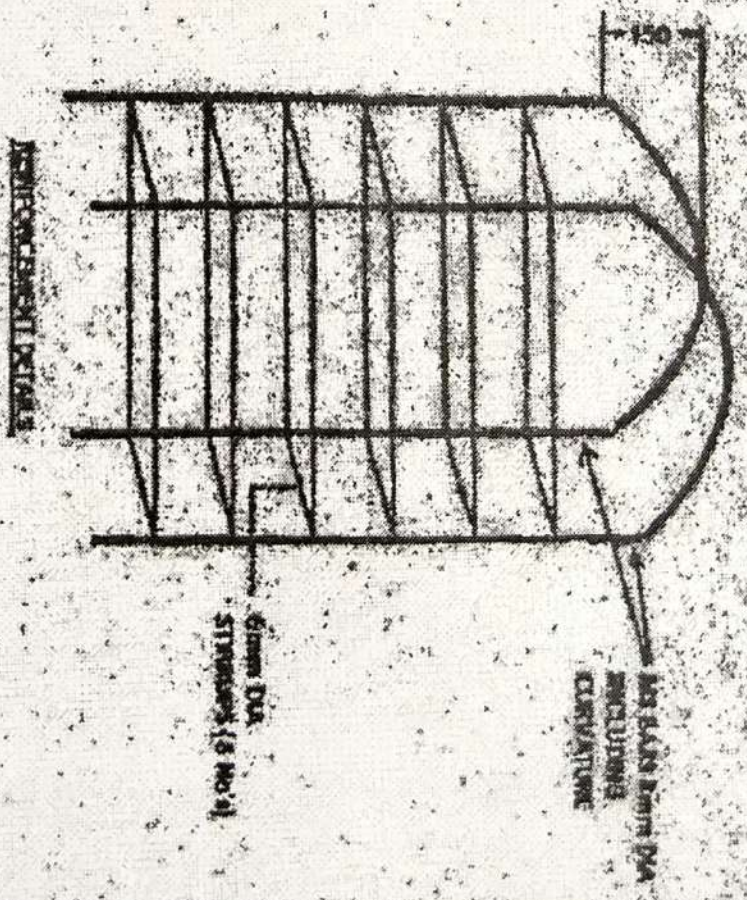
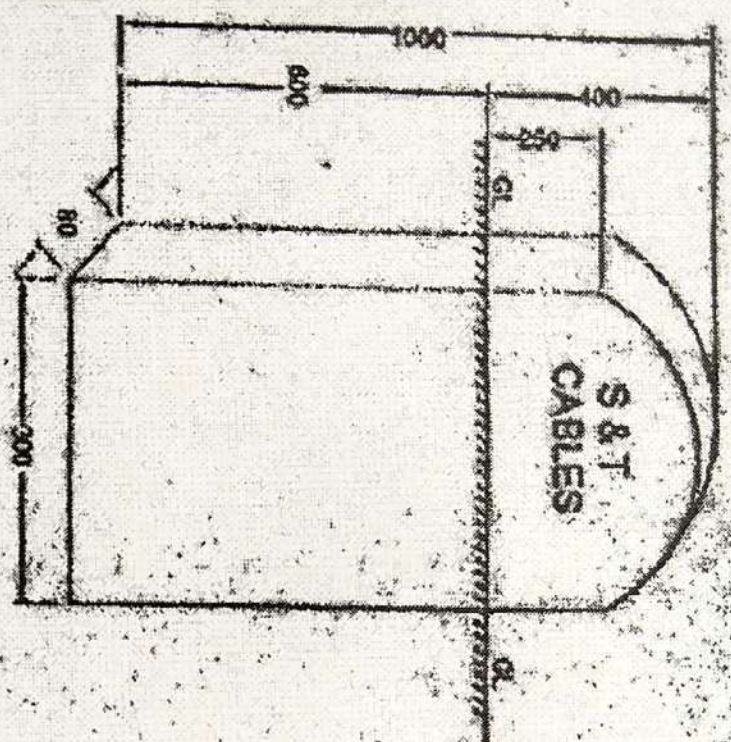


Ref No 40807



NOTE:

1. CONCRETE MIX SHOULD BE 1 CEMENT 2 SAND AND 4 HARD STONE AGGREGATE 12 MM BABY BALLAST/CHIPS
 2. ONE SIDE 'S&T' AND OTHER SIDE 'S&T' TO BE ENGRAVED CABLES
 3. FINISHING SHOULD BE SMOOTH FOR A DISTANCE OF 450 mm FROM TOP
- (ALL DIMENSIONS ARE IN MM)

At Name of Zonal Railway

Reddichangal 31/12/18

Kamlesh Chandra

WORK SHEET		FOUNDATION FOR CABLE ROUTE MARKER	
DATE	DESIGNED	DATE	(NOT TO SCALE)
21/12/18	25/12/18	21/12/18	
SP	1. CSTE	DRG NO.	BK-12710

21/12/18

ANNEXURE-III

ITEM No. A-9(SOR-2025)

LIST OF SCAFFOLDING MATERIAL REQUIRED FOR ONE CABLE TERMINATION RACK.

SN	DESCRIPTION	SIZE	UNIT	QTY
1.	Cable termination complete with all fixtures, fasteners and spares		Nos	1
2.	Top frame angle for relay rack 12 way) 6mmthick	65x65x1104mm	Nos	1
3.	Bottom frame angle for relay rack (2 way) 6mmthick	65x65x1104mm	Nos	1
4.	Vertical support angle RH	6mm thickx65x65	Nos	1
5.	Vertical support angle LH	6mm thickx65x65	Nos	1
6.	Triangle base assembly with J' bolts nuts, springs and plain washer		Nos.	2
7.	Insulators with two stud each with flat and spring washer	12mm x 20mm & 12mm x 25mm	Nos	4
8.	L Bracket re cable support assembly complete with fixtures and fasteners.		Nos	1
9.	Cable support stripes (U) 1.c. Bracket.		Nos	1
10.	8-way 6A fuse mounting stripes		Nos.	1
11.	Cable supporting strips with fasteners	5mmx20mmx150mm	Nos	3
12.	String rods with fixing bracket and fasteners complete with PVC insulation		Nos.	20
13.	Square bars for fixing 8-way terminal block, 4nos.on each bar compete with studs for fixing 8- way terminal blocks nuts, bolts flat and spring washers for fixing square bars		Nos.	20
14.	Angles for wall support. complete with angle piece 'J' bolts, bolts with nuts, plain and spring washer with	40mmx40mmx1000mm (6mm thick)	Nos.	1
15.	Ladder for outdoor cable support made of 40mm x 40mm x 6mm angle	500mm x 2000mm	Nos.	1
16.	Ladder for indoor cable run support made of 40mm x 40mm x 6mm angle	400mm x 1500mm	Nos	1
17.	8-way tag block complete with its fixing assembly. fixtures and fasteners.		Nos.	8
18.	Forming sheets with white colour	3x 1200x 2400mm	Nos.	1

✓
SSEL/11/125

✓
SSEL/11/125
03.11.25

✓
SSEL/11/125
उप मुख्य सिग्नल एवं दूरसंचार इंजीनियर/टेली एवं परियोजना
Dy. Chief Signal & Telecom Engineer /Tele. & Projects
छ.शि.म.ट. मुंबई, मध्य रेल
CSMT RAJABAI & P.M.

19.	Angle for wall support	40mmx40mmx2000mm (6mm thick)	Nos.	2
20.	Any other material required for erection of CT Rack.		Nos.	
Above list is indicative, any other material required other than listed above or variation in quantity (more/ less) shall be supplied by the contractor as per site requirement free of cost.				

[Signature]
SSB/Proj/HQ

[Signature]
Asst. Secy - II / HQ
03.11.21

[Signature]
03/11/21

उप मुख्य सिग्नल एवं दूरसंचार इंजीनियर/टेली एवं परि:
Dy. Chief Signal & Telecom Engineer /Tele. & Pro
छ.शि.म.ट. मुंबई, मध्य रेल
C.S.M.T. MUMBAI, C. RLY.

ANNEXURE-VII

ITEM No. A-229 (SOR-2025)

OPERATING TOOL FOR MODULAR TERMINAL BLOCK

SN	DESCRIPTION	QTY	MAKE
1.	Crimping Tools (Varic crimp)0.25-4sqmm	1	Wago Part No.206-204
2.	Crimping Tool UPTO 25 sqmm	1	Taparia or Similar
3.	Insulated flat plier 125 mm	1	Taparia/Jhalani
4.	Insulated side cutter plier 1.50mm	1	Taparia/Jhalani
5.	Combination plier 200 min (insulated)	1	Taparia/Jhalani
6.	Wire stripper (0.02-10 sqmm)	4	Wago Part No.206-124
7.	Insulated nose plier 4 in 12 inch	1 Each	Taparia/Jhalani
8.	Hexa Black Frame Small with Blade 6 inch	2	Superior Quality
9.	Screw driver 1.5 sqmm	1	Wago Part No.210-619
10.	Screw driver 2.5/4 sqmm	1	Wago Part No.210-620
11.	Insulated screw driver 150 x 5 mm	1	Taparia/Jhalani
12.	Insulated screw driver 150 x 6 mm	1	Taparia/Jhalani
13.	Insulated screw driver 150 x 8 mm	1	Taparia/Jhalani
14.	Insulated screw driver 250 x 8 mm	1	Taparia/Jhalani
15.	Insulated screw driver 150 x 10 mm	1	Taparia/Jhalani
16.	Cable knife 4	1	Superior Quality
17.	Test probe (Red)	1	Wago Part No.210-136
18.	Cotton measuring tape 15 Mtr	2	Superior Quality
19.	Adjustable screw wrench 6" (155mm)	1	Taparia/Jhalani
20.	Adjustable screw wrench 8" (205mm)	1	Taparia/Jhalani
21.	Adjustable screw wrench 10" (255mm)	1	Taparia/Jhalani
22.	Soldering Iron 220 V. 25/35/50/65W	3	Soldron Make Or Similar
23.	Box Spanner 5mm to 10mm	1 each	Max/Tepco/Taparia/Jhalani
24.	Continuity buzzer	10	Max/Tepco/Good Quality
NOTE:-			
The Rly. Reserves the right to reject the entire/part tools found to be of inferior quality.			

[Signature]
SSE/Proj/HQ

[Signature]
Asstt Proj-II/HQ
07.11.25

[Signature]
By CS/Proj-HQ
07.11.25

Annexure-I

Minimum requirement of embedded Computer for Electronic Interlocking (EI) Ref No.
STS/E/TAN/3007 Ver. 2.0 Dated: 22.04.2026

S.N	Description	Requirement
1.	CPU	Intel® Xeon®/Core™ i7/i5/i3 Processor or better.
2.	OS (Pre-installed)	Windows 10/ Windows 7/ Linux or better version OS.
3.	System Memory (RAM)	Minimum 8GB, DDR4 SO-DIMM
4.	Storage (Built-in)	Minimum 256 GB SSD
5.	Other Peripherals & interface	
	a) Keyboard	Wired Keyboard of proven brand to be used as required by OEM.
	b) Mouse	Wired Mouse of proven brand to be used as required by OEM.
	c) Audio	1 Mic-in and 1 Line-out
	d) Display	a) A commercial display Monitor suitable to work 24X7 application of proven brand shall be used. b) Minimum 2 port supporting 4K @ 60Hz or better shall be available in embedded PC.
6.	Ethernet Interface (LAN)	Minimum 2 auto sensing M12 ports
7.	Serial Interface	a) Minimum 2 COM RS-232/422/485 b) Minimum 3 ports USB 3.0
8.	Environmental Limits	
	a) Operating temp.	Wide temperature models: -10° to +70° C
	b) Ambient Relative Humidity	5% to 95% (non-condensing)
	c) Anti-vibration	Comply EN 50155: Railway applications – Electronic Equipment on Rolling Stock
	d) Anti-shock	Comply EN 50155: Railway applications – Electronic Equipment on Rolling Stock
9.	Power Requirements (Input Voltage)	12 V to 36 V DC
10.	Standards and Certifications	a) Comply EN 50155: Railway applications – Electronic Equipment on Rolling Stock b) EMC : EN 50121/IEC 61000-3-3/EN 55024 or FCC part 15 subpart-B Class A
11.	Warranty	2 years and supplier to give additional 3 years (total 5 years from date of commissioning)
12.	Fan less	Yes
13.	EI OEM Certificate	Certificate stating that " proven make VDU control terminal and MT (Maintenance Terminal) PC compatible with our EI as per specifications recommended by railways has been installed ". Certificate to be submitted by EI OEM before commissioning EI.


SSE/SIG/SUR


DSTE/HQ/SUR


Sr.DSTE/SUR

Annexure -II

VDU

Description	Requirement
Resolution	UHD (3840 X 2160)
warranty	Extended warranty of 4 years
Industrial operating Voltage	wide range
Speaker	Inbuilt
Monitor	55"
IP	5X or higher
Connectivity Options HDMI	RS 485 OFC bi-Directional converters (Slave)-1 per set, OFC hub 4 quad-1 per set, RS 232 cable with both side connectors-6 per set, DP to HDMI port cables-1 per set.


SSE/SIG/SUR


DSTE/HQ/SUR


Sr.DSTE/SUR

Annexure -III

VDU Table

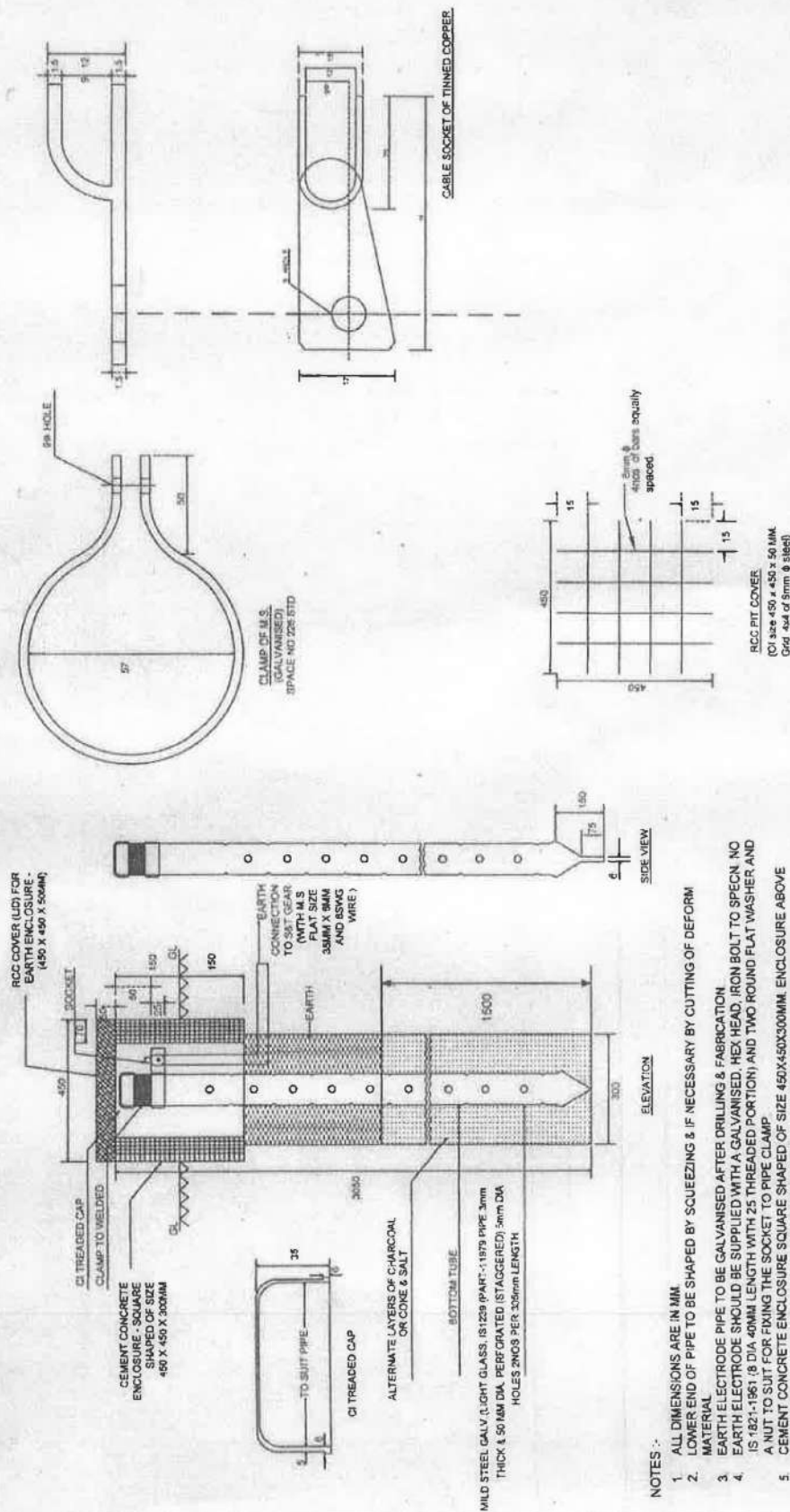
Description	Requirement
Table	U shape, space for having 2 VDU and 2 Block counters. Dimensions as per site requirements and field approved drawing, 18 mm thick Marine Ply covered with 1 mm sun mica sheet to be used
Chair	Godrej fabric Beat visitor Chair (4 Nos per table)


SSE/SIG/SUR


DSTE/HQ/SUR


Sr.DSTE/SUR

Conventional Earth Electrode with RCC concrete enclosure with cover

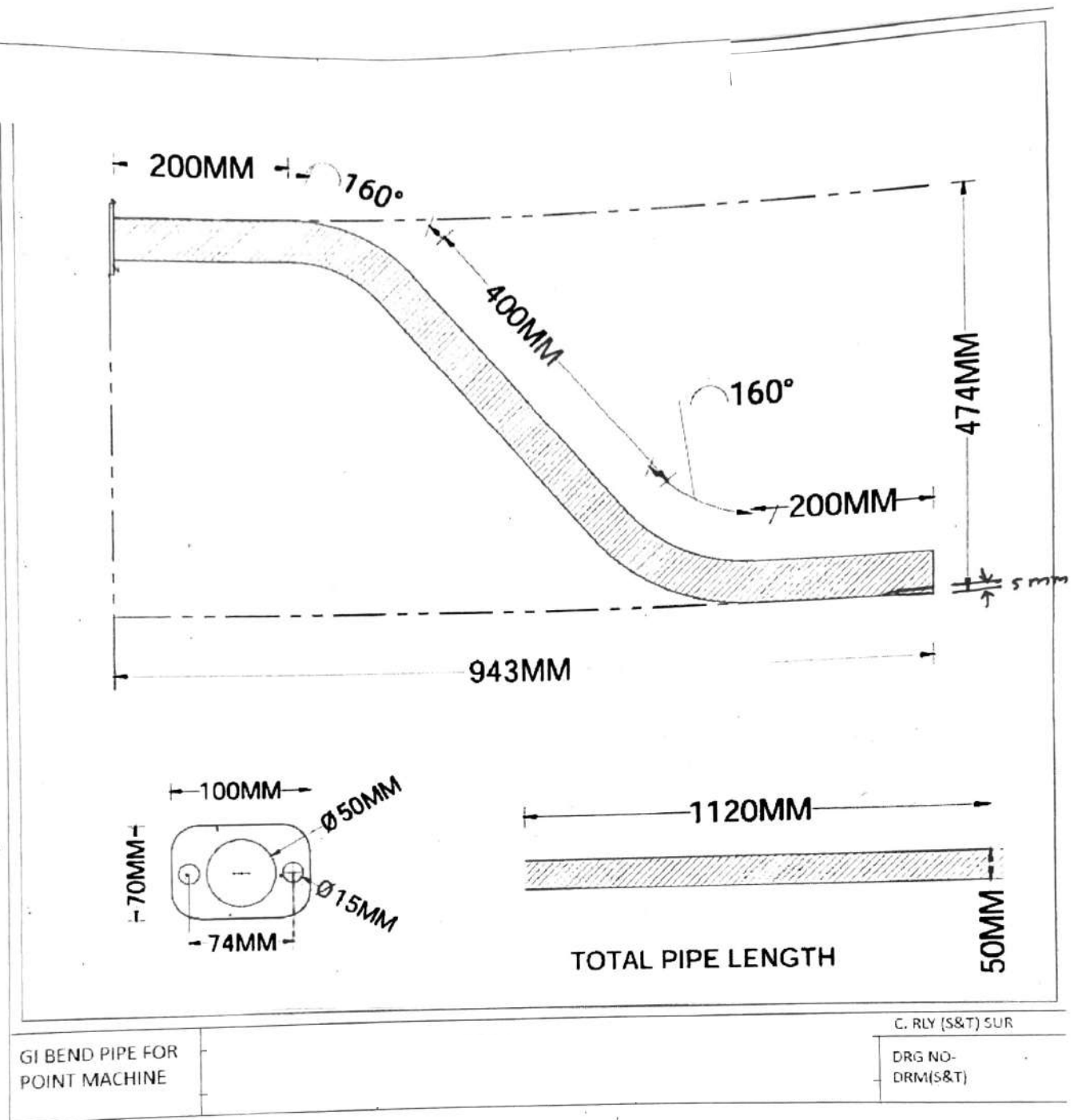


NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. LOWER END OF PIPE TO BE SHAPED & IF NECESSARY BY CUTTING OF DEFORM.
3. MATERIAL
4. EARTH ELECTRODE PIPE TO BE GALVANISED AFTER DRILLING & FABRICATION
5. EARTH ELECTRODE SHOULD BE SUPPLIED WITH A GALVANISED HEX HEAD, IRON BOLT TO SPECN. NO. IS-1821-1961 (8 DIA 40MM LENGTH WITH 25 THREADED PORTION) AND TWO ROUND FLAT WASHER AND A NUT TO SUIT FOR FIXING THE SOCKET TO PIPE CLAMP
6. CEMENT CONCRETE ENCLOSURE SQUARE SHAPED OF SIZE 450X450X300MM. ENCLOSURE ABOVE GROUND LEVEL SHOULD BE PLASTERED WITH 1:4 CEMENT AND SAND
7. 150MM LAYER OF COMMON SALT AND CHARCOAL & SIEVED SOIL EACH ALTERNATIVELY WILL BE PLACED AROUND THE PIPE
8. IN TERMS PARA 19.33.2 (ISEW II) THE THIRTHING LEAD SHALL BE M S FLAT SIZE 35MM X 6MM EARTH ENCLOSURE SHALL BE OF 70MM THICKNESS.
9. RCC PRE CAST COVERS USING TMT Fc-500 REINFORCEMENT STEEL OF SIZE 450X450X50MM USING 4X4 GRID OF 8MM DIA STEEL SHALL BE PROVIDED
10. CONNECTION BETWEEN EARTH AND SAT GEARS SHALL BE MADE BELOW THE EARTH. IN ADDITION TO M S FLAT, ONE 18WG GI WIRE ALSO TO BE CONNECTED BETWEEN EARTH ELECTRODE AND SAT GEAR M S FLAT. SHALL BE PAINTED WITH ANTI-CORROSIVE PAINT BEFORE CONNECTION.
11. NORMALLY NO EARTH PIT SHALL BE INSTALLED BETWEEN TWO TRACKS OR AT A DISTANCE OF LESS THAN 2500MM FROM NEARBY TRACK.
12. ALL OUTER AND INNER SURFACES OF EARTH ENCLOSURES SHALL BE PAINTED BY BIRLA WHITE CEMENT OF SIMILAR PAINT BEFORE INSTALLATION. ALSO UPPER PORTION OF COVER SHALL BE PAINTED WITH BIRLA WHITE CEMENT OR SIMILAR PAINT.
13. EARTH VALVES SHALL BE PAINTED IN WHITE PAINT ON BACK GROUND OF BLACK PAINT.

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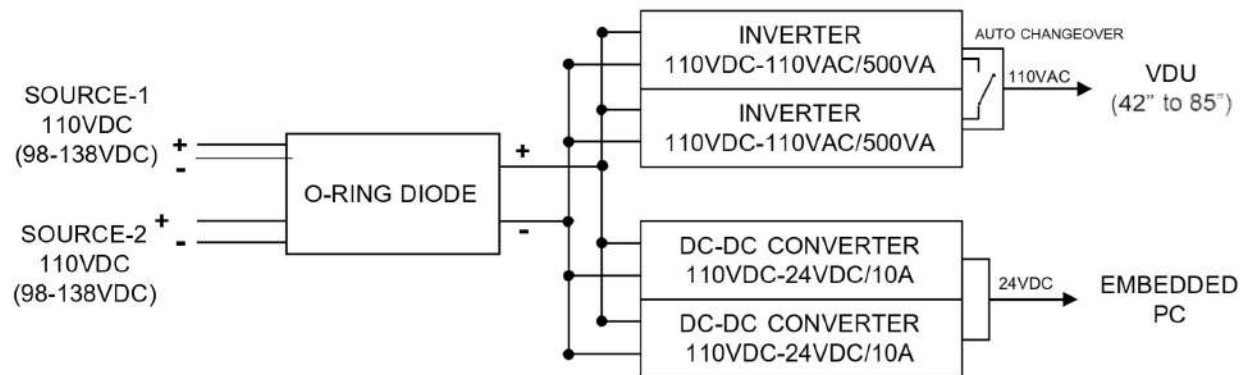
DRAWN BY  S. S. G. G. 10/10/13	CHECKED BY  EST/DO	APPROVED BY  D. S. T. P. D. 15/10/17	CENTRAL RAILWAY (S & T) EARTH ELECTRODE WITH RCC ENCLOSURE & COVER DRG NO. - CR / S&T / SK - 815 01/0-
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- Note —
- (i) Dia. 50mm & thickness of 5mm
 - (ii) Material of GI pipe B class
 - (iii) Drawing is not to scale
 - (iv) GI bend pipe for pt m/c cable entry 50mm dia & 1200mm long with welded plate for one end.

POWER SUPPLY ARRANGEMENT FOR VISUAL DISPLAY UNIT (VDU)/ EMBEDDED PC

Block Diagram:



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MUKESH KUMAR
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POWER SUPPLY ARRANGEMENT FOR VISUAL DISPLAY UNIT (VDU)/ EMBEDDED PC

Rack Dimension:

Front View



Top View



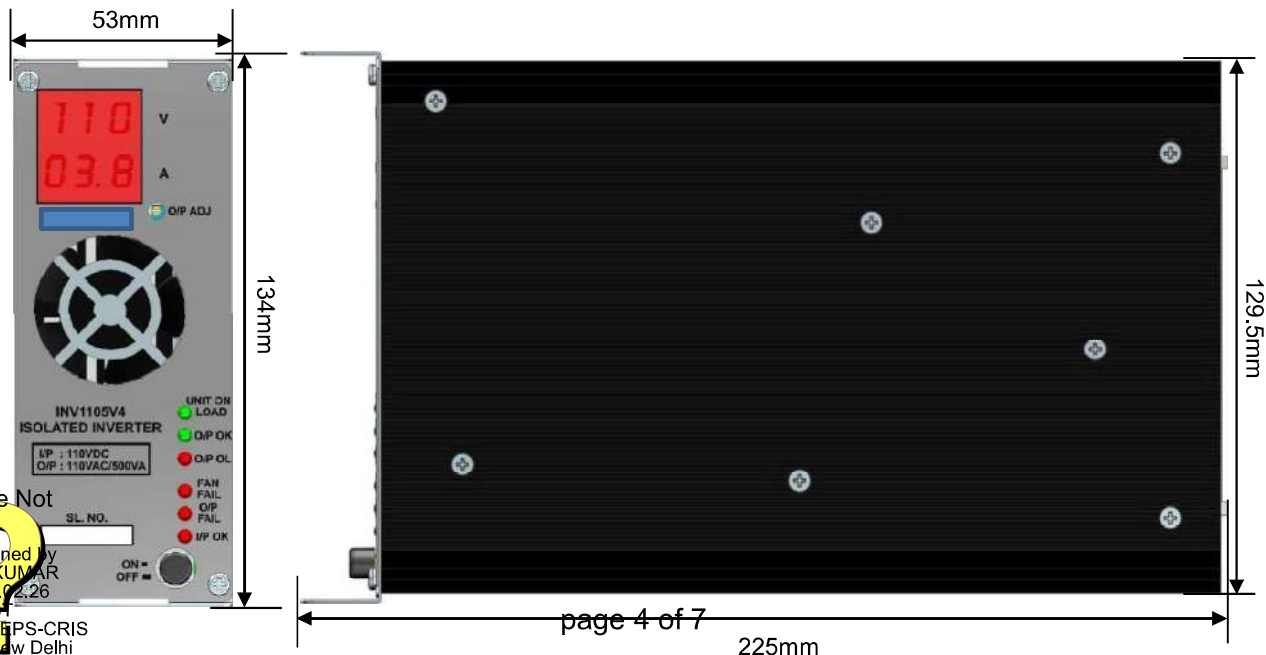
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POWER SUPPLY ARRANGEMENT FOR VISUAL DISPLAY UNIT (VDU)/ EMBEDDED PC

Specification of Inverter (INV1105V4):

	PARAMETERS	READING
INPUT	VOLTAGE [V]	110VDC (98V to 138 VDC)
	CURRENT [A]	4.5A
	EFFICIENCY [%]	>85%
	LINE REGULATION	<1.5%
OUT PUT	VOLTAGE [V]	110 VAC
	CURRENT [A]	3.75A (500VA)
	LOAD REGULATION	<1.5%
	OUTPUT VOLTAGE ADJUSTMENT RANGE	110 - 130 VAC
	OUT PUT VOLTAGE SETTING [V]	110.6VAC
	FREQUENCY [Hz]	50Hz (47.5-52.5)Hz
	POWER FACTOR	0.80 LAGGING TO UNITY
	WAVEFORM	Sine wave
PROTECTION CIRCUIT AND OTHERS	OVER CURRENT PROTECTION	4.6A
	OPERATING INDICATION	Unit on load, O/P OK, O/P OL, fan fail, O/P fail, I/P OK
	INPUT PROTECTION	Reverse polarity protection
	OUTPUT PROTECTION	Short circuit & over load
ISOLATION	INPUT-OUTPUT	1kVA
	INPUT-PE	1kVA
	OUTPUT-PE	1kVA
INSULATION	INPUT-OUTPUT	> 100 M Ohm
	INPUT-PE	> 100 M Ohm
	OUTPUT-PE	> 100 M Ohm
ENVIRONMENT	OPERATING TEMPERATURE	-10 to 70 °C
	STORAGE TEMPRATURE	-20 to 75 °C
OTHERS	CASE SIZE/WEIGHT	134x53x225mm/1.4Kg
	COOLING METHOD	Temp Controlled Fan(Switch on at ≥55°C)



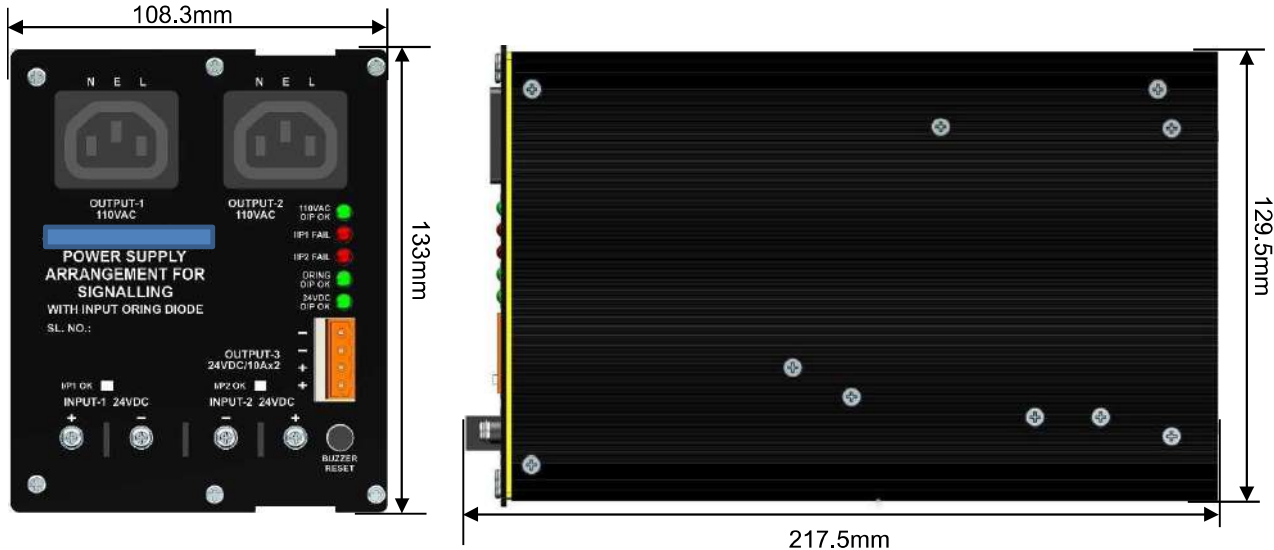
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Location: New Delhi

POWER SUPPLY ARRANGEMENT FOR VISUAL DISPLAY UNIT (VDU)/ EMBEDDED PC

Specification of O-Ring Diode:

	PARAMETERS	READING
INPUT SOURCE 1	VOLTAGE [V]	110VDC (98VDC - 138 VDC)
	CURRENT [A]	15A
INPUT SOURCE 2	VOLTAGE [V]	110VDC (98VDC - 138 VDC)
	CURRENT [A]	15A
OUT PUT	VOLTAGE [V]	110VDC
	CURRENT [A]	15A
INDICATIONS & ALARM	OPERATING INDICATION	110VAC O/P OK, ORING O/P OK, 24VDC O/P OK
	BUZZER	I/P 1 Fail, I/P 2 Fail
ISOLATION	INPUT-PE	1 kVA
	OUTPUT-PE	1 kVA
INSULATION	INPUT-PE	> 100 M Ohm
	OUTPUT-PE	> 100 M Ohm
ENVIRONMENT	OPERATING TEMPERATURE	-10 to +70 °C
	STORAGE TEMPERATURE	-20 to +75 °C
	HUMIDITY	95% RH
OTHERS	CASE SIZE/WEIGHT	133x108.3x217.5mm/750g



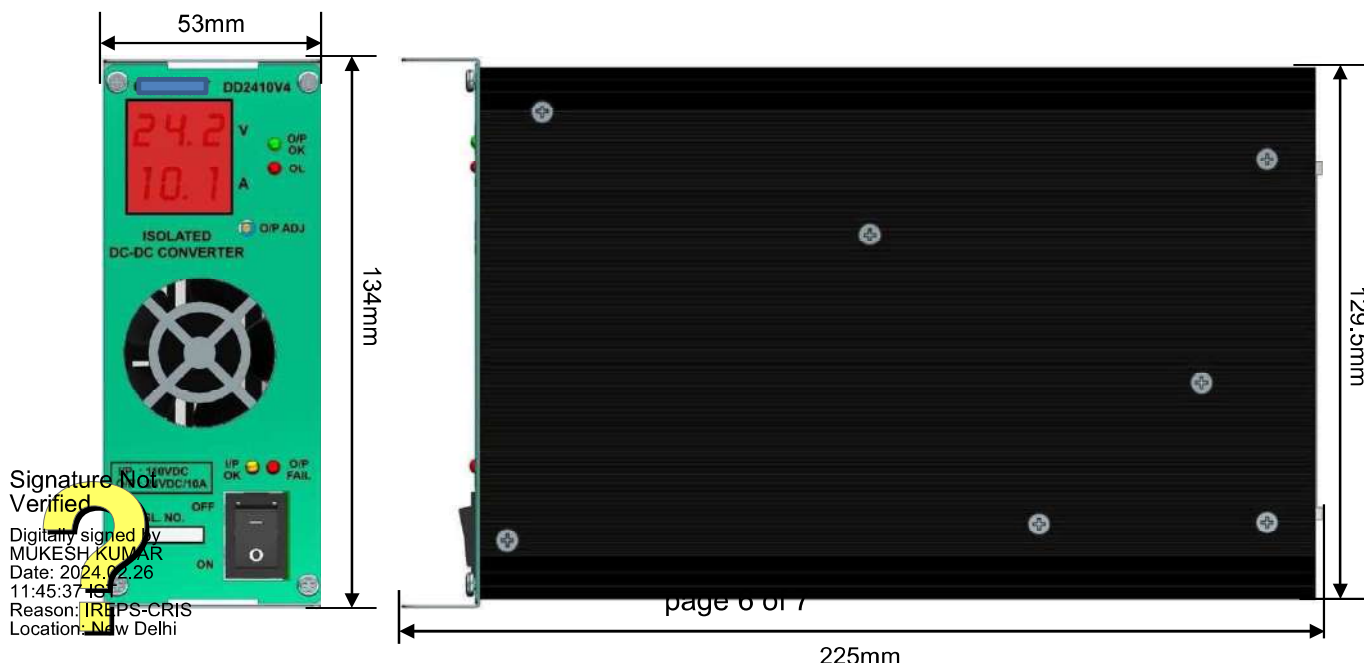
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Location: New Delhi

POWER SUPPLY ARRANGEMENT FOR VISUAL DISPLAY UNIT (VDU)/ EMBEDDED PC

Specification of DC-DC Converter (DD2410V4):

	PARAMETERS	READING
INPUT	VOLTAGE [V]	110VDC (98VDC - 138 VDC)
	CURRENT [A]	2.6A
	EFFICIENCY [%]	>80%
	LINE REGULATION	<1%
OUT PUT	VOLTAGE [V]	24.20V
	CURRENT [A]	10A
	LOAD REGULATION	<1%
	RIPPLE	<1%
	OUT PUT VOLTAGE ADJUSTMENT RANGE	24VDC - 32VDC
	OUT PUT VOLTAGE SETTING [V]	24.20VDC
PROTECTION CIRCUIT AND OTHERS	OVER CURRENT PROTECTION	10.4A
	OVER VOLTAGE PROTECTION	>33V
	OPERATING INDICATION	O/P OK, OL, I/P OK, O/P fail
	INPUT PROTECTION	Reverse polarity protection
	OUTPUT PROTECTION	Short circuit & over load
	LOAD SHARING	Active Current Sharing at 50% - 100% load
ISOLATION	INPUT-OUTPUT	1 kVA
	INPUT-PE	1 kVA
	OUTPUT-PE	1 kVA
INSULATION	INPUT-OUTPUT	> 100 M Ohm
	INPUT-PE	> 100 M Ohm
	OUTPUT-PE	> 100 M Ohm
ENVIRONMENT	OPERATING TEMPERATURE	-10 to +70 °C
	STORAGE TEMPRATURE	-20 to +75 °C
	HUMIDITY	95% RH
OTHERS	CASE SIZE/WEIGHT	134x53x225mm/1.2Kg
	COOLING METHOD	Temp Controlled Fan(Switch on at ≥55°C)



Annexure-B

Tender specification

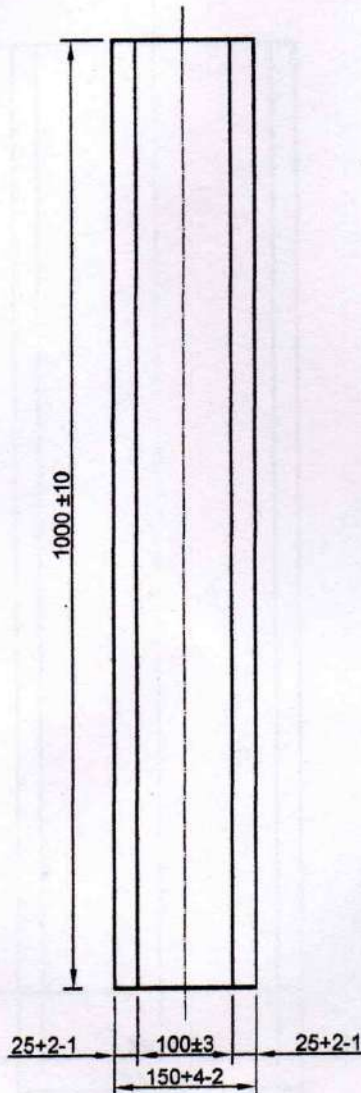
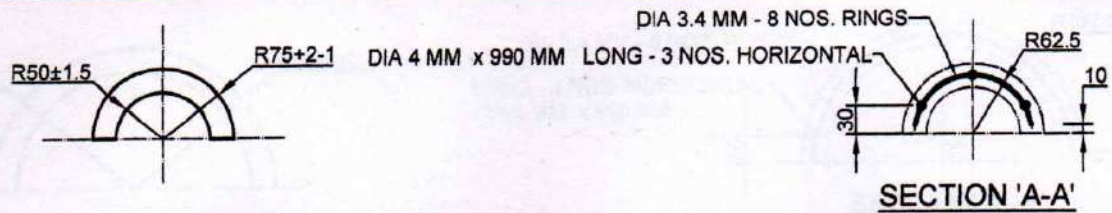
Supply, Installation, Testing and Commissioning with OEM certification of Modular power supply arrangement for VDU (42"-85") and embedded PC with input and output redundancy arrangement and hot pluggable modules having voltage & load current digital display on each module. Each set consisting of :-

- 1.** Isolated inverters (master/slave with auto changeover)-2 Nos. input 110V DC, output 110VAC, 500VA (as per RDSO TAN No-STs/E/TAN/3012 Version 3.0 Dated-03.11.2022)
- 2.** Isolated DC-DC converters-02 Nos. connected in parallel with built in O-ring diode, active current sharing as RDSO/SPN/165/2023 version 4.0 or latest (input:110VDC, output:24VDC/10A)
- 3.** Input (redundancy)O-ring diode module with two input sources and one output supply along with potential free contacts, alarm and acknowledgment switch.
- 4.** 3U stainless steel rack with back panel, mother board and front panel power connectors, power cord for VDU panel.

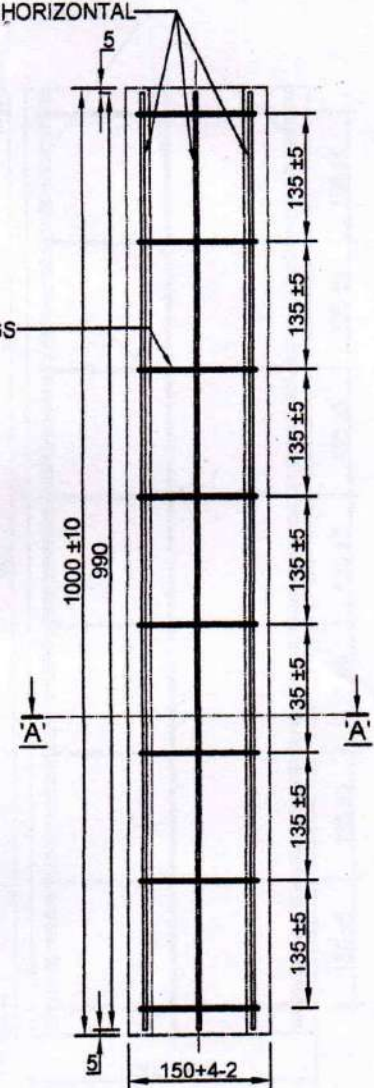
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MUKESH KUMAR
Date: 2024.02.26
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Reason: IREPS-CRIS
Location: New Delhi



DIA 3.4 MM - 8 NOS. RINGS



REINFORCEMENT DETAILS

SCHEDULE FOR REINFORCEMENT (CONC. MIX M30 GRADE)		
SIZE IN MM	MILD STEEL OR HARD DRAWN STEEL ALONG LENGTH - MAIN	HARD DRAWN STEEL FOR RING-SPIRAL
1000 x 150 x 25	DIA 4 MM x 990 MM LONG x 3 NOS. HORIZONTAL	DIA 3.4 MM x 8 NOS. RING-SPIRAL

DIMENSIONAL DETAILS

- 1) LENGTH - 1000 ±10 MM
 - 2) INNER DIA- 100 ±3 MM
 - 3) OUTER DIA - 150+4-2 MM
 - 4) THICKNESS - 25+2-1 MM
 - 5) GRADE OF CONCRETE - M30
 - 6) CONSIDERING REF IS. CODE - 458-2003
- (A)- FOR TOLERANCES REF CLAUSE 8.2 OF (IS. CODE - 458-2003)

REF I.S. CODE - 458-2003

TABLE -2 PAGE NO.7
FOR NP2- 100 MM INNER DIA
INNER DIMETER - 100 MM
OUTER DIAMETER - 150 MM
MAIN BARS - 0.295 KG/M
SPIRAL BARS - 0.09 KG/M

BASED ON C.RLY DRG NO.

R-ST-12151

RCC HALF ROUND PIPE

100 MM DIA

SSE /SIG/DRG

ADSTE / SUR

SR.DSTE / SUR

C.RLY(S&T)SUR

DRG NO. DRM (S&T)

SUR/06/2023/(A)