDISON / BRIDGELUX / NATIONSTAR / REFOND/APT or any other LED with LM-80 certified by National/International Accredited Certifying Agencies
2	LED type	SMD LED Chip
3	Lamp/ System Efficacy	120
4	LED Life	Minimum 50,000 Burning Hours
5	Lumen Maintenance	L <sub>70</sub>
6	Beam Angle	> / = 120°
7	Rated Voltage	220 to 240V
8	Input Operating Voltage	90 to 300 Volts
9	Higher Cut off Voltage	300V
10	Driver Type	Industrial Grade
11	Surge Protection internal	Up to 4 KV
12	Surge Protection external	Up to 10 KV
13	Other protections	Output Short Circuit Protection, Output Overload Protection, Input Over Voltage Protection, Input and Output Reverse Polarity and as per IS10322/Part 5/Section 3
14	Insulation Class	Class-I
15	THD	≤ 20%
16	Efficiency Of Driver Electronic	> / = 85
17	Correlated Colour temperature (CCT)	5700K-6500k
18	Color Rendering Index	> / = 70
19	Power Factor	≥ 0.90
20	Driver components	Industrial grade,
21	Optical Lens material	Poly carbonate lens / PMMA
22	Housing of Luminaire	Corrosion resistant powder coated Pressure die casted aluminium alloy with higher thermal conductivity, Material of the fasteners: Stainless steel (Grade - 304),
23	Heat Sink	The heat sink provided with die-cast aluminium along with sufficient heat sink fins to dissipate heat effectively,
24	Lamp (Luminaire) cover:	Heat Resistant Toughened UV Glass/Clear Polycarbonate
25	PCB:	MCPCB provided with FR4 grade minimum 0.8 to 1.0 mm thick or more
26	Construction of Luminaire Body	Moulded / Extruded silicon loop gasket provided in the luminaire body to ensure a weatherproof seal between the UV Glass cover and the metal housing to exclude the entry of dust, water, insects, etc., and the
27	Provision of luminaire connecting wire along with the supply of material	40 cm (ISI marked )
28	Marking	As per IS 10322 ( Part I) - 1982 or latest amendments
29	Ingress Protection	IP 66
30	Warranty	5 year

- Note:**
1. Firm shall submit BIS CRS compliance as per IS 10322 (Part 5 sec 3 2012: latest)
  2. Firm shall submit ISO Certification: ISO: 9001:2015
  3. Firm shall submit LM 79/ IS: 16106 test reports for luminaire from NABL accredited laboratory and
  4. Firm shall submit warranty (for free replacement) certificate for 5 years along with supply.



Technical Specification of the BLDC 1200MM Ceiling Fan		
S No	Parameters	Specification
1	Motor	Brushless DC (BLDC)
2	Sweep Size	1200 mm
3	Min. Air Delivery	220 Cu.m/ min
4	BEE Star Rating	5 Star
5	Power Consumption & Power Factor	28 Watts & 0.9
6	Speed	Variable Speed
7	Total Harmonic Distortion	$\leq 10\%$
8	Speed Control	IR Remote operated
9	Service value of Fan m <sup>3</sup> /min/W	$\geq 6.0$
10	Voltage Range	140V to 240V
11	Class of Insulation	Class B
12	Standard Color	White/Cream/Ivory
13	Blade Thickness and No. of Blades	1.1 mm and 3
14	Blade material	Aluminium
15	Double Ball Bearing	Yes
16	Down Rod Size ( Without Shackle)	300 mm
17	Shank Thickness (Min.)	2 mm
18	Shackle Thickness (Min.)	2 mm
19	Canopy	2 No's
20	Marking of Each Ceiling fan	As per clause 8.1 of IS 374
21	Testing	Type Testing reports to be submitted, Issued any NABL accredited certifying agency
22	Warranty	5 Years
23	Governing BIS Specifications	IS: 374/2019 or latest amendment - Specification for Electric Ceiling Fan that covers Performance and safety requirements of BLDC fans

ACTUAL LAYOUT MAY BE DIFFERENT IN PRODUCTION THIS IS ONLY FOR REFERENCE



NOTES: -

- A. MATERIAL : - C.R.C.A 1.2 mm
- B. POWDER COATING : - ERA WHITE.
- C. GENERAL TOLERANCE : -  $\pm 5.0$  mm
- D. ALL DIMENSIONS ARE IN MM.
- E. DEGREE OF PROTECTION IS IP-20.

LEGENDS: -

- 1. INCOMER : OPTIPRO SP MCB 6A C TYPE - 01 No. (MAKE:INDOASIAN).
- 2. BRASS NEUTRAL LINK 9X6 MM & ALUMINIUM EARTH LINK SIZE 8X6 MM.
- 3. SOCKET WIRING IN 1.5Sqmm FRLS PVC CABLE.
- 4. 6A 3PIN SHYNORA SOCKET (Cat. 810620)-04Nos..
- 5. 6A 1WAY SHYNORA SWITCH (Cat. 810600)-06Nos.
- 6. 6A 1Module SHYNORA Double USB Charger 3000mA,15W Type A+C (Cat. 810669)-01No.

CLASS	DIMENSIONS IN mm					Shorter side length X				Tolerances for threads (no indication) :		
	0.5 - 3	3 - 6	6 - 30	30 - 120	> 120	0 - 10	10 - 50	50 - 120	120 - 400		Screw	Nut
FINE	$\pm 0.05$	$\pm 0.05$	$\pm 0.1$	$\pm 0.15$	$\pm 0.2$	$\pm 1^*$	$\pm 30^*$	$\pm 20^*$	$\pm 10^*$	Fine	6g	6H
MEDIUM	$\pm 0.1$	$\pm 0.1$	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 1^*$	$\pm 30^*$	$\pm 20^*$	$\pm 10^*$			
COARSE	$\pm 0.2$	$\pm 0.3$	$\pm 0.5$	$\pm 0.8$	$\pm 1.2$	$\pm 1^*30^*$	$\pm 1^*$	$\pm 30^*$	$\pm 30^*$	Coarse	6e	6G
VERY COARSE	---	$\pm 0.5$	$\pm 1$	$\pm 1.5$	$\pm 2.5$	$\pm 3^*$	$\pm 2^*$	$\pm 1^*$	$\pm 30^*$			
Material SEE NOTES		Surface Treat. SEE NOTES		Thermal Treat. ---		Surface area Total (cm <sup>2</sup> ) ---		Qty. 2000		Weight (g)		
A4		Supersedes		Scale N.T.S.		Date 25.09.2024		DGND. B.K.		APPD. S.K.		
TITLE :-		MOBILE CHARGING SINGLE DOOR DB		Drawing No.		91009203		Revision		02		
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