Amendment No. 5 (Technical)

Date: 19.01.2018

Tender Package Name: : **"Construction of 2X50 MVA, 220/33 kV Nagrota (New) substation including LILO of 220kV Kishenpur- Barn S/C line on D/C Tower at Nagrota Substation under PMDP Scheme-15.**

Tender Specification No- RECTPCL/PIA/JKPDD/SS &LILO- 01 Dated: 18-11-2017

S. No.	Clause No.	Existing Clause	To be Read as
A. Technical Specification, Part-I (SUBSTATION), SECTION-I (Project),VOL-II			
1	**11.0**	**SPECIFIC REQUIREMENT** 11.1 …… 10.4 5.0H.P pump for 220/33kV S/S shall be supplied and installed by the contractor for each cable trench sump pit and drain sump pit. The estimated quantity of 3.0 H.P is given in BPS. 10.5 Erection, Testing and Commissioning of Power Transformer, Circuit Breaker, Isolators, Relay & protection panels, sub-station automation system and Tele-protection equipment's shall be done by the contractor under the supervision of respective equipment manufacturers. Such supervision charges shall be included by the bidder in the erection charges for the respective equipment	**SPECIFIC REQUIREMENT** 11.1 …… **11.4** 5.0H.P pump for 220/33kV S/S shall be supplied and installed by the contractor for each cable trench sump pit and drain sump pit. The estimated quantity of **5.0 H.P** is given in BPS. **11.5** Erection, Testing and Commissioning of Power Transformer, Circuit Breaker, Isolators, Relay & protection panels, sub-station automation system and Tele-protection equipment's shall be done by the contractor under the supervision of respective equipment manufacturers. Such supervision charges shall be included by the bidder in the erection charges for the respective equipment in the BPS. **11.6** Soil investigation including soil resistivity measurement in line with technical specification shall be in the scope of contractor.

S. No.	Clause No.	Existing Clause	To be Read as
		in the BPS. 10.6 Soil investigation including soil resistivity measurement in line with technical specification shall be in the scope of contractor. 10.7 The bidder is required to quote the price of compete isolator i.e. Insulator and metallics together. 10.8 The detailed specification for maintenance & testing equipment's enclosed at Annexure - II 10.9 The contractor shall provide outdoor power receptacle (with 400A rating) suitable for oil filtration unit near 220/66kV & 220/33kV transformer Area of switchyard. The provision for cable from Main switchboard to oil filtration units shall also be in the scope of contractor. 10.10 The requirement of digital protection coupler (for both end of 220 kV lines) shall be as Annexure-III of Section-Project. 10.11 In section GTR and other Technical specification, the word "Purchaser" and/or "Owner" may be read as "Employer"	**11.7** The bidder is required to quote the price of compete isolator i.e. Insulator and metallics together. **11.8** The detailed specification for maintenance & testing equipment's enclosed at Annexure - II **11.9** The contractor shall provide outdoor power receptacle (with 400A rating) suitable for oil filtration unit near 220/66kV & 220/33kV transformer Area of switchyard. The provision for cable from Main switchboard to oil filtration units shall also be in the scope of contractor. **11.10** The requirement of digital protection coupler (for both end of 220 kV lines) shall be as Annexure-III of Section-Project. **11.11** In section GTR and other Technical specification, the word "Purchaser" and/or "Owner" may be read as "Employer"

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<tr><td colspan="4">B. Technical Specification, Part-I (SUBSTATION), SECTION-XXIII (Drawings),VOL-II</td></tr>
<tr><td>1</td><td>Existing Section</td><td>Existing Drawings</td><td>Revised section for Indicative Tender Drawings is annexed at Annexure-1 to Amendment-5</td></tr>
<tr><td colspan="4">C. Technical Specification, Part-I (SUBSTATION), SECTION-XXIV (Approved Make of various Equipments),VOL-II</td></tr>
<tr><td>1</td><td>Existing Section as amendment through Amendment no-1</td><td>Existing provisions</td><td>Revised List of Proposed Suppliers/Sub-Contractors is annexed at Annexure-2 to Amendment-5.</td></tr>
<tr><td colspan="4">D. Technical Specification, Part-II (LILO), SECTION-IX (Indicative Tender Drawing for LILO),VOL-II</td></tr>
<tr><td>1</td><td>Existing Section</td><td>Existing Drawings</td><td>Revised section for Indicative Tender Drawings is annexed at Annexure-3 to Amendment-5</td></tr>
<tr><td colspan="4">E. Second Envelope (Price Schedule),VOL-III</td></tr>
<tr><td>1</td><td>Second Envelope (Price Schedule)
Schedule - 1
II, 4.5 (d)</td><td>
<table>
<tr><th>Description</th><th>Unit</th><th>Qty</th></tr>
<tr><td>6</td><td>7</td><td>8</td></tr>
<tr><td>Double Tension String for ACSR 'ZEBRA"</td><td></td><td>13</td></tr>
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Schedule – 1, I,
C-I (33 kV Equipment), 2.0 (i, ii, iii)</td><td>
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<tr><td>36 KV, 1250A, 25 KA, 3-PHASE HDB ISOLATOR WITH ONE E/S</td><td>Nos</td><td>7</td></tr>
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<tr><td>36 kV, 1250A, 25 KA, 3-Phase HDB Isolator with two E/s</td><td>Nos</td><td>7</td></tr>
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Sl. No. - Q</td><td>
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Schedule –1 , I
Sl. No. - R- 17.0</td><td>
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C-I (33 kV Equipment), 2.0 (i, ii, iii)</td><td>
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Sl. No. – R-17.0</td><td>
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<tr><td>10</td><td>Second Envelope (Price Schedule)
Schedule – 3 II, 3.0, under “Description”</td><td>Transportation and Erection of various type of towers, tower parts and tower extension (complete) with bolts and nuts, including tack welding and supply and application of zinc rich primer and two coats of enamel paint……
……...</td><td>Erection of various type of towers, tower parts and tower extension (complete) with bolts and nuts, including tack welding and supply and application of zinc rich primer and two coats of enamel paint……
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<tr><td>11</td><td>Second Envelope (Price Schedule)
Schedule – 3 II, 7.0, under “Description”</td><td>Transportation & installation of Earthing for towers
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<tr><td>12</td><td>Second Envelope (Price Schedule)
Schedule – 3 II, 8.0, under “Description”</td><td>Transportation & Installation of tower accessories
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“Description”</td><td>……..</td><td>……..</td></tr>
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<tr><td>15</td><td>Second Envelope (Price Schedule)

Schedule – 3
II, 11.2, under
“Description”</td><td>Transportation and installation of following
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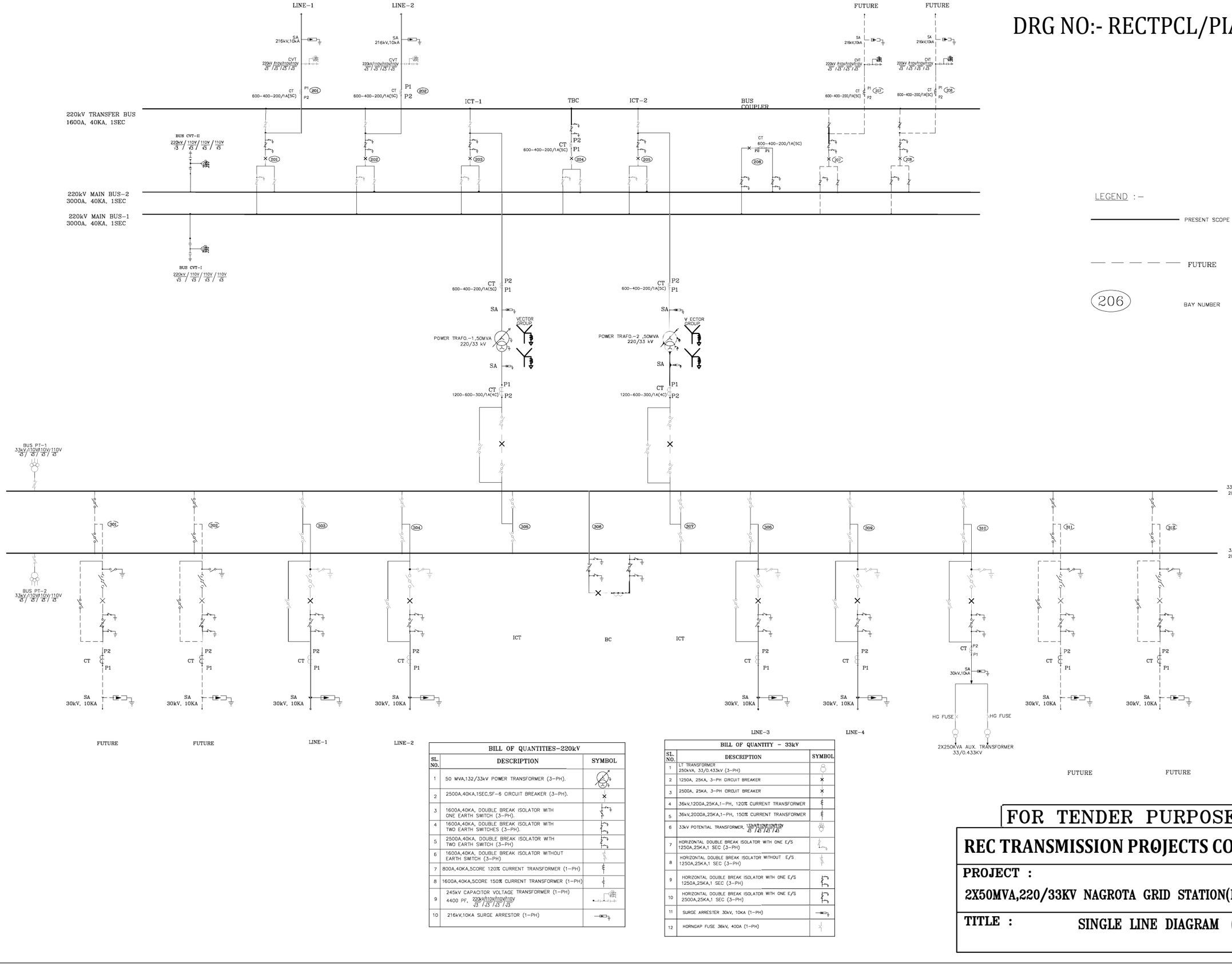
TECHNICAL SPECIFICATION

VOL-II, SEC-XXIII

DRAWINGS

Sr. No.	Drawing Name	Drawing No.
23.01	SLD NAGROTA (REVISED)	RECTPCL/PIA/DRG/01
23.02	LT_SWITCHGEAR_SLD	RECTPCL/PIA/DRG/02
23.03	PLAN_FOR_FFPH_FOR_NAGROTA_SS	RECTPCL/PIA/DRG/03
23.04	STANDARD_EARTHING_DETAILS	RECTPCL/PIA/DRG/04
23.05	DETAIL_FOR_CABLE_TRENCH_CROSSING_SH-1	RECTPCL/PIA/DRG/05
23.06	DETAIL_FOR_CABLE_TRENCH_SECTIONS_SH-2	RECTPCL/PIA/DRG/06
23.07	DETAIL_OF_ROAD_CULVERTS_SH-1	RECTPCL/PIA/DRG/07
23.08	DETAILS_OF_BITUMINOUS_ROAD_SH-1	RECTPCL/PIA/DRG/08
23.09	DETAILS_OF_CABLE_TRENCH_SECTION_SH-1	RECTPCL/PIA/DRG/09
23.10	DETAILS_OF_DRAIN_SH-1	RECTPCL/PIA/DRG/10
23.11	DETAILS_OF_SWITCHYARD_GATE_SH-1	RECTPCL/PIA/DRG/11
23.12	GA_&__RCC_DETAIL_OF_SUMP_PIT_SH-1	RECTPCL/PIA/DRG/12
23.13	RCC_DETAIL_FOR_CABLE_TRENCH_SECTIONSSH-1	RECTPCL/PIA/DRG/13
23.14	STANDARED_DETAILS_FOR_SWITCH_YARD_CHAIN_LINK_FENCING__SH-	RECTPCL/PIA/DRG/14
23.15	48V_DCDB_SLD	RECTPCL/PIA/DRG/15
23.16	110V_DCDB_SLD	RECTPCL/PIA/DRG/16
23.17	0. 415V_ACDB_SLD	RECTPCL/PIA/DRG/17
23.18	415V_MAIN_SWITCH_BOARD_SLD	RECTPCL/PIA/DRG/18
23.19	ELDB_SLD	RECTPCL/PIA/DRG/19
23.20	MLDB_SLD	RECTPCL/PIA/DRG/20
23.21	OPGW_DRAWING	RECTPCL/PIA/DRG/21
23.22	CONTROL_ROOM_BUILDING_FOR_NAGROTA_SS	RECTPCL/PIA/DRG/22
23.23	POLYMER INSULATOR	RECTPCL/PIA/DRG/23
23.24	GA - 50M LM (SHEET 1 OF 4)-LAYOUT1	RECTPCL/PIA/DRG/24
23.25	GA - 50M LM (SHEET 2 OF 4)-MODEL	RECTPCL/PIA/DRG/25
23.26	GA - 50M LM (SHEET 3 OF 4)-LAYOUT1	RECTPCL/PIA/DRG/26
23.27	GA - 50M LM (SHEET 4 OF 4)-MODEL	RECTPCL/PIA/DRG/27
23.28	BEAM-B1-MODEL	RECTPCL/PIA/DRG/28
23.29	BEAM-B2-MODEL	RECTPCL/PIA/DRG/29
23.30	SECURITY ROOM	RECTPCL/PIA/DRG/30
23.31	ANNEXURE-E (ROUTE MAP) 220 KV SC LILO ON BARAN TO KISHNPUR-1	RECTPCL/PIA/DRG/31
23.32	TOWER 2T1P-MODEL	RECTPCL/PIA/DRG/32
23.33	TOWER 2T2P-MODEL	RECTPCL/PIA/DRG/33
23.34	TOWER 2T4-MODEL	RECTPCL/PIA/DRG/34
23.35	NAGROTA INDICATIVE 220KV SECTION-MODEL	RECTPCL/PIA/DRG/35
23.36	BURIED CABLE TRENCH NAGROTA-MODEL (1)	RECTPCL/PIA/DRG/36
23.37	NAGROTA INDICATIVE 33KV SECTION-MODEL (1)	RECTPCL/PIA/DRG/37
23.38	NAGROTA INDICATIVE LAYOUT-MODEL (1)	RECTPCL/PIA/DRG/38

DRG NO:- RECTPCL/PIA/DRG-01



LEGEND :-

PRESENT SCOPE

FUTURE

206 BAY NUMBER

BILL OF QUANTITIES-220kV

SL. NO.	DESCRIPTION	SYMBOL
1	50 MVA,132/33kV POWER TRANSFORMER (3-PH).	
2	2500A,40KA,1SEC,SF-6 CIRCUIT BREAKER (3-PH).	
3	1600A,40KA, DOUBLE BREAK ISOLATOR WITH ONE EARTH SWITCH (3-PH).	
4	1600A,40KA, DOUBLE BREAK ISOLATOR WITH TWO EARTH SWITCHES (3-PH).	
5	2500A,40KA, DOUBLE BREAK ISOLATOR WITH TWO EARTH SWITCH (3-PH)	
6	1600A,40KA, DOUBLE BREAK ISOLATOR WITHOUT EARTH SWITCH (3-PH)	
7	800A,40KA,5CORE 120% CURRENT TRANSFORMER (1-PH)	
8	1600A,40KA,5CORE 150% CURRENT TRANSFORMER (1-PH)	
9	245kV CAPACITOR VOLTAGE TRANSFORMER (1-PH) 4400 PF, 220kV/110V/110V/110V / √3 / √3 / √3 / √3	
10	216kV,10KA SURGE ARRESTOR (1-PH)	

BILL OF QUANTITY - 33kV

SL. NO.	DESCRIPTION	SYMBOL
1	LT TRANSFORMER 250kVA, 33/0.433kV (3-PH)	
2	1250A, 25KA, 3-PH CIRCUIT BREAKER	
3	2500A, 25KA, 3-PH CIRCUIT BREAKER	
4	36kV,1200A,25KA,1-PH, 120% CURRENT TRANSFORMER	
5	36kV,2000A,25KA,1-PH, 150% CURRENT TRANSFORMER	
6	33kV POTENTIAL TRANSFORMER, 132kV/110V/110V/110V / √3 / √3 / √3 / √3	
7	HORIZONTAL DOUBLE BREAK ISOLATOR WITH ONE E/S 1250A,25KA,1 SEC (3-PH)	
8	HORIZONTAL DOUBLE BREAK ISOLATOR WITHOUT E/S 1250A,25KA,1 SEC (3-PH)	
9	HORIZONTAL DOUBLE BREAK ISOLATOR WITH ONE E/S 1250A,25KA,1 SEC (3-PH)	
10	HORIZONTAL DOUBLE BREAK ISOLATOR WITH ONE E/S 2500A,25KA,1 SEC (3-PH)	
11	SURGE ARRESTER 30kV, 10KA (1-PH)	
12	HORNGAP FUSE 36kV, 400A (1-PH)	

FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD

PROJECT :

2X50MVA,220/33KV NAGROTA GRID STATION(DISTRICT JAMMU)

TITLE : **SINGLE LINE DIAGRAM (REVISED)**

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
2	TIME DELAY RELAY	4	FOUR POLE MCCB
27X	AUXIALARY RELAY		AIR CIRCUIT BREAKER
95	THREE POLE VOLTAGE CONTROL DEFINITE TIME DELAY RELAY		2 POLE MCB
27	INST. UNDER VOLTAGE RELAY	2	2 POLE MCCB
59	INST. OVER VOLTAGE RELAY		AIR BREAK SWITCH
96	EARTH LEAKAGE RELAY	M	HVW MOTOR
50	INST. OVER CURRENT RELAY	ASS	AMMETER SELECTOR SWITCH
50N	INST. EARTH FAULT RELAY	VSS	VOLTMETER SELECTOR SWITCH
51	IDMT OVER CURRENT RELAY IN TWO PHASE	A	AMMETER
51 O/L	SINGLE POLE DEFINITE TIME DELAY RELAY FOR MOTOR O/L ALARM IN ONE PHASE	V	VOLTMETER
51N	1 POLE IDMT E/F RELAY		DG SET
27A	SINGLE POLE INST. UNDER VOLTAGE RELAY		
27B	SINGLE POLE INST. UNDER VOLTAGE RELAY		
87	3 POLE DIFFERENTIAL RELAY		

FROM 33KV BUSBAR

FROM 250kVA TRANSFORMER

LT OUTDOOR AUXILIARY STATION TRANSFORMER

AVR

415V MAIN SWITCH BOARD (1A)

BUS-A 415V,3PH,4WIRE,1000A,20KA FOR 1Sec.

BUS-B

415V MAIN LIGHTING DISTRIBUTION BOARD (3A)

LIGHTING TRANSFORMER # I

LIGHTING TRANSFORMER # II

BUS-A BUS-B BUS-C 415V,3Ø,4WIRE,400A, 20KA FOR 1 Sec.

415V EMERGENCY LIGHTING DISTRIBUTION BOARD (3B)

LIGHTING TRANSFORMER

415V,3Ø,4WIRE,200A, 20KA FOR 1 Sec.

UPS

415V DG SET

415V AMF PANEL

415V, 3ø, 4WIRE, 1000A, 20KA FOR 1Sec.

415V AC DISTRIBUTION BOARD (2A)

MCB DB FOR CONTROL ROOM AREA

Automatic Changeover Arrangement

UPS

Water Cooling System

UPS SCOPE UNDER UPS MANUFACTURER

CHARGER # I FLOAT/BOOST

CHARGER # 2 FLOAT/BOOST

FROM OTHER SOURCE

220V DC DISTRIBUTION BOARD # I (1D)

220V DC DISTRIBUTION BOARD # II (2D)

DC MODULE

220V, 400A, 4KA FOR 1Sec.

220V BATTERY

BATTERY DISCHARGE FEEDER

NOTES:

1. THIS DRG. SHALL BE READ IN CONJUNCTION WITH RECTPCL TECHNICAL SPECIFICATION LT SWITCHGEAR REV.–05
2. NO TWO AC SOURCE SHALL BE PARALLED AT ANY STAGE.
3. DG SET SHALL BE AUTO START TYPE.
4. LIGHTING TRANSFORMERS WILL BE IN RESPECTIVE BOARDS, DEGREE OF PROTECTION FOR THIS MODULE SHALL BE ATLEAST IP: 31.
5. EACH TRAFO. MB SHALL BE FED BY ATLEAST ONE SOURCE FROM 415V ACDB. SECOND SOURCE SHALL BE LOOPED FROM NEAREST TRAFO. MB WHICH SHALL BE FED FROM ANOTHER SOURCE FROM 415V ACDB.
6. AS PER CLAUSE NO: 1.26.3.1 OF LT SWITCHGEAR THAT DC BUSBAR SHORT CIRCUIT CURRENT RATING SHOULD BE 4 KA FOR 1 SEC.

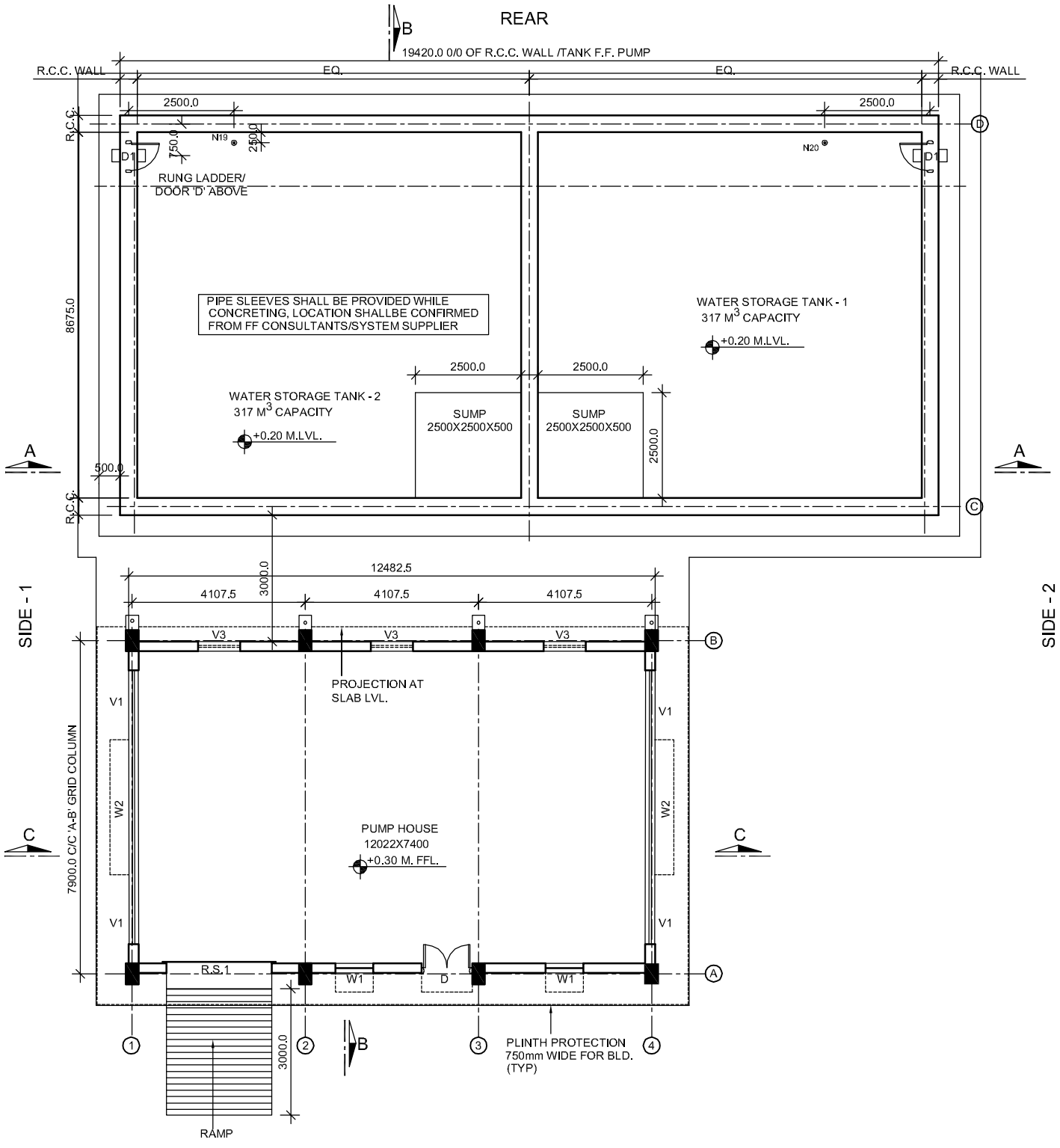
DRG NO:- RECTPCL/PIA/DRG-02

For Tender Purpose only

REC TRANSMISSION PROJECTS COMPANY LTD

PROJECT : **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE : **LT SWITCHGEAR SLD**



FRONT

GROUND FLOOR PLAN FOR FFPH

DRG NO:- RECTPCL/PIA/DRG-03

For Tender Purpose Only

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : 2x50 MVA, 220/33 KV Nagrota Substation

TITLE : **GROUND FLOOR PLAN FOR FIRE WATER PUMP HOUSE & WATER TANK**

GENERAL INSTRUCTION FOR EARTHING:

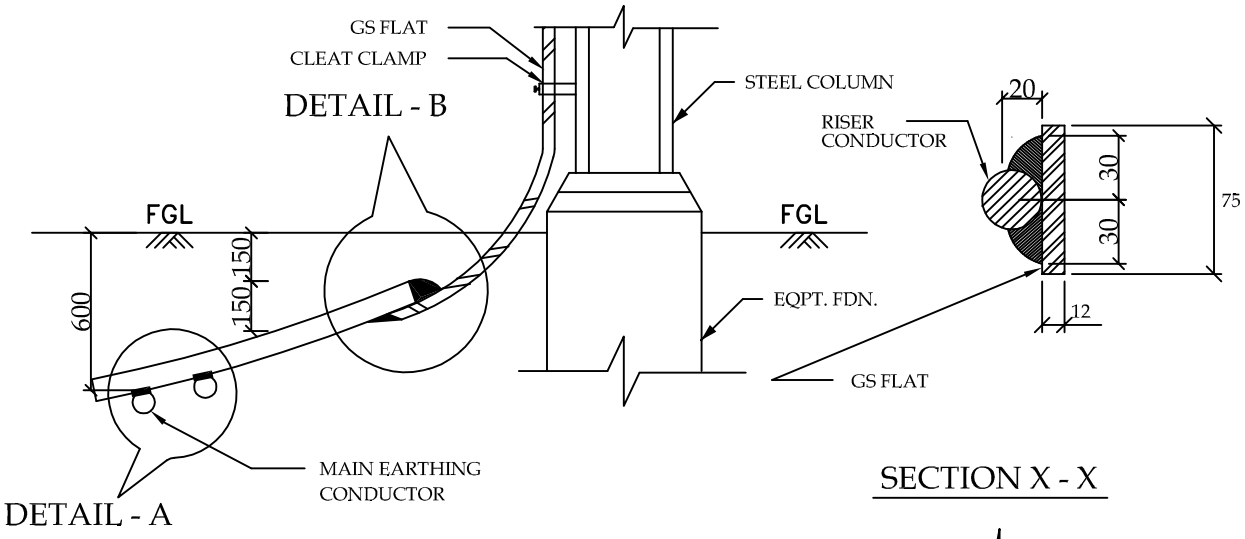
1. Location of earthing conductors / risers shown in the earthing drawing may change to suit the site condition.
2. Two different risers of one structure/equipment shall be connected to different conductors of main earthmat.
3. Earthing conductor around the building shall be burried at a minimum distance of 1500 mm from the outer boundary of the building.
4. Minimum distance of 6000 mm shall be maintained between two treated (pipe) electrode.
5. For surge arrester, earthing lead from surge counter to to main earthmat shall be shortest in length as pratically as possible. Earthing lead from surge arrester shall not be passed through any pipe.
6. No welding is allowed in the over ground earthing leads/risers if the length is less than 6m .

DRG NO:- RECTPCL/PIA/DRG-04

For Tender Purpose only

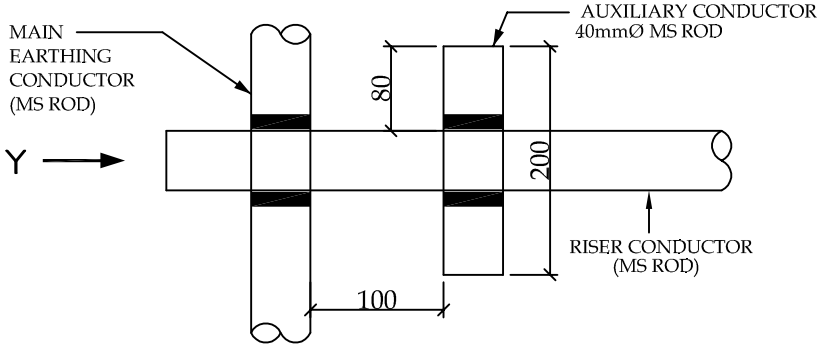
PROJECT :- **2x50 MVA, 220/33 KV Nagrota substation**

TITLE:- STANDARD EARTHING DETAILS

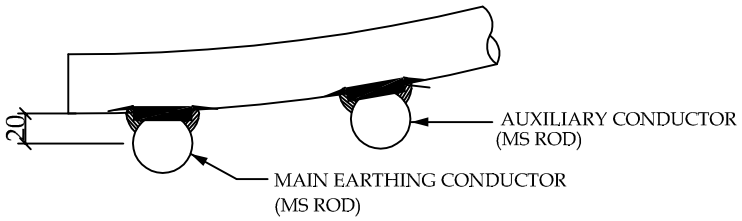


SECTION X - X

TYPICAL DETAILS OF RISER

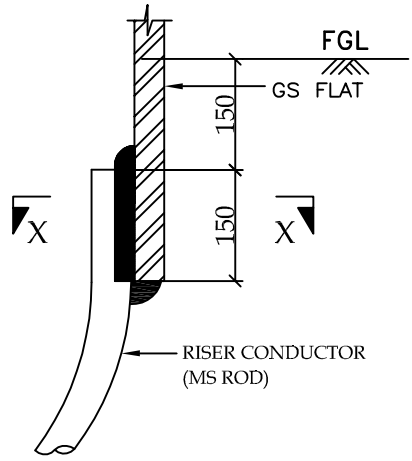


PLAN



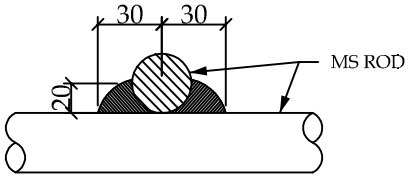
ELEVATION

DETAIL - A



ELEVATION

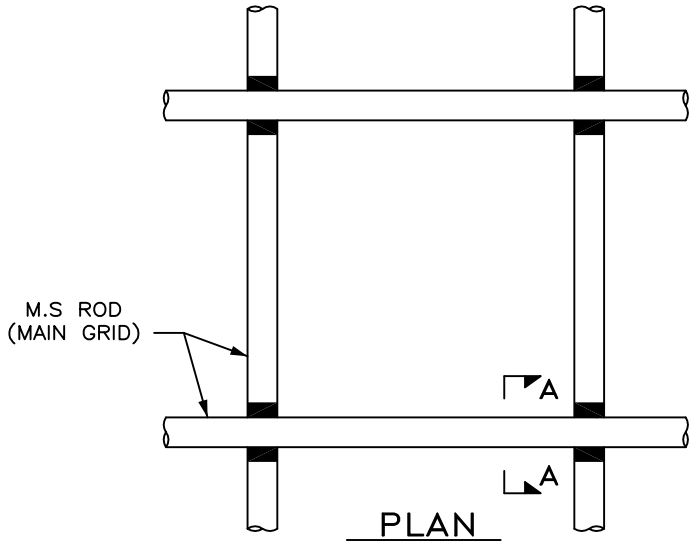
DETAIL - B



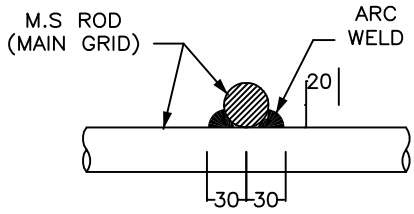
VIEW - Y

DRG NO:- RECTPCL/PIA/DRG-04

For tender purpose only			
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**			
TITLE:- STANDARD EARTHING DETAILS			
CKD BY	PRPD BY	Date	

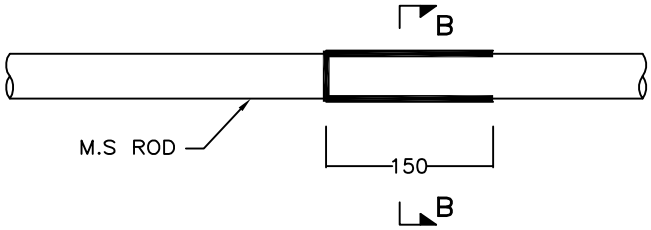


PLAN



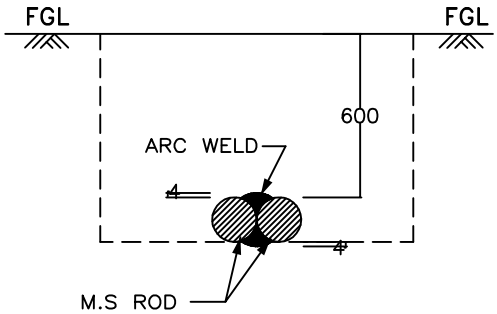
SECTION A – A

DETAIL OF CROSS JOINT

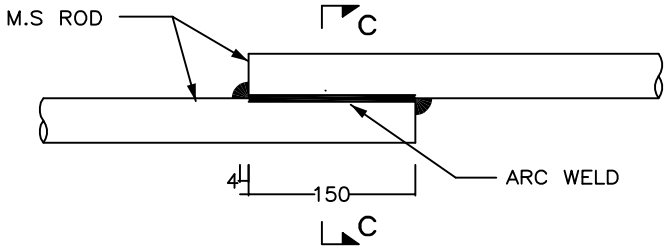


ELEVATION

(CONDUCTORS KEPT ON SIDES)

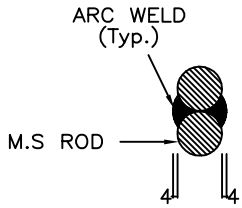


SECTION B – B



ELEVATION

(CONDUCTORS ONE ABOVE THE OTHER)



SECTION C – C

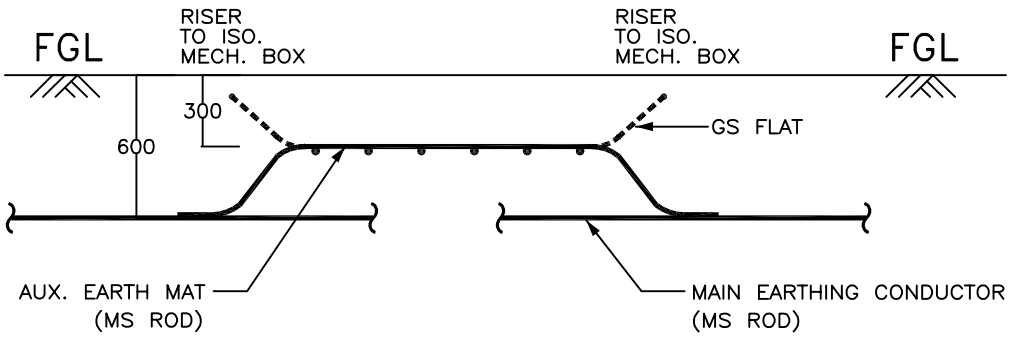
DETAIL OF LAP JOINT

DRG NO:- RECTPCL/PIA/DRG-04

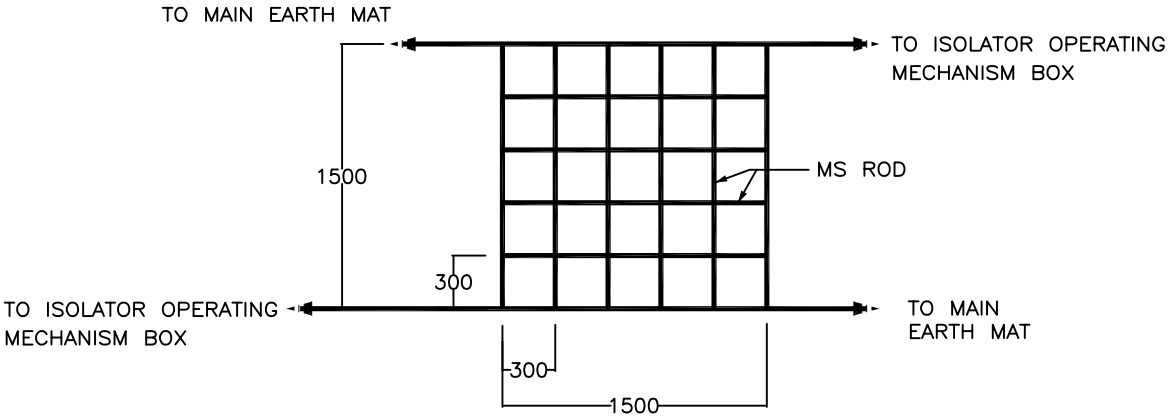
For Tender Purpose only

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

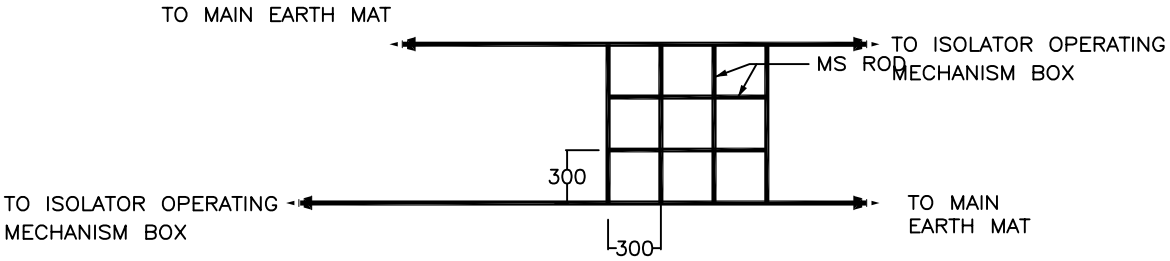
TITLE:- STANDARD EARTHING DETAILS



ELEVATION



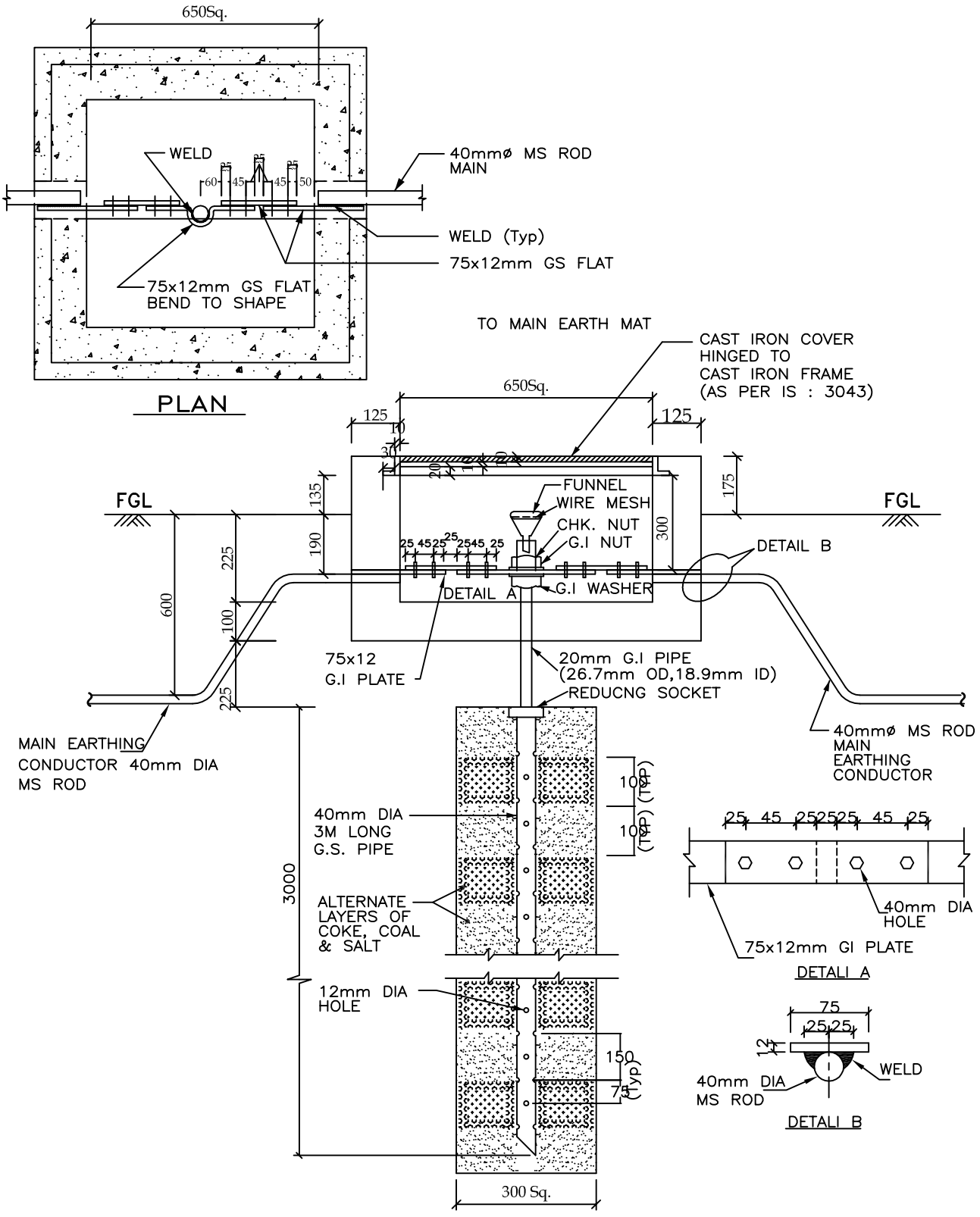
PLAN (For 220kV & above class isolators)



PLAN (For 132kV & below class isolators)

DRG NO:- RECTPCL/PIA/DRG-04

For tender purpose only
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**
TITLE:- STANDARD EARTHING DETAILS



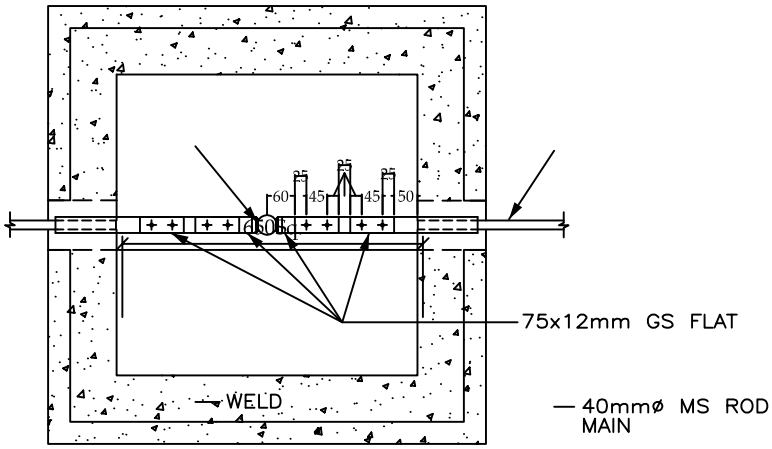
For Tender Purpose Only

DRG NO:- RECTPCL/PIA/DRG-04

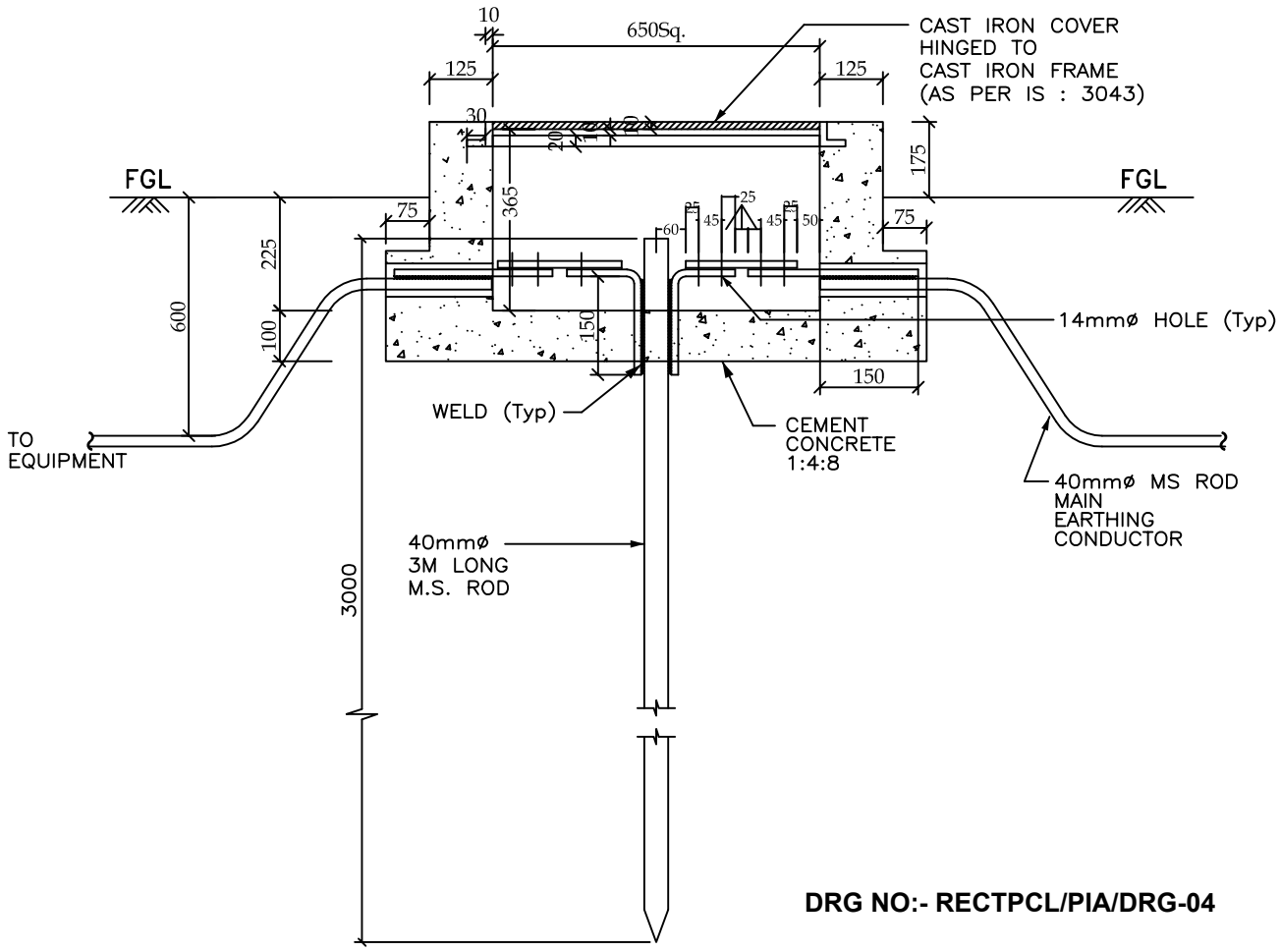
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

ROD ELECTRODE WITH TEST LINK FOR LM, TOWER WITH PEAK, CVT, LA



PLAN



DRG NO:- RECTPCL/PIA/DRG-04

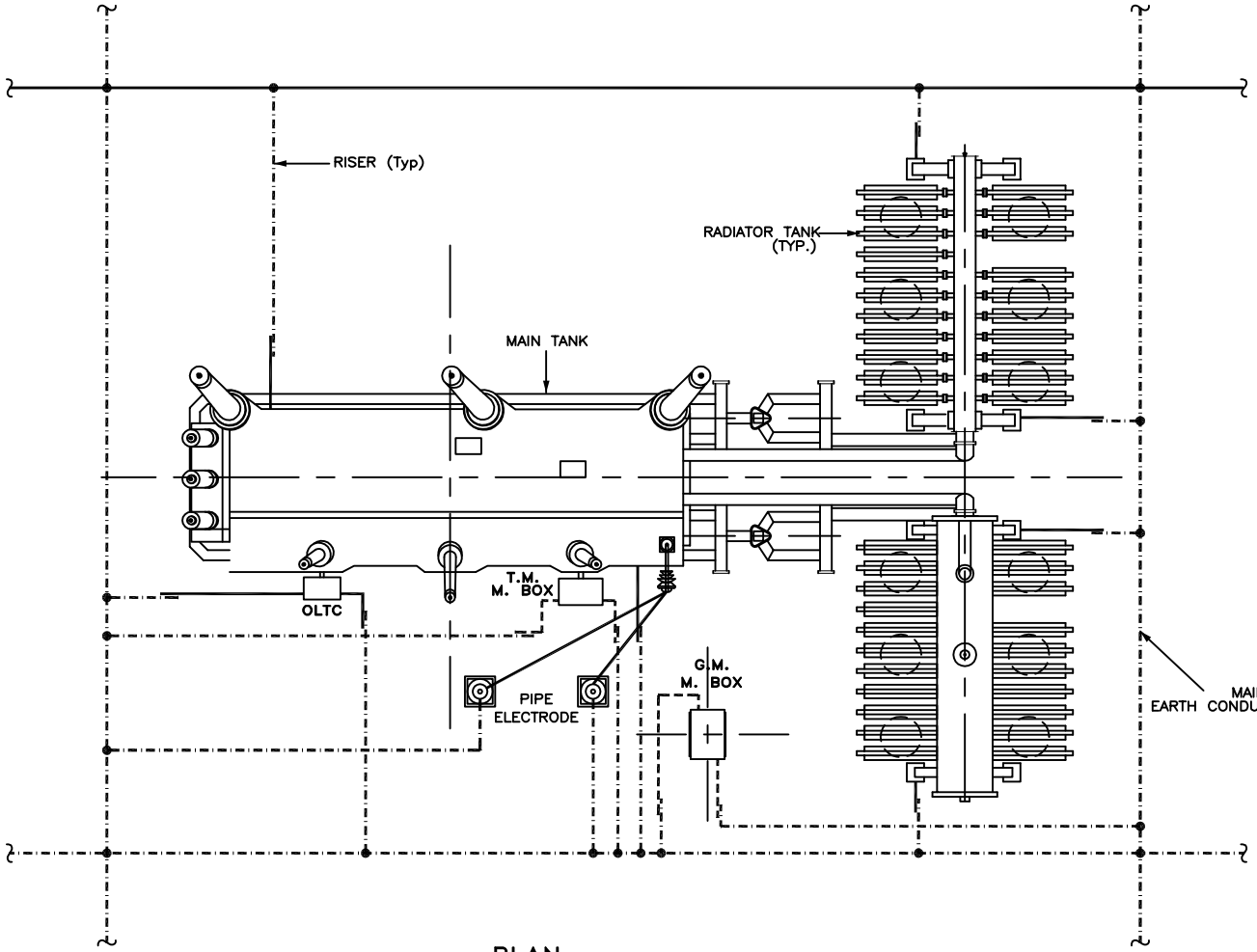
ELEVATION

For Tender Purpose only

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF TRANSFORMER/ REACTOR



PLAN

LEGEND

— · — · —	40mmø MS ROD
———	75 x 12 mm GS FLAT
- - - - - -	50 x 6 mm GS FLAT

NOTES :-

1. No. OF RISERS :-

MAIN TANK	–	2 Nos.
RADIATOR TANK	–	4 Nos.
OLTC	–	2 Nos. (ICT only)
M. BOX	–	2 Nos./M. BOX
NEUTRAL EARTH ELECTRODE	–	2 Nos.

2. No. OF PIPE ELECTRODE REQUIRED = 2 Nos.
3. PYLON SUPPORTS SHALL BE EARTHED TO THE MAIN EARTHING CONDUCTOR BY GS FLAT.

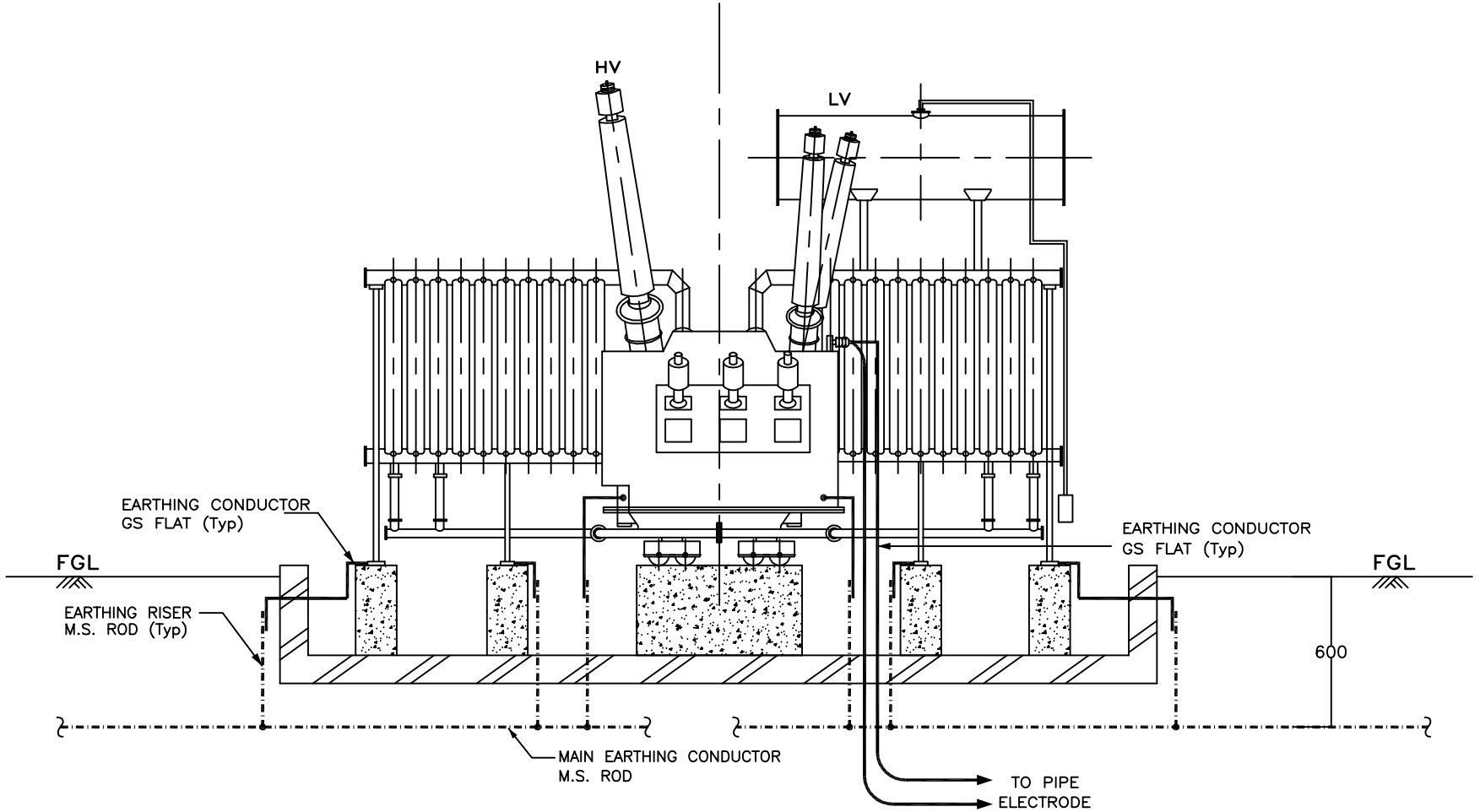
DRG NO:- RECTPCL/PIA/DRG-04

For tender Purpose only

PROJECT :- **2 x 50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF TRANSFORMER/ REACTOR



LEGEND

- 40mmø MS ROD
- 75 x 12 mm GS FLAT
- 50 x 6 mm GS FLAT

END VIEW

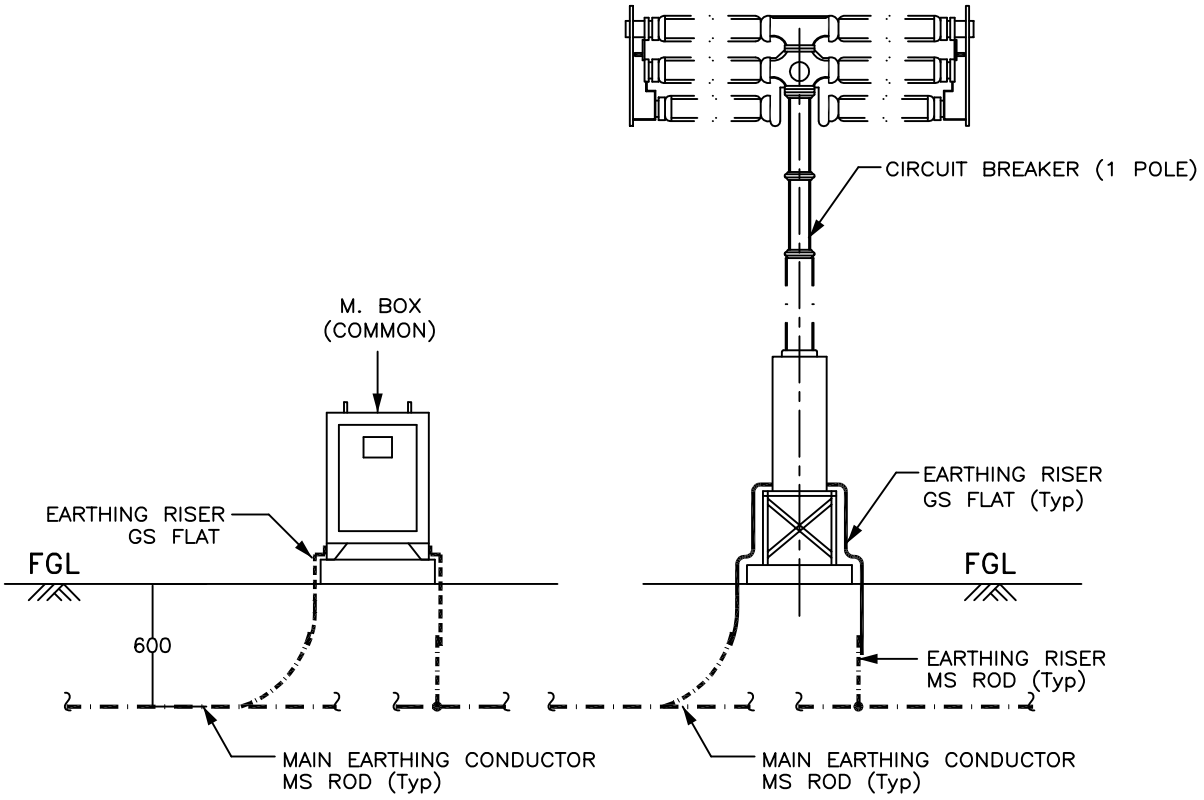
DRG NO:- RECTPCL/PIA/DRG-04

For Tender Purpose only

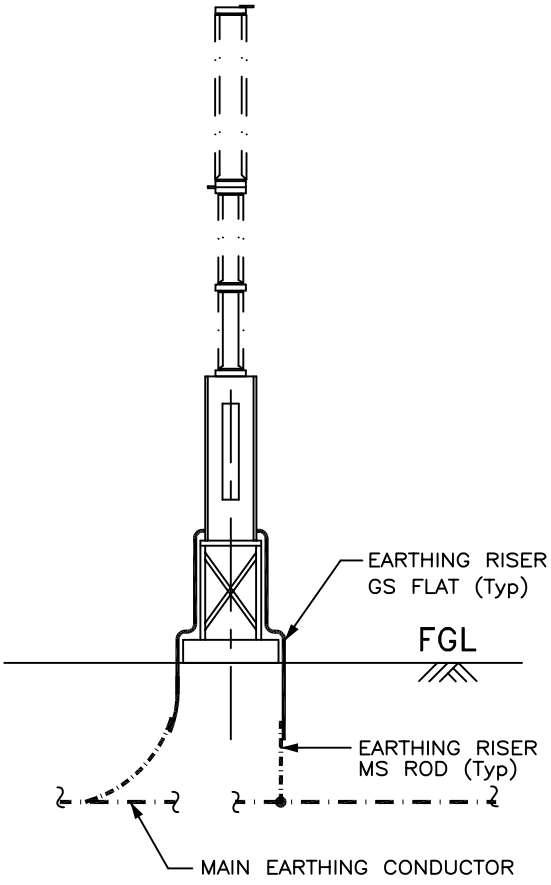
PROJECT :- 2x50 MVA, 220/33 KV Nagrota Substation

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF CIRCUIT BREAKER



ELEVATION



NOTES :–

1. No. OF RISERS FOR CIRCUIT BREAKER = 2 Nos. / PHASE
1. No. OF RISERS FOR LADDER (IF Applicable) = 2 Nos.
2. No. OF RISERS FOR MAR. BOX = 2 Nos.
3. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

LEGEND

- 40mmø MS ROD
- 75 x 12 mm GS FLAT
- 50 x 6 mm GS FLAT

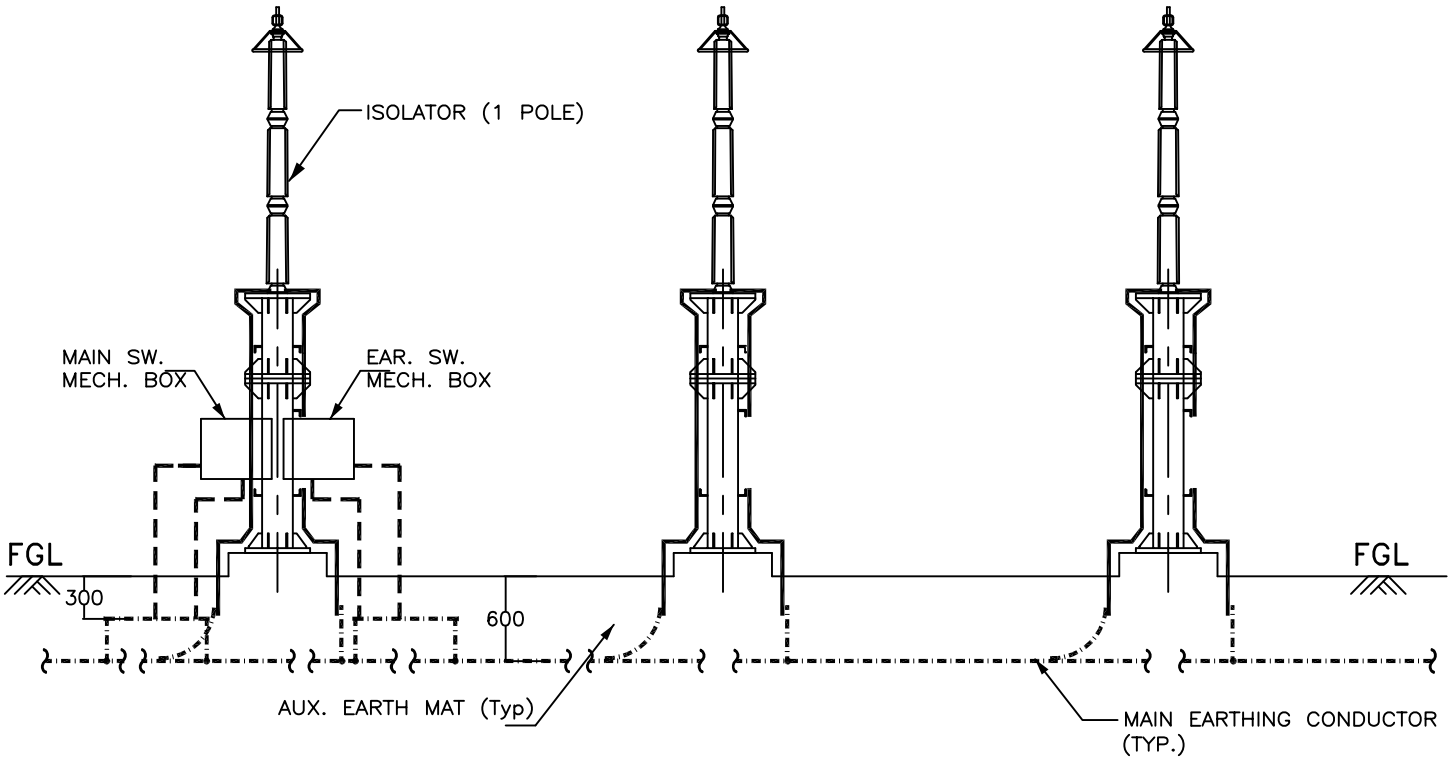
DRG NO:- RECTPCL/PIA/DRG-04

For tender Purpose only

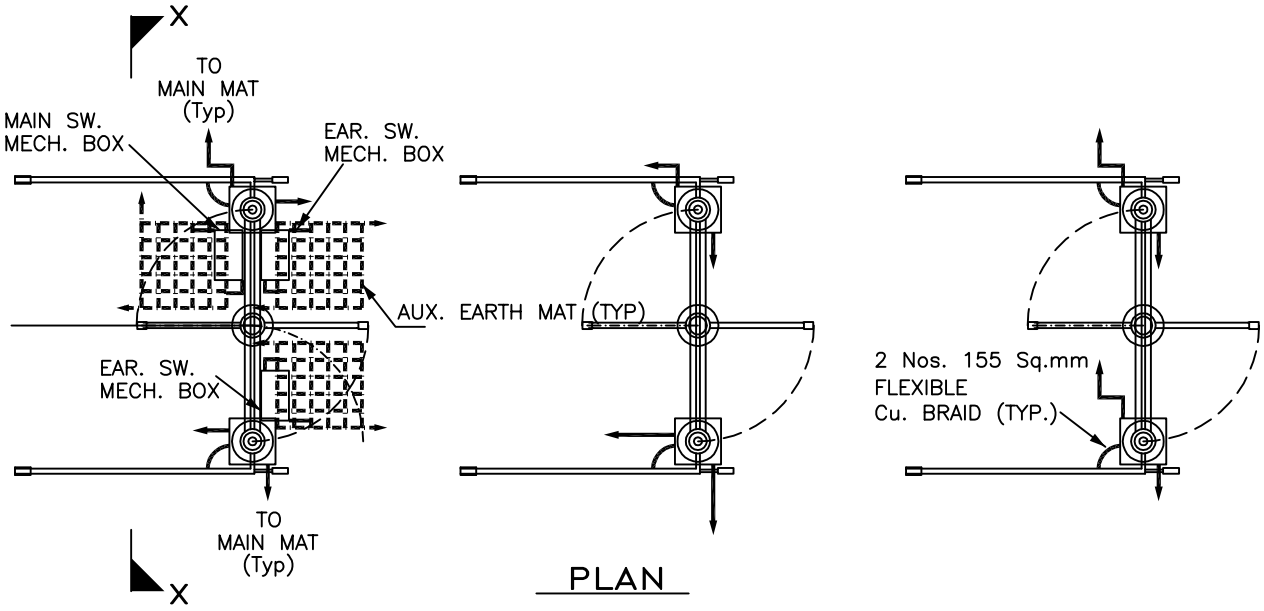
PROJECT :- 2x50 MVA, 220/33 KV nagrota substation

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF ISOLATOR



ELEVATION



PLAN

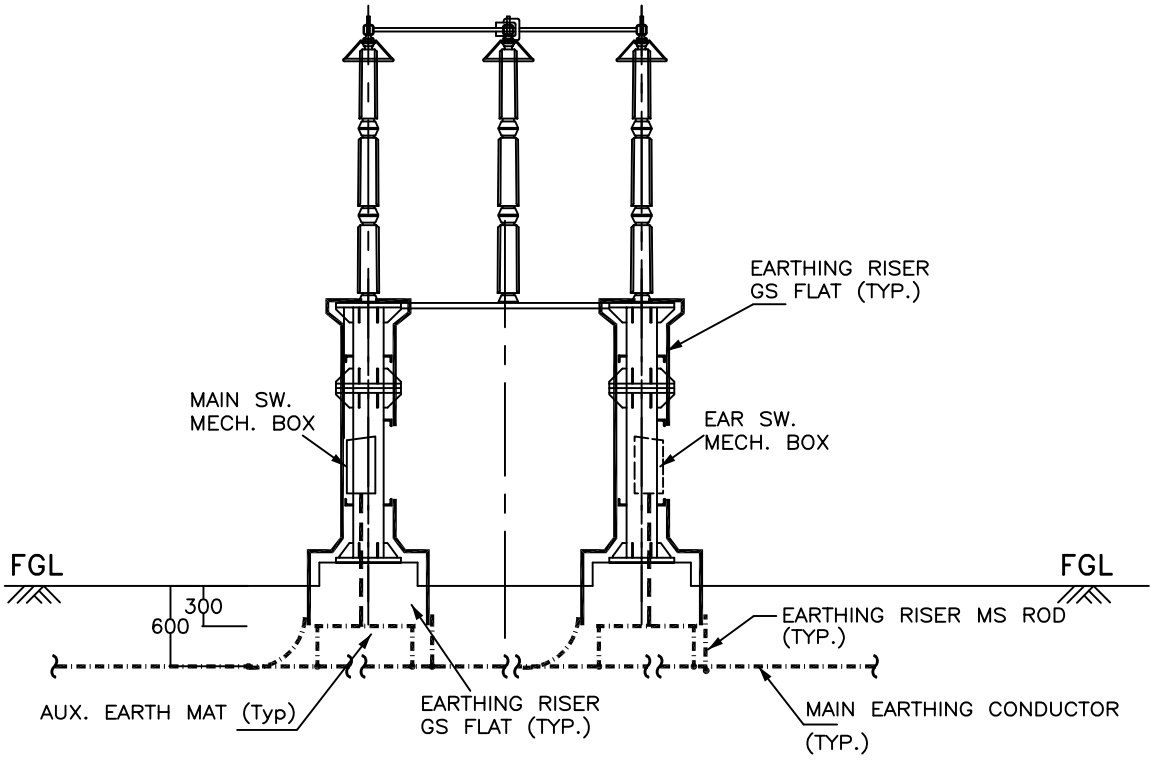
For tender Purpose only

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

DRG NO:- RECTPCL/PIA/DRG-04

EARTHING OF ISOLATOR (1 PH)



VIEW – X X

LEGEND

—— · —— · ——	40mmø MS ROD
————————	75 x 12 mm GS FLAT
- - - - - - - - - - - - - - - -	50 x 6 mm GS FLAT

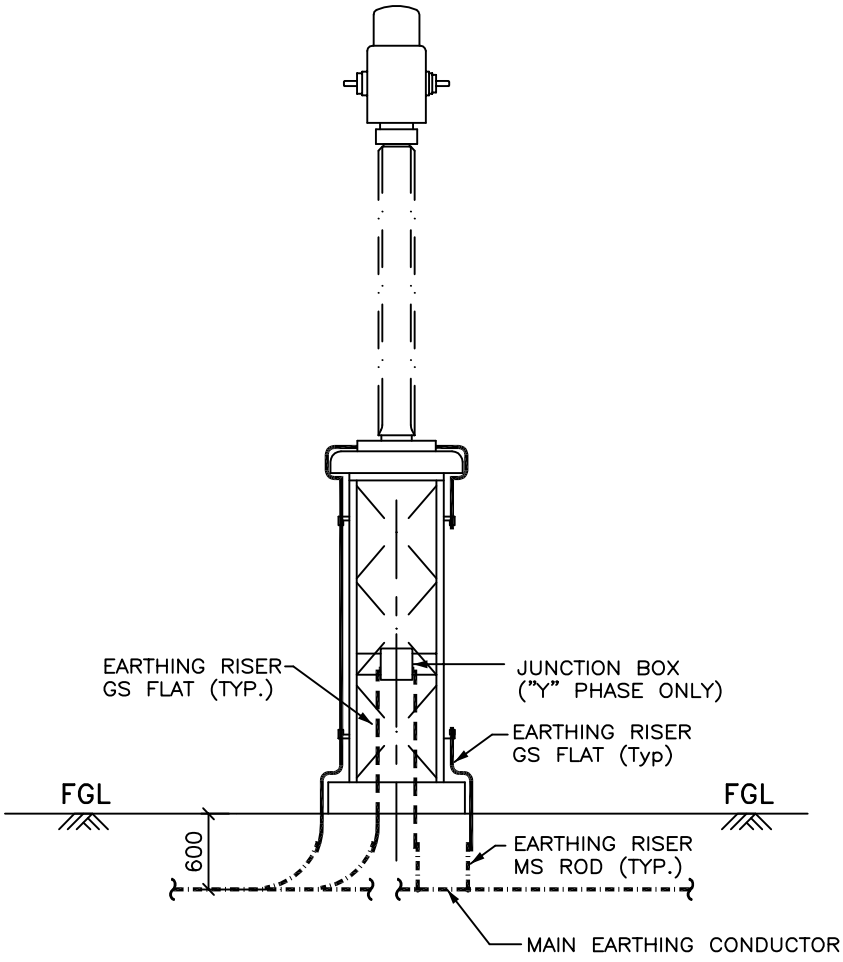
NOTES :–

1. No. OF RISERS FOR ISOLATOR = 4 Nos. / PHASE.
2. No. OF RISERS FOR MAIN MECH. BOX = 2 Nos.
3. No. OF RISERS FOR EARTH SW. MECH. BOX = 2 Nos. / BOX.
4. No. OF AUXILIARY EARTH MAT = 1 Nos. FOR EACH MB
5. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.
6. NO. OF AUX. EARTHMAT IS INDICATIVE ONLY. IT SHALL BE EXECUTED AS PER ACTUAL NUMBER/POSITION OF EARTH SWITCHES.

DRG NO:- RECTPCL/PIA/DRG-04

For Tender Purpose only
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**
TITLE:- STANDARD EARTHING DETAILS

EARTHING OF CURRENT TRANSFORMER (1 PH)



ELEVATION

LEGEND

40mmø MS ROD

75 x 12 mm GS FLAT

50 x 6 mm GS FLAT

NOTES :-

1. No. OF RISERS = 2 Nos. / PHASE.
2. No. OF RISERS FOR JUN. BOX = 2 Nos.
3. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

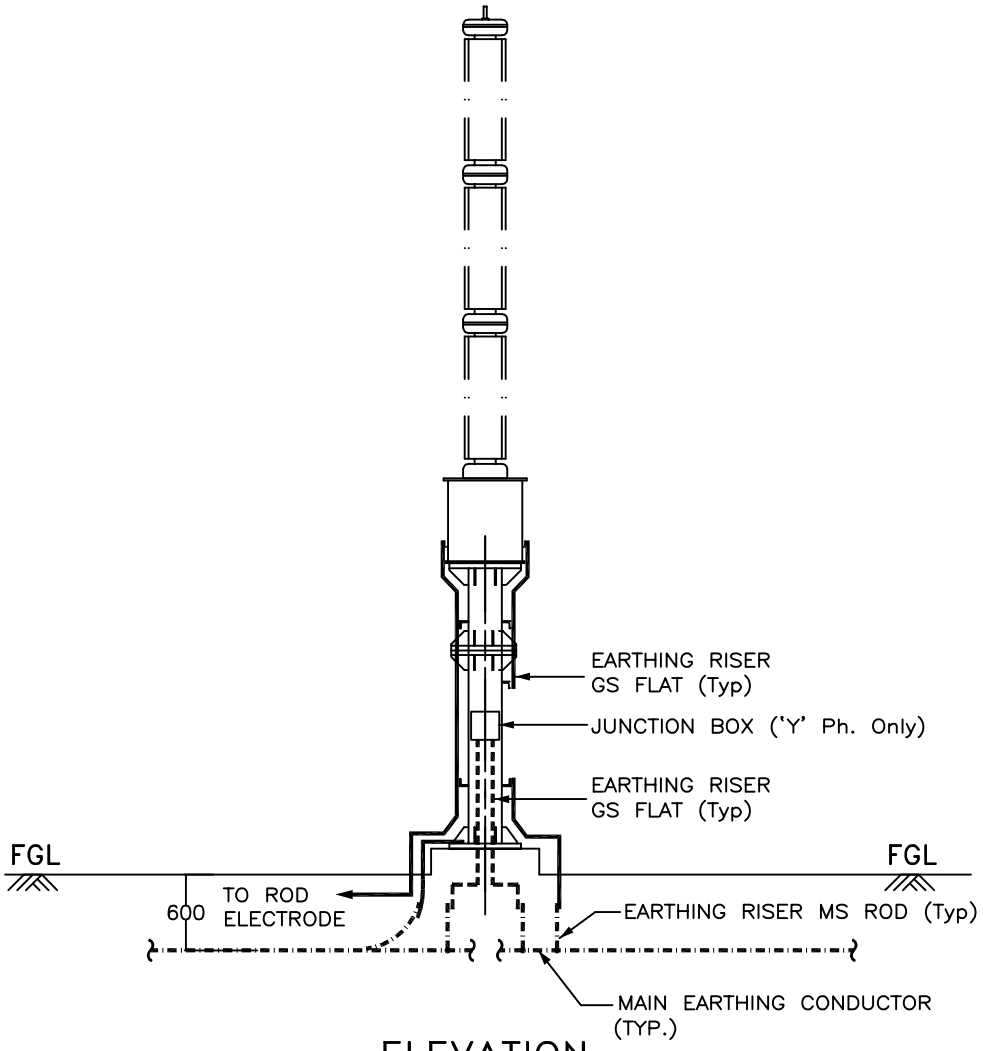
For Tender Purpose only

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

DRG NO:- RECTPCL/PIA/DRG-04

EARTHING OF CAPACITIVE VOLTAGE TRANSFORMER (1 PH)



ELEVATION

LEGEND

- 40mmø MS ROD
- 75 x 12 mm GS FLAT
- 50 x 6 mm GS FLAT

NOTES :–

1. No. OF RISERS = 3 Nos. / PHASE.
2. No. OF RISERS FOR J. BOX = 2 Nos.
3. No. OF ROD ELECTRODE REQUIRED = 1 No. / PHASE.
4. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

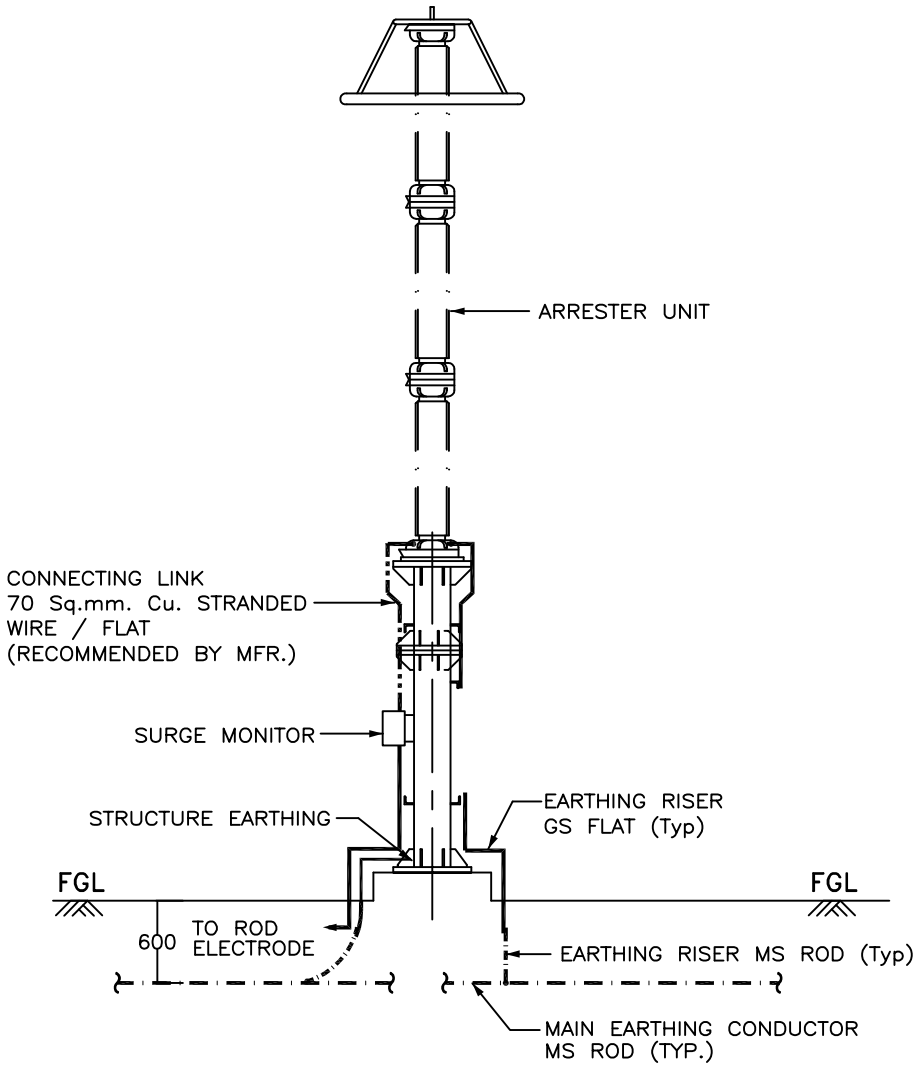
For Tender Purpose only

DRG NO:- RECTPCL/PIA/DRG-04

PROJECT :- **2x50 MVA, 220/33 KV nagrota substation**

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF SURGE ARRESTER (1PH)



ELEVATION

LEGEND

40mmø MS ROD

75 x 12 mm GS FLAT

NOTES :–

1 . No. OF RISERS = 3 Nos. / PHASE.
2 . No. OF ROD ELECTRODE REQUIRED = 1 No. / PHASE.
3 . CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

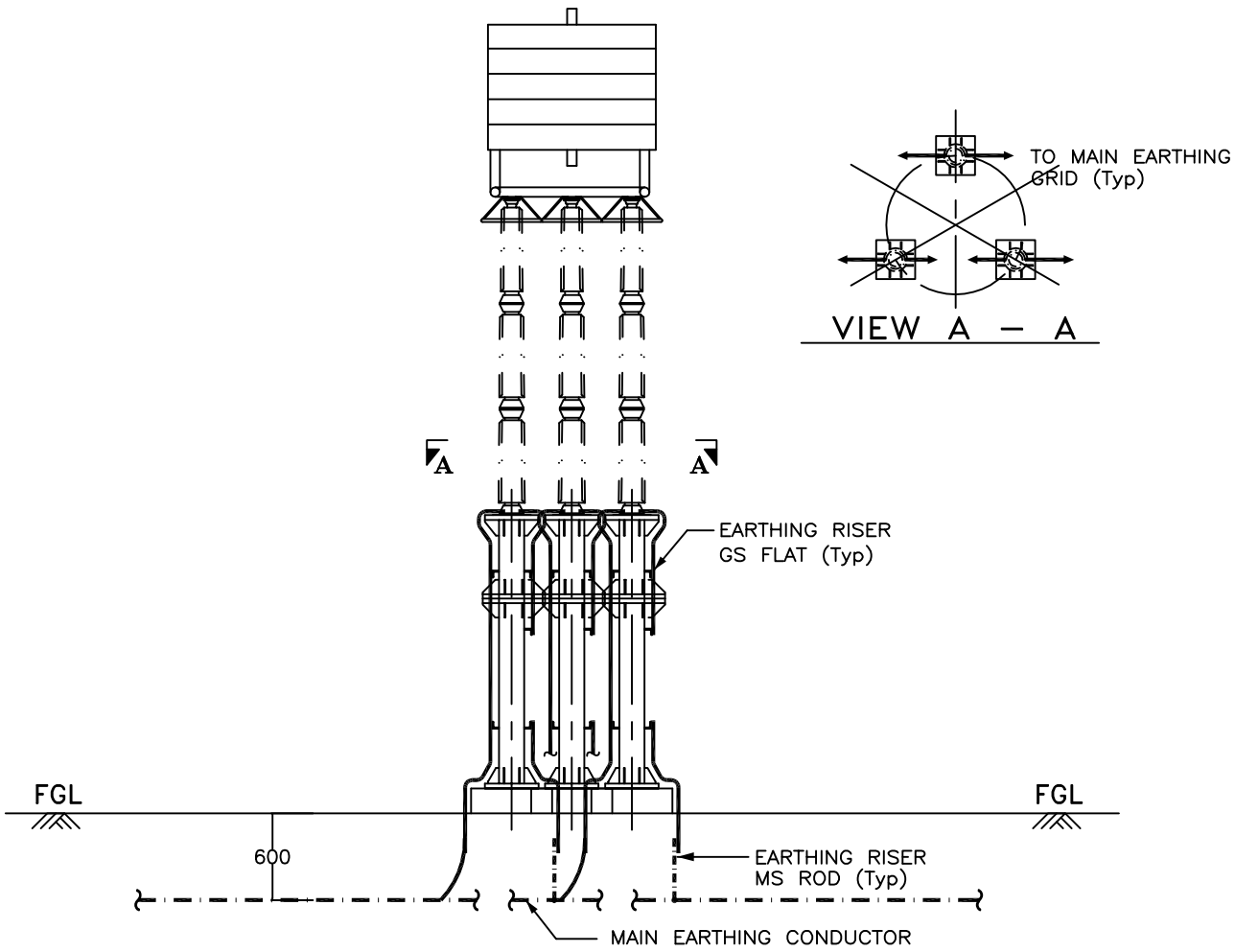
For tender purpose only

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substatiuon**

TITLE:- STANDARD EARTHING DETAILS

DRG NO:- RECTPCL/PIA/DRG-04

EARTHING OF WAVE TRAP (1PH)



ELEVATION

LEGEND

40mmø MS ROD

75 x 12 mm GS FLAT

NOTE :–

1. No. OF RISERS = 6 Nos. / PHASE.
2. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

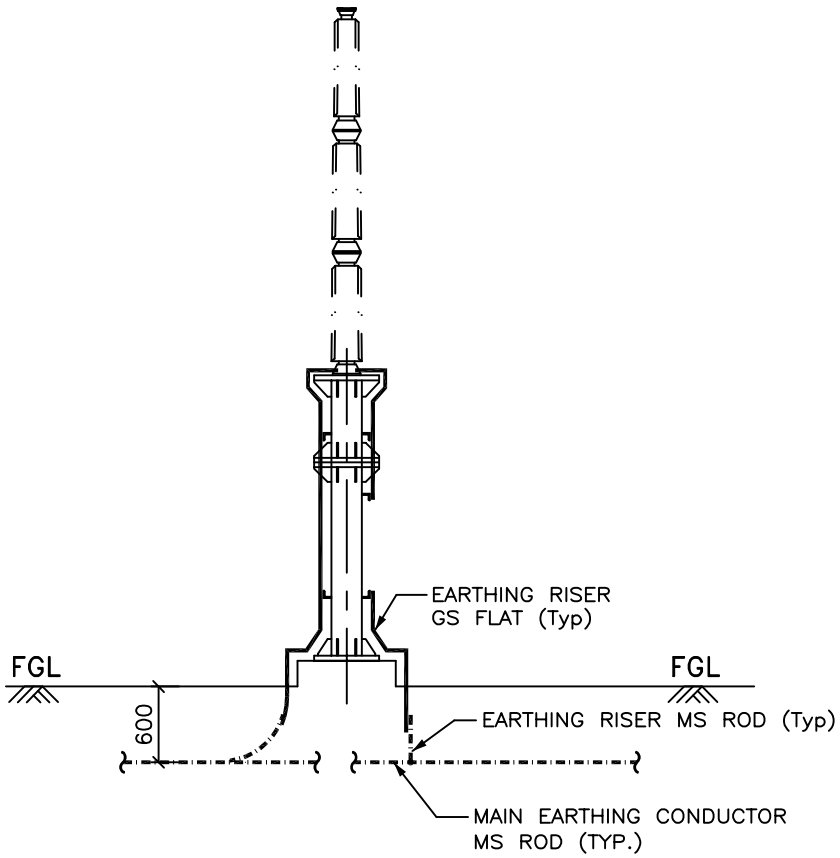
For tender purpose only

DRG NO:- RECTPCL/PIA/DRG-04

PROJECT :- **2x50 MVA, 220/33 KV nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF POST INSULATOR (1PH)



ELEVATION

LEGEND

40mmø MS ROD

75 x 12 mm GS FLAT

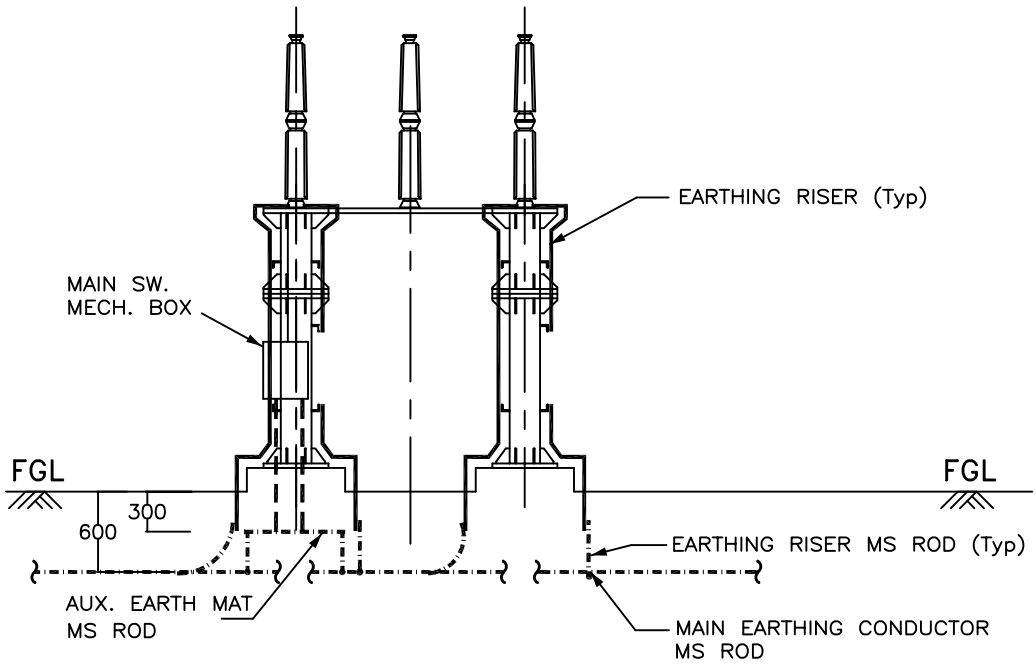
NOTES :–

1. No. OF RISERS = 2 Nos. / PHASE.
2. CLEAT CLAMP SHALL BE PROVIDED AT 1000mm INTERVAL.

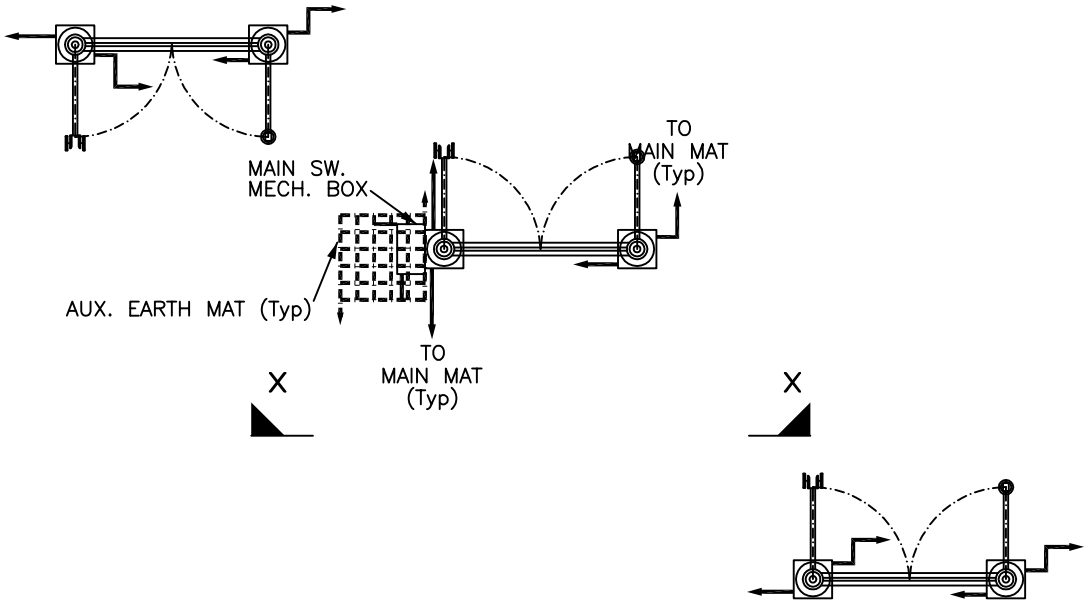
DRG NO:- RECTPCL/PIA/DRG-04

For tender Purpose only
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**
TITLE:- STANDARD EARTHING DETAILS

TANDEM ISOLATOR



VIEW – X X

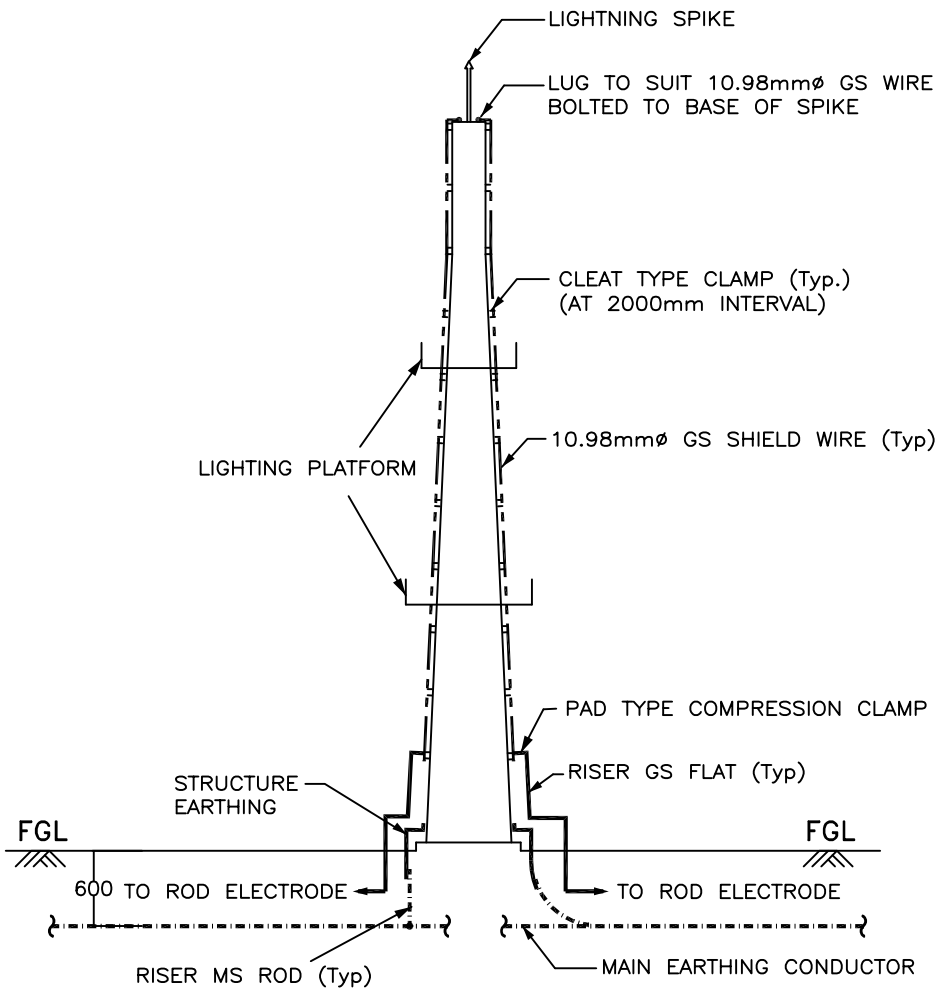


PLAN

DRG NO:- RECTPCL/PIA/DRG-04

For tender purpose only
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**
TITLE:- STANDARD EARTHING DETAILS

EARTHING OF LIGHTNING MAST



ELEVATION

NOTES :–

1. No. OF RISERS = 4 Nos.
2. No. OF ROD ELECTRODE REQUIRED = 2 Nos.
3. No. OF PAD TYPE CLAMP = 2 Nos.

LEGEND

40mmø MS ROD

75 x 12 mm GS FLAT

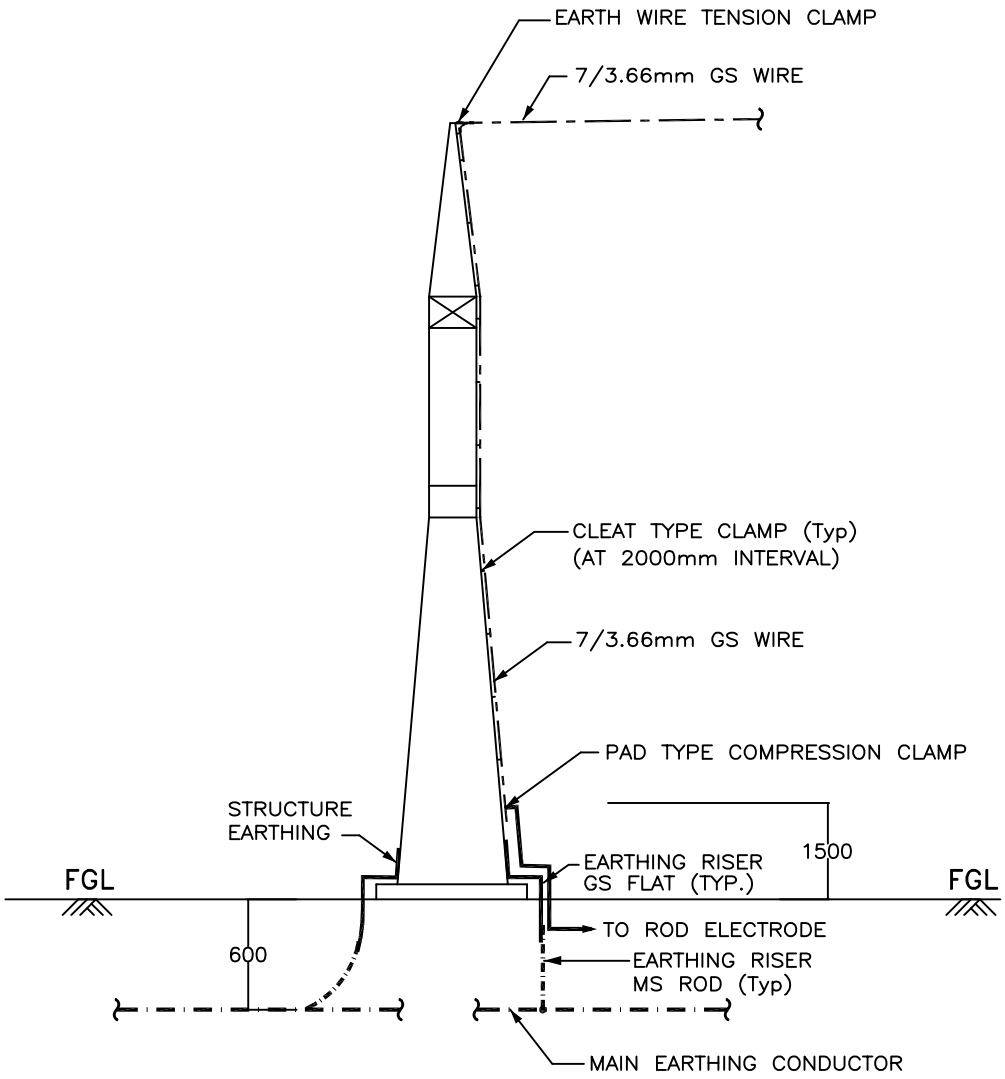
For tender Purpose only

PROJECT :- **2x50 MVA, 220/33 KV nagrota substation**

TITLE:- STANDARD EARTHING DETAILS

DRG NO:- RECTPCL/PIA/DRG-04

EARTHING OF TOWER WITH PEAK



ELEVATION

LEGEND

- 40mmø MS ROD
- 75 x 12 mm GS FLAT

NOTES :–

1. No. OF RISERS = 3 Nos.
2. No. OF ROD ELECTRODE REQUIRED = 1 No.
3. No. OF PAD TYPE CLAMP = 1 No.

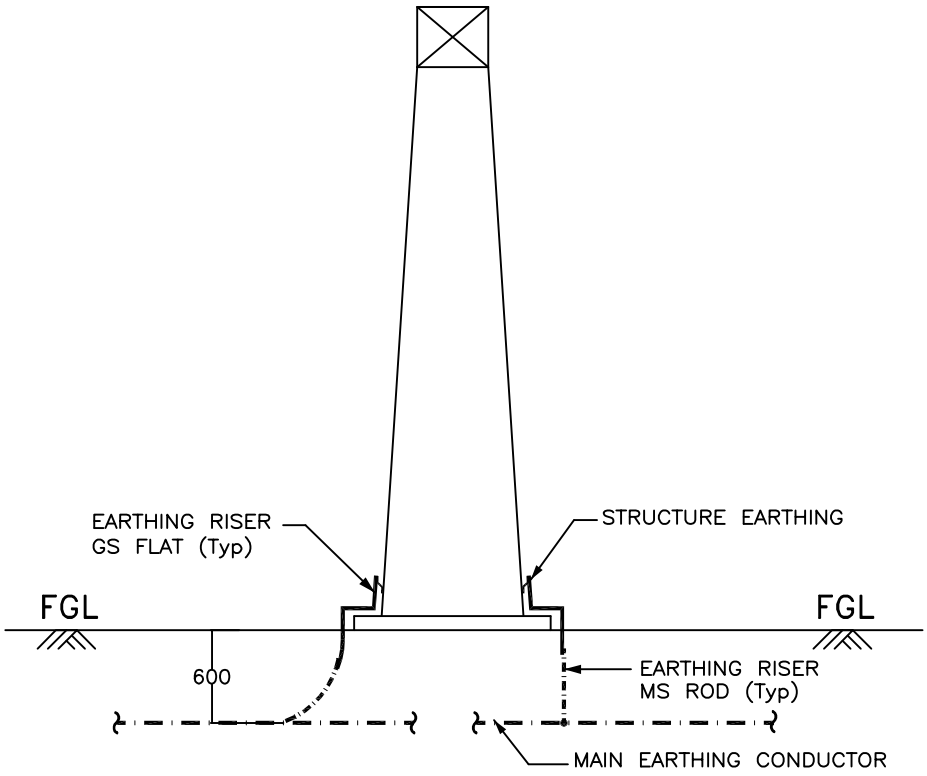
For Tender purpose only

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

DRG NO:- RECTPCL/PIA/DRG-04

EARTHING OF TOWER WITHOUT PEAK



ELEVATION

LEGEND

40mmø MS ROD

75 x 12 mm GS FLAT

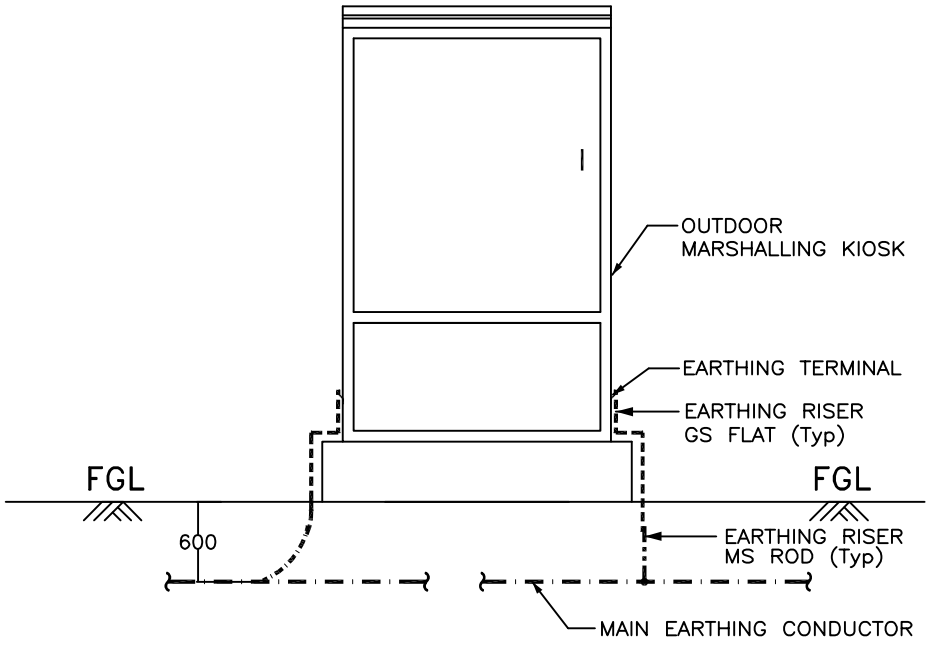
NOTES :–

1. No. OF RISERS = 2 Nos.

DRG NO:- RECTPCL/PIA/DRG-04

For tender purpose only			
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**			
TITLE:- STANDARD EARTHING DETAILS			
CKD BY	PRPD BY	Date	

EARTHING OF BAY MARSHALLING BOX



ELEVATION

LEGEND

—— · —— · ——	40mmø MS ROD
————————	75 x 12 mm GS FLAT
- - - - - - - - - - - - - - -	50 x 6 mm GS FLAT

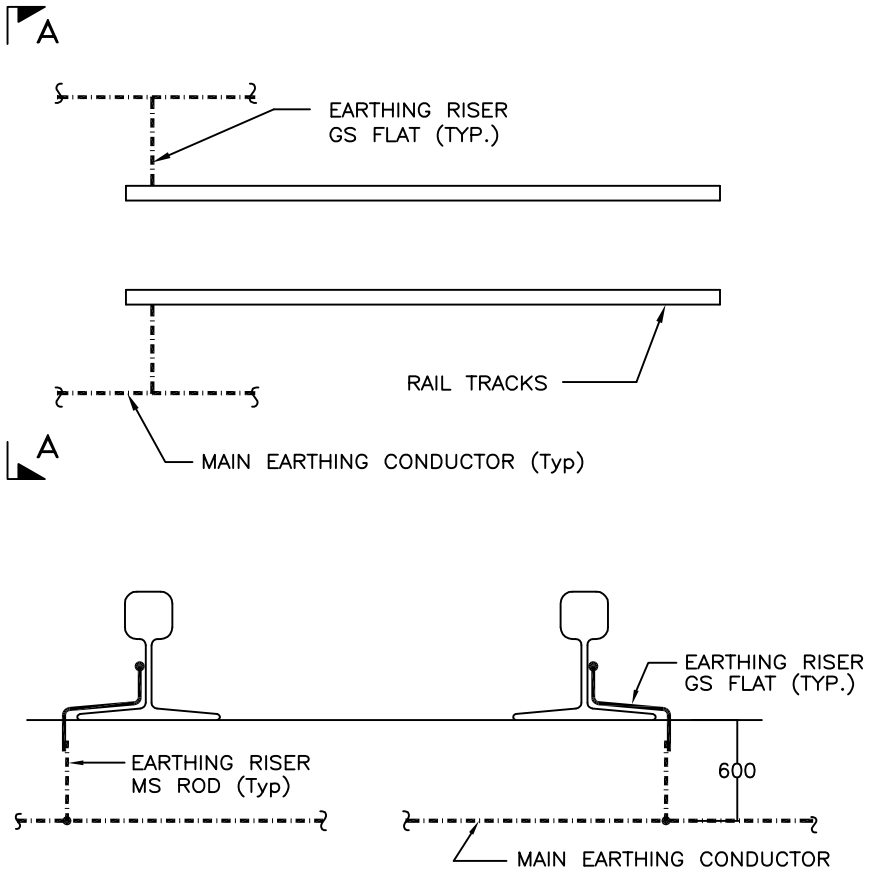
NOTE :–

1. No. OF RISERS = 2 Nos.

DRG NO:- RECTPCL/PIA/DRG-04

For Tender Purpose Only
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**
TITLE:- STANDARD EARTHING DETAILS

EARTHING OF RAIL TRACK



SECTION A – A

LEGEND

40mmø MS ROD

75 x 12 mm GS FLAT

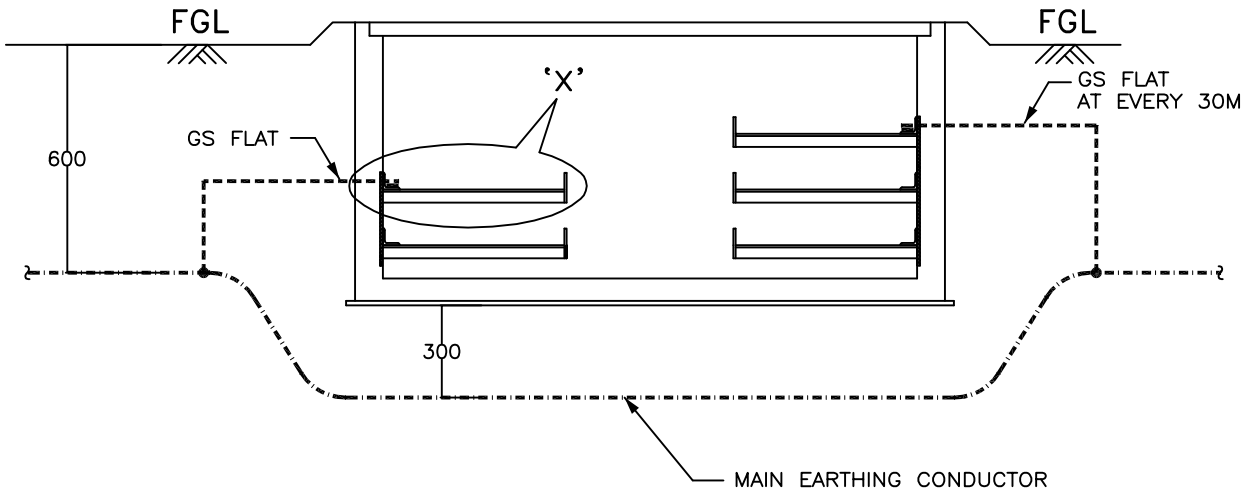
NOTES :–

1. EACH RAIL SHALL BE EARTHED AT 30M INTERVAL AND ALSO AT BOTH ENDS.

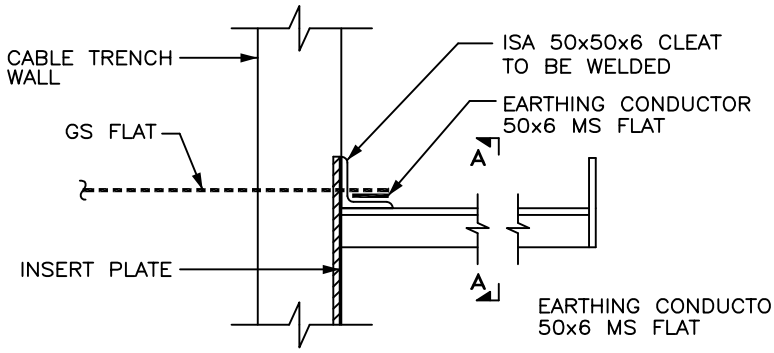
DRG NO:- RECTPCL/PIA/DRG-04

For tender Purpose only
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**
TITLE:- STANDARD EARTHING DETAILS

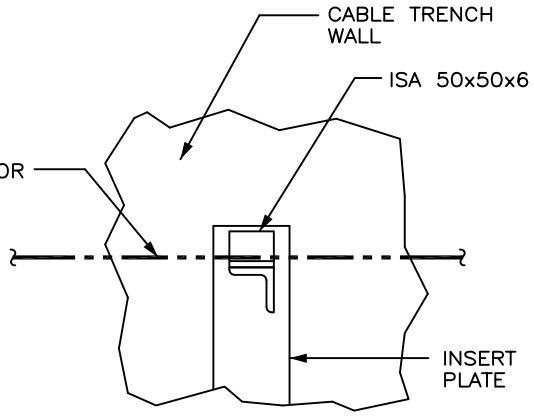
EARTHING OF CABLE TRENCH



TYPICAL CROSS SECTION OF CABLE TRENCH



DETAIL – X



SECTION A – A

NOTES :–

1. MS FLAT SHALL RUN ON TOP TIER ALL ALONG THE CABLE TRENCHES & WELDED TO EACH OF THE RACKS.
2. MS FLAT SHALL BE EARTHED AT 30M INTERVAL AND ALSO AT BOTH ENDS.

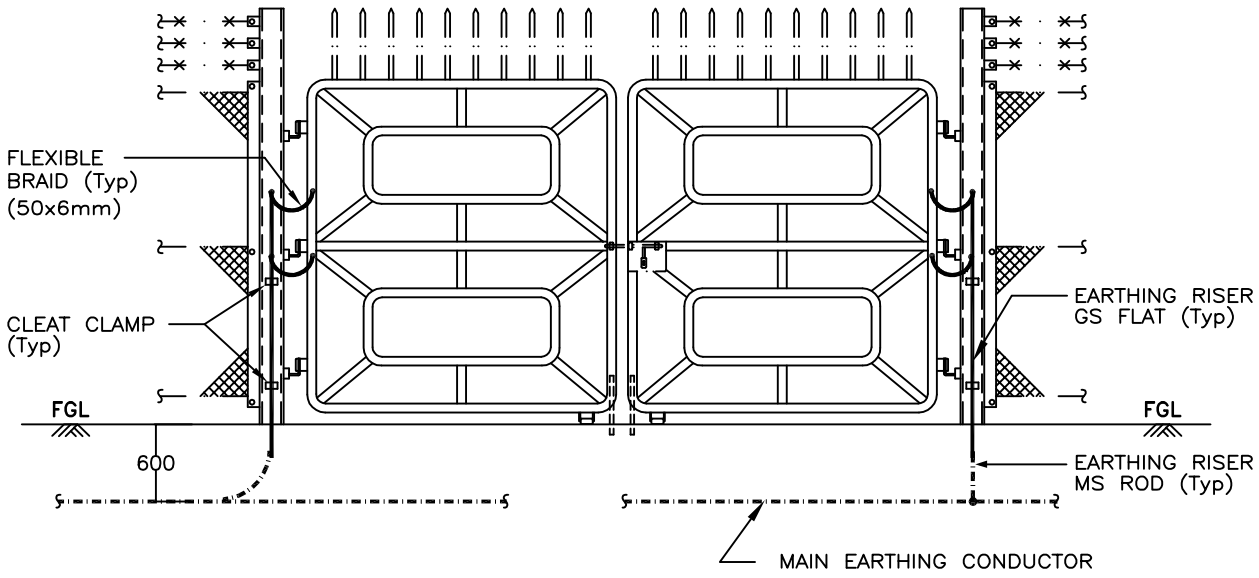
DRG NO:- RECTPCL/PIA/DRG-04

For Tender Purpose only

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF GATES



MAIN GATE

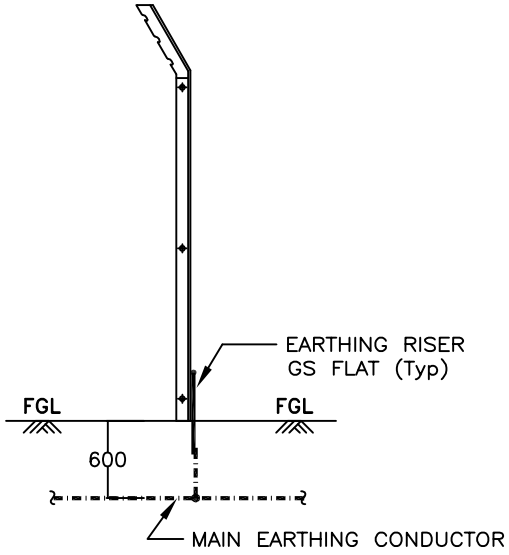
LEGEND

- 40mmø MS ROD
- 75 x 12 mm GS FLAT
- 50 x 6 mm MS FLAT

NOTES :–

	FENCE POST	MAIN GATE
1 . No. OF RISERS REQUIRED	1	2
2 . No. OF FLEXIBLE BRAID	–	4

3. ALL GATES & EVERY ALTERNATE FENCE SHALL BE CONNECTED TO EARTHING GRID.



FENCE POST
(ALTERNATE FENCE POST)

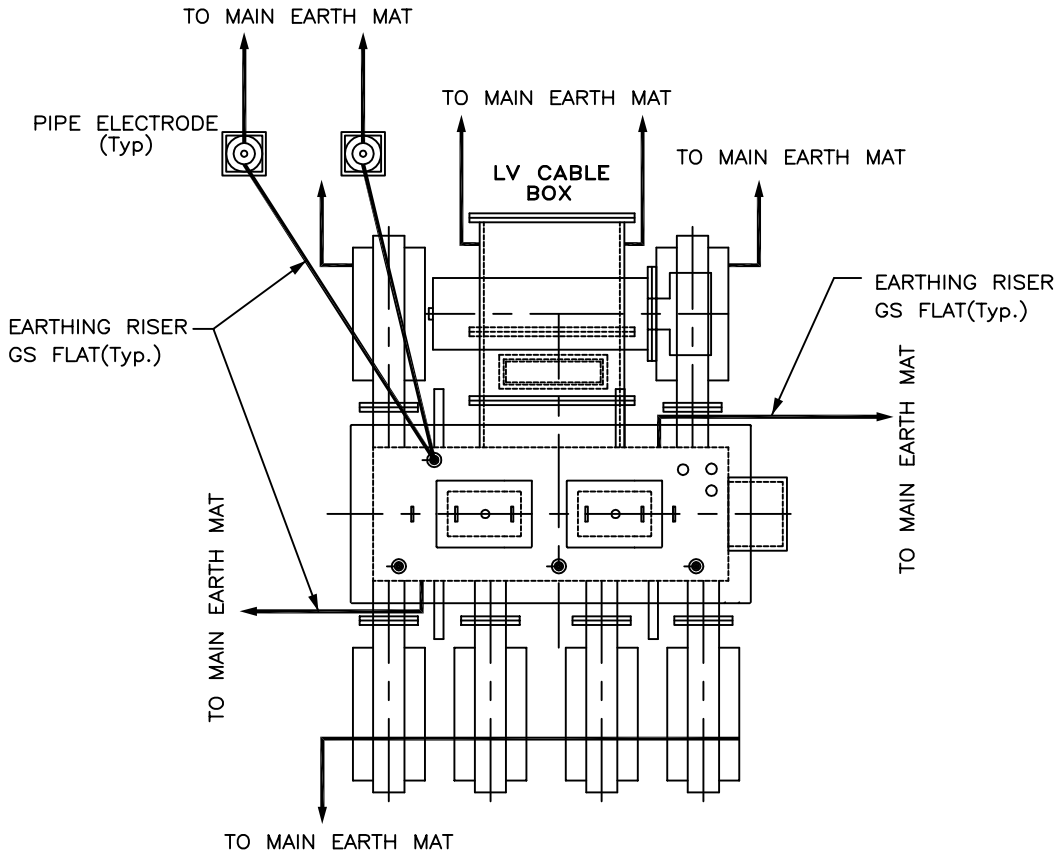
DRG NO:- RECTPCL/PIA/DRG-04

For tender purpose only

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF LT TRANSFORMER



PLAN

LEGEND

40mmø MS ROD

75 x 12 mm GS FLAT

50 x 6 mm GS FLAT

NOTES :–

1. No. OF RISERS FOR MAIN TANK & T.M. MAR. BOX = 4 Nos.
2. No. OF RISERS FOR LV CABLE BOX & RADIATOR = 4 Nos.
3. No. OF RISERS FOR PIPE ELECTRODE = 2 Nos.
4. No. OF PIPE ELECTRODES REQUIRED = 2 Nos.

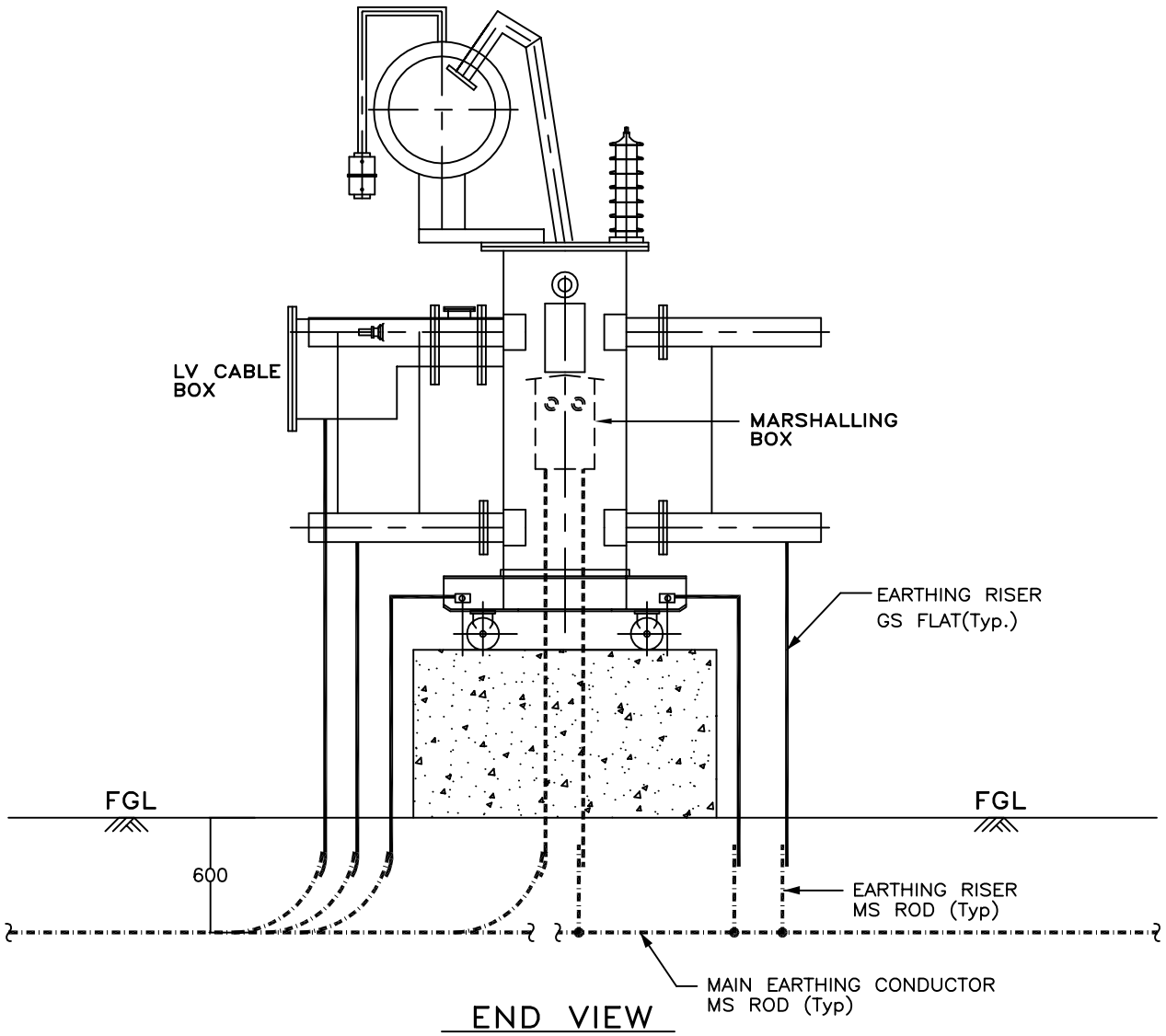
DRG NO:- RECTPCL/PIA/DRG-04

For tender purpose only

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF LT TRANSFORMER



END VIEW

For tender purpose only

DRG NO:- RECTPCL/PIA/DRG-04

PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**

TITLE:- STANDARD EARTHING DETAILS

EARTHING OF PYLON SUPPORTS

Pylon supports shall be grounded through 50x6mm GI flat to the ring around the Pylon supports of 75x12mm GI flat which in tu rn is connected to the main grid (40 mm dia MS rod) at 2 to3 points as available.

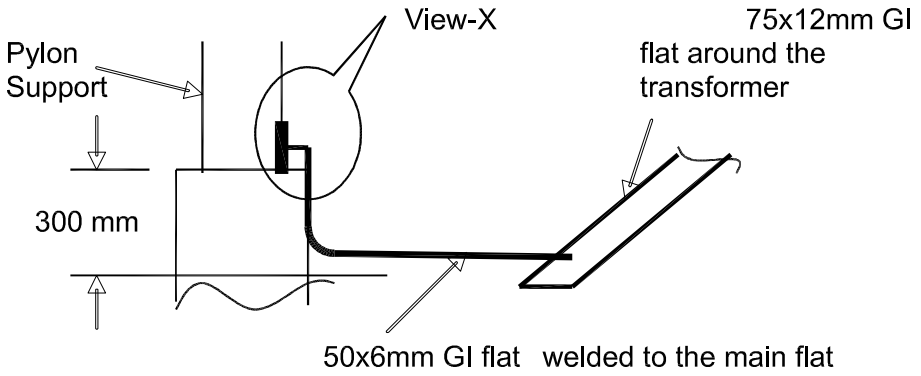


Fig.- Elevation (Earthing of Pylon Supports)

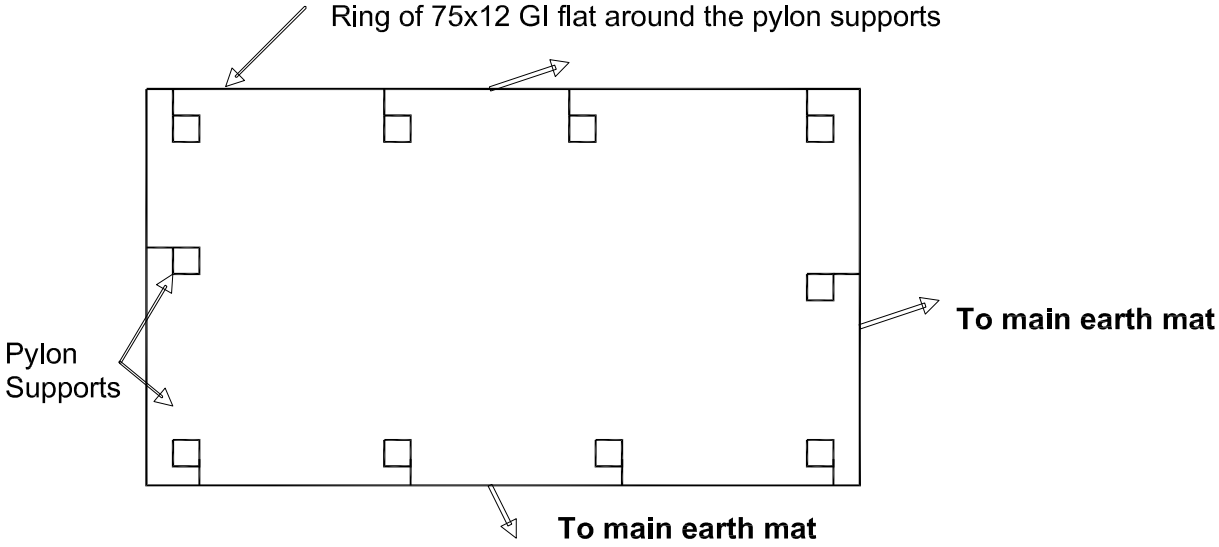


Fig.- Layout (Earthing of Pylon Supports)

DRG NO:- RECTPCL/PIA/DRG-04

For tender purpose only
PROJECT :- **2x50 MVA, 220/33 KV Nagrota Substation**
TITLE:- STANDARD EARTHING DETAILS

EARTHING OFHYDRANT/ HVW SPRAY PIPING

These pipes shall be grounded at pump house through 50x6mm GI flat connected to the main flat, 75x12mm running around the room.

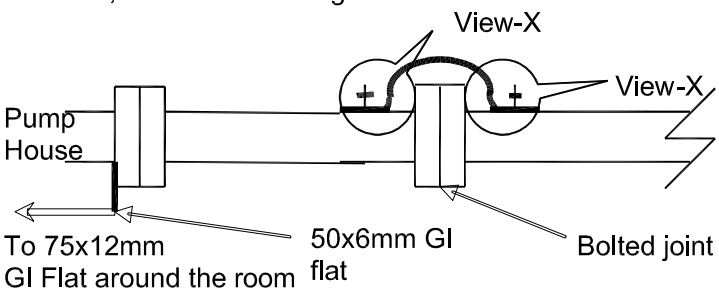


Fig.-Earthing of Hydrant / HVW Spray Piping

EARTHING OFHYDRANT POST/ HOSE BOX

A bolt shall be welded to these structures at the time of installation which can be used to connect them to the nearest riser or main 75x12mm GI flat through 50x6mm GI flat.

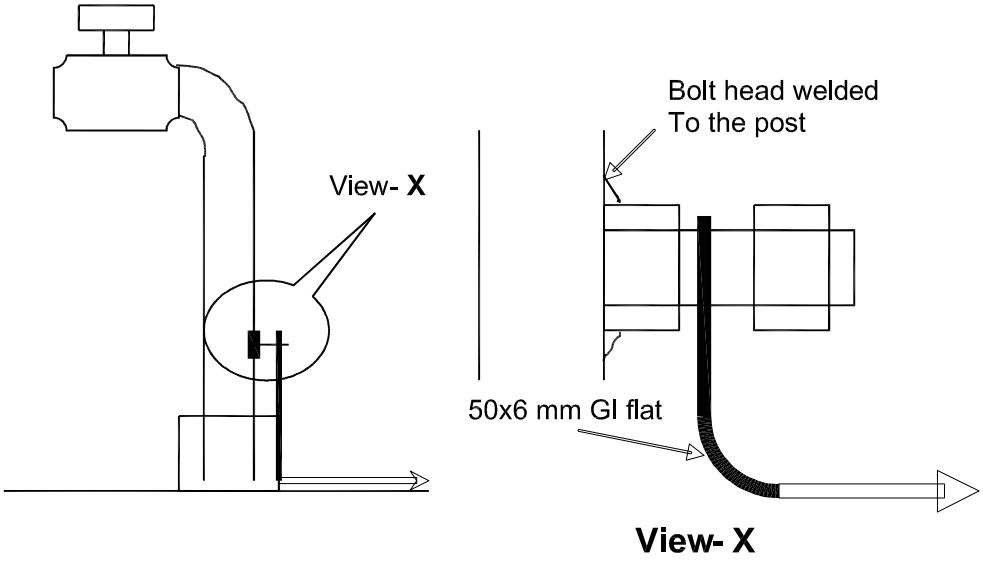
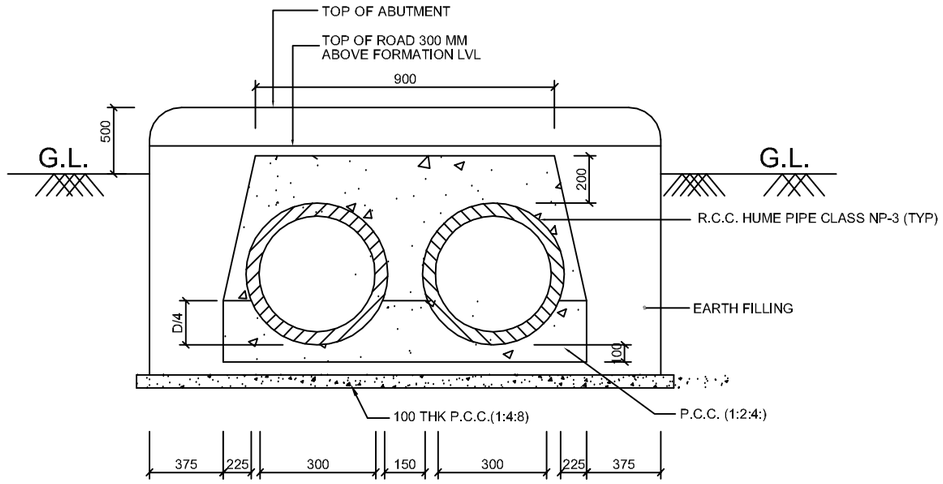


Fig.- Earthing of hydrant box / hose box

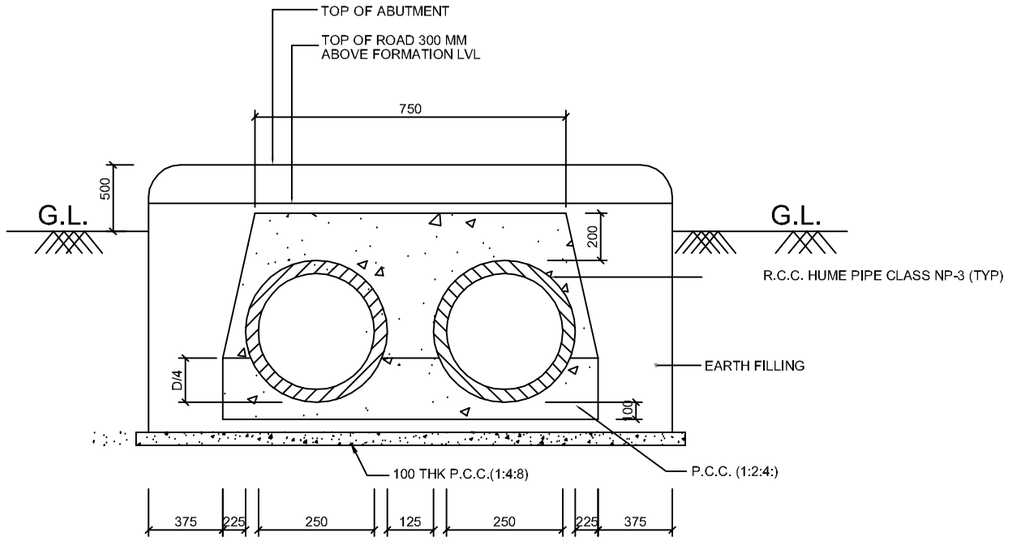
RELEASED FOR CONTRUCTION

	For tender purpose only
PROJECT :-	**2x50 MVA, 220/33 KV Nagrota Substation**
TITLE:- STANDARD EARTHING DETAILS	

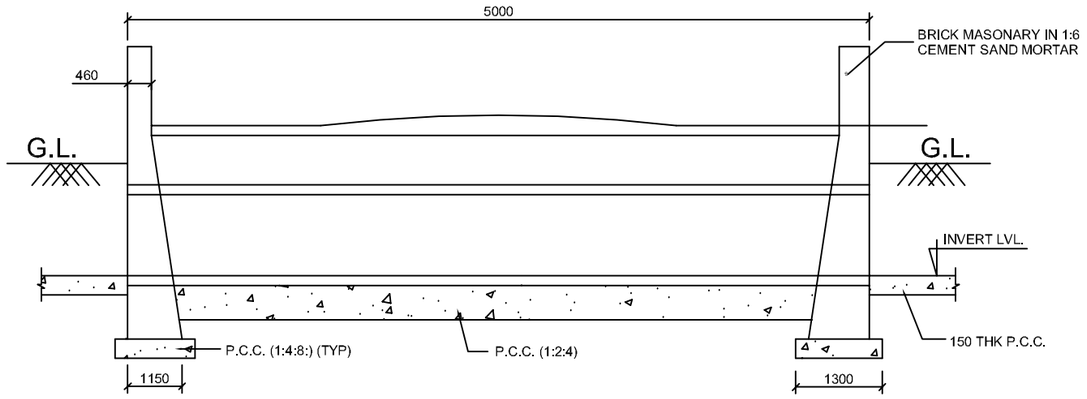
DRG NO:- RECTPCL/PIA/DRG-04



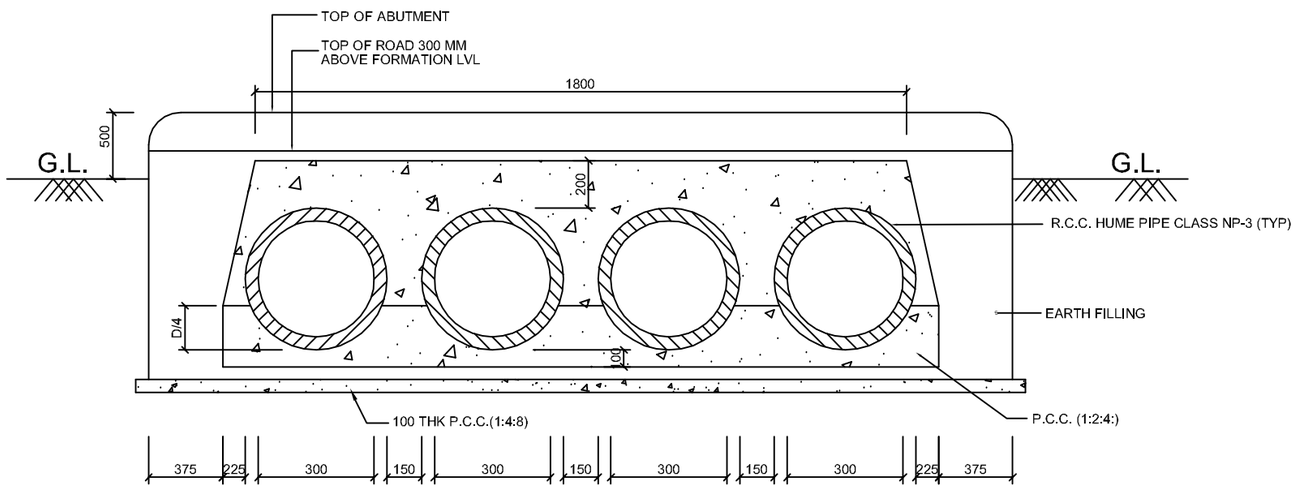
CABLE TRENCH SECTION 2-2 CROSSING ROAD



CABLE TRENCH SECTION 3-3 CROSSING ROAD



LONGITUDUNAL SECTION THROUGH CABLE TRENCH CROSSING ROAD



CABLE TRENCH SECTION 1-1 CROSSING ROAD

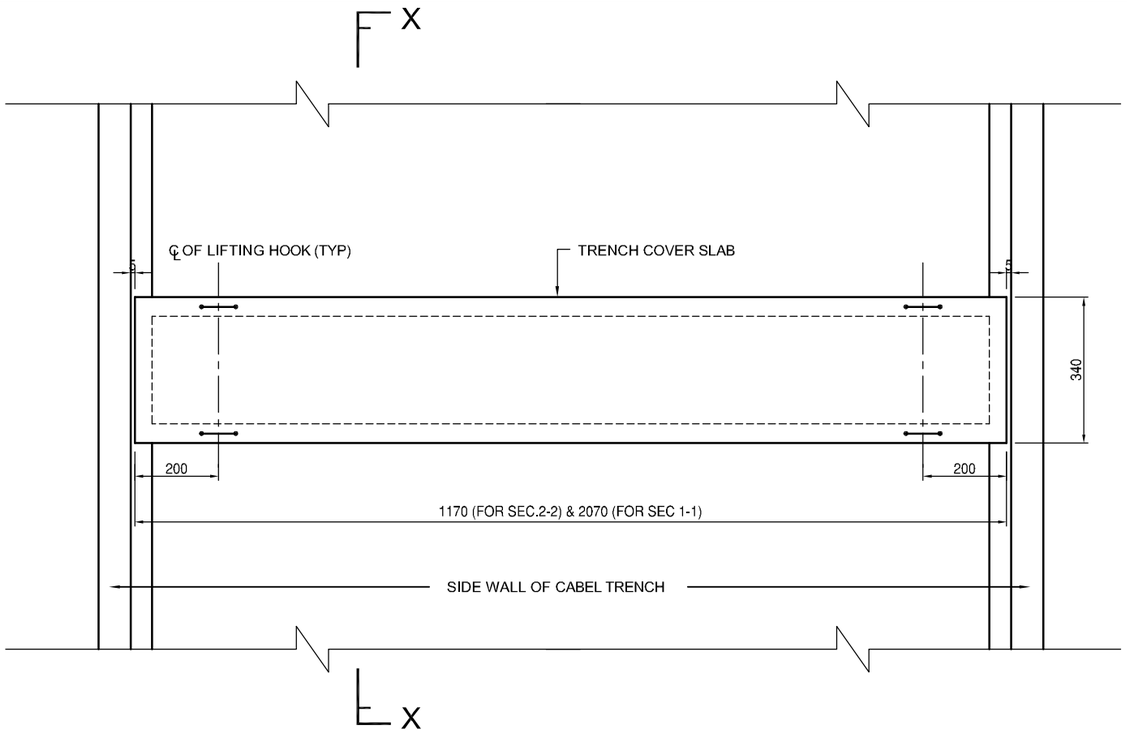
NOTES:-

1. ALL DIMENSIONS ARE IN MM.
2. DO NOT SCALE THE DRG.
3. RCC HUME PIPE SHALL BE OF GRADE NP3.
4. CLASS 75 BRICKS SHALL BE USED.
5. CONCRITE MIX USE FOR COVRING RCC PIPE SHALL BE 1:2:4
   (1CEMENT: 2 COURSE SAND: 4 STONE AGGREGATE OF 20 MM NORMINAL SIZE)
6. ALL IN CONCRETE SHALL BE 1:4:8
   (1CEMENT: 4 COURSE SAND: 8 STONE AGGREGATE OF 40 MM NORMINAL SIZE)
7. BRICK MASSONARY SHALL BE DONE USING CEMENT MORTAR
   (1CEMENT: 6 FINE SAND)

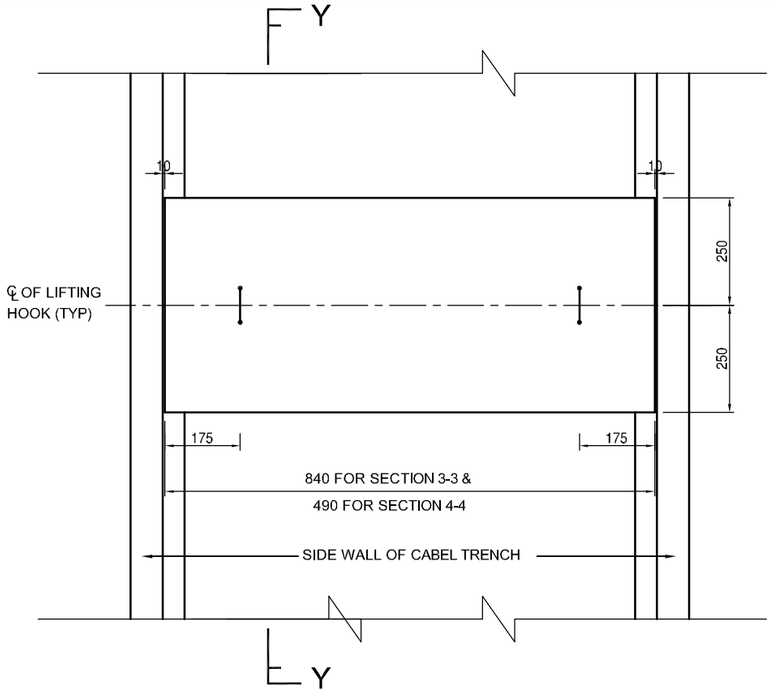
DRG NO:- RECTPCL/PIA/DRG-05

FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.	
PROJECT :	2x50 MVA, 220/33 KV Nagrota substation
TITLE :	DETAIL FOR CABLE TRENCH CROSSING



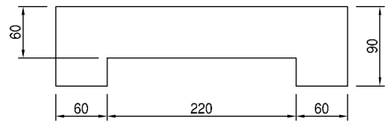
DETAIL OF TRENCH COVER SLAB FOR SECTION (1-1) & (2-2)



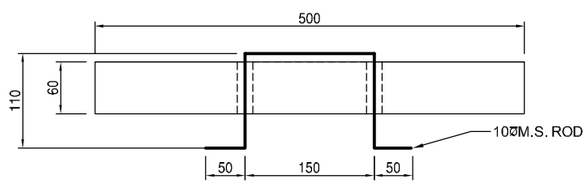
DETAIL OF TRENCH COVER SLAB FOR SECTION (3-3) & (4-4)

NOTE:

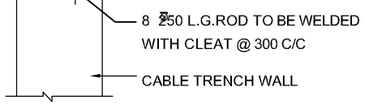
1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE SPECIFIED.
2. DO NOT SCALE THE DRG. FOLLOW WRITTEN DIMENSION ONLY.
3. R.C.C. MIX SHALL BE 1:1.5:3 (1CEMENT:1.5COARSE SAND:3 STONE AGGREGATE) 20MM NOMINAL SIZE.
4. LEAN CONC. SHALL BE 1:4:8.
5. CLEAR COVER FOR BOTTOM SLAB REINF. ON TOP SIDE IS 25mm.
6. LIFTING HOOK ARE TO BE PROVIDED IN EVERY TENTH SLAB.
7. NECESSARY OPENING SHALL BE PROVIDED AT APPROPROATE LOCATION TO TAKE OUT CABLES.
8. FOR ACTUAL DEPTH OF TRENCHES REFER CABLE TRENCH LAYOUT.
9. F.G.L. DENOTES FINISHED GRADED LAVEL (FORMATION LEVEL).
10. F.G.L. TO BE TAKEN FROM LAYOUT DRG.
11. A SLOPE OF 1:250 SHALL BE GIVEN IN THE DIRECTION PERPENDICULAR TO THE RUN OF THE TRENCH FOR ALL SECTIONS.
12. ALL CABEL TRENCHES SHALL BE GIVEN A SLOPE OF 1:1000 IN THE DIRECTION OF MAIN RUN.
13. EARTHING CONDUCTOR `E' 50X6 M.S.FLAT WOULD BE WELDED ON THE CABLE SUPPORTING STRUCTURES BEFORE INSTALATION OF CABLE.
14. ALL STEEL STRUCTURE PLATES WOULD BE PAINTED WITH NON CORROSIVE PAINT ON A SUITABLE PRIMER BEFORE INSTALLATION OF CABLES. EARTHING CONDUCTOR WOULD HAVE RED PAINT.
15. TRENCH WALL SHALL CLEAR THE EQUIPMENT FOUNDATION BY 100mm.(MINIMUM)
16. NECESSARY CONSTRUCTION JOINT SHALL BE PROVIDED AT EVERY 30M. MIN OR AS PER SITE REQUIREMENT.
17. 40mm CLEAR COVER FOR WALL AND BOTTOM SLAB REINFORCEMENT WHICH IS TOWARDS EARTH SIDE SHALL BE PROVIDED.
18. ALL SUPPORT ANGLE SHALL BE L50X50X6.
19. ANCHORING FLAT (75X6mm)SHALL BE PROVIDED AT EACH SUPPORT ANGLE POINT.
20. EARTHING CONDUCTOR MKD.`E' SHALL BE PROVIDED ON THE TOP TIER OF EACH CABLE TRENCH SECTIONS.
21. TRENCH WALL SHALL CLEAR THE TOWER FOUNDATION BY 1000mm (MIN.)



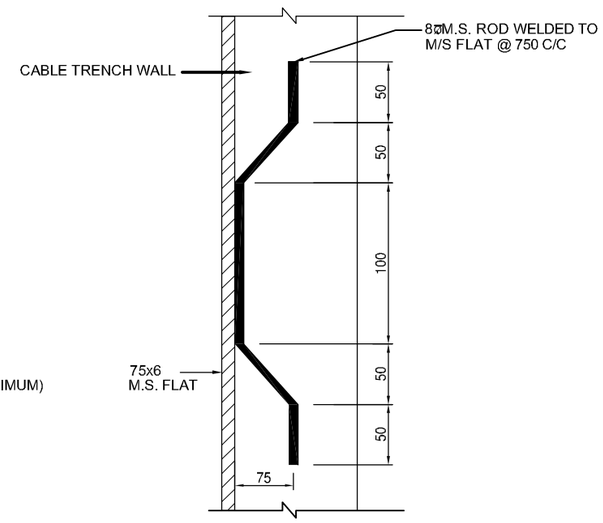
SECTION X-X



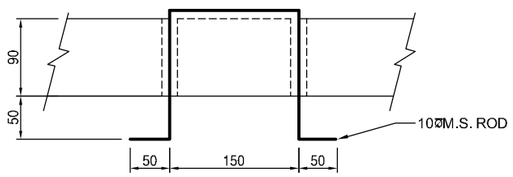
SECTION Y-Y



TYPICAL DETAIL OF SLAB SUPPORT



TYPICAL DETIAL OF ANCHORING 75X6 M.S.FLAT

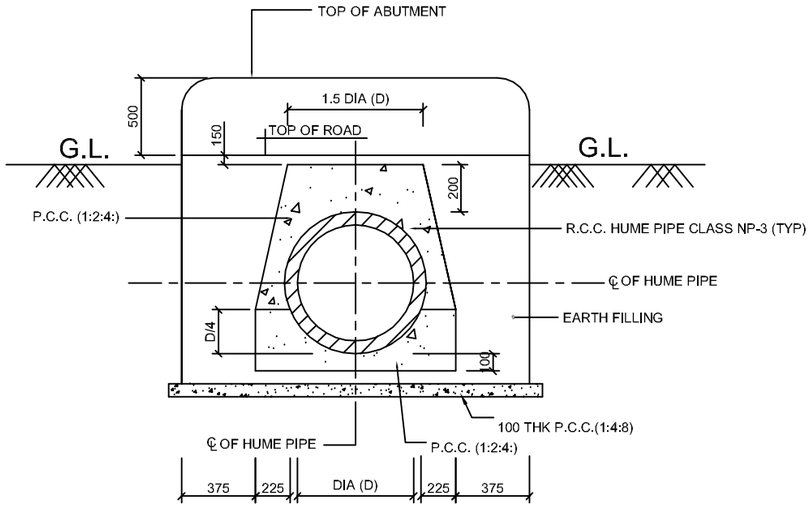


DETAIL OF LIFTING HOOK FOR SECTION 1-1 & 2-2

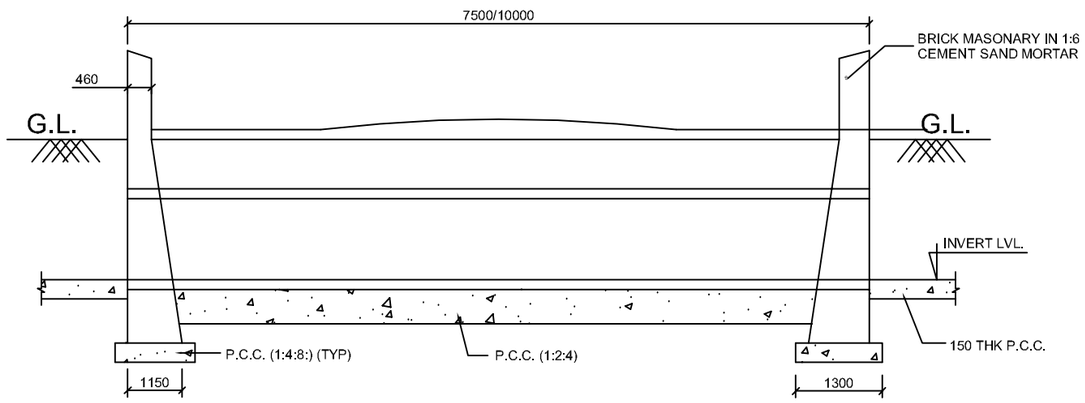
DRG NO:- RECTPCL/PIA/DRG-06

FOR TENDER PURPOSE ONLY

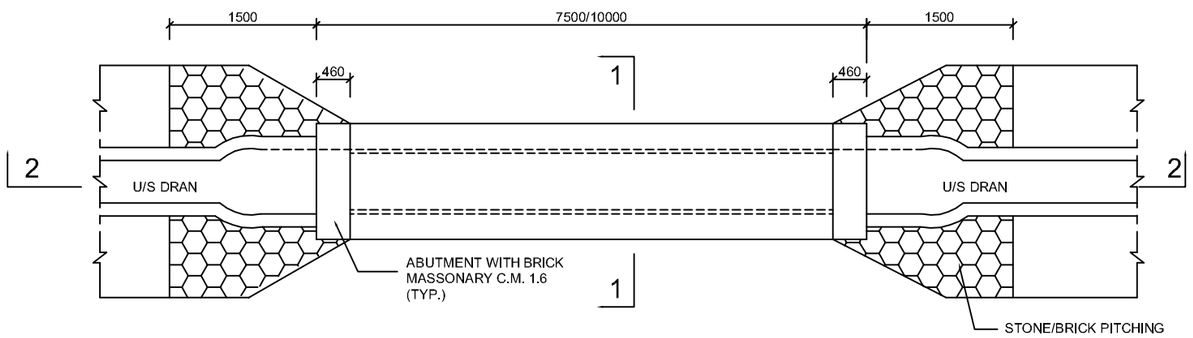
REC TRANSMISSION PROJECTS COMPANY LIMITED	
PROJECT :	2x50 MVA, 220/33 KV Nagrota Substation
TITLE :	DETAIL FOR CABLE TRENCH SECTIONS
SHEET 2 OF 2	



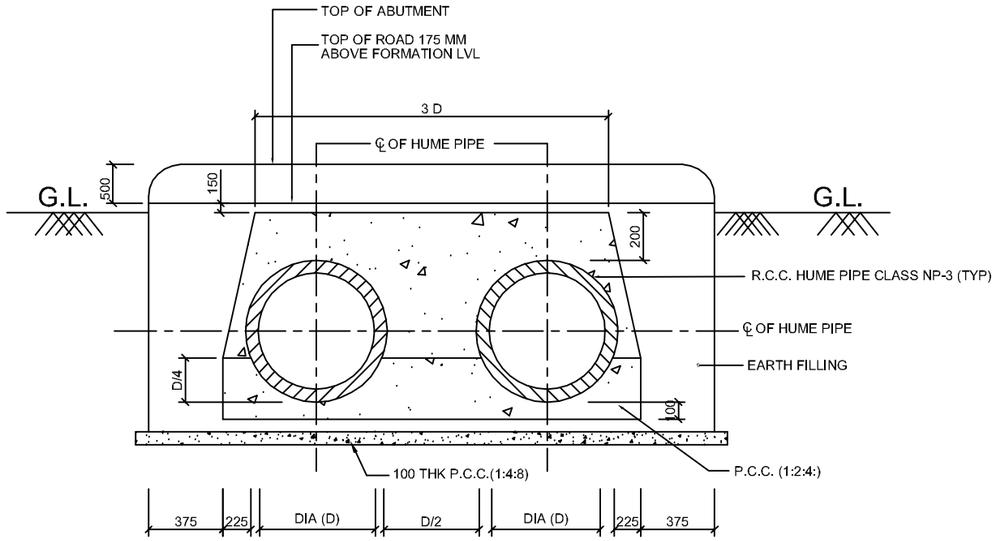
SECTION 1-1 FOR SINGLE PIPE



SECTION 2-2



PLAN OF PIPE CULVERT



SECTION 1-1 FOR DOUBLE PIPE CULVERT

NOTES:-

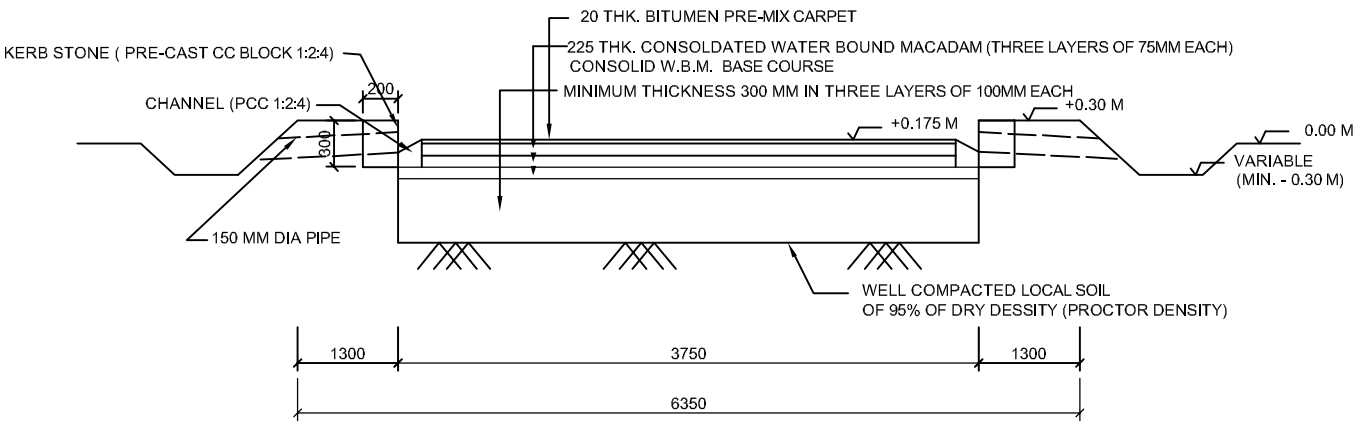
1. ALL DIMENSIONS ARE IN MM.
2. DO NOT SCALE THE DRG.
3. WORK SHALL BE DONE AS PER C.P.W.D. SPECIFICATION.

DRG NO:- RECTPCL/PIA/DRG-07

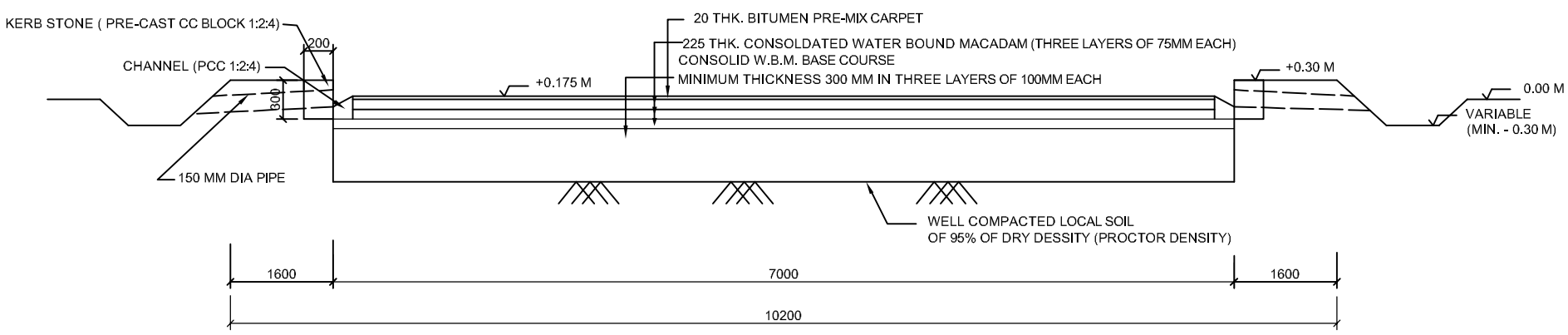
RELEASED FOR TENDER

REC TRANSMISSION PROJECTS COMPANY LIMITED	
PROJECT :	**2x50 MVA, 220/33 KV Nagrota Substation**
TITLE :	**DETAIL OF ROAD CULVERTS**
SHEET 1 OF 1	

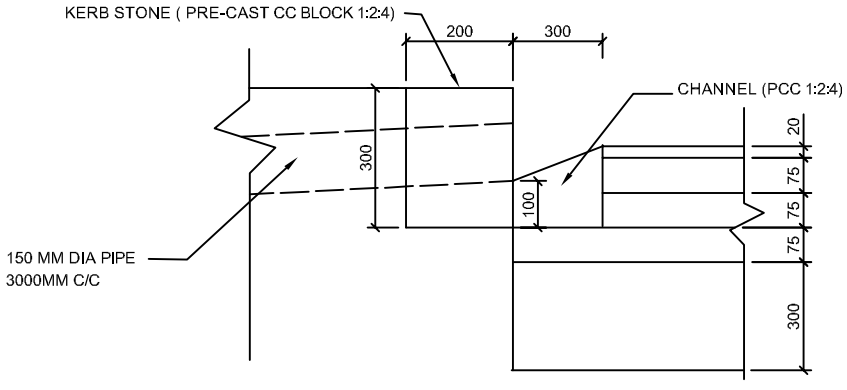
DETAILS OF BLACK TOP / BITUMINOUS ROADS (FLEXIBLE PAVEMENT)



TYP. CROSS SECTION OF 3.75 M WIDE ROAD



TYP. CROSS SECTION OF 7.0 M WIDE ROAD

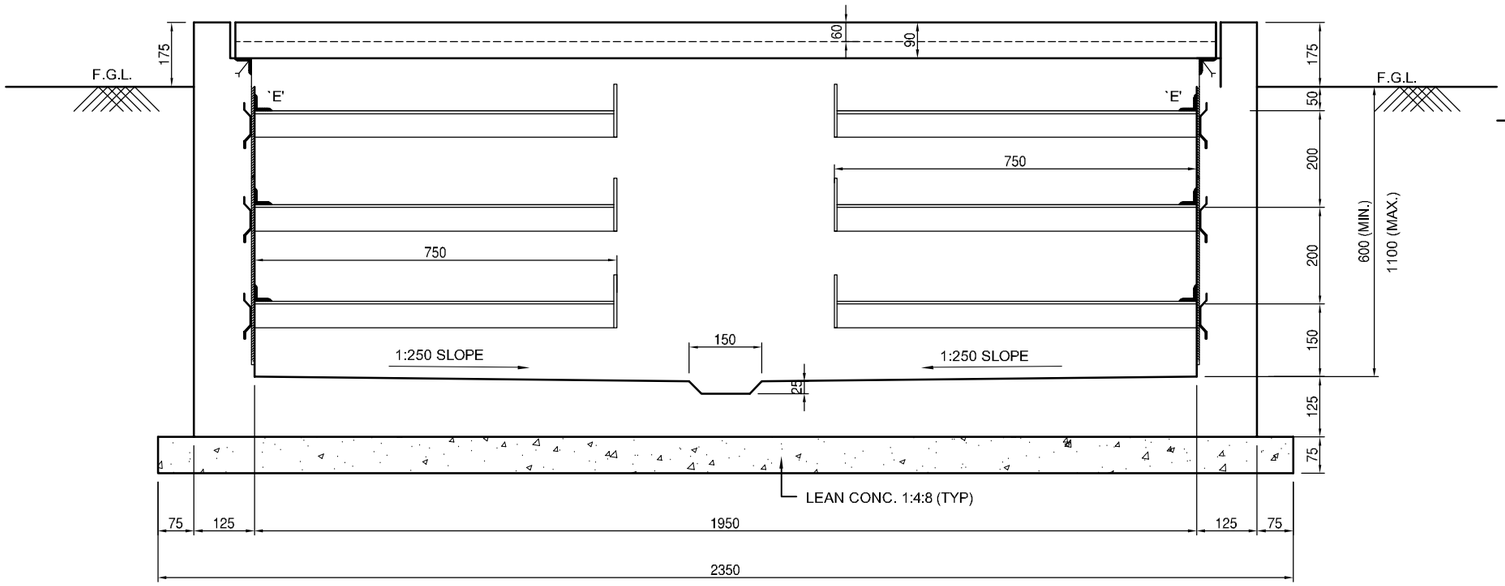


TYP. DETAILS OF KERB STONE AND CHANNEL

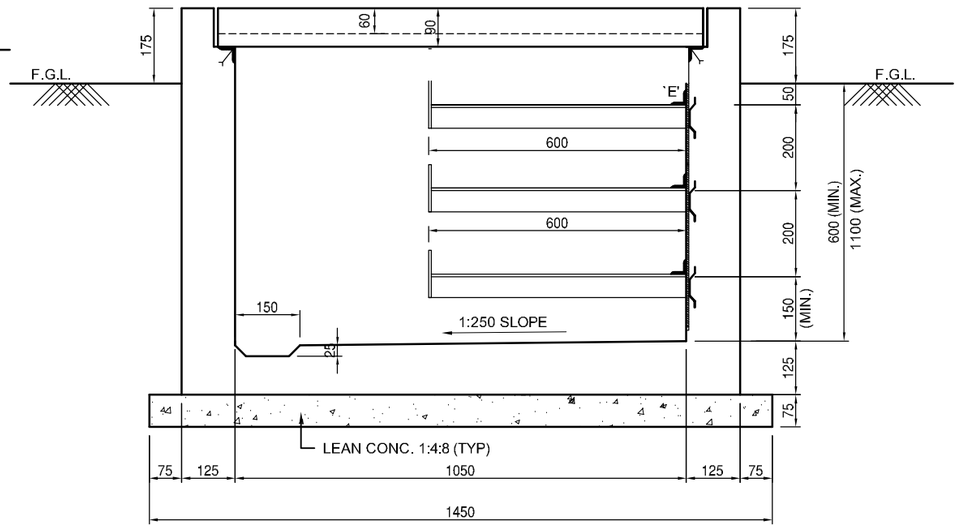
DRG NO:- RECTPCL/PIA/DRG-08

FOR TENDER PURPOSE ONLY

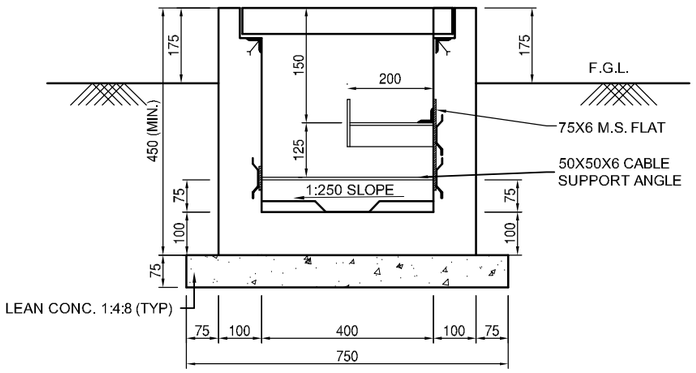
REC TRANSMISSION PROJECTS COMPANY LIMITED	
PROJECT :	**2x50 MVA, 220/33 KV Nagrota Substation**
TITLE :	DETAILS OF BITUMINOUS ROAD



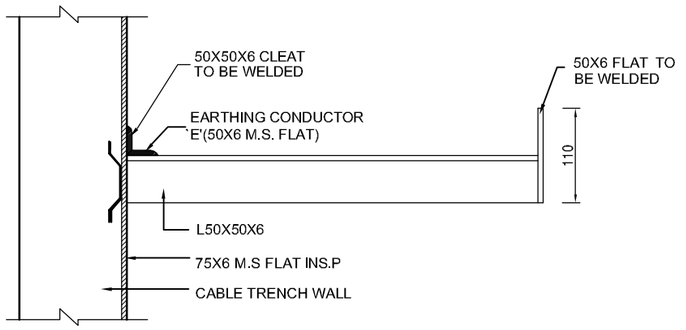
SECTION 1-1



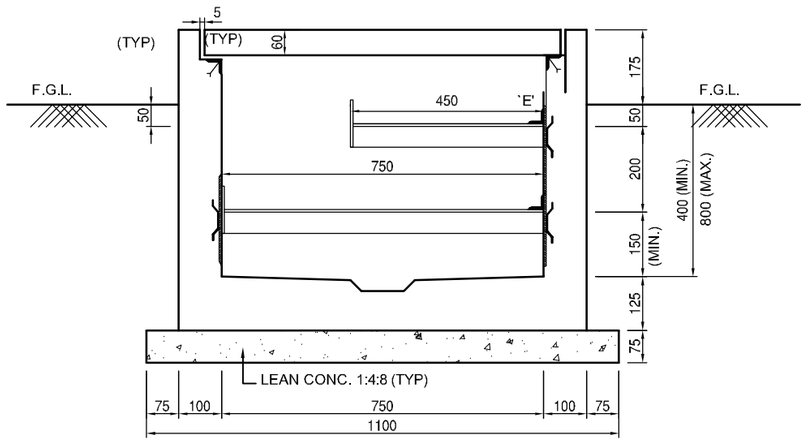
SECTION 2-2



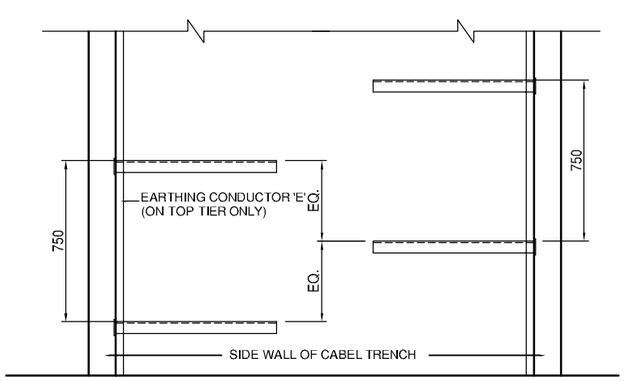
SECTION 4-4



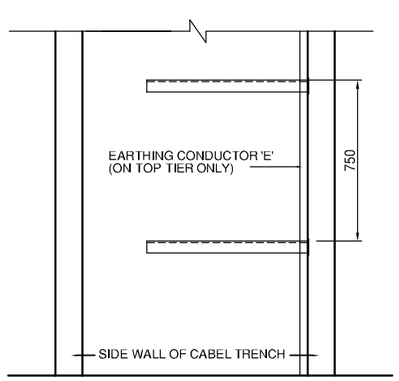
TYPICAL CABLE SUPPORT



SECTION 3-3



PLAN
CABLE TRAY SUPPORT FOR SECTION 1-1



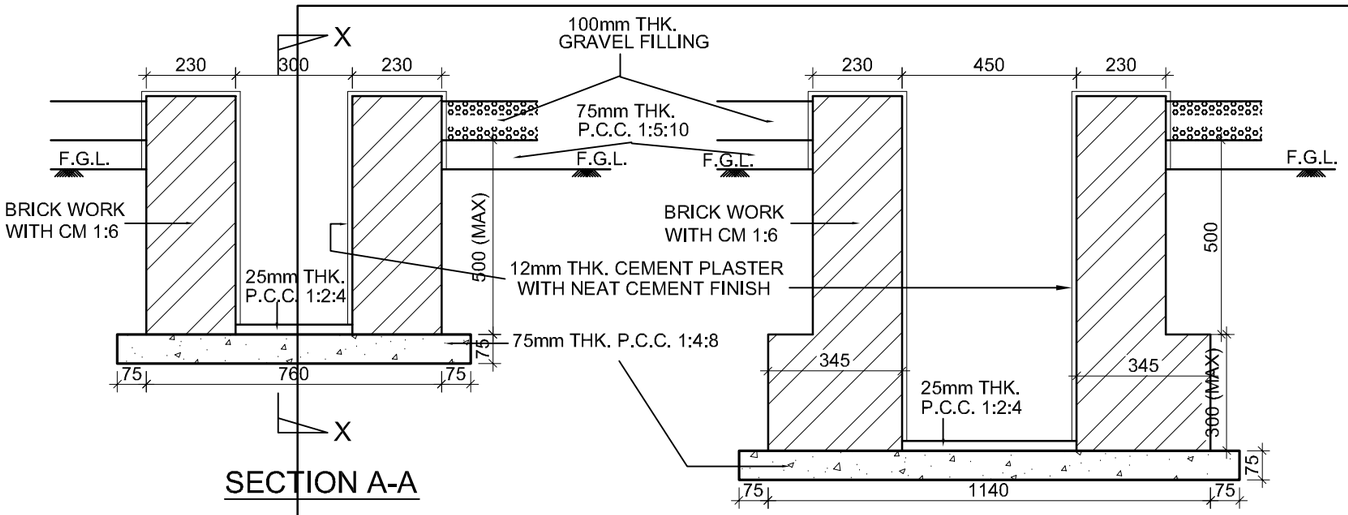
PLAN
CABLE TRAY SUPPORT FOR
SECTION 2-2 & 3-3

DRG NO:- RECTPCL/PIA/DRG-09

FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT :	2x50 MVA, 220/33 KV Nagrota Substation
TITLE :	**DETAIL FOR CABLE TRENCH SECTIONS**

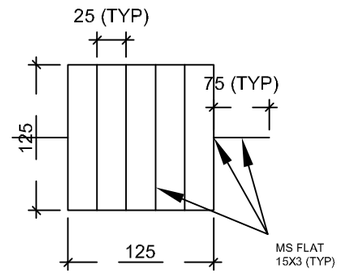


SECTION A-A

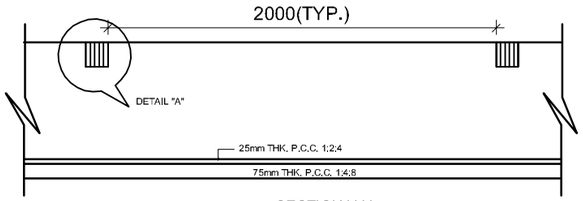
(FOR DEPTH UP TO 600 MM)

SECTION B-B

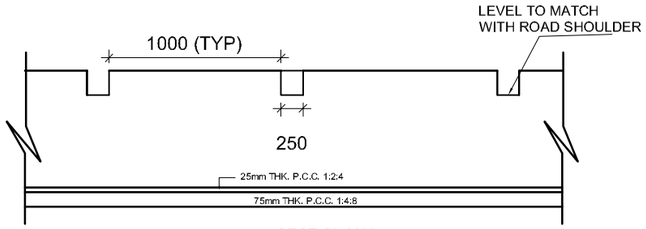
(FOR DEPTH FROM 600 TO 900 MM)



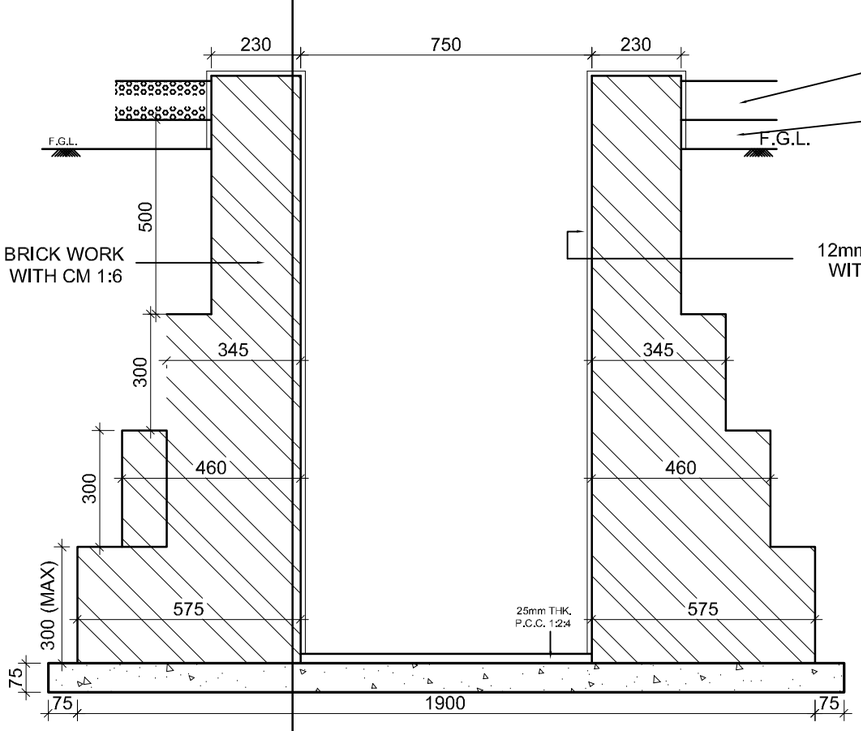
DETAIL "A"



SECTION X-X
(APPLICABLE FOR GRAVEL SIDE)

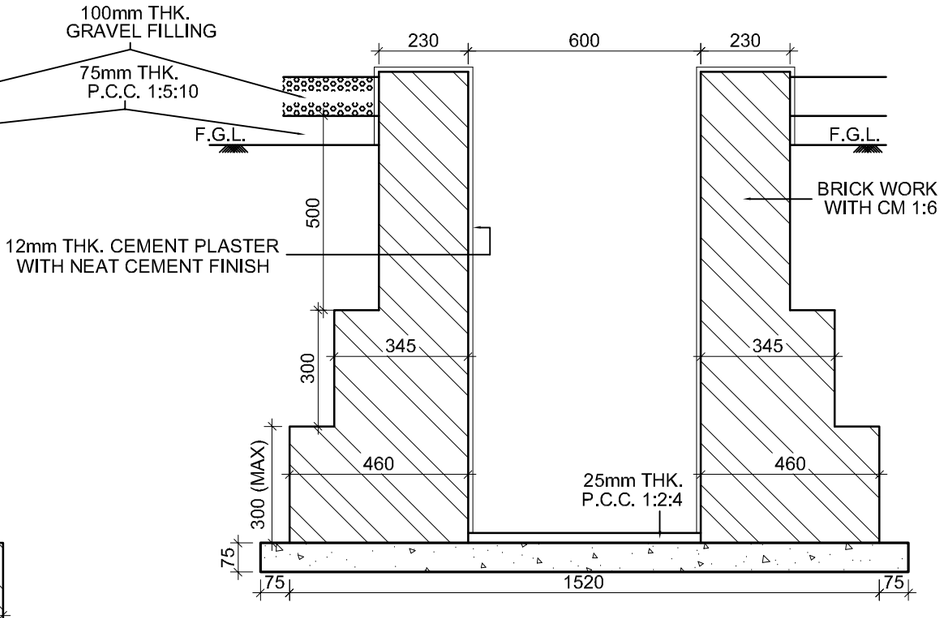


SECTION X-X
(APPLICABLE FOR ROAD SIDE)



SECTION D-D

(FOR DEPTH FROM 1200 TO 1500 MM)



SECTION C-C

(FOR DEPTH FROM 900 TO 1200 MM)

NOTES:-

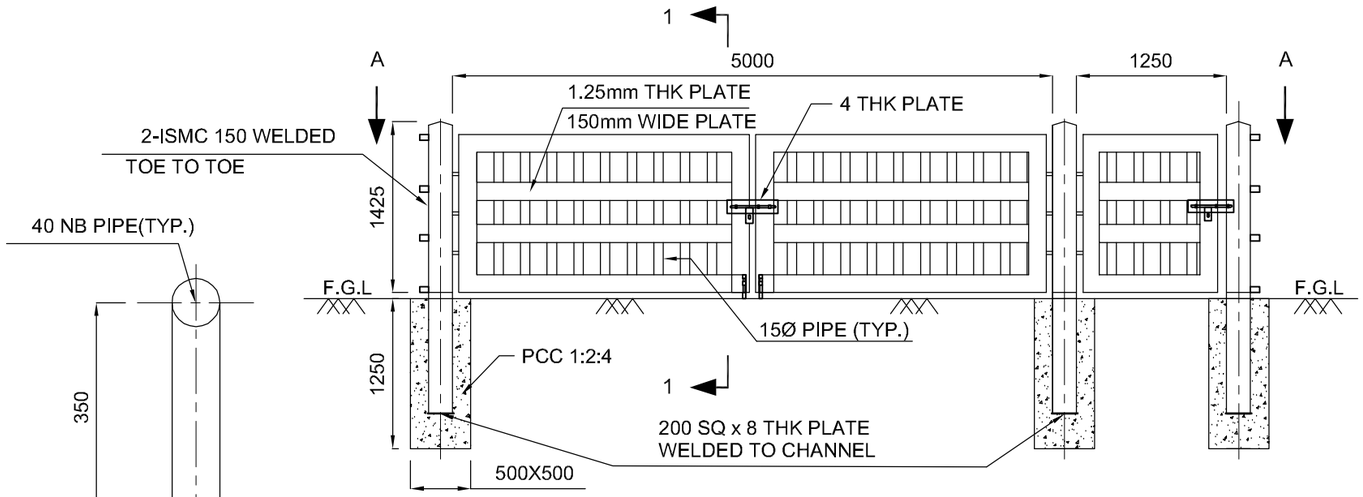
1. ALL DIMENSIONS ARE IN MM. & ELEVATIONS ARE IN METRE UNLESS NOTED OTHERWISE.
2. ALL DRAINS SHALL BE GIVEN A MINIMUM SLOPE OF 1: 1000 IN THE LONGITUDINAL DIRECTION
3. MINIMUM DEPTH OF DRAIN SHALL BE 300MM BELOW FGL.
4. WHERE EVER TWO SECTIONS ARE MEETING A TRANSITION ZONE SHALL BE CONSTRUCTED HAVING LENGTH 1000mm.
5. 75X75mm WEEP HOLE SHALL BE PROVIDED AT SPACING OF 1500mm HORIZONTALY & 300mm VERTICALLY IN STAGGERED MANER.
6. DEPTH OFF DRAIN IS TAKEN AS HEIGHT FROM TOP OF DRAIN TO INVERT OF DRAIN
7. LAYOUT OF DRAIN WILL BE ISSUED DURING EXECUTION STAGE

DRG NO:- RECTPCL/PIA/DRG-10

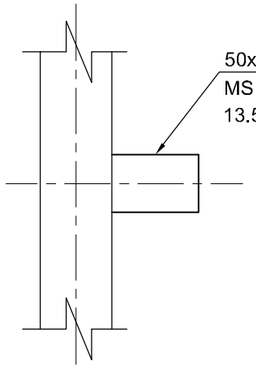
FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.

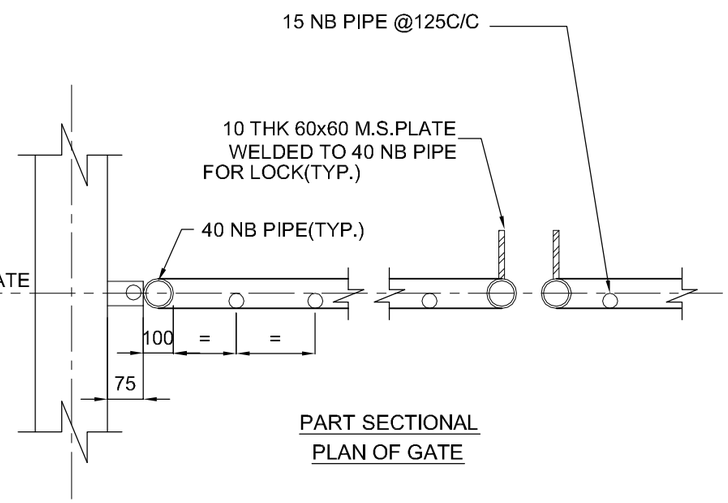
PROJECT :	2x50 MVA, 220/33 KV Nagrota Substation
TITLE :	DETAILS OF DRAIN



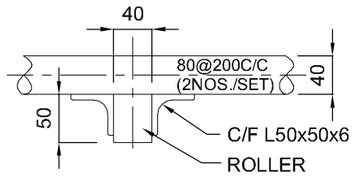
SWITCHYARD FENCING GATE DETAIL



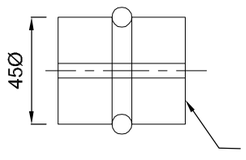
DETAIL -B



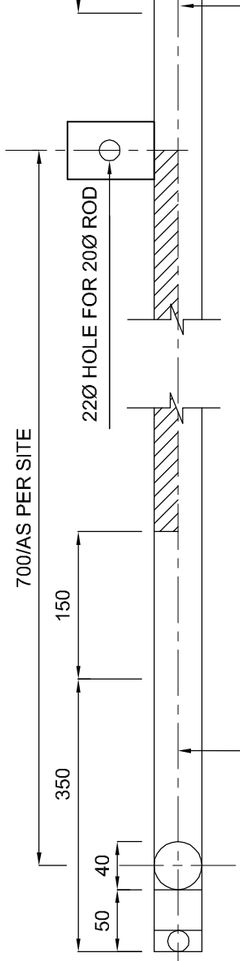
PART SECTIONAL
PLAN OF GATE



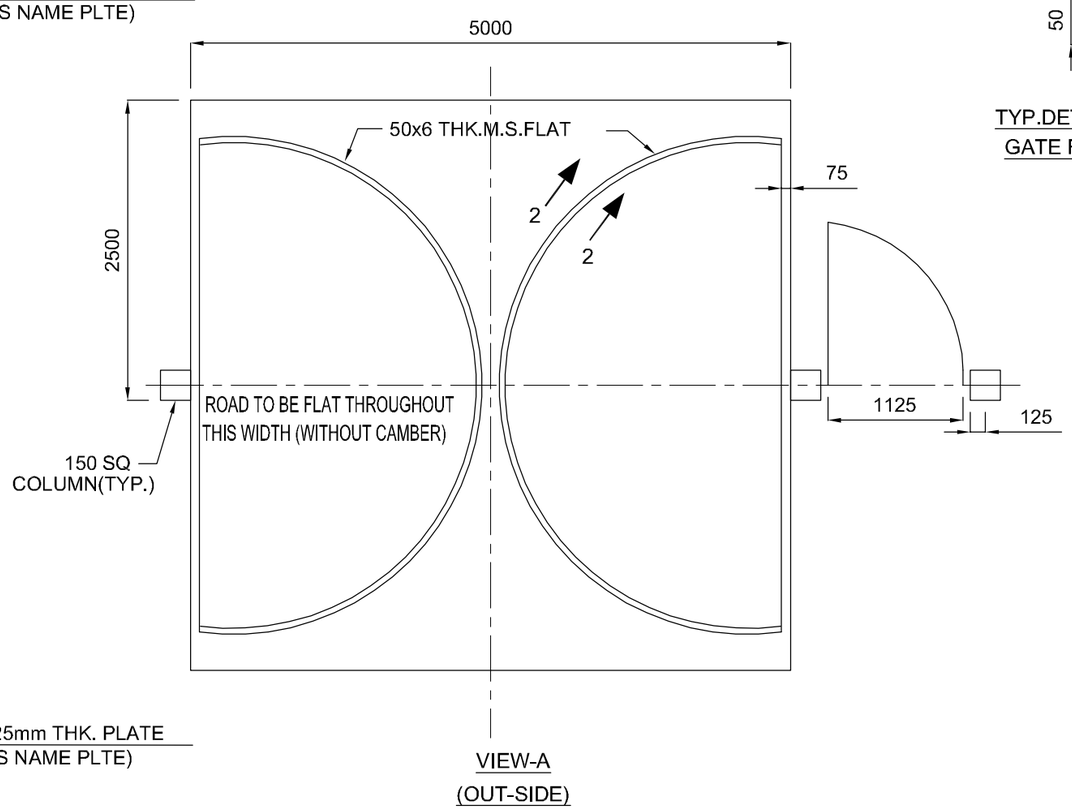
TYP.DETAIL OF
GATE ROLLER



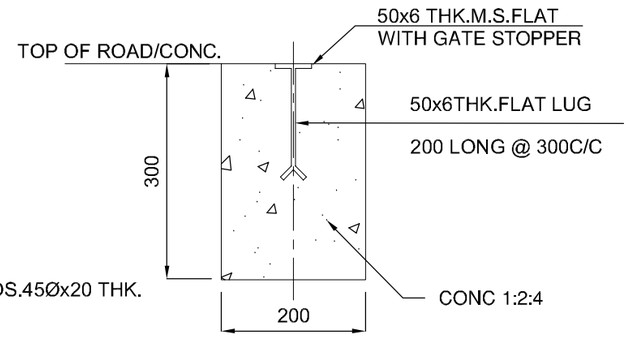
DETAIL -A
(ROLLER BEARING)



SECTION 1-1



VIEW-A
(OUT-SIDE)



SECTION 2:2

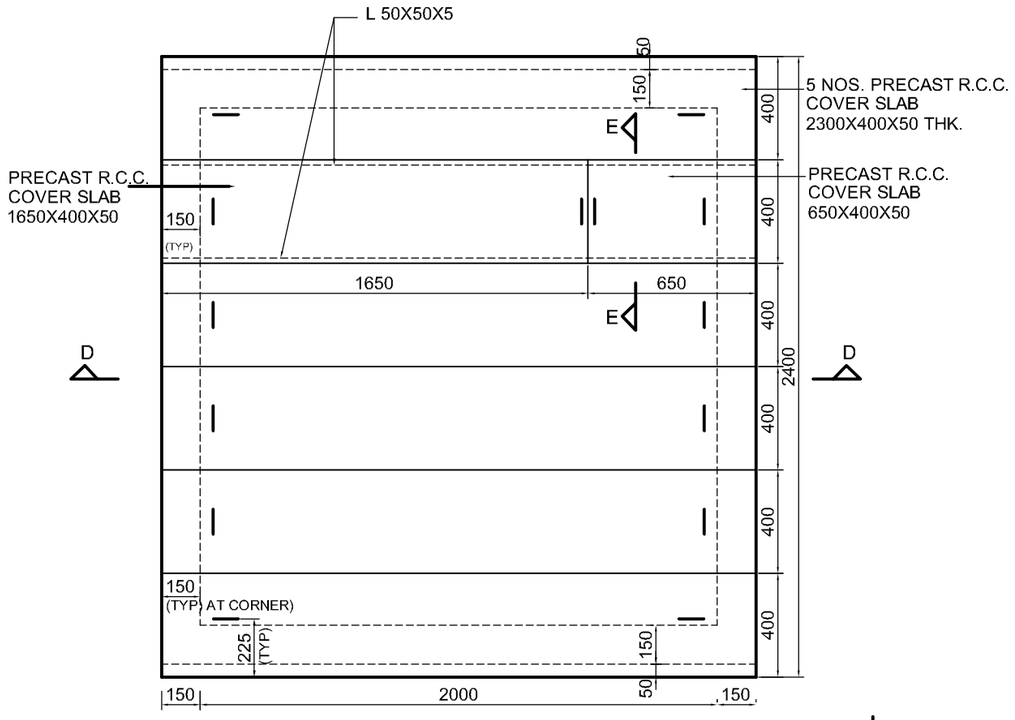
NOTES:

1. ALL DIMENSIONS ARE IN MM & ELEVATION ARE IN METER UNLESS NOTED OTHERWISE
2. ALL LEAN CONC. SHALL BE PCC (1:4:8)UNLESS NITED OTHERWISE.
3. UNLESS NOTED OTHERWISE LAP/ANCHOR LENGTH SHALL BE 50 TIMES THE DIA OF BARS
4. ALL STRUCTURAL STEEL CONFORM TO IS:2062 &SHALL PAINTED WITH A COAT OF APPROVED STEEL PRIMER &TWO COATS OF SYNTHETIC ENAMEL. PAINT UNLESS NOTED OTHERWISE.
5. DROP BOLTS SHOULD BO PROVIDED ON THE FAR SIDE ONLY.
6. ALL WELDS ARE 6MM THK. FILLET WELDS UNLESS NOTED OTHERWISE.
7. GATE & M.S.HOOKS TO BE PAINTED WITH ONE COAL APPROVED STEEL PRIMER BEFORE ERECTION &TWO COAT OF SYNTHETIC PAINTS AFTER ERECTION.
8. STRUCTURAL PIPES SHALL BE MEDIUM TYPE CONFORMING TO IS 1161/806

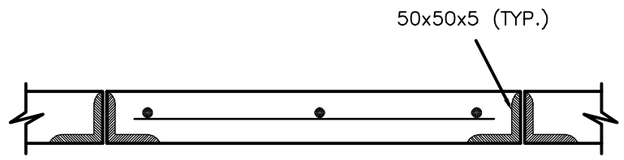
FOR TENDER PURPOSE ONLY

DRG NO:- RECTPCL/PIA/DRG-11

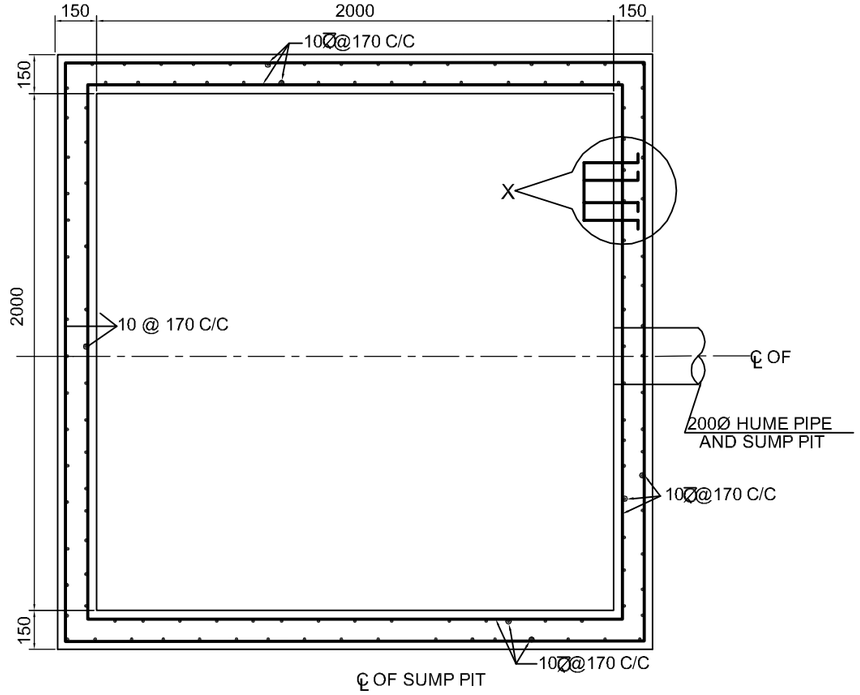
REC TRANSMISSION PROJECTS COMPANY LTD.	
PROJECT :	2x50 MVA, 220/33 KV Nagrota Substation
TITLE :	DETAILS OF SWITCHYARD GATE



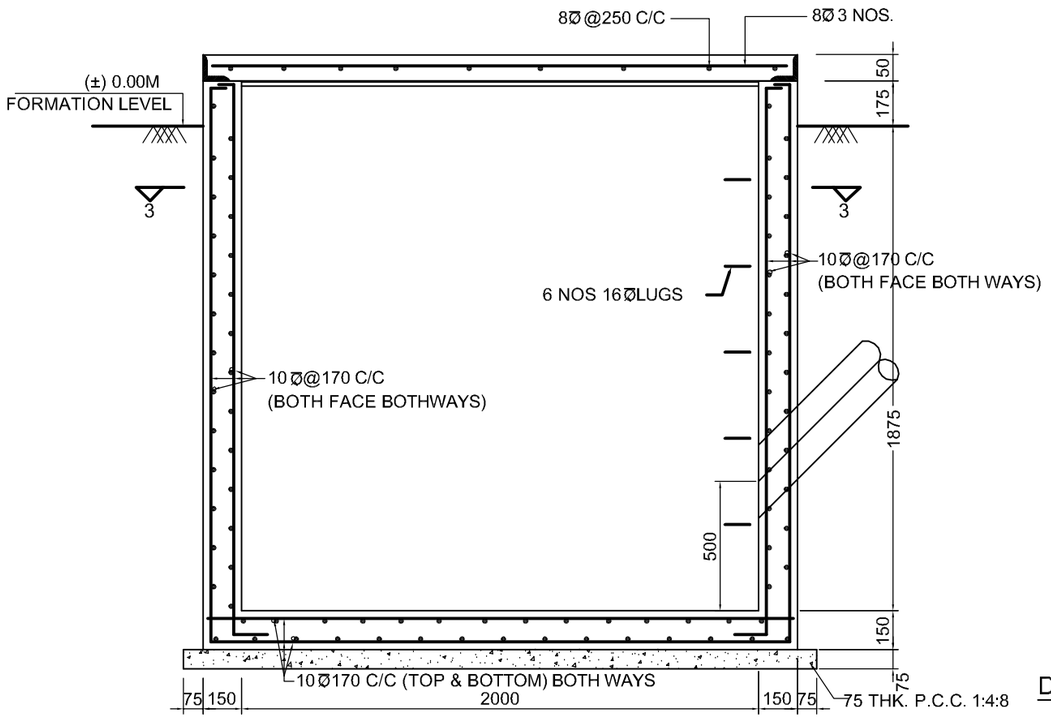
TOP PLAN OF SUMP PIT



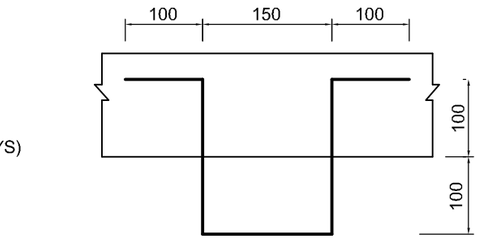
SECTION E-E



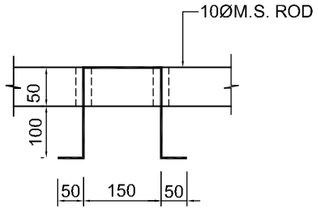
SECTION 3-3



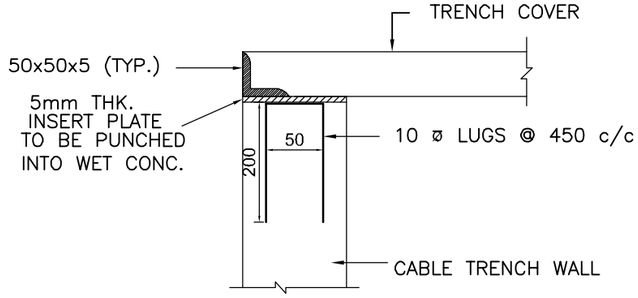
SECTION D-D



DETAIL 'X'



DETAIL OF LIFTING HOOK



TYPICAL DETAIL OF SLAB SUPPORT

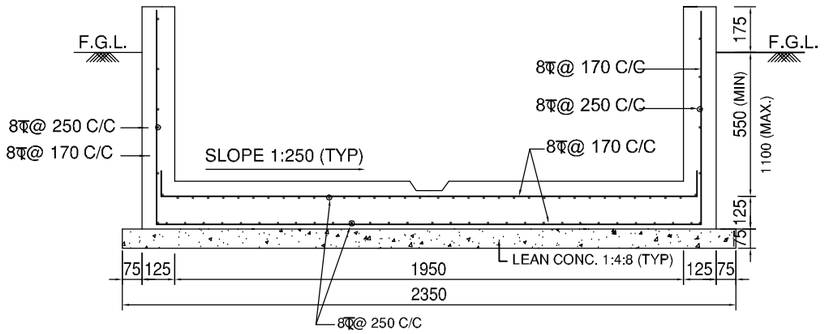
NOTE:

1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE SPECIFIED.
2. R.C.C. MIX.SHOULD BE 1:1.5:3 (1 CEMENT: 1.5 COARSE SAND:3 STONE AGGREGATE 20mm NOMINAL SIZE.)
3. LEAN CONC. SHALL BE IN THE RATIO.1:4:8. (1 CEMENT:4 COURSE SAND: 8STONE AGGREGATE 40MM NORMINAL SIZE)
4. FOR ALL OTHER NOTES REF. DRG. No. C/ENGG/STD/CT-1(SHEET-2)

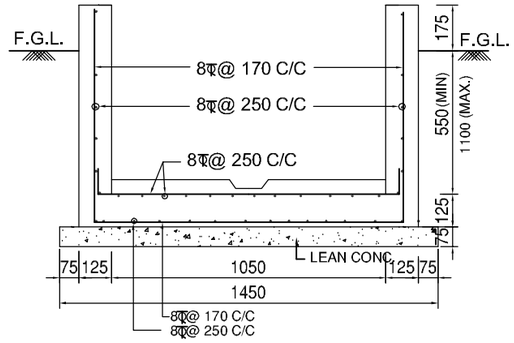
FOR TENDER PURPOSE ONLY

DRG NO:- RECTPCL/PIA/DRG-12

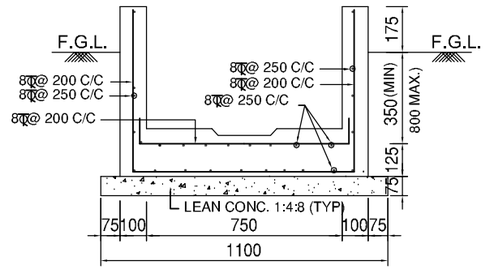
REC TRANSMISSION PROJECTS COMPANY LTD.	
PROJECT :	2x50 MVA, 220/33 KV Nagrota Substation
TITLE :	GA & RCC DETAIL OF SUMP PIT



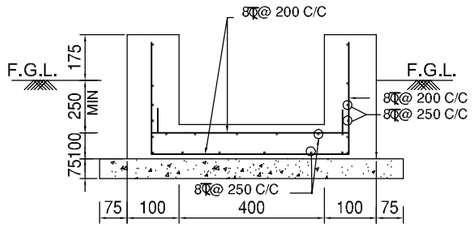
SECTION 1-1



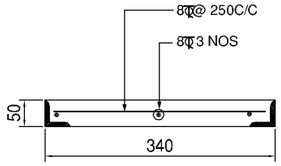
SECTION 2-2



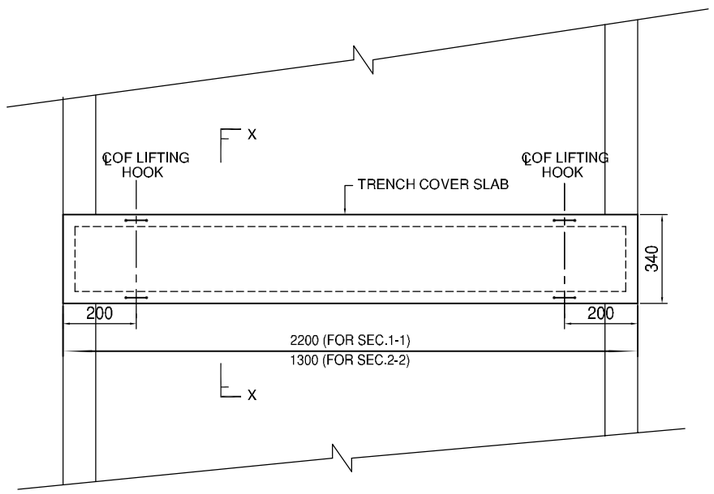
SECTION 3-3



SECTION 4-4

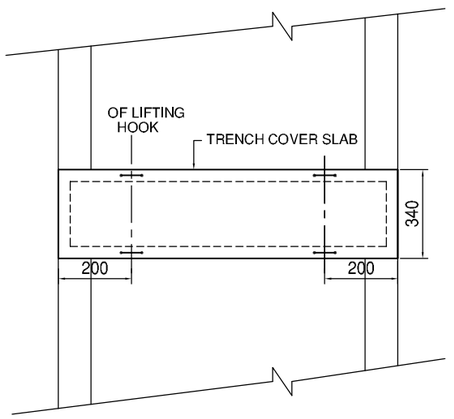


SECTION X-X



PLAN

(DETAIL OF TRENCH COVER FOR SECTION 1-1 & 2-2)



(DETAIL OF TRENCH COVER FOR SECTION 3-3 & 4-4)

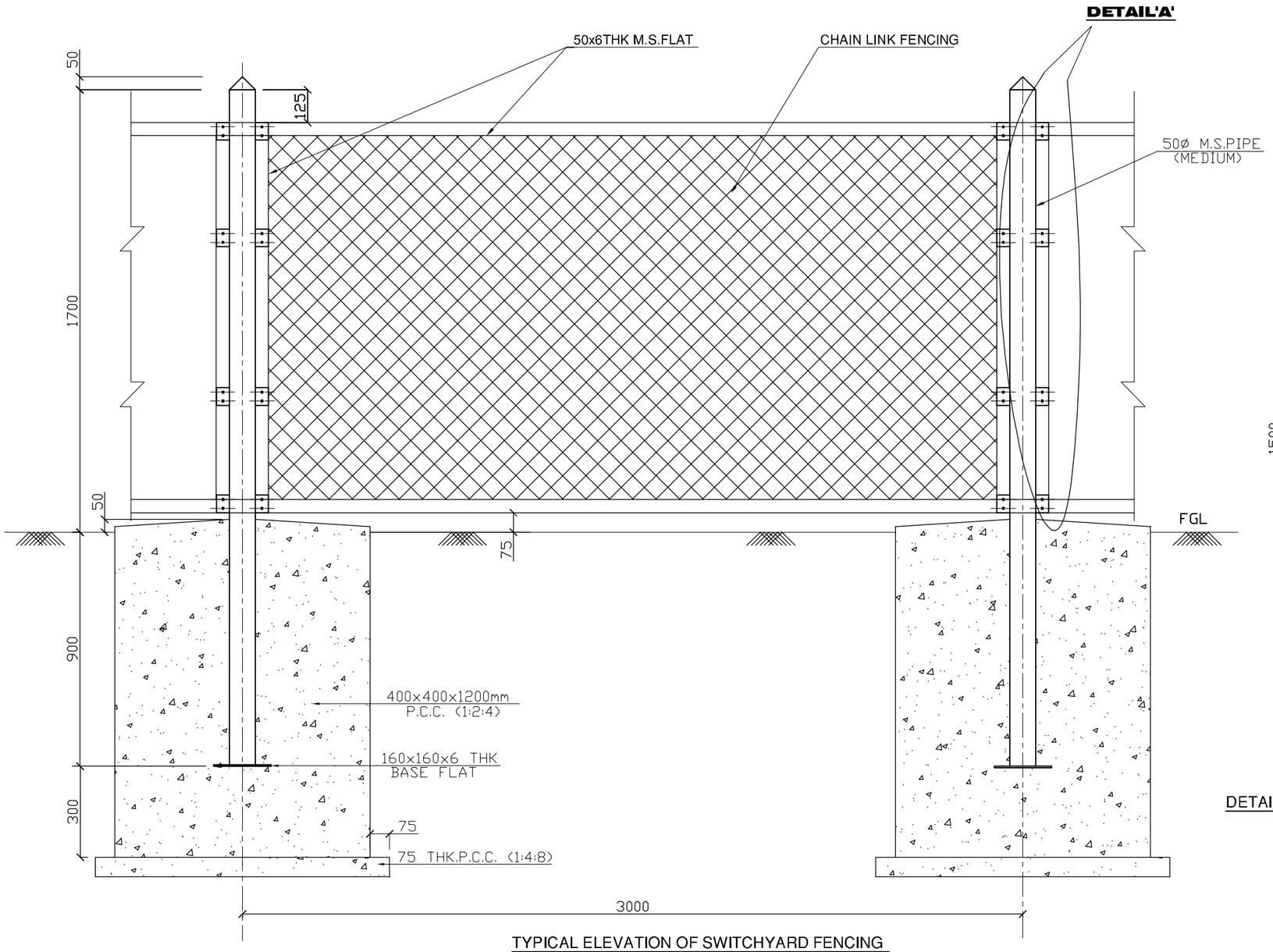
DRG NO:- RECTPCL/PIA/DRG-13

NOTE:

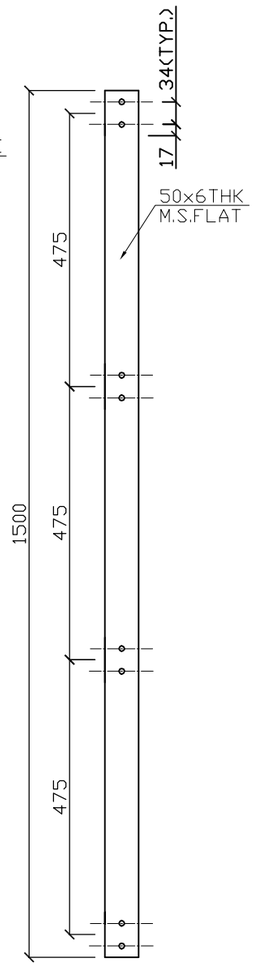
1. ALL DIMENSIONS ARE IN mm. UNLESS OTHERWISE SPECIFIED.
2. R.C.C. MIX.SHOULD BE 1:1.5:3 (1 CEMENT: 1.5 COARSE SAND:3 STONE AGGREGATE 20mm NOMINAL SIZE.)
3. LEAN CONC. SHALL BE IN THE RATIO.1:4:8.

FOR TENDER PURPOSE ONLY

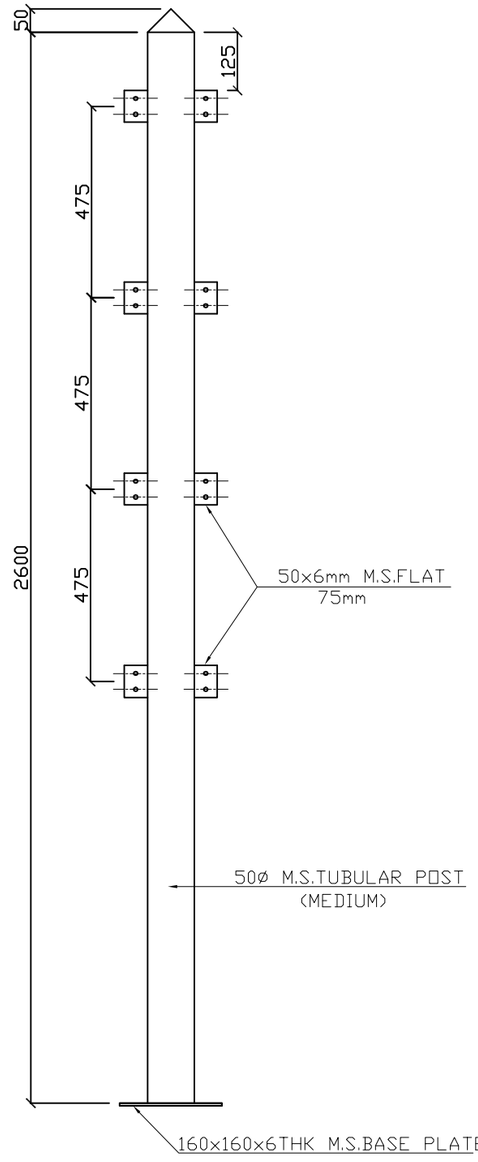
REC TRANSMISSION PROJECTS COMPANY LTD.	
PROJECT :	**2x50 MVA, 220/33 KV Nagrota Substation**
TITLE :	RCC DETAIL FOR CABLE TRENCH SECTIONS



TYPICAL ELEVATION OF SWITCHYARD FENCING



DETAIL VERTICAL M.S. FLAT
'A'



DETAIL OF TUBULAR POST

NOTES:

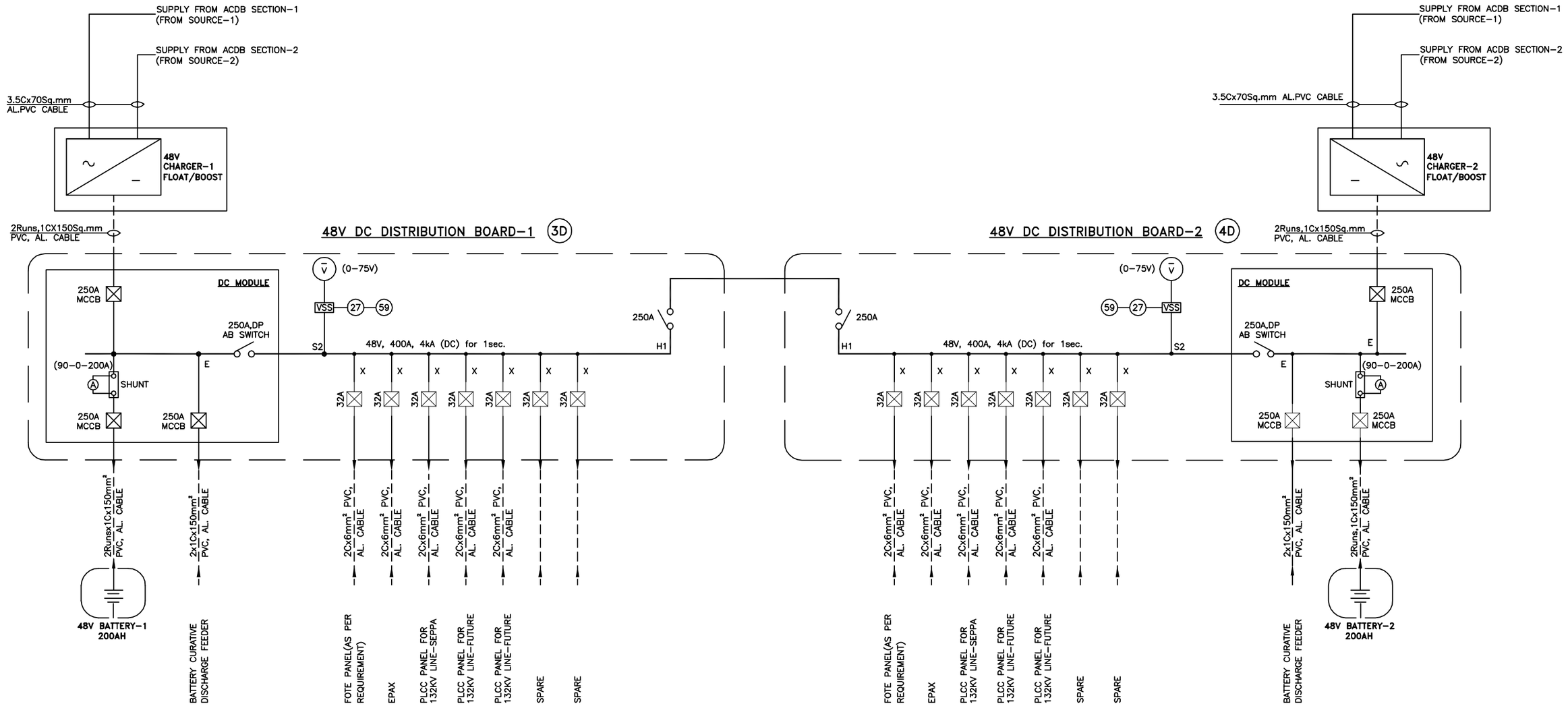
1. ±0.00 SHALL DENOTE SWITCHYARD FINISHED FORMATION LEVEL
2. CHAIN LINK FENCING SHALL HAVE 3.15 mm DIAMETER WIRE AS PER IS 2721 WITH 75x75 mm MESH SIZE AND PAINTED
3. TUBULAR POST SHALL BE PLACED @ 3.0m CENTRE TO CENTRE AND SHALL REST IN WELL COMPACTED EARTH
4. CORNER TUBULAR POST SHALL BE PROVIDED CLEATS IN FOUR SIDES SUITING TO REQUIREMENT
5. TUBES/PIPES OF POST SHALL BE GALVANIZED
6. CONCRETE GRADE FOR P.C.C. SHALL CONFORM IS 456: LATEST
7. EXPOSED SURFACE OF CONCRETE PAD (P.C.C.) SHALL BE PLASTERED WITH 12mm THICK CEMENT PLASTER (1:6)

DRG NO:- RECTPCL/PIA/DRG-14

FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT :	2x50 MVA, 220/33 KV Nagrota substation
TITLE :	STANDARED DETAILS FOR SWITCH YARD CHAIN LINK FENCING CHAIN LINK FENCING



LEGEND:-

SYMBOL	DESCRIPTION
⊠	DOUBLE POLE MCCB
(A)	AMMETER
(V)	VOLTMETER
VSS	VOLTMETER SELECTOR SWITCH
(27)	U/V RELAY
(59)	O/V RELAY

NOTES:-

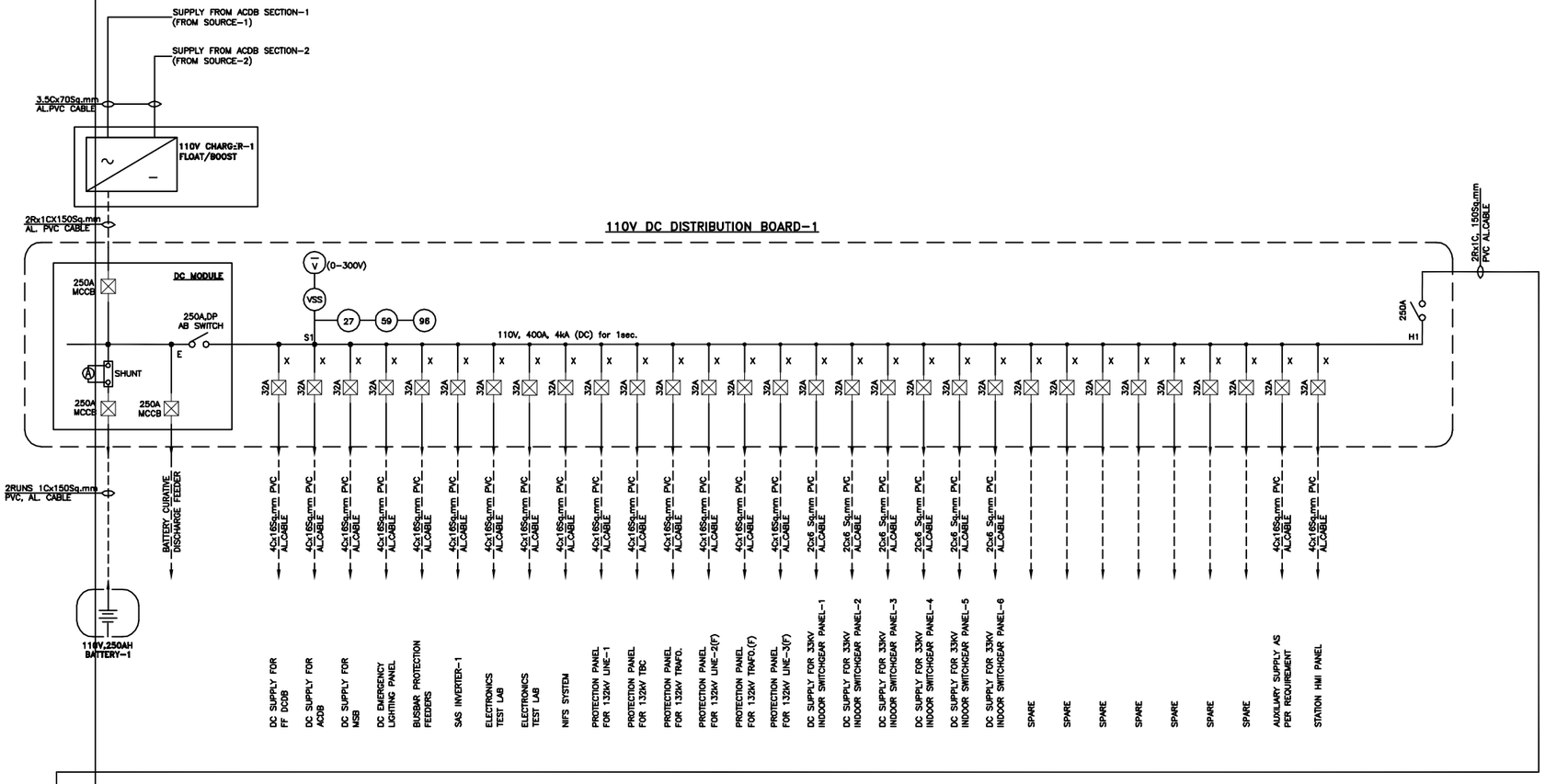
1. DCDB SHALL MEET REQUIREMENT AS PER SECTION LT SWITCHGEAR OF TECHNICAL SPECIFICATION.
2. ALL DIGITAL/ANALOGUE INPUT/OUTPUTS REQUIRED FOR SAS SYSTEM SHALL BE CONSIDERED BY THE LT SWITCHGEAR MANUFACTURER.

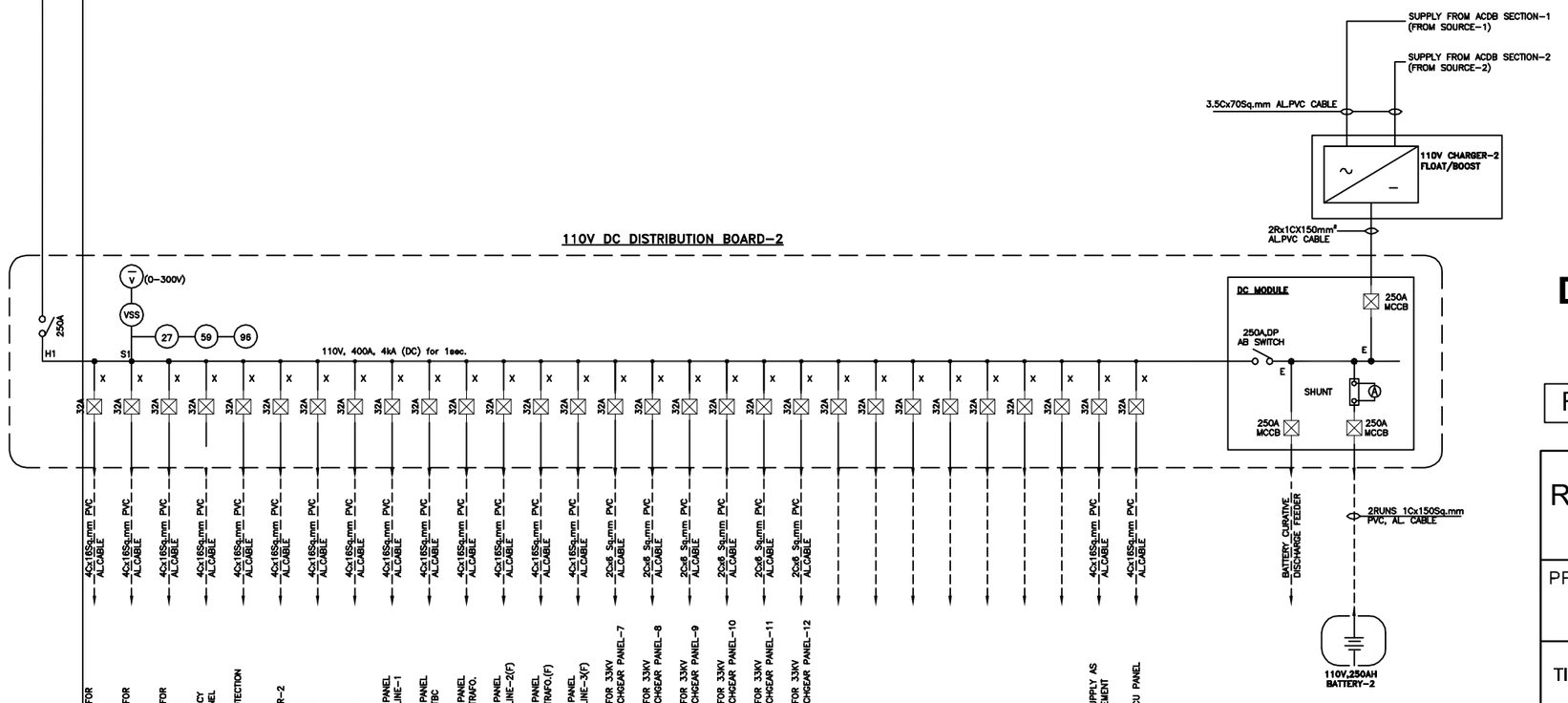
DRG NO:- RECTPCL/PIA/DRG-15

RELEASED FOR TENDER

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT :	2X50 MVA, 220/33 KV NAGROTA SUBSTATION
TITLE :	SINGLE LINE DIAGRAM FOR 48V DCDB





LEGEND:-

SYMBOL	DESCRIPTION
⊠	DOUBLE POLE MCCB
	DOUBLE POLE AIR BREAK SWITCH
	DOUBLE POLE MCB
(A)	AMMETER
(V)	VOLTMETER
(VSS)	VOLTMETER SELECTOR SWITCH
(27)	U/V RELAY
(59)	O/V RELAY
(96)	EARTH LEAKAGE RELAY

NOTE :-

1. NUMBER OF FEEDERS SHALL BE PROVIDED IN EACH BOARD AS PER REQUIREMENT OF SUB-STATION.
2. ONE DC 'X' TYPE MODULE IN EACH 110V DCDB SHALL BE PROVIDED FOR EACH LINE, TRANSFORMER, BUS REACTOR, TBC, BC BAY INCLUDING FUTURE BAYS AS SHOWN IN SUBSTATION SLD.
3. RATING OF BUS BARS/FEEDERS INDICATED IN THIS DRAWING ARE MINIMUM REQUIREMENT AND MAY BE INCREASED DURING DETAILED ENGINEERING IF FOUND INADEQUATE RESPECT TO OFFERED LOADS / SYSTEM.
4. ALL DIGITAL/ANALOGUE, INPUT/OUTPUTS REQUIRED FOR SAS SYSTEM SHALL BE CONSIDERED BY THE LT SWITCHGEAR MANUFACTURER.
5. AS PER VENDOR DRAWINGS OF 33kV GIS PANEL ONLY ONE DC SUPPLY IS USED. HENCE WE HAVE INDICATED SIX GIS PANELS IN DCDB-I & ANOTHER SIX PANELS IN DCDB-II.

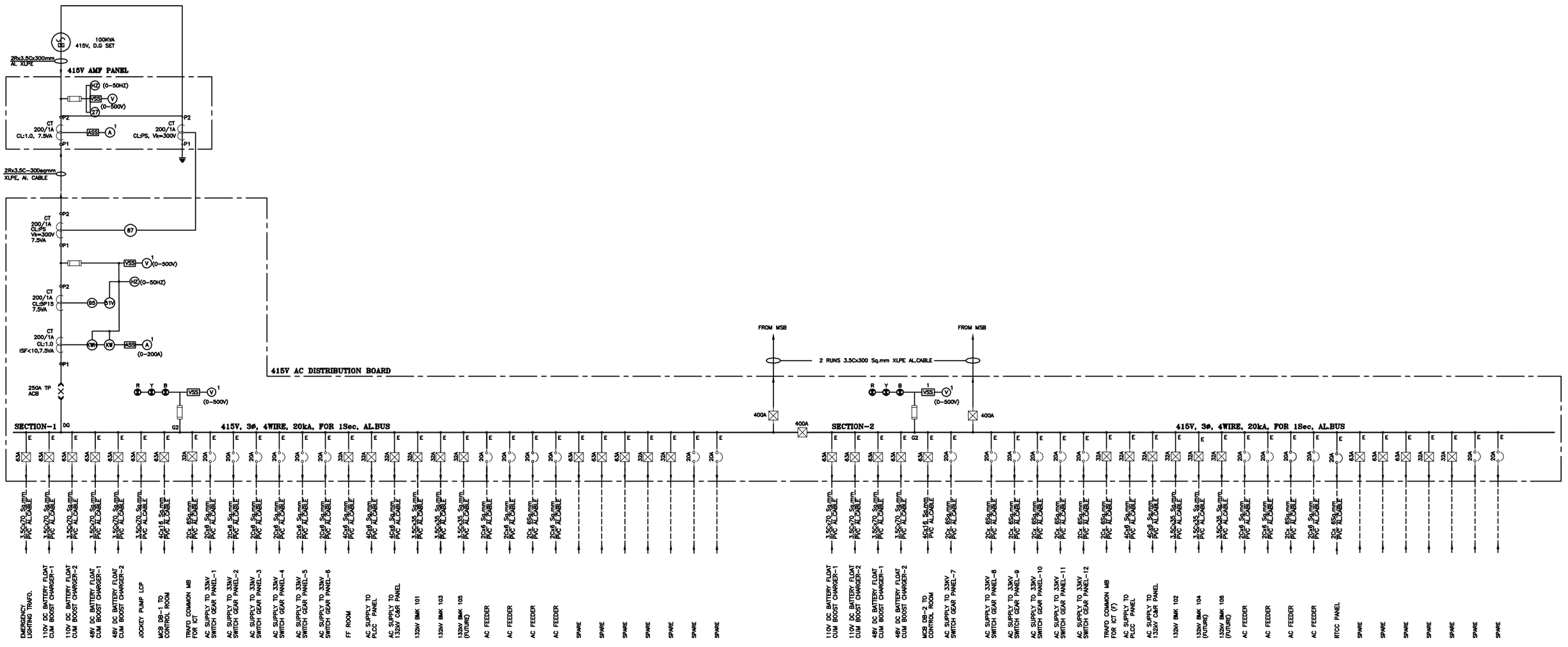
DRG NO:- RECTPCL/PIA/DRG-16

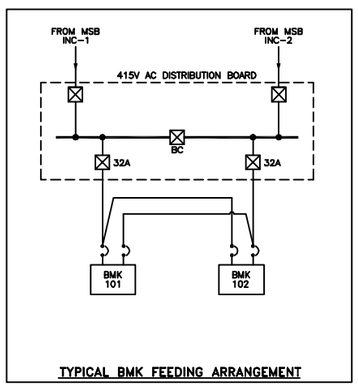
RELEASED FOR TENDER

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT :	2X50 MVA, 220/33 KV NAGROTA SUBSTATION
TITLE :	SINGLE LINE DIAGRAM FOR 110V DCDB

841 X 594 – A1





TYPICAL BMK FEEDING ARRANGEMENT

LEGEND:-

SYMBOL	DESCRIPTION
VSS	VOLTMETER SELECTOR SWITCH
KW	KILO WATT METER
KWH	KILO WATT HOUR METER
HZ	FREQUENCY METER
27	2 POLE INSTANTANEOUS UNDER VOLTAGE RELAY + AUXILIARY RELAY + TIMER
51	IDMT OVER CURRENT RELAY
51N	IDMT EARTH FAULT RELAY
51V	VOLTAGE CONTROLLED DEFINITE TIME O/C RELAY
87	DIFF. PROTECTION RELAY
	DIESEL GENERATOR SET
95	OVERLOAD ALARM RELAY

LEGEND:-

SYMBOL	DESCRIPTION
	DRAWOUT TYPE 3 POLE AIR CIRCUIT BREAKER (DRAWOUT TYPE)
	4POLE MOULDED CASE CIRCUIT BREAKER (MCCB) (NON DRAWOUT TYPE)
	DOUBLE POLE MCB
	FUSE
	INDICATING LAMP
	CURRENT TRANSFORMER
A	AMMETER
V	VOLTMETER
ASS	AMMETER SELECTOR SWITCH

NOTE :-

1. INTERLOCK SHALL BE PROVIDED BETWEEN INC1, INC2 & B/C SUCH THAT ONLY TWO BREAKERS SHALL BE IN SERVICE AT A TIME IN MAIN SWITCHBOARD.
2. NO TWO AC SOURCE SHALL BE PARALLELED AT ANY STAGE.
3. DG SET SHALL BE AUTO START TYPE.
4. EACH BAY MB & TRANSFORMER MB SHALL BE FED BY ATLEAST ONE SOURCE FROM 415V ACDB. SECOND SOURCE SHALL BE LOOPED FROM NEAREST BAY MB & TRANSFORMER MB WHICH SHALL BE FED FROM ANOTHER SOURCE FROM 415V ACDB.
5. 1PH & 3PH AC SUPPLY FOR ALL BAY EQUIPMENTS SHALL BE FED FROM THE BMK.
6. AUTOMATIC SUPPLY CHANGE OVER SHALL BE ACHIEVED AS PER TECHNICAL SPECIFEICATION, SECTION –LT SWITCHGEAR.
7. AS PER VENDOR DRAWINGS OF TRANSFORMER COMMON MARSHALLING BOX AND 33kV GIS PANEL, ONE SINGLE PHASE AC SUPPLY IS REQUIRED. HENCE WE HAVE INDICATED SINGLE PHASE FEEDERS.

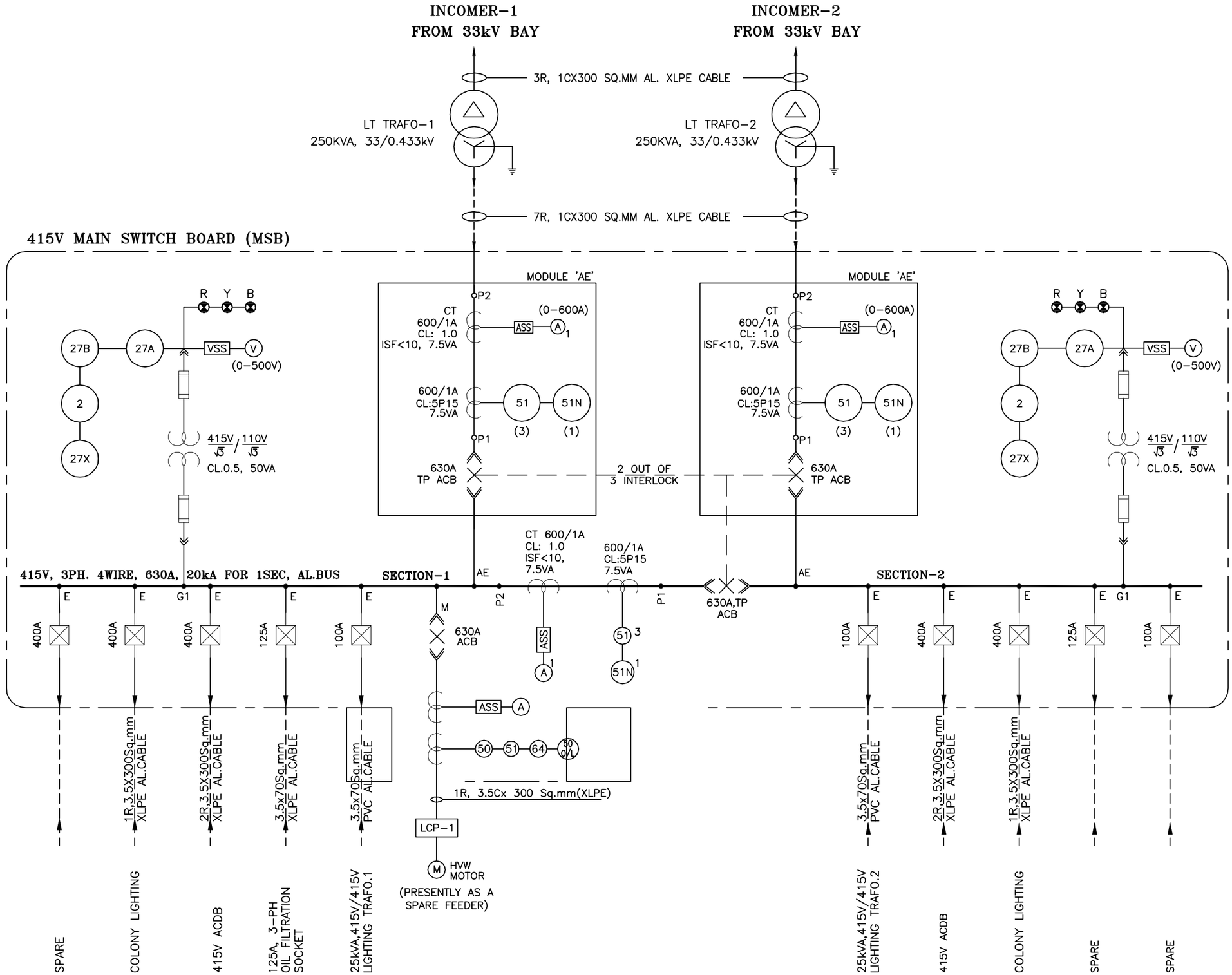
DRG NO:- RECTPCL/PIA/DRG-17

RELEASED FOR TENDER

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT :	2X50 MVA, 220/33 KV NAGROTA SUBSTATION
TITLE :	SINGLE LINE DIAGRAM FOR 415V ACDB

841 X 594 – A1



LEGEND:-

SYMBOL	DESCRIPTION
	3 POLE AIR CIRCUIT BREAKER (DRAWOUT TYPE)
	FOUR POLE MOULDED CASE CIRCUIT BREAKER (NON DRAWOUT TYPE)
	FUSE
	INDICATING LAMP
	CURRENT TRANSFORMER
	VOLTAGE TRANSFORMER
A	AMMETER
V	VOLTMETER
ASS	AMMETER SELECTOR SWITCH
VSS	VOLTMETER SELECTOR SWITCH
27A 27B	UNDER VOLTAGE RELAY
27X	VOLTAGE MONITARING RELAY
50	INSTANTANEOUS OVER CURRENT RELAY
50 O/L	OVER LOAD RELAY
51	IDMT OVER CURRENT RELAY
51N	IDMT EARTH FAULT RELAY
2	TIMER
64	EARTH FAULT RELAY

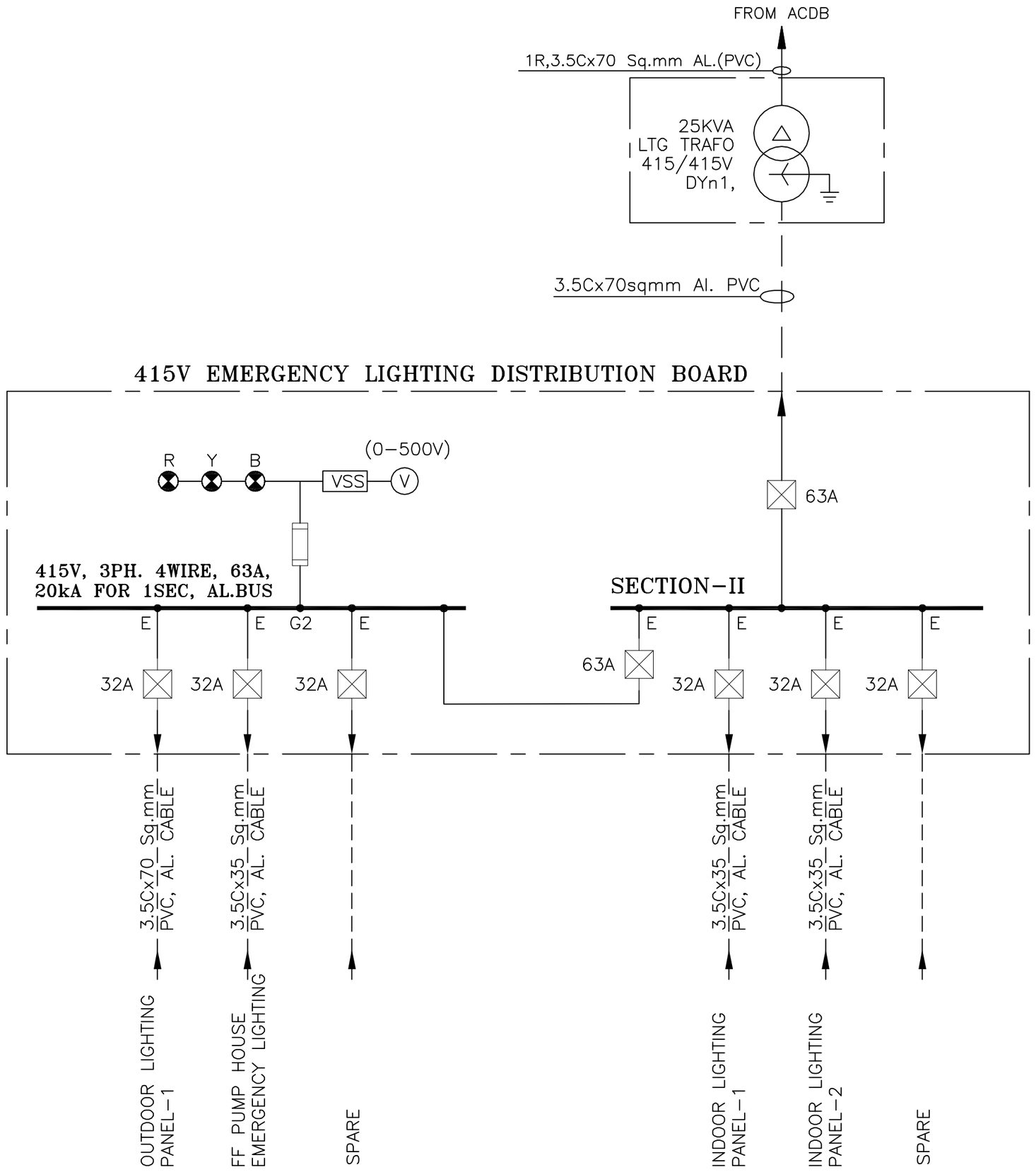
DRG NO:- RECTPCL/PIA/DRG-18

RELEASED FOR TENDER

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : 2X50 MVA, 220/33 KV NAGROTA SUBSTATION

TITLE : **SINGLE LINE DIAGRAM FOR 415V MAIN SWITCH BOARD**



LEGEND:-

SYMBOL	DESCRIPTION
	LTG TRANSFORMER
	4POLE MCCB
	FUSE
	INDICATING LAMP
VSS	VOLTAGE SELECTOR SWITCH
V	VOLTMETER

DRG NO:- RECTPCL/PIA/DRG-19

RELEASED FOR TENDER

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT :	2X50 MVA, 220/33 KV TRANSMISSION COMPANY LIMITED
TITLE :	SLD FOR EMERGENCY LIGHTING DISTRIBUTION BOARD

297 X 210 - A4

FROM
415V AC MAIN SWITCH BOARD

1R,3.5Cx70 Sq.mm AL.(PVC)

25KVA
LTG TRAFO-1
415/415V

1R,3.5Cx70 Sq.mm AL.(PVC)

FROM
415V AC MAIN SWITCH BOARD

1R,3.5Cx70 Sq.mm AL.(PVC)

25KVA
LTG TRAFO-2
415/415V

1R,3.5Cx70 Sq.mm AL.(PVC)

R Y B 1 VSS (V) (0-500V)

100A

100A

R Y B VSS 1 (V) (0-500V)

415V, 3PH. 4WIRE, 100A,
20kA FOR 1SEC, AL.BUS

SECTION-1

SECTION-2

100A

E E G2 E E E E E E E E E E E G2 E

63A 63A 63A 63A 63A 100A 32A 63A 63A 32A 63A 32A 63A 32A

3.5Cx70 Sq.MM PVC AL.CABLE

3.5Cx70 Sq.MM PVC AL.CABLE

3.5Cx70 Sq.MM PVC AL.CABLE

3.5Cx70 Sq.MM PVC AL.CABLE

3.5Cx35 Sq.MM AL.PVC CABLE

3.5Cx70 Sq.MM AL.PVC CABLE

3.5Cx35 Sq.MM AL.PVC CABLE

3.5Cx70 Sq.MM AL.PVC CABLE

3.5Cx35 Sq.MM AL.PVC CABLE

SPARE

STREET LIGHTING PANEL-1

SWITCHYARD LIGHTING PANEL-1

SWITCHYARD LIGHTING PANEL-2

SWITCHYARD LIGHTING PANEL-3

INDOOR LIGHTING PANEL-1

63A OUTDOOR RECEPTACLE

SPARE

INDOOR LIGHTING PANEL-2

63A OUTDOOR RECEPTACLE

FF PUMPHOUSE NORMAL LIGHTING

SPARE

SPARE

LEGEND:-

SYMBOL	DESCRIPTION
	LTG TRANSFORMER
	4POLE MCCB
	FUSE
	INDICATING LAMP
VSS	VOLTAGE SELECTOR SWITCH
V	VOLTMETER

DRG NO:- RECTPCL/PIA/DRG-20

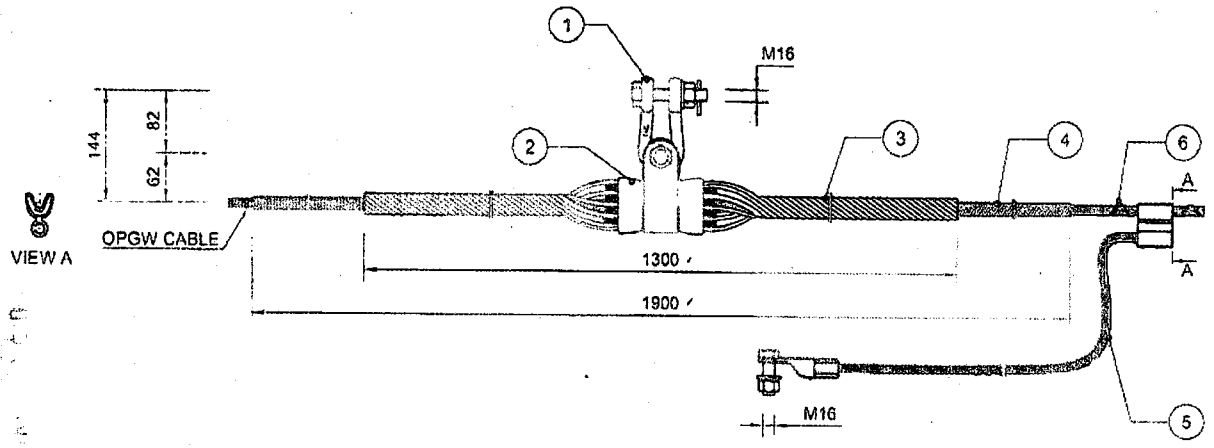
RELEASED FOR TENDER

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : 2X50 MVA, 220/33 KV NAGROTA SUBSTATION

TITLE : SLD FOR MAIN LIGHTING DISTRIBUTION BOARD

420 X 297 – A3



ITEM CODE	F	0	0	5	0	5	0	0	1

TECHNICAL DATA

1. ASSEMBLY MINIMUM ULTIMATE TENSILE STRENGTH - 59 KN.
2. FERROUS PARTS HOT DIP GALVANIZED AS PER ISO:1461.
3. DIAMETER OF THE OPGW CABLE 11.4 MM, UTS :59 KN.
4. ALL DIMENSIONS ARE IN mm.
5. WEIGHT - 4.57 ± 0.46 Kg.
6. WEIGHT IS INDICATIVE ONLY.
7. HARDWARE FITTING TOLERANCES AS PER IEC 61284.

DRG NO:- RECTPCL/PIA/DRG-21

REC TRANSMISSION PROJECTS COMPANY LTD.

FOR TENDER PURPOSE ONLY

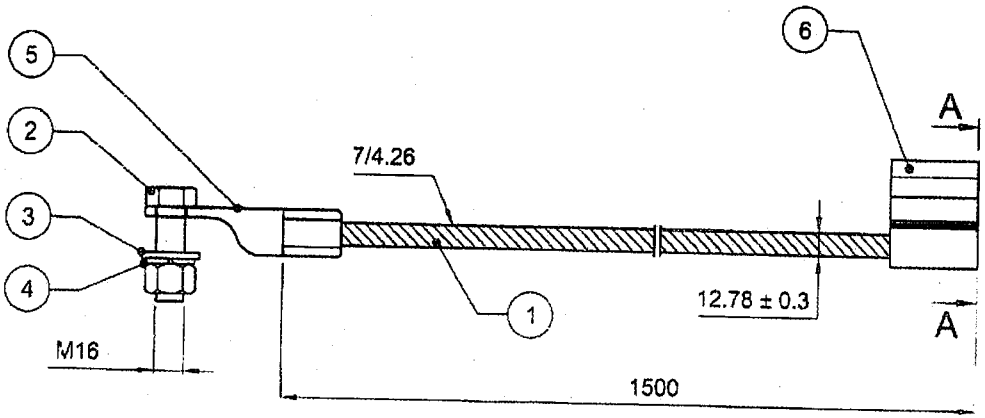
S.NO.	DESCRIPTION	MATERIAL	COMP. DRG NO.	UTS (KN)	QTY(NOS)
6	RETAINING ROD	AL.CLAD STEEL (IEC:1232)	TAG/RR/001/LP	-	1 SET
5	FLEXIBLE ALUMINIUM BOND	ALUMINIUM ALLOY	TAG/FAB/002/LP	-	1
4	PROTECTION ROD	AL.ALLOY (TYPE - 65032, IS: 733)	TAG/PR/005/LP	-	1 SET
3	HELICAL ARMOUR ROD	AL.ALLOY (TYPE - 65032, IS: 733)	TAG/HAR/004/LP	-	1 SET
2	A.G.CLAMP BODY	AL.ALLOY (TYPE - 4600, IS: 617)	AGSC/2000/LP	70	1 SET
1	D-SHACKLE	FORGED STEEL(CL - IV, IS: 2004)	DS/1601/LP	70	1

TITLE: **OPGW SINGLE SUSPENSION ASSEMBLY**

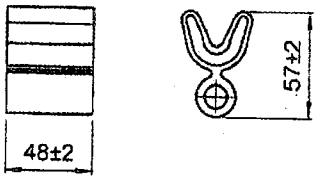
ASSEMBL' 2/70/001/LP

DATE	
DRAWN	
CHECKED	
APPROVED	

SCALE NTS



VIEW A-A



Y TYPE CLAMP (REFERENCE)

TECHNICAL DATA

1. FERROUS PARTS HOT DIP GALVANIZED AS PER ISO:1461.
2. SPRING WASHER ELECTROGALVANIZED AS PER SPEC.
3. GENERAL TOLERANCE UNLESS OTHERWISE SPECIFIED IS ± 3%.
4. ALL DIMENSIONS ARE IN mm.
5. WEIGHT - 0.69 ± 0.07 Kg.
6. WEIGHT IS INDICATIVE ONLY.
7. HARDWARE FITTING TOLERANCES AS PER IEC : 61284.

DRG NO:- RECTPCL/PIA/DRG-21

REC TRANSMISSION PROJECTS COMPANY LTD

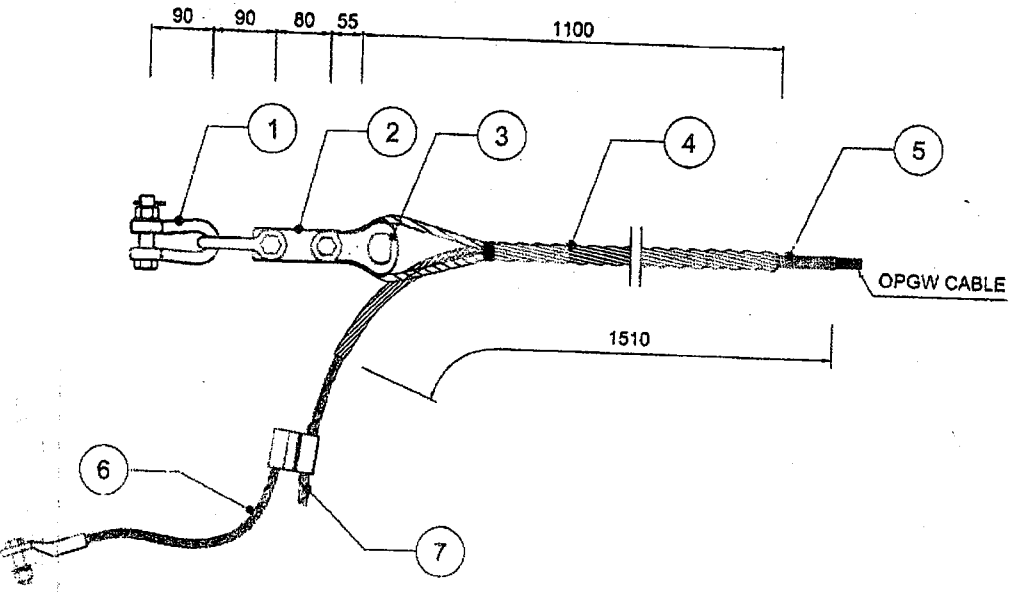
FOR TENDER PURPOSE ONLY

S.NO.	DESCRIPTION	MATERIAL	COMP. DRG NO.	QTY (NOS).	UTS (kN)
6	Y TYPE CLAMP	AL. ALLOY(TYPE-63400, IS: 733).	-	1	
5	CONNECTING LUG	ALUMINIUM (TYPE-19500)	-	1	
4	SPRING WASHER (M16)	SP.S (IS:3063)	-	1	
3	FLAT WASHER (M16)	M.S (IS:2016)	-	1	
2	BOLT & NUT	M.S (P.C.5.6 / 5.0, IS: 6639)	-	1	
1	FLEXIBLE CABLE	ALUMINIUM ALLOY (IS:398)	-	1 SET	

TITLE: **FLEXIBLE ALUMINIUM BOND WITH Y-TYPE CLAMP**

DATE
DRAWN
CHECKED
APPROVED

SCALE NTS



ITEM CODE	F	0	0	5	0	6	0	0	1

TECHNICAL DATA

1. FERROUS PARTS ARE HOT DIP GALVANIZED AS PER IS0:1461.
2. DIAMETER OF THE OPGW CABLE 11.4 MM, UTS :59 KN.
3. HOLDING STRENGTH 95% UTS OF OPGW.
4. ALL DIMENSIONS ARE IN mm.
5. WEIGHT - 6.51 ± 0.65 Kg.
6. WEIGHT IS INDICATIVE ONLY
7. HARDWARE FITTING TOLERANCES ARE AS PER IEC . 61284.

REC TRANSMISSION PROJECTS COMPANY LTD

DRG NO:- RECTPCL/PIA/DRG-21

FOR TENDER PURPOSE ONLY

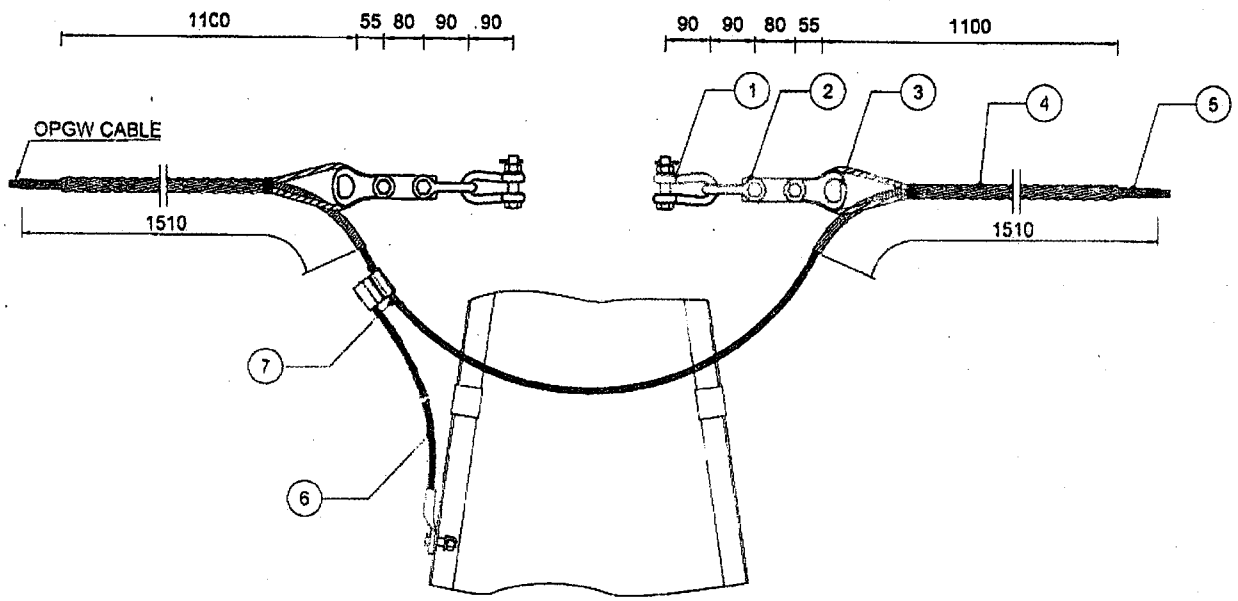
DESCRIPTION	MATERIAL	COMP. DRG NO.	UTS (KN)	QTY(NOS)
TAINING ROD	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/RR/001/LP	-	1 SET
XIBLE ALUMINIUM BOND	ALUMINIUM ALLOY	TAG/FAB/002/LP	-	1
OTECTION ROD	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/PR/1003/LP	-	1 SET
UCAL DEAD END	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/HDE/1003/LP	-	1 SET
MBLE	S.G.I / M.C.I (IS:226 / 2062)	9419/LP	100	1
ENSION PLATE	MILD STEEL (IS:2062)	EP/4012/LP	120	1
SHACKLE	FORGED STEEL (CL - IV, IS: 2004)	DS/1600/LP	120	2

TITLE:

TENSION ASSEMBLY FOR DEAD END LOCATION

DATE	
DRAWN	
CHECKED	
APPROVED	

SCALE : NTS



ITEM CODE	F	0	0	5	0	6	0	0	2

TECHNICAL DATA

1. FERROUS PARTS ARE HOT DIP GALVANIZED AS PER ISO:1461.
2. DIAMETER OF THE OPGW CABLE 11.4 MM, UTS :59 KN.
3. HOLDING STRENGTH 95% UTS OF OPGW
4. ALL DIMENSIONS ARE IN mm.
5. WEIGHT - 12.24 ± 1.2 Kg.
6. WEIGHT IS INDICATIVE ONLY.
7. HARDWARE FITTING TOLERANCES AS PER IEC : 61284.

DRG NO:- RECTPCL/PIA/DRG-21

REC TRANSMISSION PROJECTS COMPANY LIMITED

FOR TENDER PURPOES ONLY

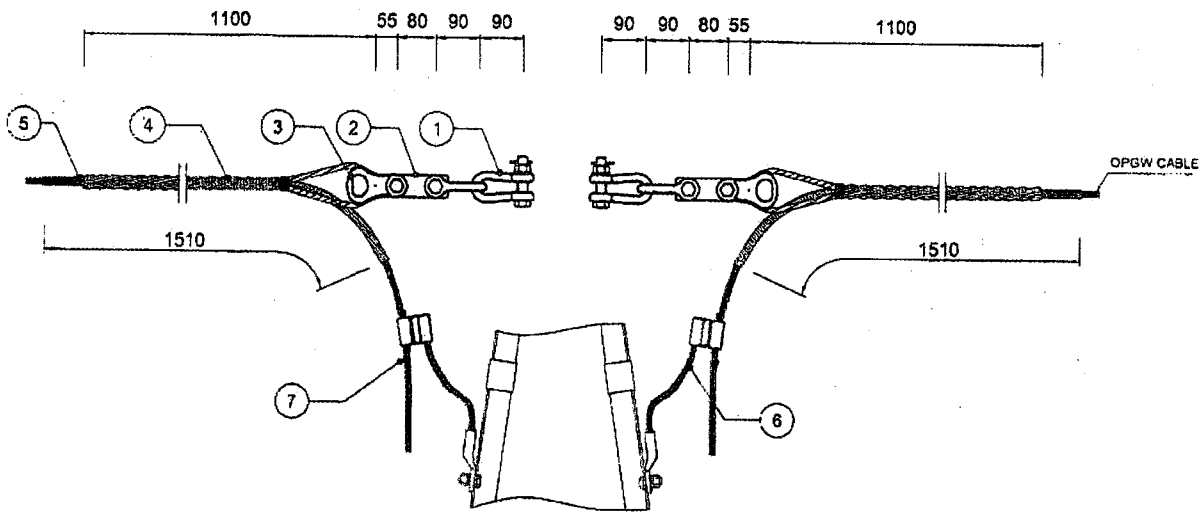
S.NC.	DESCRIPTION	MATERIAL	COMP. DRG NO.	UTS (KN)	QTY(NOS)
7	RETAINING ROD	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/RR/001/LP	-	1 SET
6	FLEXIBLE ALUMINIUM BOND	ALUMINIUM ALLOY	TAG/FAB/002/LP	-	1
5	PROTECTION ROD	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/PR/1003/LP	-	2 SETS
4	HELICAL DEAD END	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/HDE/1003/LP	-	2 SETS
3	THIMBLE	S.G.I / M.C.I (IS.226 / 2062)	9419/LP	100	2
2	EXTENSION PLATE	MILD STEEL (IS:2062)	EP/4012/LP	120	2
1	D - SHACKLE	FORGED STEEL (CL - IV, IS: 2004)	DS/1600/LP	120	4

TITLE:

TENSION ASSEMBLY FOR PASS THROUGH LOCATION

DATE	
DRAWN	
CHECKED	
APPROVED	

SCALE NTS



ITEM CODE	F	0	0	5	0	6	0	0	3

TECHNICAL DATA

1. FERROUS PARTS ARE HOT DIP GALVANIZED AS PER ISO:1461 .
2. DIAMETER OF THE OPGW CABLE 11.4 MM, UTS :59 KN.
3. HOLDING STRENGTH 95% UTS OF OPGW.
4. ALL DIMENSIONS ARE IN mm.
5. WEIGHT - 13.1 ± 1.3 Kg.
6. WEIGHT IS INDICATIVE ONLY
7. HARDWARE FITTING TOLERANCES AS PER IEC : 61284.

REC TRANSMISSION PROJECTS COMPANY LTD

DRG NO:- RECTPCL/PIA/DRG-21

FOR TENDER PURPOSE ONLY

S.NO.	DESCRIPTION	MATERIAL	COMP. DRG NO.	UTS (KN)	QTY(NOS)
7	RETAINING ROD	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/RR/001/LP	-	2 SETS
6	FLEXIBLE ALUMINIUM BOND	ALUMINIUM ALLOY	TAG/FAB/002/LP	-	2
5	PROTECTION ROD	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/PR/1003/LP	-	2 SETS
4	HELICAL DEAD END	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/HDE/1003/LP	-	2 SETS
3	THIMBLE	S.G.I / M.C.I (IS:226 / 2062)	9419/LP	100	2
2	EXTENSION PLATE	MILD STEEL (IS:2062)	EP/4012/LP	120	2
1	D - SHACKLE	FORGED STEEL (CL - IV, IS: 2004)	DS/1600/LP	120	4

TITLE:

TENSION ASSEMBLY FOR JOINT BOX LOCATION

DATE	
DRAWN	
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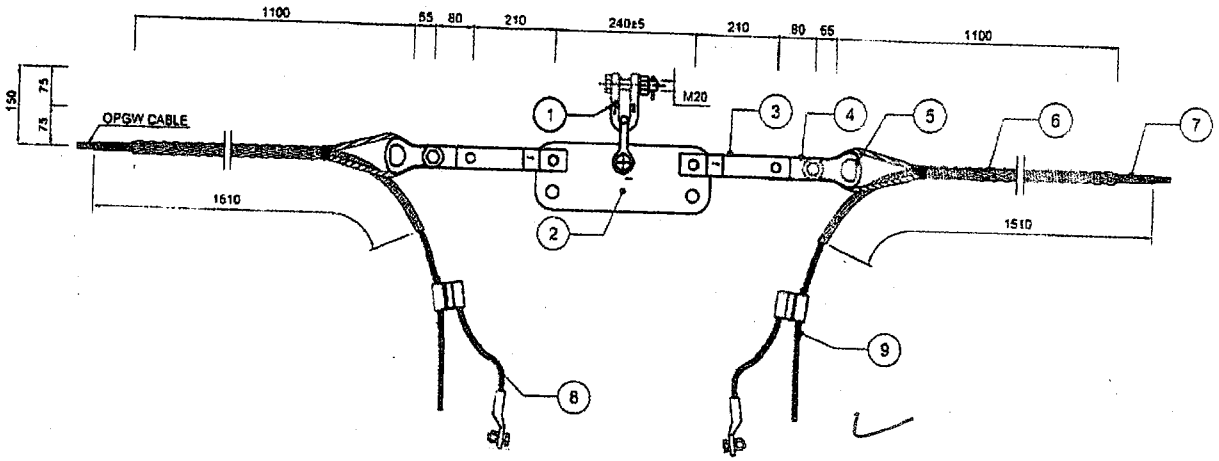
APPROVED	

SCALE : NTS



ITEM CODE	F	0	0	5	0	2	0	2	3

TECHNICAL DATA

1. FERROUS PARTS ARE HOT DIP GALVANIZED AS PER ISO:1461 .
2. DIAMETER OF THE OPGW CABLE 11.4 MM, UTS : 59 KN.
3. HOLDING STRENGTH 95% UTS OF OPGW.
4. ALL DIMENSIONS ARE IN mm.
5. WEIGHT - 20.78 ± 2.1 Kg.
6. WEIGHT IS INDICATIVE ONLY
7. HARDWARE FITTING TOLERANCES AS PER IEC : 61284.

REC TRANSMISSION PROJECTS COMPANY LTD

DRG NO:- RECTPCL/PIA/DRG-21

FOR TENDER PURPOSE ONLY

S.NO.	DESCRIPTION	MATERIAL	COMP. DRG NO.	UTS (KN)	QTY(NOS)
9	RETAINING ROD	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/RR/001/LP	-	2 SETS
8	FLEXIBLE ALUMINIUM BOND	ALUMINIUM ALLOY	TAG/FAB/002/LP	-	2
7	PROTECTION ROD	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/PR/1003/LP	-	2 SETS
6	HELICAL DEAD END	ALUMINIUM CLAD STEEL (IEC:1232)	TAG/HDE/1003/LP	-	2 SETS
5	THIMBLE	S.G.I / M.C.I (IS:226 / 2062)	9419/LP	100	2
4	EXTENSION PLATE	MILD STEEL (IS:2062)	EP/4012/LP	120	2
3	Y - TYPE EXTENSION LINK	MILD STEEL (IS:2062)	EL/3003A/LP	120	2 SETS
2	RECTANGULAR YOKE PLATE	MILD STEEL (IS:2062)	RYP/4014/LP	120	1
1	D - SHACKLE	FORGED STEEL (CL - IV, IS. 2004)	DS/1604/LP	120	2

TITLE:

TENSION ASSEMBLY ON SUSPENSION TOWER

DATE	
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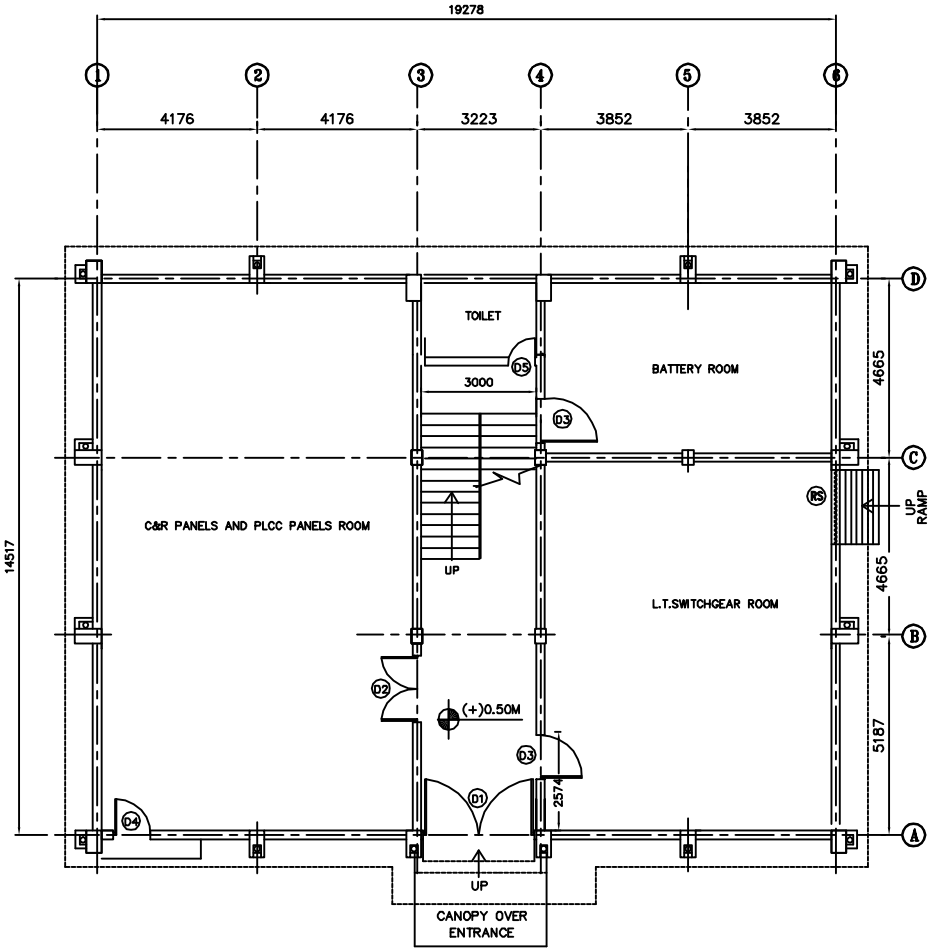
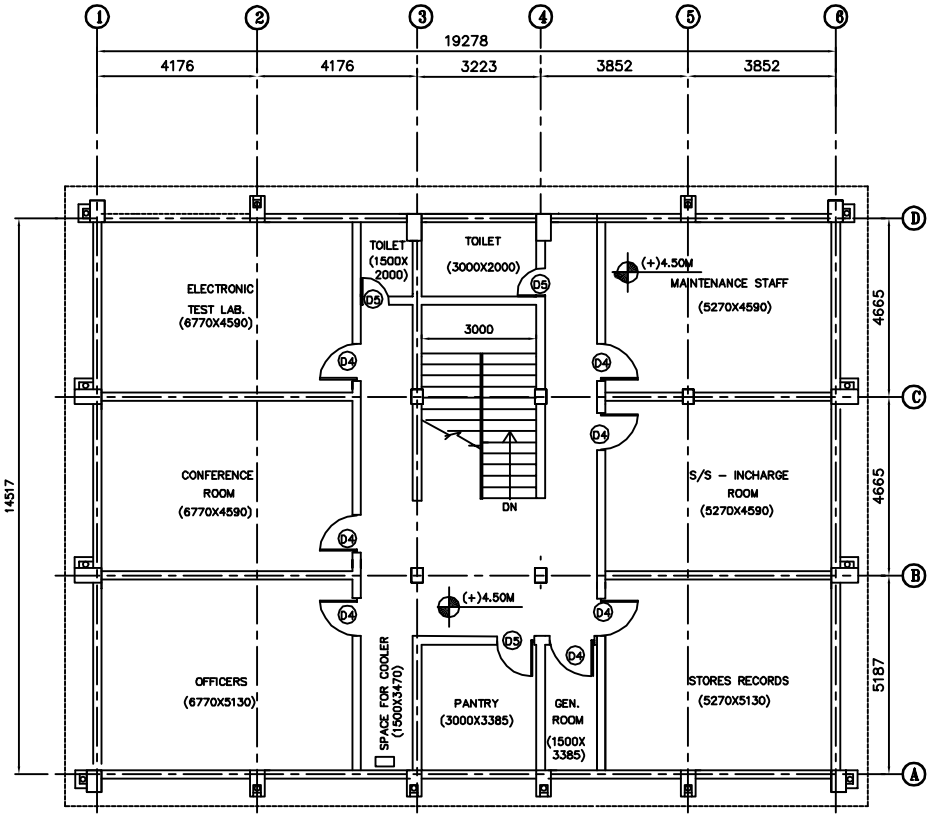
APPROVED	

SCALE NTS



GROUND FLOOR PLAN



FIRST FLOOR PLAN

NOTES:

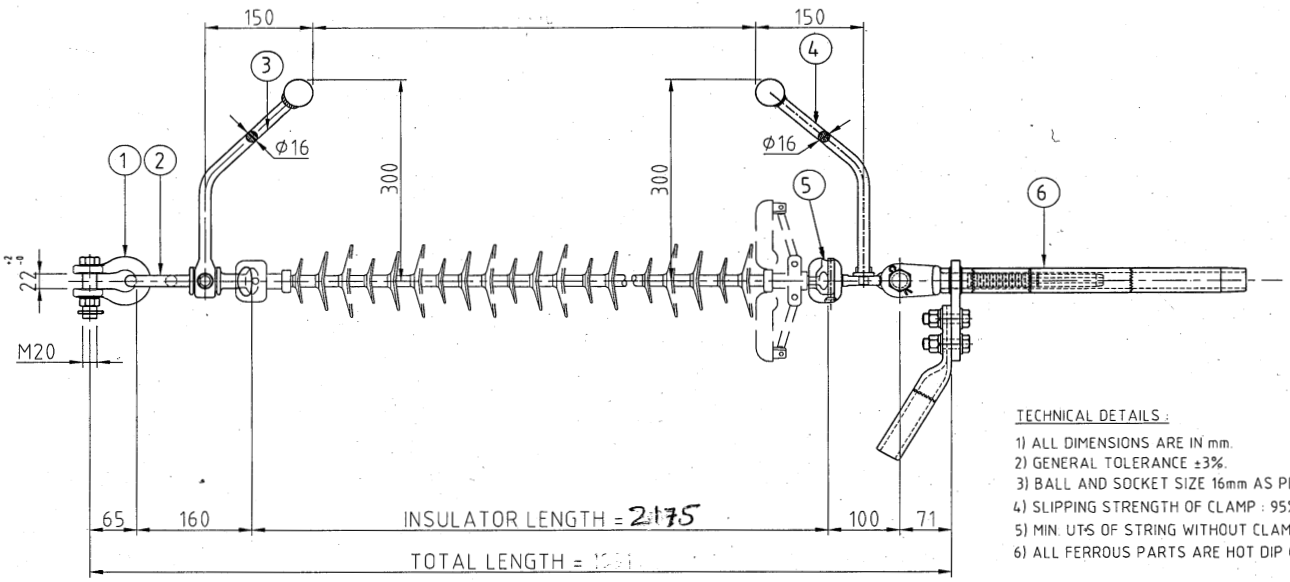
1. ALL DIMENSIONS ARE IN MM.
2. FINISHED FLOOR LEVEL OF CONTROL ROOM IS EL.(+)500MM ABOVE FINISHED GROUND LEVEL.
3. TOP OF ROOF IS AT EL(+)8250MM ABOVE FINISHED GROUND LEVEL

DRG NO:- RECTPCL/PIA/DRG-22

REC TRANSMISSION PROJECTS COMPANY LTD

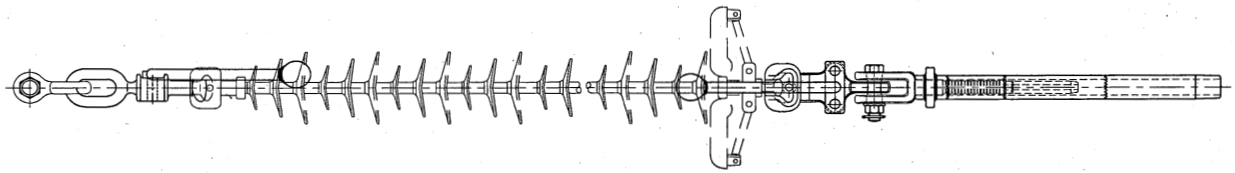
PROJECT: 2x50 MVA, 220/33 KV Nagrota Substation

TITLE: CONCEPTUAL LAYOUT PLAN OF CONTROL ROOM BUILDING



TECHNICAL DETAILS :

1) ALL DIMENSIONS ARE IN mm.
2) GENERAL TOLERANCE ±3%.
3) BALL AND SOCKET SIZE 16mm AS PER IS:2486/IEC:6012(
4) SLIPPING STRENGTH OF CLAMP : 95% of UTS OF CONDUI
5) MIN. UTS OF STRING WITHOUT CLAMP - 90 kN.
6) ALL FERROUS PARTS ARE HOT DIP GALVANIZED AS PEI



Itm.	Qty.	Description	Standard	Drg. No.	Material	Surface	UTS
6	1	Comp. Dead End clamp			Al. Alloy & steel	- - - - -	- - - - -
5	1	H.H.Socket Eye	IEC 16		Forged steel, CL-IV, IS:2004	Hot dip galvanized	90 kN
4	1	Arcing horn			Mild steel, Fe-410, IS:2062	Hot dip galvanized	1.5 kN
3	1	Arcing horn			Mild steel, Fe-410, IS:2062	Hot dip galvanized	1.5 kN
2	1	H.H Ball link	IEC 16		Forged steel, CL-IV, IS:2004	Hot dip galvanized	90 kN
1	1	Anchor Shackle			Forged steel, CL-IV, IS:2004	Hot dip galvanized	90 kN

	Date	Name
	2017	
Drawn		
Checked	06.09.	
Scale	----	
Title		

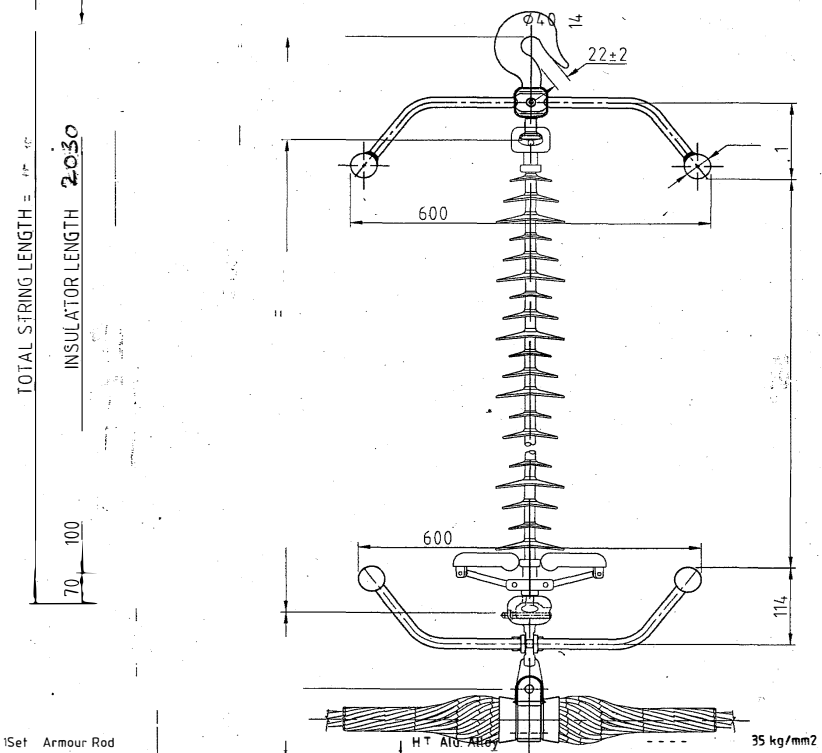
PRELIMINARY DRAWING FOR TENDE

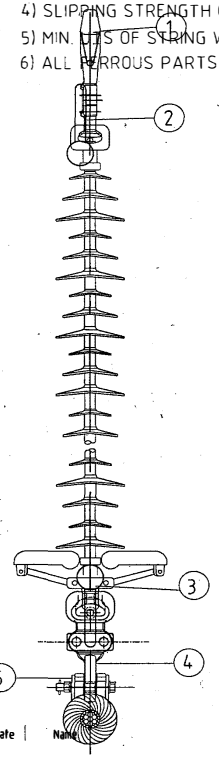
Replace for	Sim. to
Replaced by	
Art. No. I_AK11E0111	
Drg. No. I_AS11E0111	Rev. 00
No. of pages	Page

Name | Date | Modification | Number | Revision | Name | Date | Letter

TECHNICAL DETAILS :

1) ALL DIMENSIONS ARE IN mm
2) GENERAL TOLERANCE ±3%
3) BALL AND SOCKET SIZE 16mm AS PER IS 2486/IEC:60120
4) SLIPPING STRENGTH OF CLAMP 11 to 16kN.
5) MIN. UTS OF STRING WITHOUT SUSPENSION CLAMP-70 kN
6) ALL FERROUS PARTS ARE HOT DIP GALVANIZED AS PER IS :2629

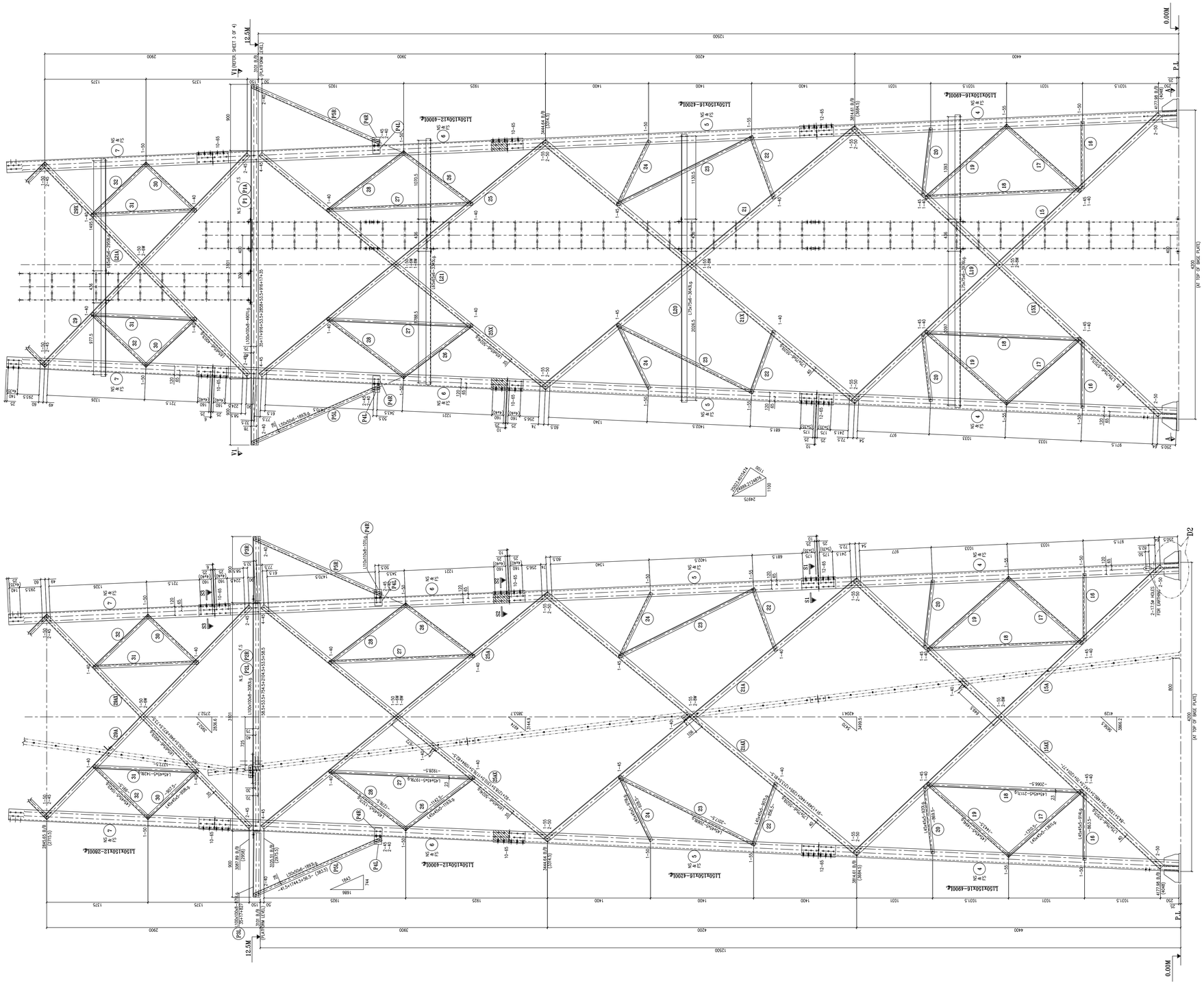


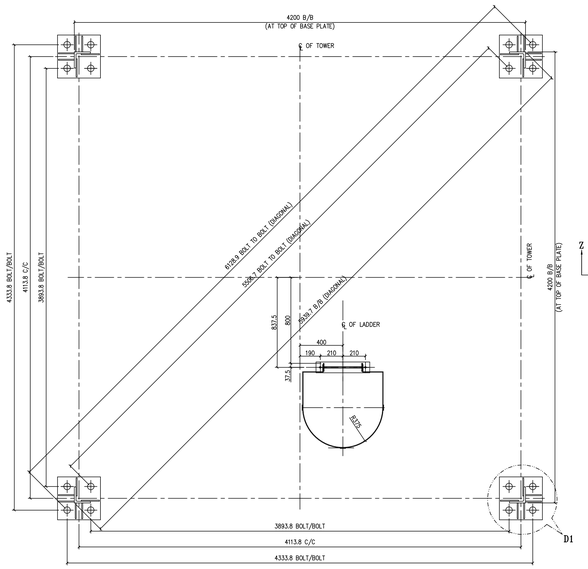


DRG NO:- RECTPCL/PIA/DRG-23

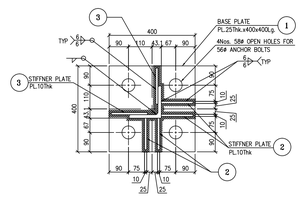
Sl. No.	Qty	Description	Standard	Drg. no	Material	Surface	UTS
5	1	Set Armour Rod			HT Alu. Alloy		35 kg/mm2
		HSU clamp			Al. Alloy LM-6, IS:617		70 kN.
4	1	H.H Socket Eye Twisted	IEC 16		Forged steel, Cl-IV, IS:2004	hot dip galv	70 kN
3	1	Arcing horn			Mild steel Fe-410, IS:2062	hot dip ga	1.5kN
2	1	Arcing horn			Mild steel Fe-410, IS:2062	hot dip galv.	1.5kN
1	1	H.H. Ball Hook	IEC 16		Forged steel, Cl-IV, IS:2004	hot dip galv.	70 kN

2017 | Date | Name
Drawn
Checked
Title
Scale
Drg. No.

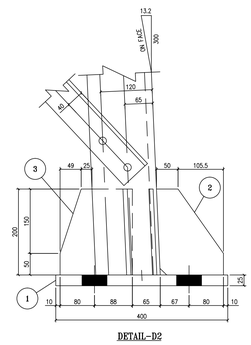




VIEW A–A



DETAIL–D1



SECTION S3–S3

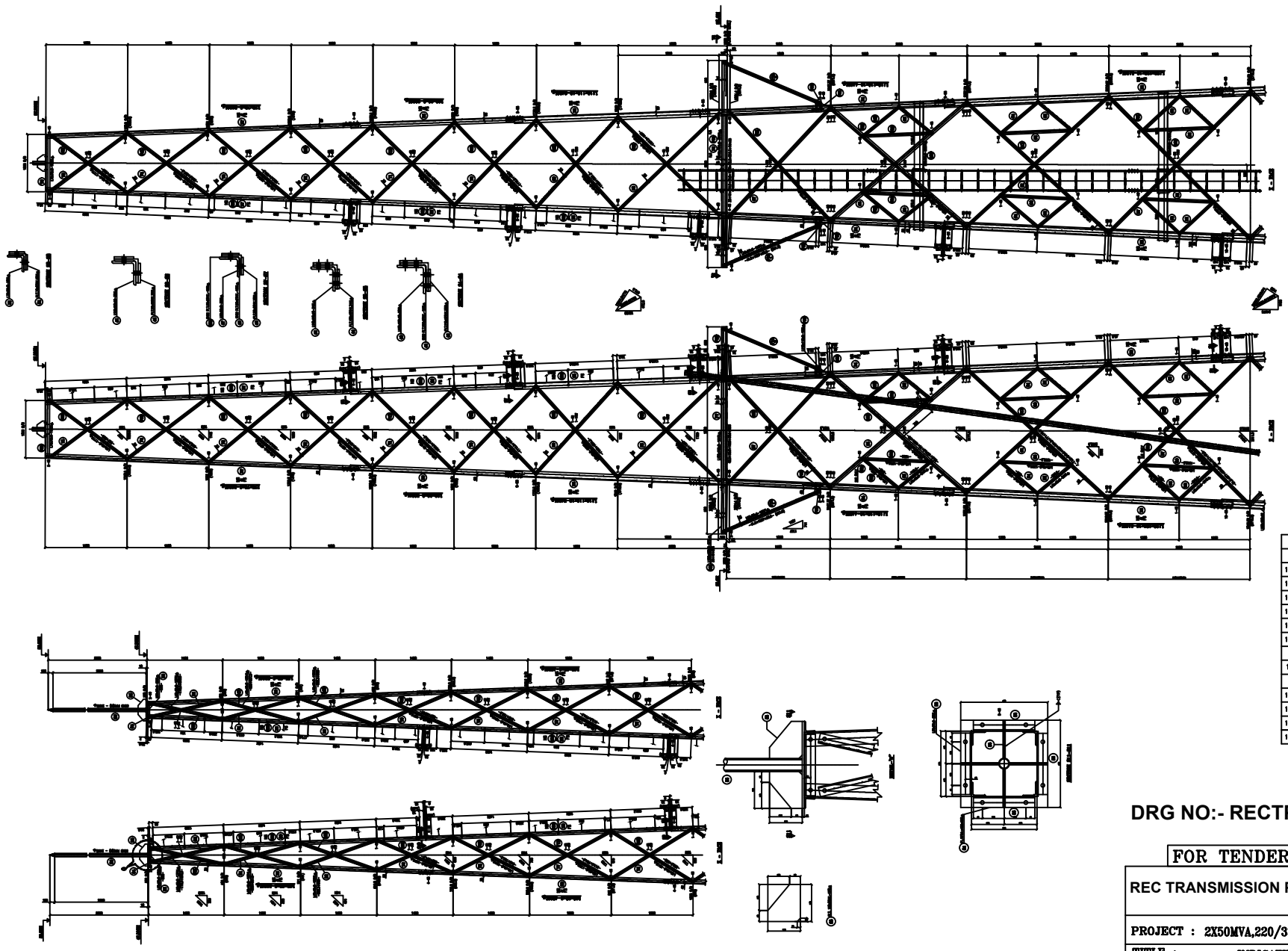
SECTION S2–S2

SECTION S1–S1

DRG NO:- RECTPCL/PIA/DRG-24

FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD
PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA
TITLE : INDICATIVE 50M LM



REQUIREMENT OF BOLTS, NUTS AND WASHERS			
SIZE	QTY.	GRADE	REMARKS
16ø x 35mm Lg.	8	5.6	BOLTS & NUTS
16ø x 40mm Lg.	100	5.6	"
16ø x 45mm Lg.	416	5.6	"
16ø x 50mm Lg.	36	5.6	"
16ø x 55mm Lg.	152	5.6	"
16ø x 60mm Lg.	80	5.6	"
16ø x 175mm Lg.	53		STEP BOLTS WITH SPRING WASHERS
16ø x 6 THK	28	–	PACK WASHERS
16ø x 8 THK	24	–	PACK WASHERS
16ø x 10 THK	24	–	PACK WASHERS
16ø x 3.5 THK	792	–	SPRING WASHERS

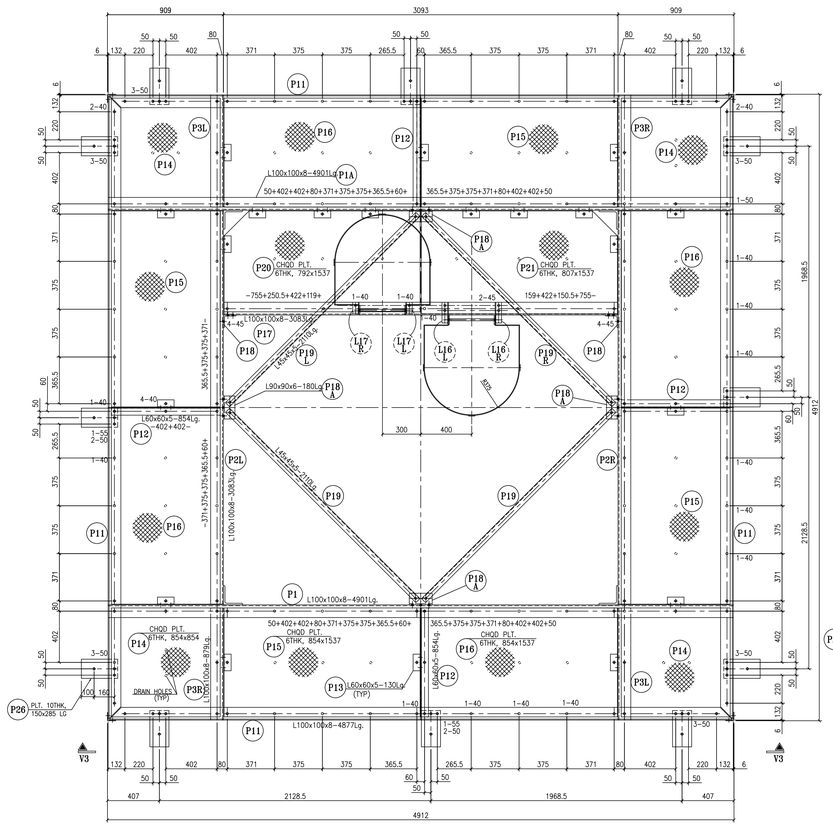
DRG NO:- RECTPCL/PIA/DRG-25

FOR TENDER PURPOSE ONLY

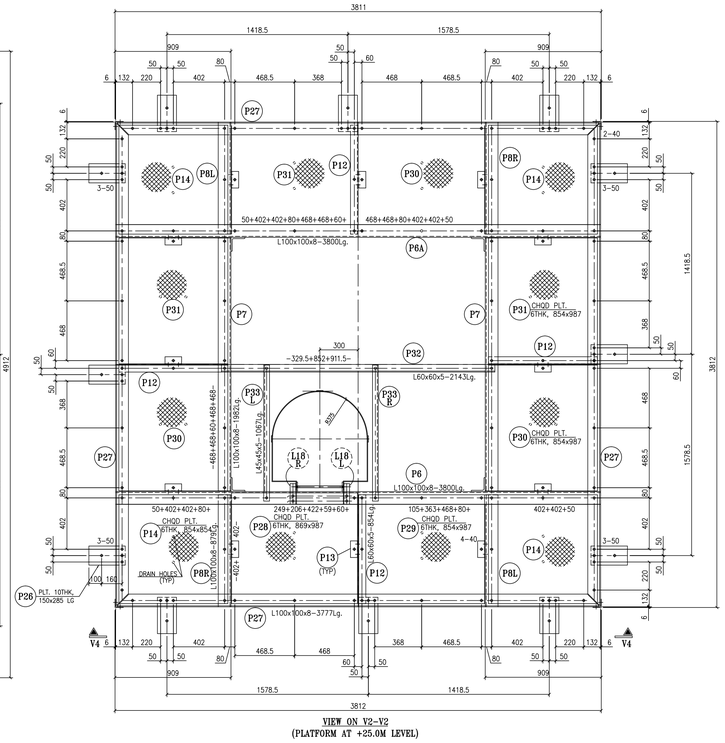
REC TRANSMISSION PROJECTS COMPANY LTD

PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA

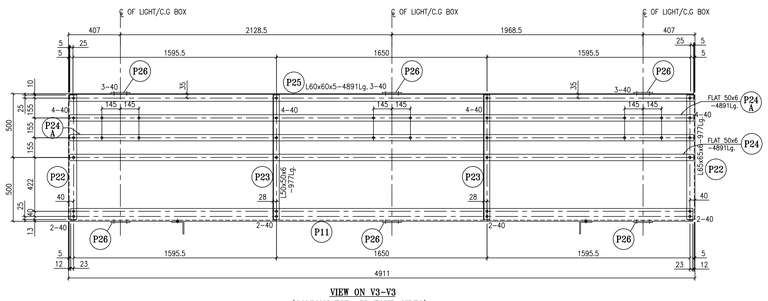
TITLE : INDICATIVE 50M LM



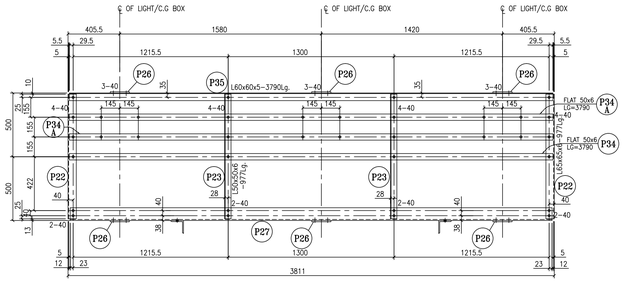
VIEW ON V1-V1
(PLATFORM AT +12.5M LEVEL)



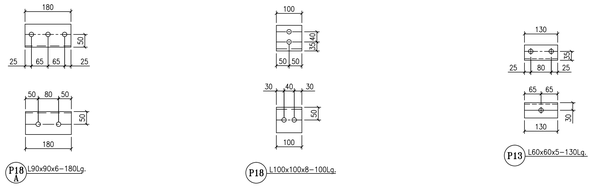
VIEW ON V2-V2
(PLATFORM AT +25.0M LEVEL)



VIEW ON V3-V3
(COMMON FOR ALL FOUR SIDES)



VIEW ON V4-V4
(COMMON FOR ALL FOUR SIDES)



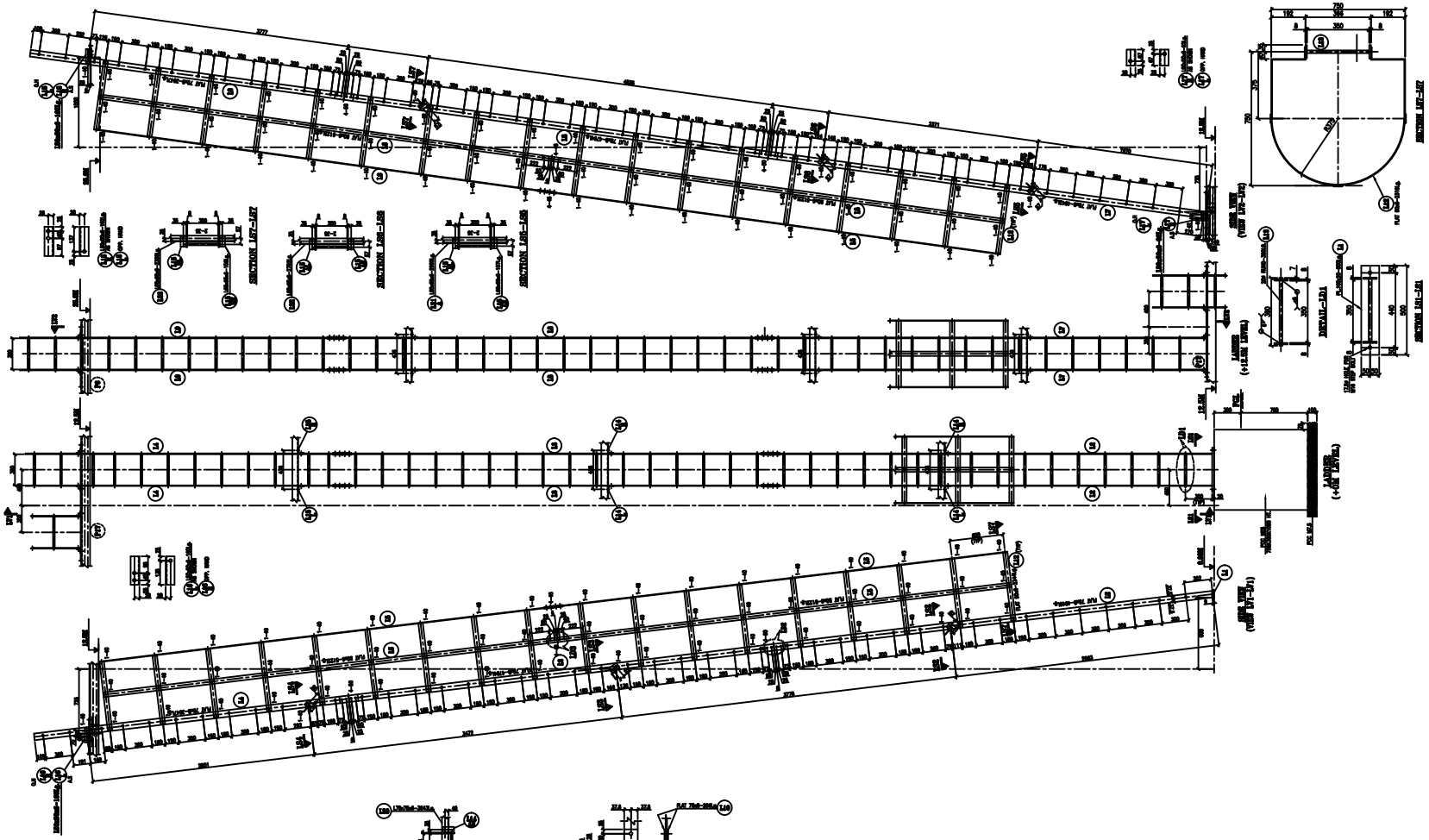
DRG NO:- RECTPCL/PIA/DRG-26

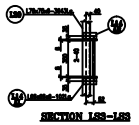
FOR TENDER PURPOSE ONLY

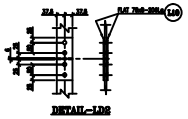
REC TRANSMISSION PROJECTS COMPANY LTD

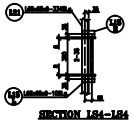
PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA

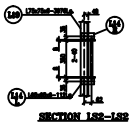
TITLE : INDICATIVE 50M LM

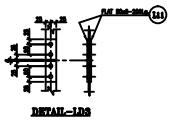








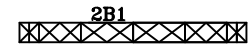




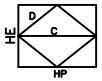
DRG NO:- RECTPCL/PIA/DRG-27

FOR TENDER PURPOSE ONLY

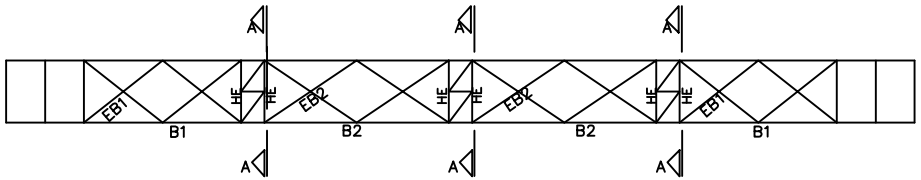
REC TRANSMISSION PROJECTS COMPANY LTD
PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA
TITLE : INDICATIVE 50M LM



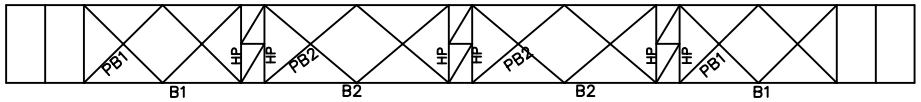
KEY PLAN



VIEW A-A



ELEVATION



PLAN

SEC. MKD	SECTION	BOLTS
B1-B2	MS L 80X80X6	4 D/S
EB1	MS L 50X50X5	2 S/S
PB1	MS L 50X50X5	2 S/S
EB2	MS L 45X45X4	1 S/S
PB2	MS L 45X45X4	1 S/S
HE	MS L 65X65X6	2 S/S
HP	MS L 65X65X6	2 S/S
D	MS L 45X45X4	1 S/S
C	MS L 50X50X4	2 S/S

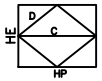
DRG NO:- RECTPCL/PIA/DRG-28

FOR TENDER PURPOSE ONLY

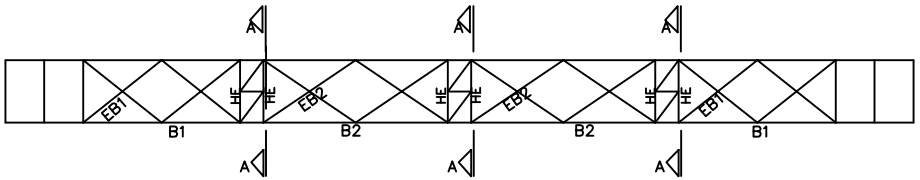
REC TRANSMISSION PROJECTS COMPANY LTD

PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA

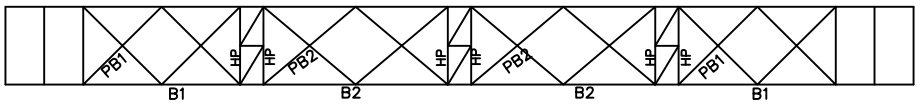
TITLE : INDICATIVE BEAM 1 STR



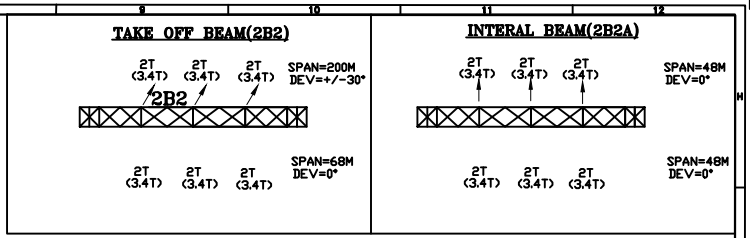
VIEW A-A



ELEVATION



PLAN



KEY PLAN

DRG NO:- RECTPCL/PIA/DRG-29

FOR TENDER PURPOSE ONLY

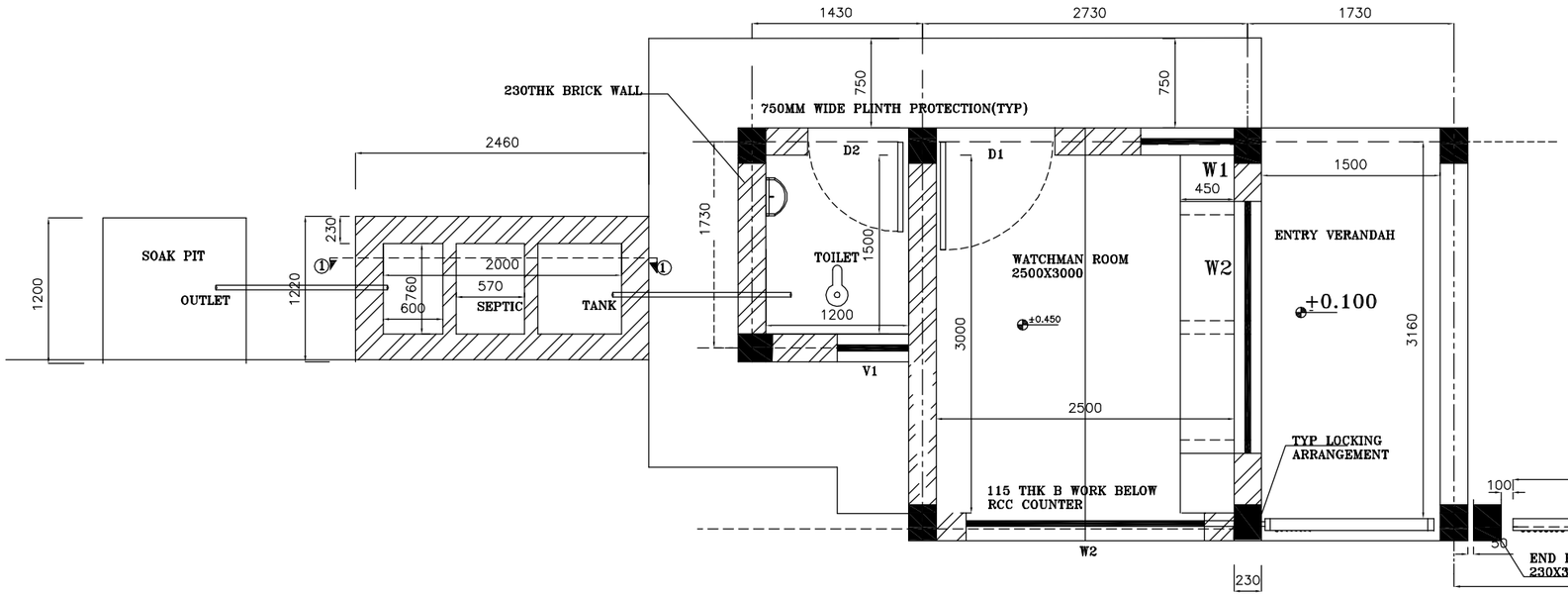
REC TRANSMISSION PROJECTS COMPANY LTD

PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA

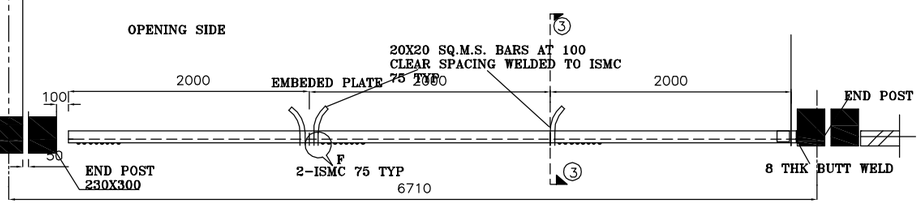
TITLE : INDICATIVE BEAM 1 STR

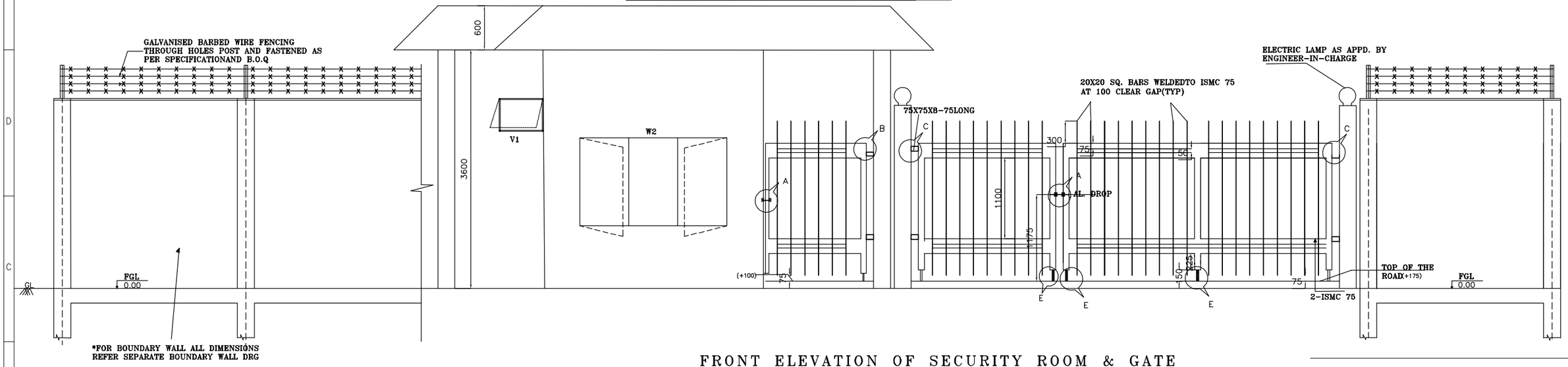
NOTE:-

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. PROVIDE BRICK WORK IN ENGLISH BOND IN 1:6CEMENT MORTAR (1CEMENT:6 COARSE SAND)
3. a) BRICKWORK TO BE DONE WITH BRICK OF FIRST CLASS DESIGNATION–75.
   b) PLASTERING WORK SHALL BE IN CEMENT MORTAR1:6(1CEMENT:6FINE SAND) THICKNESS OF PLASTER SHALL BE AS PER B.O.Q.
4. ALL EXPOSED PLASTER SURFACES TO BE PAINTED WITH MINIMUM OF TWO COATS OF COLOUR WASH OVER A BASE COAT OF WHITE WASH WITH LIME.
5. ALL STRUCTURAL STEEL SHALL CONFORM TO IS:2062 AND SHALL BE PAINTED WITH TWO OR MORE COATS OF SYNTHETIC ENAMEL PAINTS OF APPROVED BRAND AND MANUFACTURE OVER A PRIMING COAT OF APPROVED STEEL PRIMER.
6. CONCRETE FOR R.C.C. WORK SHALL BE OF GRADE 1:1.5:3(1CEMENT:1.5 COARSE SAND :3 GRADED STONE AGGREGATE 20MM NOMINAL SIZE).
7. REINFORCEMENT BARS SHALL BE TMT BARS CONFORMING TO IS:1786 LATEST REVISION.
8. STRUCTURE STEEL USED FOR GRADING SHALL CONFORM TO IS:2062 LATEST EDITION.
9. LAP/ANCHORAGE SHALL BE 50X DIA OF BAR.
10. CLEAR COVER TO MAIN REINFORCEMENT SHALL BE AS FOLLOWS
    a) FOOTING –50MM
    b) SLAB – 20MM
    c) COLUMN–40MM
    d) BEAMS –25MM



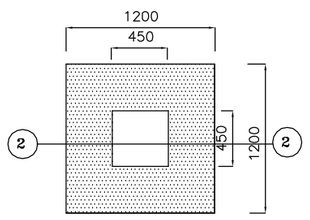
PLAN OF SECURITY ROOM AND GATE





FRONT ELEVATION OF SECURITY ROOM & GATE

DOOR WINDOW SCHEDULE				
TYPE	SIZE	LEVEL	LINTEL LEVEL	TOTAL NOS
D1	900X2100	+0.450	+2.55	1
D2	750X2100	+0.450	+2.55	1
W1	900X1200	+1.350	+2.55	1
W2	2000X1200	+1.350	+2.55	2
V1	600X450	+2.100	+2.55	1



SOAK PIT PLAN

DRG NO:- RECTPCL/PIA/DRG-30

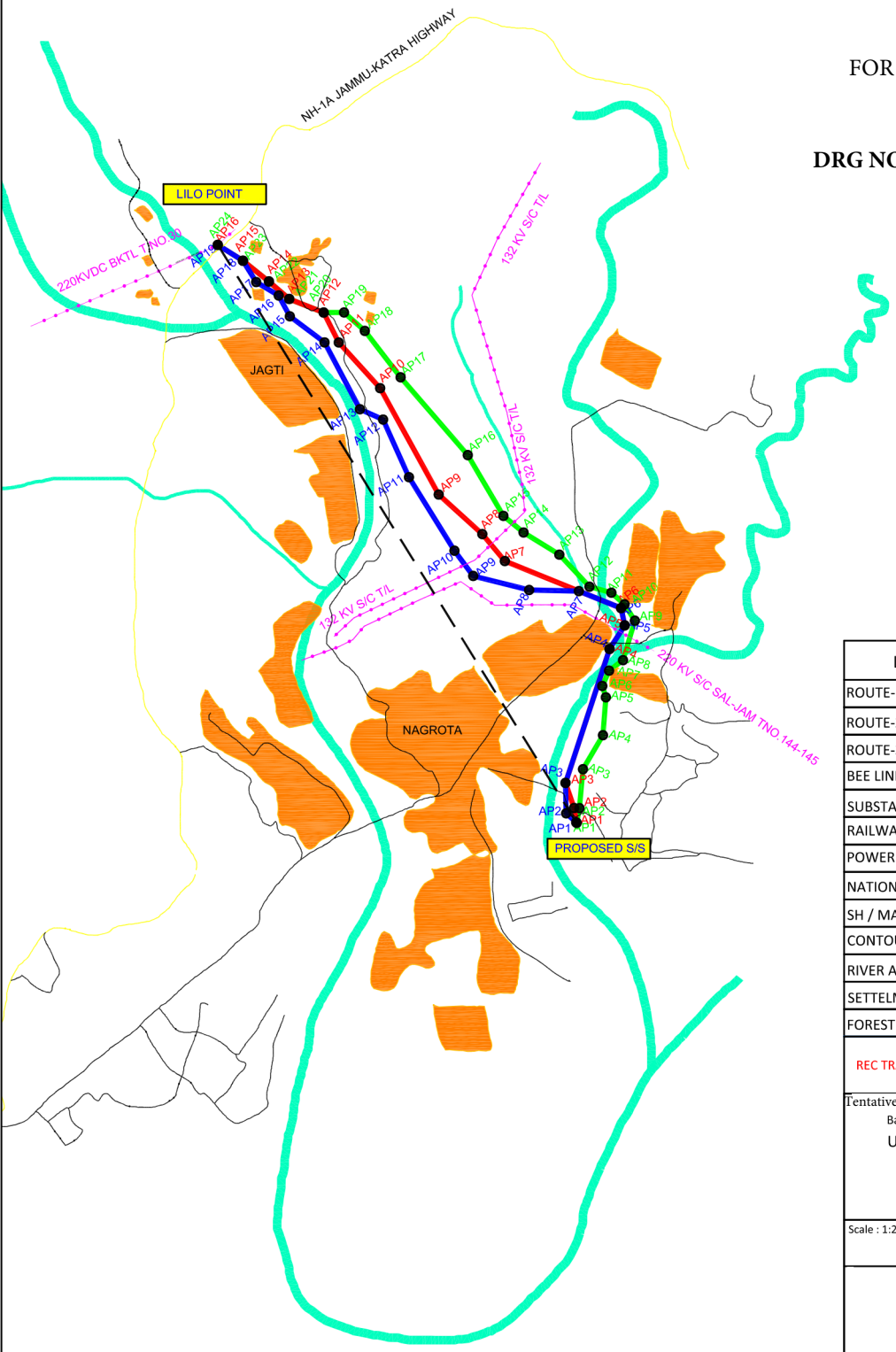
REC TRANSMISSION PROJECTS COMPANY LTD

FOR TENDER PURPOSE ONLY

TITLE : Security Room

FOR TENDER PURPOSE ONLY

DRG NO:- RECTPCL/PIA/DRG-31



LEGEND (SHEET 1 OF 1)	
ROUTE-1 (Proposed)	
ROUTE-2	
ROUTE-3	
BEE LINE	
SUBSTATION	
RAILWAY LINE	
POWER LINE 132KVABOVE	
NATIONAL HIGHWAY	
SH / MAJOR ROAD	
CONTOUR	
RIVER AND WATER BODY	
SETTELMENT	
FOREST	

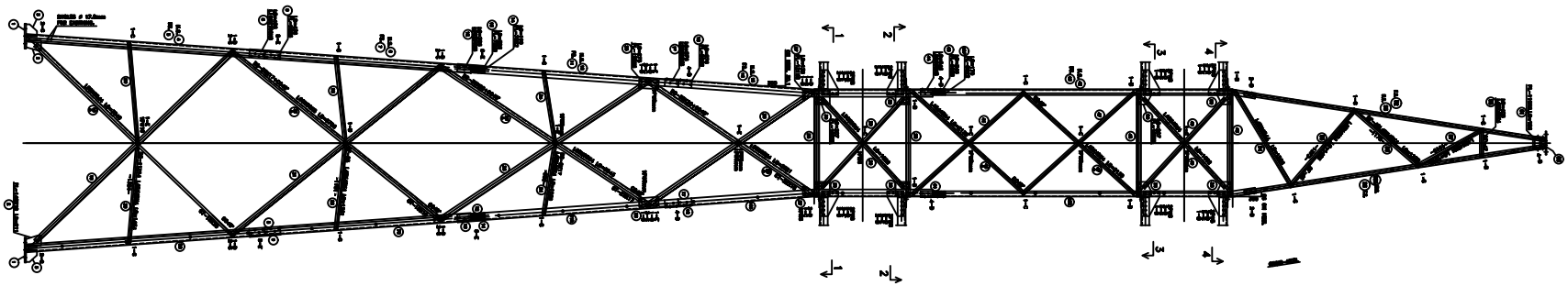
REC TRANSMISSION PROJECTS COMPANY LIMITED

Tentative Route Alignment Drawing of 3 Alternative Routes Based on Toposheets, Walk Over Survey and Using Modern Survey Techniques For

220kV S/C LILO OF BARN TO KISHNPUR TL LINE

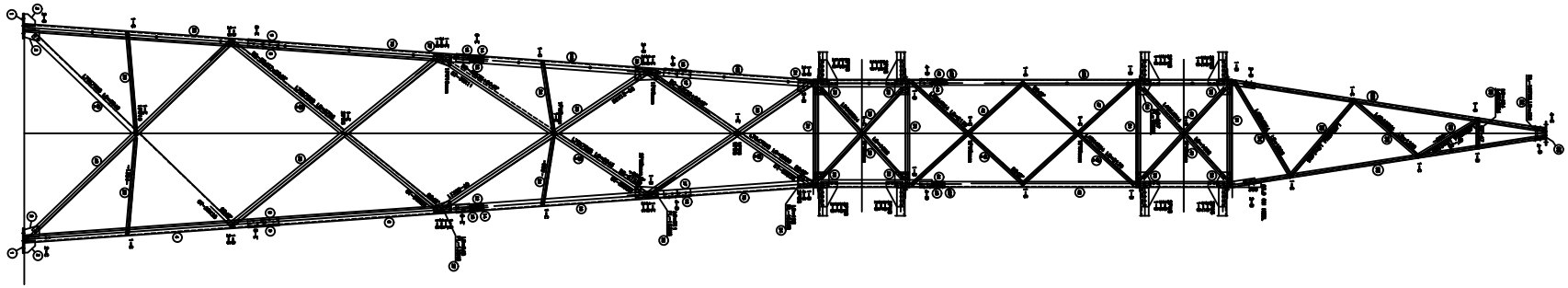
Scale : 1:20000

TRANS.FACE.

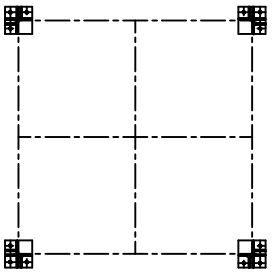


L110X110X10 LG=3390 | L110X110X10 LG=2888 | L100X100X8 LG=2900 | L100X100X8 LG=2558+2 | L75X75X5 LG=4521-6 | L50X50X5 LG=4244

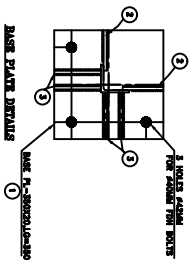
LONG.FACE.



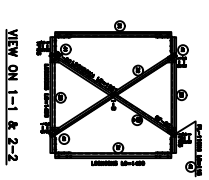
KEY PLAN FOR BASE PLATE



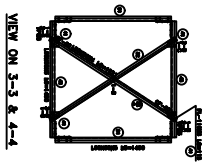
BASE PLATE DETAILS

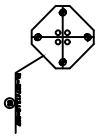


VIEW ON 1-1 & 2-2



VIEW ON 3-3 & 4-4





DRG NO:- RECTPCL/PIA/DRG-32

FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD
PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA
TITLE : INDICATIVE TWR STR

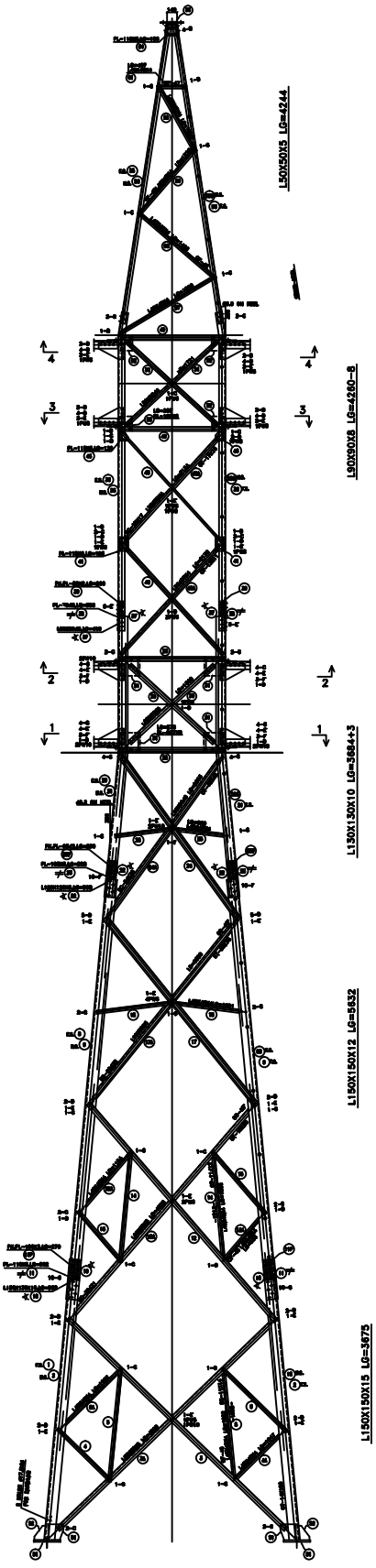
DRG NO:- RECTPCL/PIA/DRG-33

FOR TENDER PURPOSE ONLY

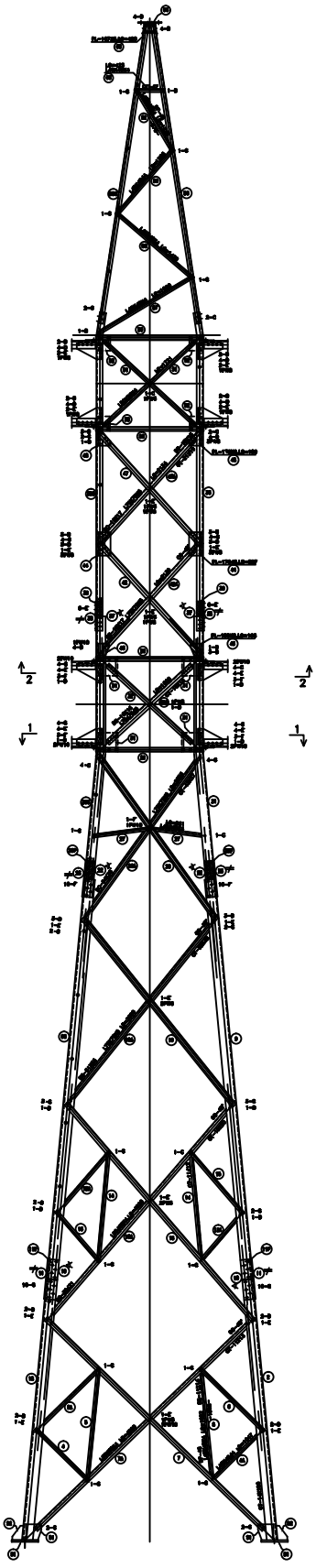
REC TRANSMISSION PROJECTS COMPANY LTD

PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA

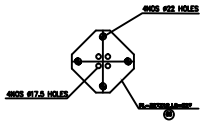
TITLE : INDICATIVE TWR STR

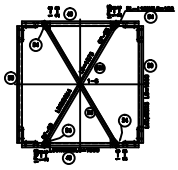


TRANS.FACE.

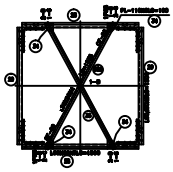


LONGITUDINAL FACE.

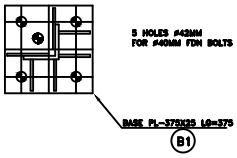




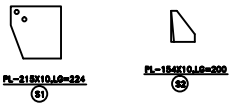
VIEW 3-3 & 4-4

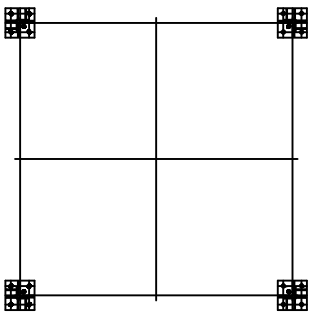


VIEW 1-1 & 2-2



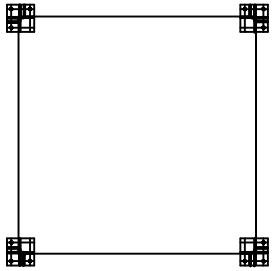
BASE PLATE DETAILS



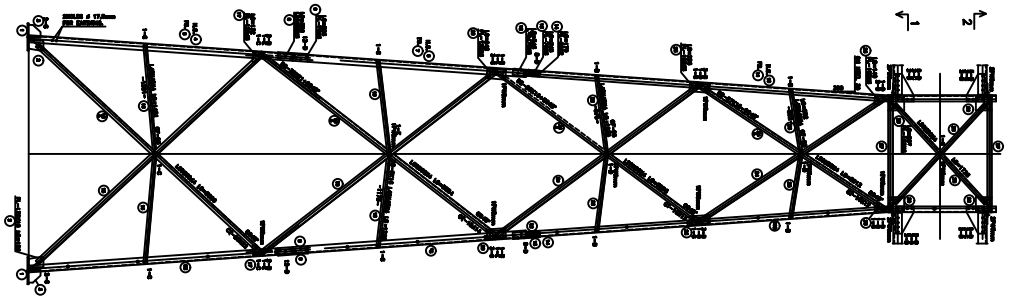


KEY PLAN FOR BASE PLATE

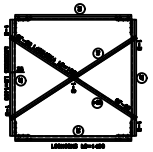
KEY PLAN FOR BASE PLATE



TRANS.FACE.



VIEW ON 1-1 & 2-2

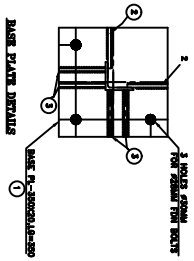


L90X90X8 LG=3400

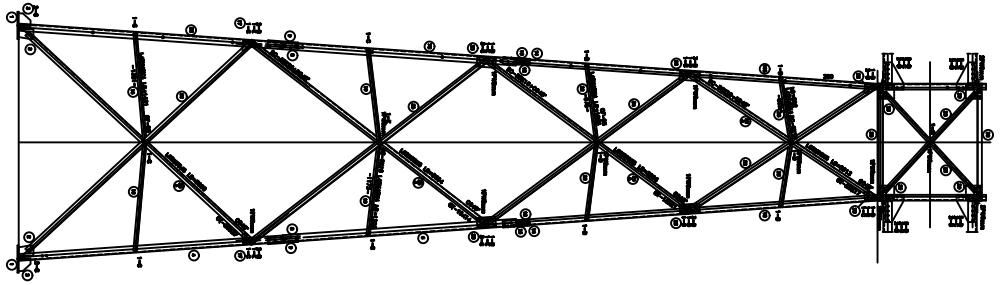
L90X90X8 LG=3000

L75X75X6 LG=8040+2

BASE PLATE DETAILS



LONG.FACE.



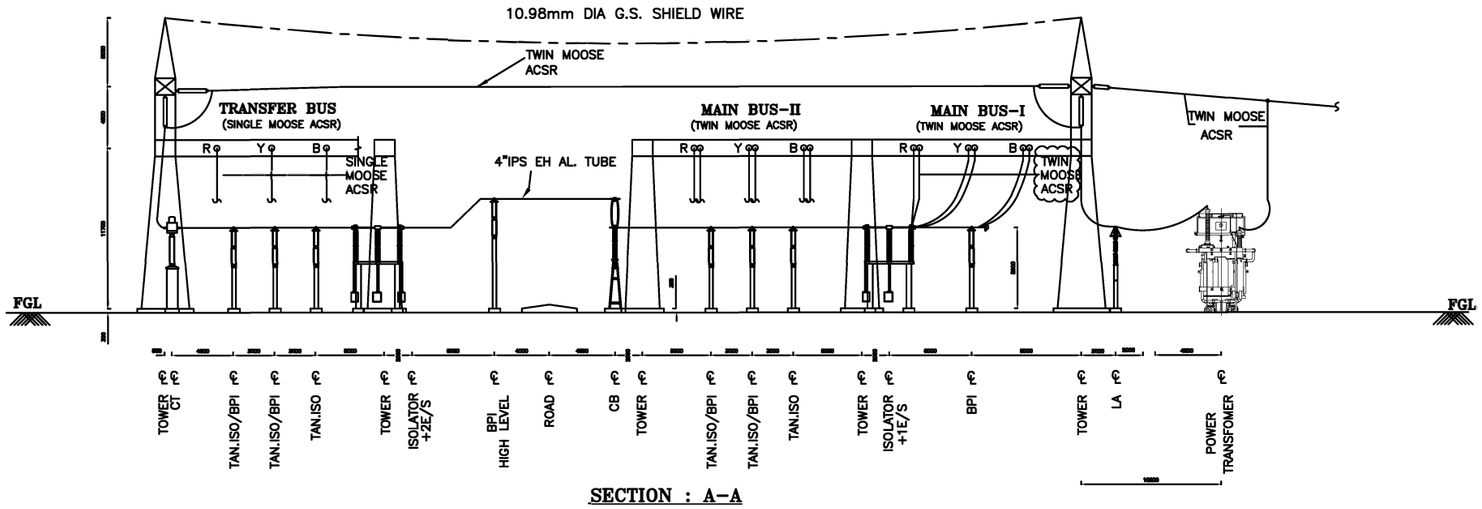
DRG NO:- RECTPCL/PIA/DRG-34

FOR TENDER PURPOSE ONLY

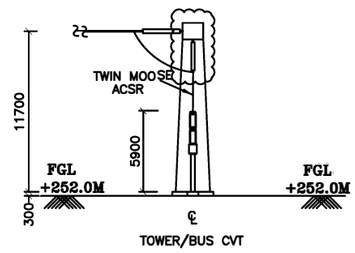
REC TRANSMISSION PROJECTS COMPANY LTD

PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA

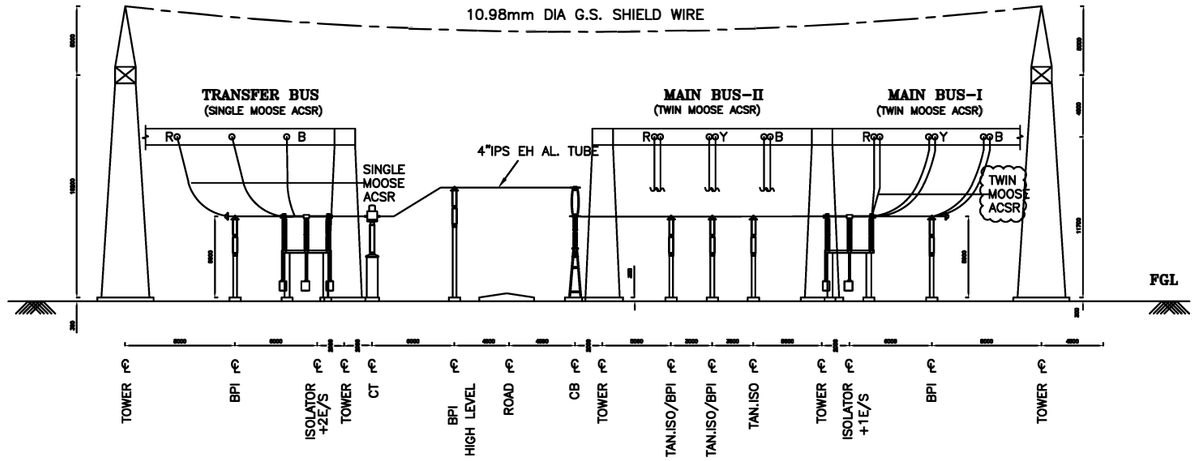
TITLE : INDICATIVE TWR STR



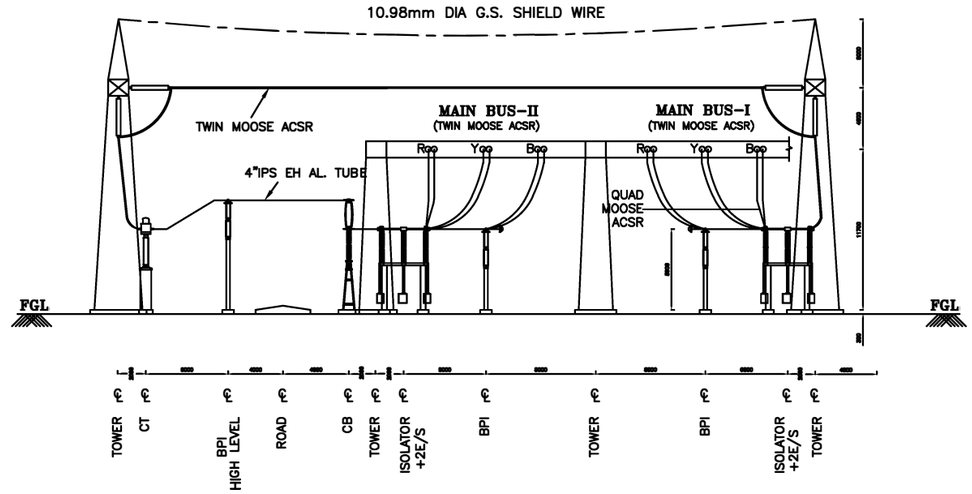
SECTION : A-A
220kV ICT HV FEEDER



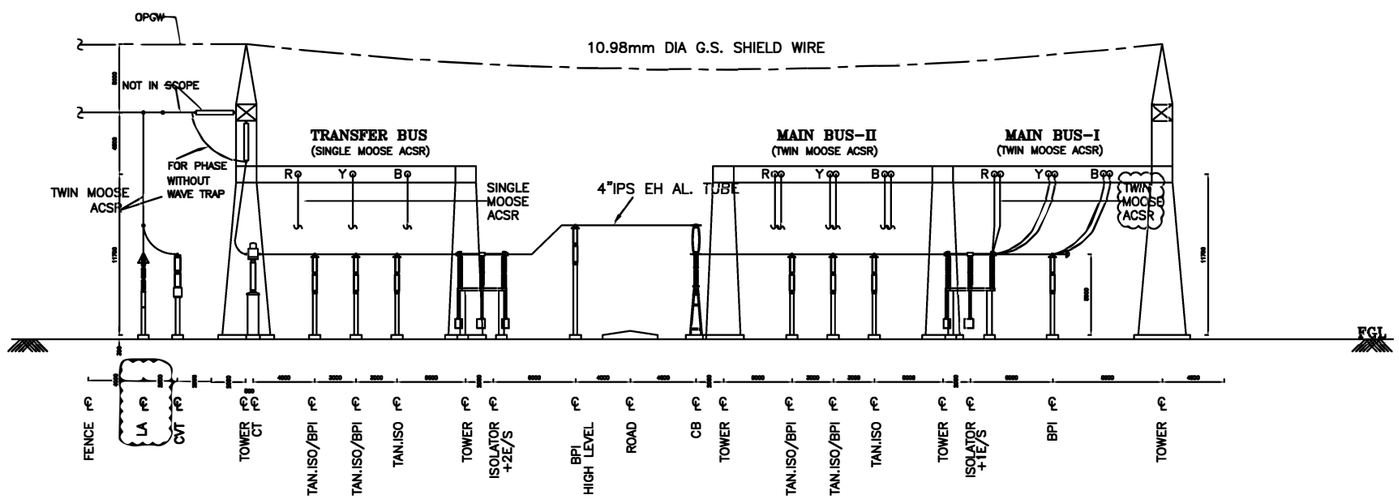
SECTION : E-E
BUS CVT-220kV



SECTION : B-B
220kV TRANSFER BUS COUPLER BAY



SECTION : D-D
220kV BUS COUPLER BAY

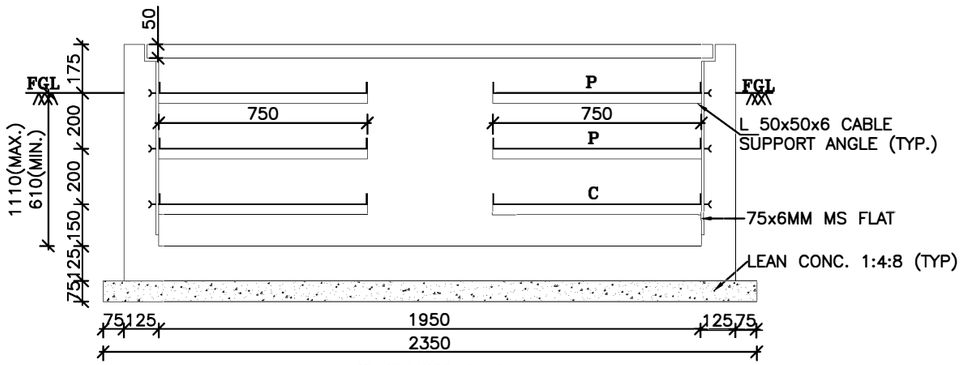


SECTION : C-C
220kV LINE FEEDER

DRG NO:- RECTPCL/PIA/DRG-35

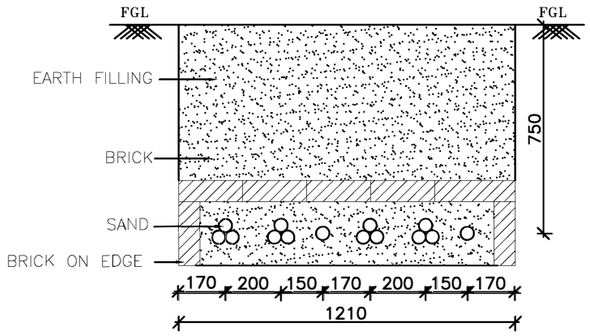
FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.				
PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA				
TITLE : INDICATIVE 220KV LAYOUT SECTION				
DATE	DRAWN	CHECKED	SCALE	
			NTS	



SECTION 1–1

SCALE 1:20



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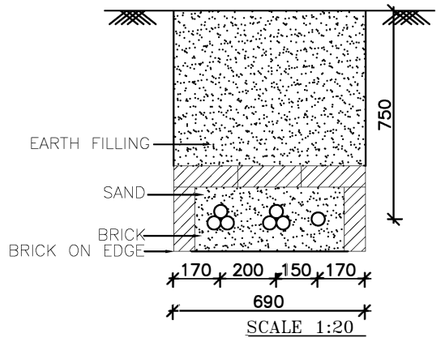

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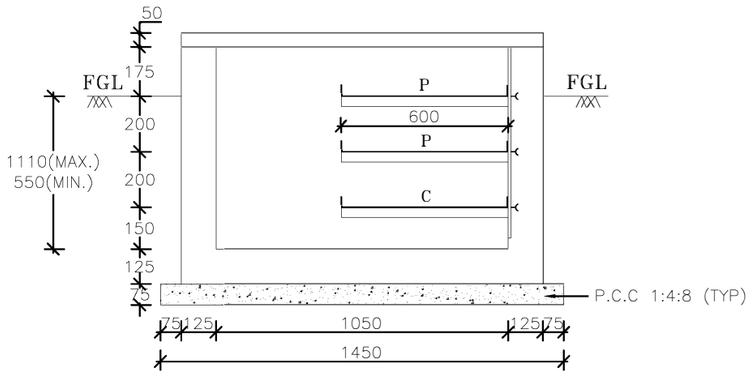
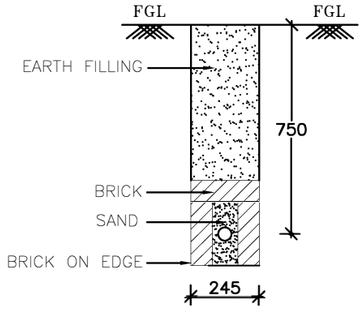


SECTION–2–2

(SCALE 1:20)



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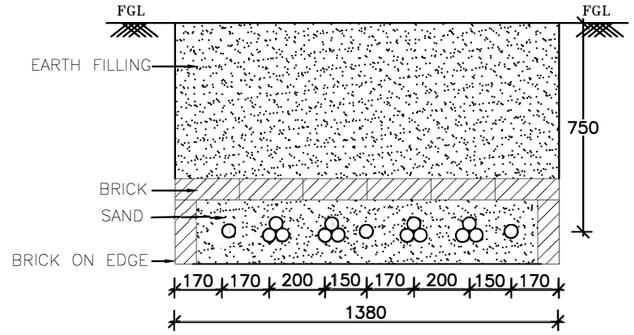
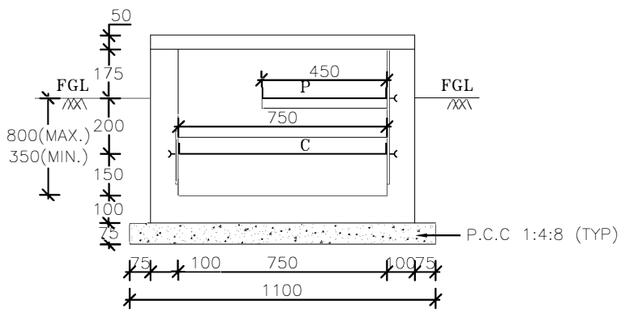
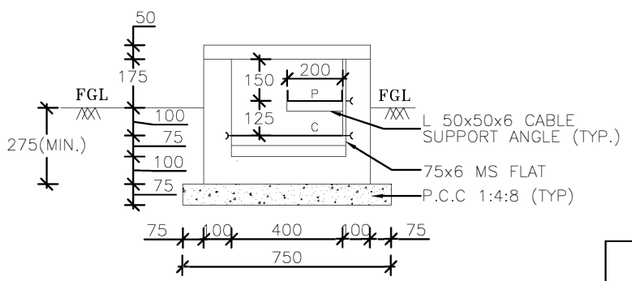


SCALE 1:20



SECTION–3–3

(SCALE 1:20)



SECTION–4–4

(SCALE 1:40)

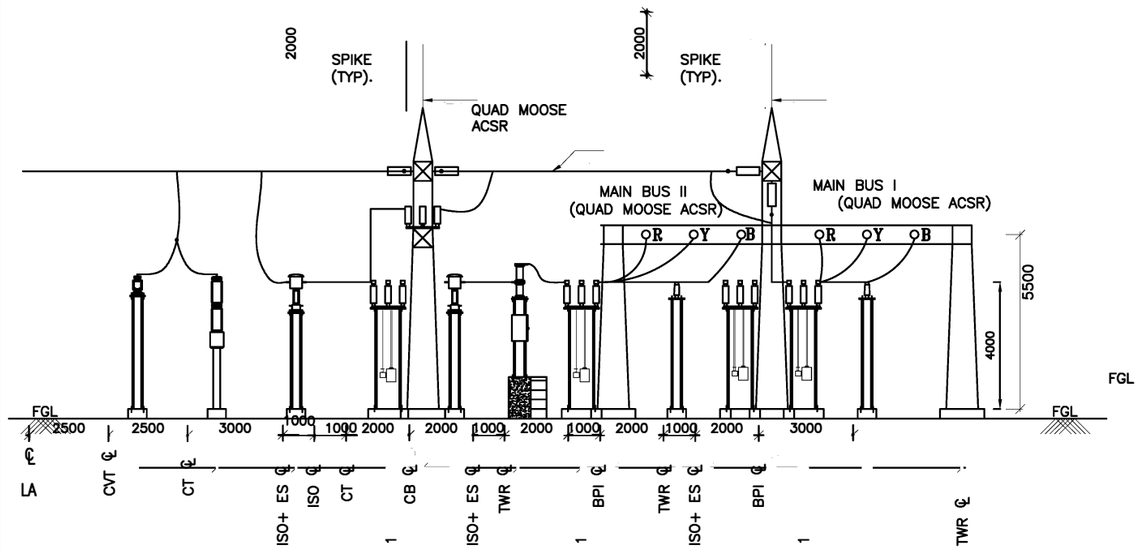
DRG NO:- RECTPCL/PIA/DRG-36

FOR TENDER PURPOSE ONLY

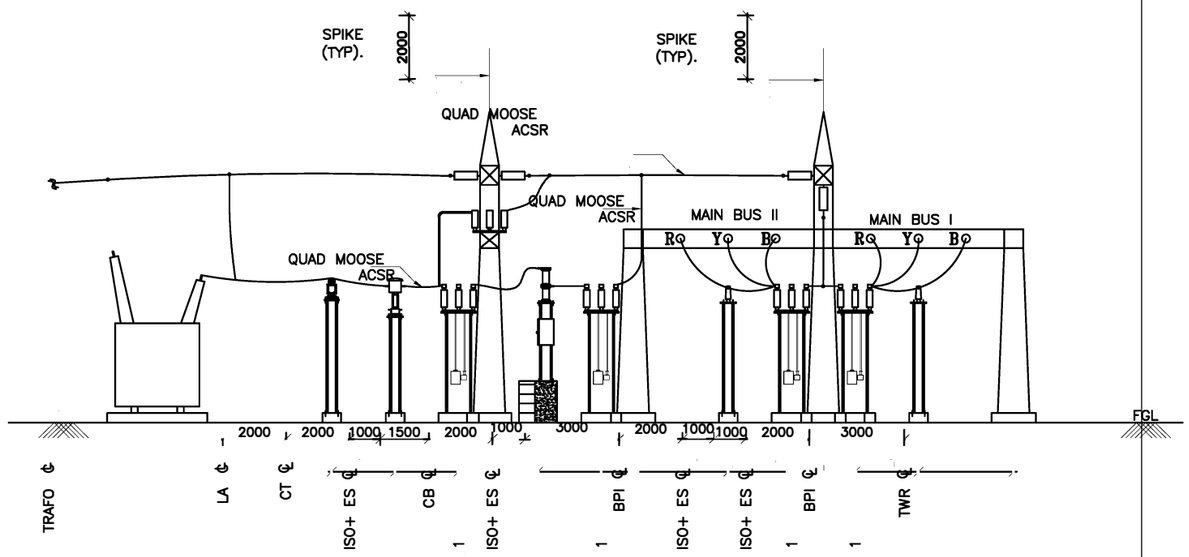
REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA

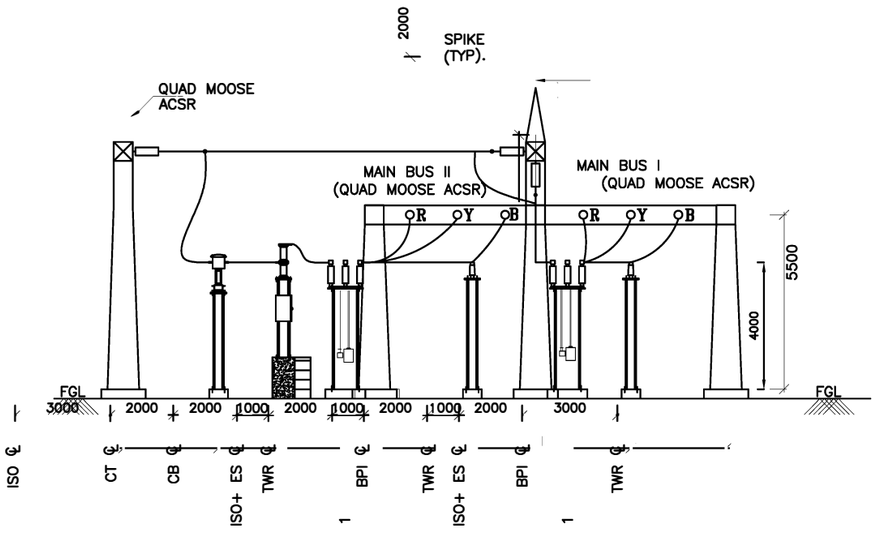
TITLE : INDICATIVE BURIED CABLE TRENCH SECTION



33KV LINE BAY



33KV TRANSFORMER BAY



33KV BUS COUPLER BAY

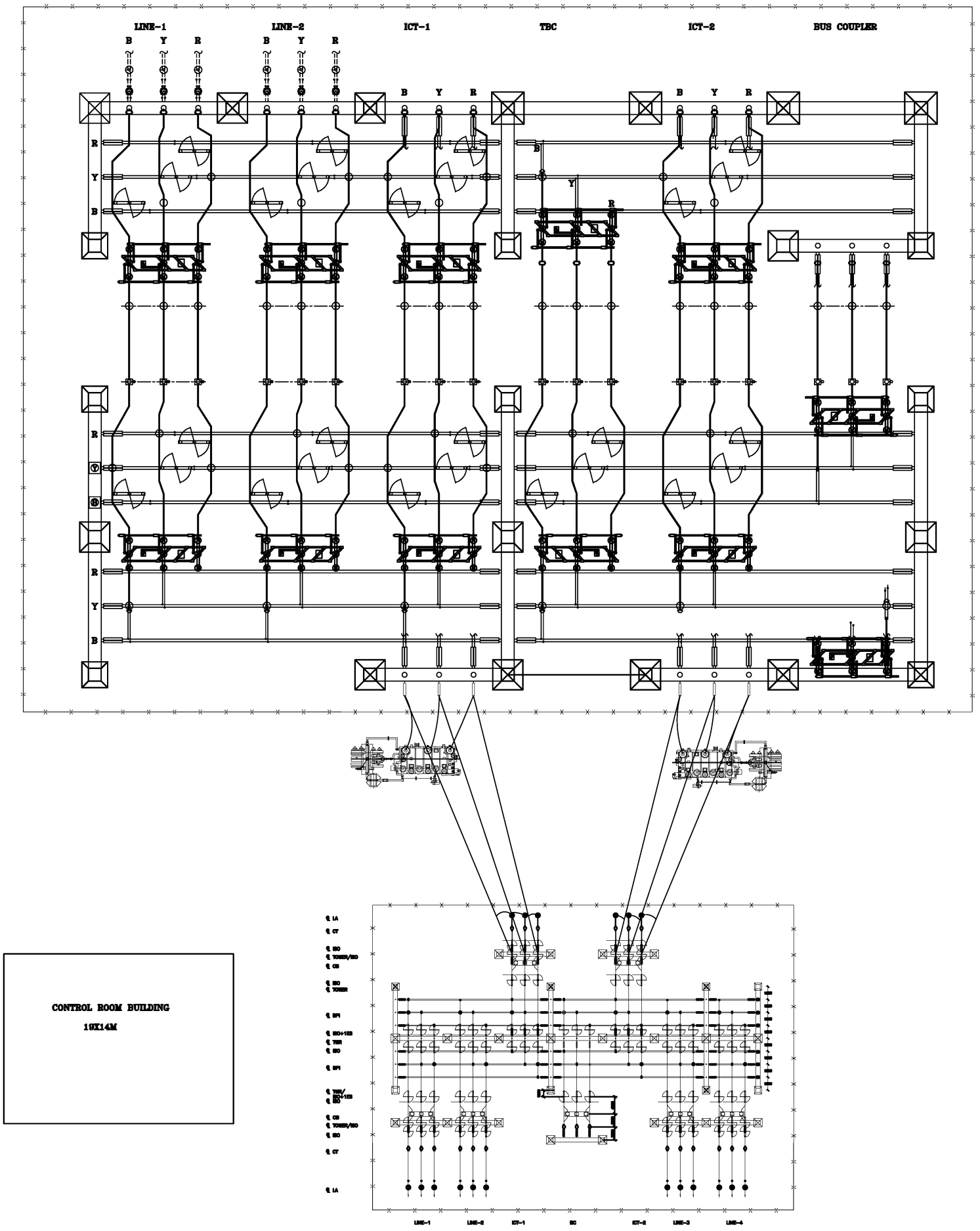
DRG NO:- RECTPCL/PIA/DRG-37

FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : 2X50MVA,220/33KV GRID STATION AT NAGROTA

TITLE : INDICATIVE 33KV LAYOUT SECTION



MAIN STORE
16.67X6M

CONTROL ROOM BUILDING
19X14M

SECURITY POST

GATE

DRG NO:- RECTPCL/PIA/DRG-38

FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : 2X50MVA, 220/33KV GRID STATION AT NAGROTA

TITLE : INDICATIVE LAYOUT PLAN

DATE	DRAWN	CHECKED	SCALE	DRAWING No.	
			NTS	J&K/LAY/002	

Annexure-2 to Amendment-5

LIST OF PROPOSED SUPPLIERS/SUB-CONTRACTORS

Sl. No.	DESCRIPTION OF EQUIPMENT	NAME OF THE SUPPLIERS
1	220/33kV Power Transformer	Toshiba/CGL/Bharat Bijlee/ABB/ Siemens/BHEL/Kanohar/ EMCO/T&R
2	SHUNT REACTOR	CG/ALSTOM/Siemens/TBEA and Other Approved Vendor of POWERGRID
3	245kV Circuit Breaker	CGL/GE/ABB/Siemens/ALSTOM
4	245kV Capacitive Voltage Transformer	CGL/GE/ABB/Siemens/ALSTOM/BHEL/ MEHRU
5	245kV Voltage Transformer	CGL/GE/ABB/Siemens/ALSTOM/ MEHRU/SCT and Other Approved Vendor of POWERGRID
6	245kV Current Transformer	CGL/GE/ABB/Siemens/Mehru/ BHEL/ ALSTOM/TOSHIBA/SCT and Other Approved Vendor of POWERGRID
7	245kV ISOLATOR	ABB /Siemens/GR Power/S&S/ HIVELM/Switchgear & Structures
8	36kV ISOLATOR	ABB /Siemens/GR Power/ HIVELM/Universal/Electrolites/ Ultima/Switchgear & Structures
9	245 kV & 36kV Surge Arrester	Oblum/Lamco/CGL
10	Control & Relay Panel	Schneider/ABB/Siemens /GE India/ BHEL/ALSTOM/ZIV/L&T and Other Approved Venders of POWERGRID
11	Substation Automation	Schneider/ABB/Siemens /GE India/ ALSTOM/ZIV/L&T and Other Approved Vendor of POWERGRID
12	DIGITAL PROTECTION COUPLER	ABB/ALSTOM/ZIV-Spain/Siemens and Other Approved Vendor of POWERGRID
13	33kV HT Cable	KEI/Paramount/HAVELLS/Polycab/RPG
14	1.1 kV Power & Control Cables(PVC)	Polycab Cables/ KEI/Gemscab/ Paramount Cables/Havells/RPG/ LASER and Other Approved Vendor of POWERGRID
15	1.1 kV XLPE Power Cables	KEI/ Paramount/Universal Gemscab/Krishna/Havells and Other Approved Vendor of POWERGRID
16	110V & 48V Battery	Amara Raja/Exide/HBL
17	110V & 48V Battery Charger	STATCON/HBL/Amara Raja/ Chabbl/ Caldyne/Chloride
18	LT Switchgear	Vikas Engg./Unilec/ Jackson/ SPACEAGE/Jasper/Nitya/BHEL/ Maktel/Control & Switchgear and Other Approved Vendor of POWERGRID
19	LT Transformer	ABB/ TESLA/Toshiba/Technical Associate/East India/Vijay

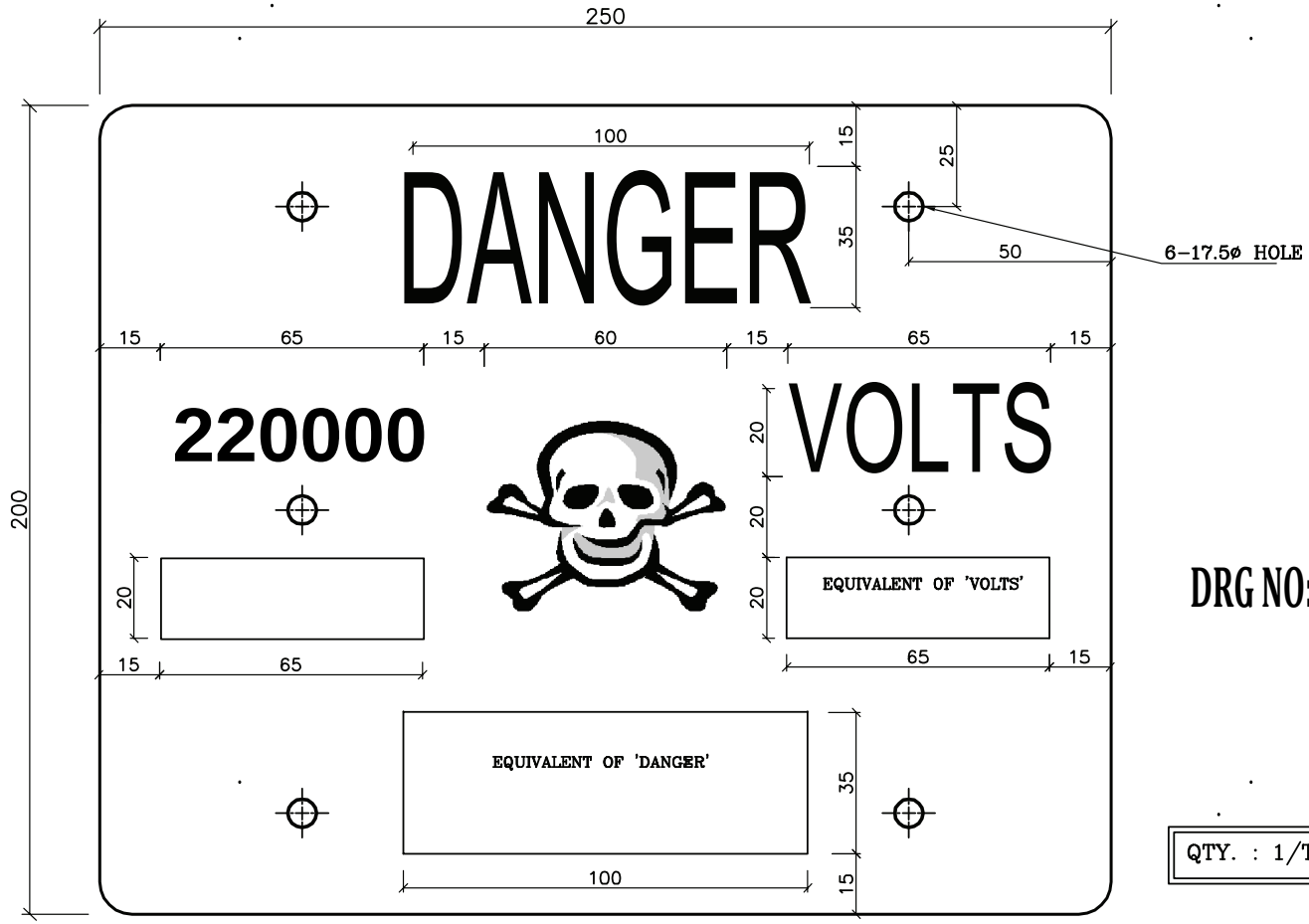
20	**33kV Indoor Switchgear (GIS Type)**	**Siemen Germany/Switchgear/CGL/ ABB/L&T/Scheinder**
21	**132 & 220 kV INDOOR SWITCHGEAR (GIS TYPE)**	**ABB/GE/Siemens/NHVS/HYOSUNG/CGL**

Note:

1. Contractor may propose new make/sub-vendor meeting technical (qualifying) requirement as stipulated in technical Specification for above mentioned brought-out items within 90 days from the date of NOA for approval of RECTPCL. The cost of assessment shall borne by contractor in case of new vendors as per RECTPCL requirement.

PART-B
VOLUME-II, SECTION-IX
INDICATIVE TENDER DRAWINGS FOR LILO

Sr. No.	Drawing Name	Drawing No.
11.01	DANGER BOARD	RECTPCL/PIA/DRG/LILO/01
11.02	DOUBLE CIRCUIT TOWER	RECTPCL/PIA/DRG/ LILO /02
11.03	NUMBER PLATE1	RECTPCL/PIA/DRG/ LILO /03
11.04	PHASE PLATE1	RECTPCL/PIA/DRG/ LILO /04
11.05	PIPE EARTHING ARRANGEMENTS-MODEL	RECTPCL/PIA/DRG/ LILO /05
11.06	STEP BOLT	RECTPCL/PIA/DRG/ LILO /06
11.07	STR ACD (BARBED WIRE TYPE) MODEL 1	RECTPCL/PIA/DRG/ LILO /07
11.08	TENTATIVE SHAPE OF TOWER FOOTING	RECTPCL/PIA/DRG/ LILO /08
11.09	TOWER FOOTING	RECTPCL/PIA/DRG/ LILO /09



BILL OF MATERIALS/TOWER							
Sl NO.	Qty (Nos)	Section (mmxmmxmm)	Length (mm)	U/wt (kg)	Wt/Pc (kg)	Total Wt (kg)	
1	1	SHEET 2MM THK. 200	250	15.70	00.79	00.79	
					SUBTOTAL=	00.79	
Total List of Bolts&Nuts							
2	2	16 Dia HRH Bolt&Nut	35.0	0.1220		00.24	
3	2	Spring Washer for M16 Bolt	03.5	0.0090		00.02	
					SUBTOTAL=	00.26	
(FOR 1 NO. OF DANGER PLATE) TOTAL WT / TOWER=						01.05	

DRG NO:- RECTPCL/PIA/DRG/LILO/01

QTY. : 1/TOWER

NOTES:-

1. ALL DIMENSIONS ARE IN MM.
2. MATERIALS :
   MILD STEEL – IS2062:2006 E250 (fy=250N/sqmm)
   BOLTS & NUTS 16ø – GRADE 5.6/5 (IS: 12427–1988)
   BOLT SET: ONE BOLT+ONE NUT+ONE SPRING WASHER.
3. DRAWING IS MADE AS PER IS:2551–1983.
4. SIZE OF PLATE SHALL BE 250mm X 200mm X 2mm.
5. LETTERS AND NUMBERING SHALL BE RED ENAMELLED.
6. BACK GROUND: WHITE VITREOUS ENAMELLED.
7. BACK/REAR: BLACK VITREOUS ENAMELLED.
8. ALL LETTERING SHOULD BE CENTRALLY SPACED.
9. THE DIMENSIONS FOR THE WORDS IN DISTRICT LANGUAGE ARE MAINLY FOR GUIDANCE, HOWEVER, CARE SHOULD BE TAKEN TO SPACE THEM CENTRALLY BETWEEN THE EDGES AND THE AREA OF THE SKULL AND BONES.
10. THE LOCATION OF THE FIXING HOLES SHALL BE LEFT TO THE CHOICE OF THE USER.
11. THE CORNER OF THE PLATE SHOULD BE ROUNDED OFF.

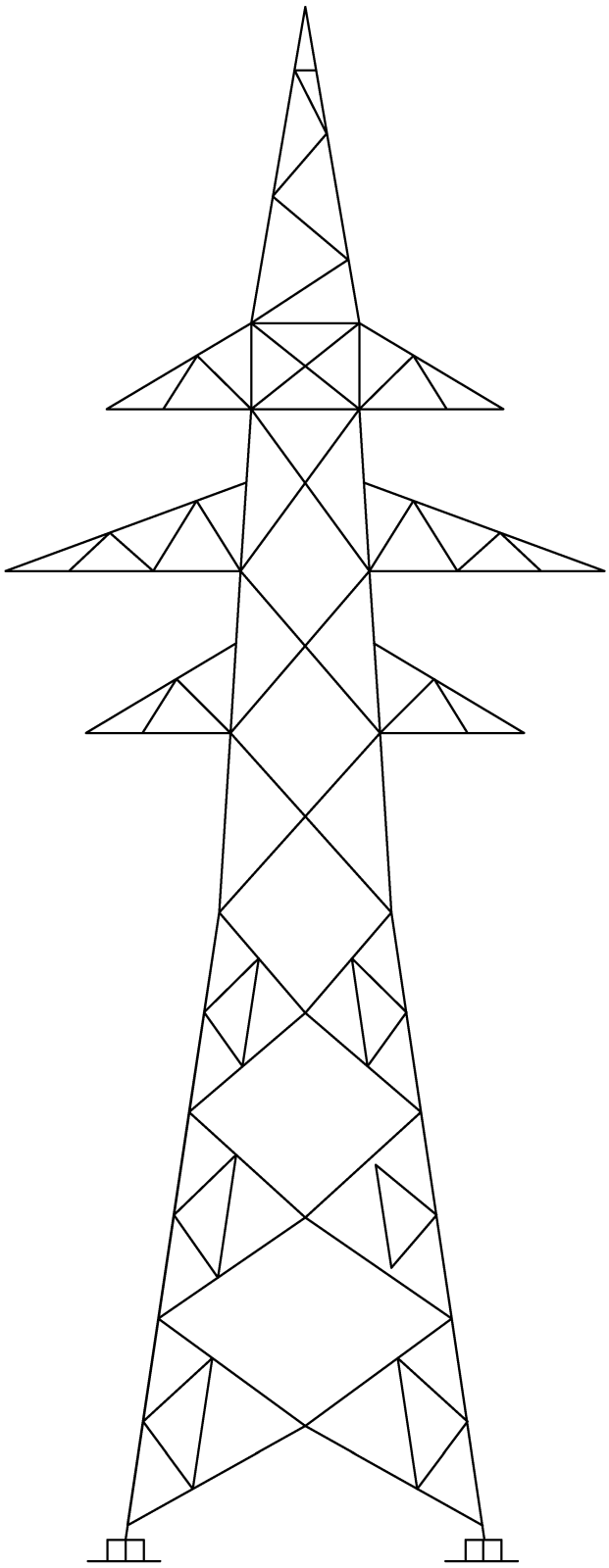
FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : **LILO Line Associated with 2x 50 MV, 220/33 KV Nagrota Substation**

TITLE : DANGER PLATE

SHEET. NO. : 1/1



DRG NO:- RECTPCL/PIA/DRG/LILO/02

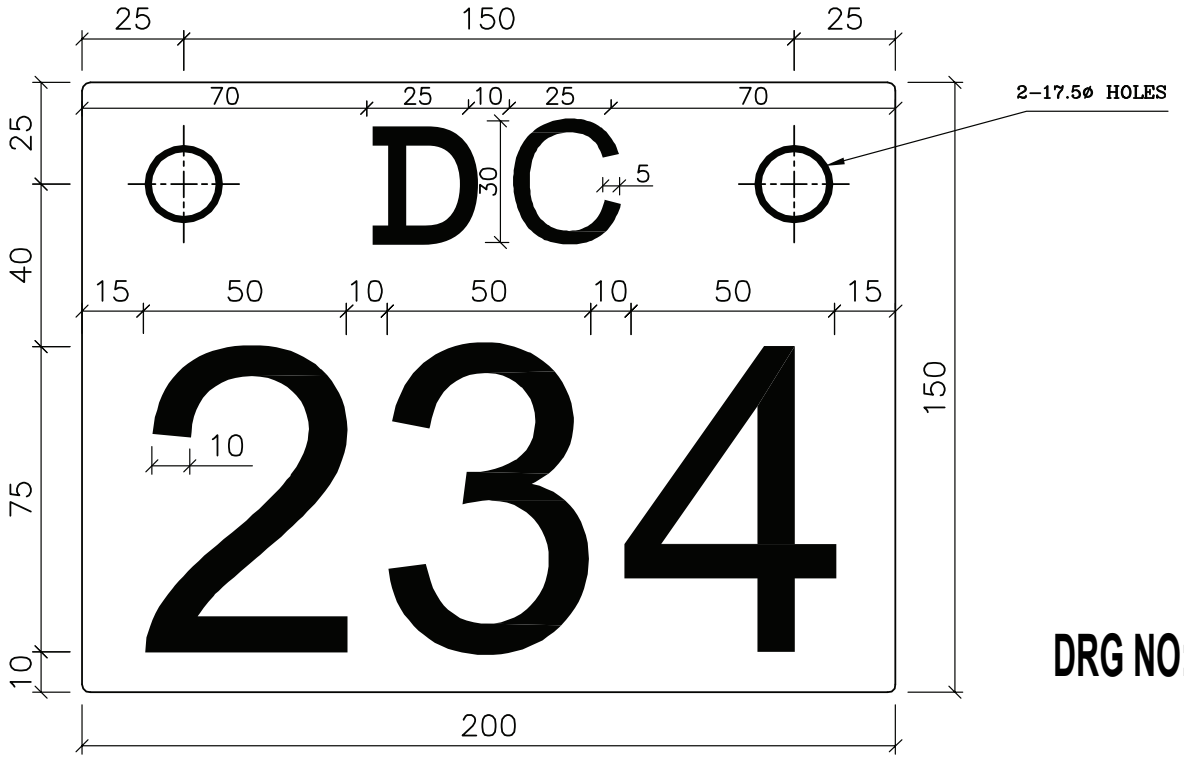
FOR TENDER PURPOSE ONLY

REC TRANSMISSSION PROJECTS COMPANY LTD.

PROJECT: LILO associated with 2x50 MVA, 220/33 KV Nagrota Substation

TITLE: **DOUBLE CIRCUIT TOWER**

BILL OF MATERIALS/TOWER							
Sl NO.	Qty (Nos)	Section (mmxmmxmm)	Length (mm)	U/wt (kg)	Wt/Pc (kg)	Total Wt (kg)	
1	1	SHEET 2MM THK. 150	200	15.70	00.47	00.47	
					SUBTOTAL=	00.47	
Total List of Bolts&Nuts							
2	2	16 Dia HRH Bolt&Nut	35.0	0.1220		00.24	
3	2	Spring Washer for M16 Bolt	03.5	0.0090		00.02	
					SUBTOTAL=	00.26	
(FOR 1 NO. OF NUMBER PLATE) TOTAL WT / TOWER=						00.73	



DRG NO:- RECTPCL/PIA/DRG/LILO/03

NUMBER PLATE

QTY. : 1/TOWER

NOTES:–

1. ALL DIMENSIONS ARE IN MM.
2. MATERIALS :
   MILD STEEL – IS2062:2006 E250 (fy=250N/sqmm)
   BOLTS & NUTS 16ø – GRADE 5.6/5 (IS: 12427–1988)
   BOLT SET: ONE BOLT+ONE NUT+ONE SPRING WASHER.
3. DRAWING IS MADE AS PER IS:5613 (PART2/SEC I) –1985.
4. SIZE OF PLATE SHALL BE 200mm X 150mm X 2mm.
5. LETTERS AND NUMBERING SHALL BE RED ENAMELLED.
6. BACK GROUND: WHITE VITREOUS ENAMELLED.
7. BACK/REAR: BLACK VITREOUS ENAMELLED.
8. 'SC' REPRESENTS FIRST LETTER OF STARTING & ENDING PLACE OF LINE.
9. '234' REPRESENTS TOWER NOS.
10. THE CORNER OF THE PLATE SHOULD BE ROUNDED OFF.

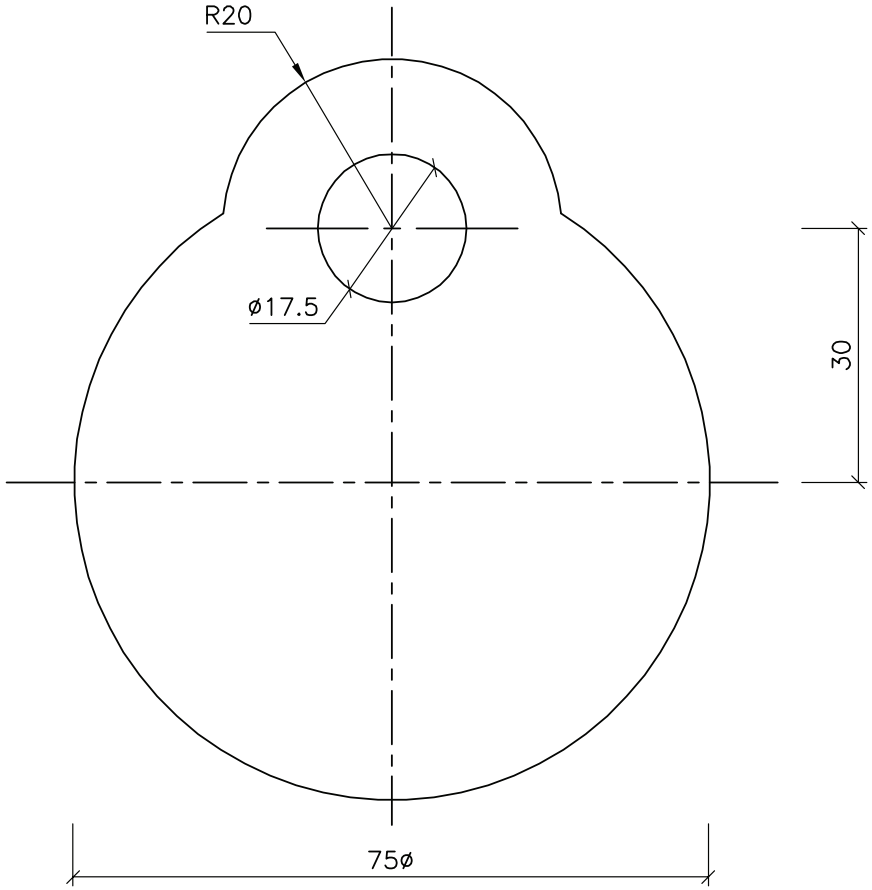
FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : LILO associated with 2x50 MVA, 220/33 KV Nagrota Substation

TITLE : NUMBER PLATE

SHEET. NO. : 1/1



PHASE PLATE

BILL OF MATERIALS/TOWER							
Sl NO.	Qty (Nos)	Section (mmxmmxmm)		Length (mm)	U/wt (kg)	Wt/Pc (kg)	Total Wt (kg)
1	6	SHEET 2MM THK.	75	88	15.70	00.103	00.62
						SUBTOTAL=	00.62
Total List of Bolts&Nuts							
2	6	16 Dia HRH Bolt&Nut		35.0	0.1220		00.73
3	6	Spring Washer for M16 Bolt		03.5	0.0090		00.06
						SUBTOTAL=	00.79
(FOR 6 NOS. OF PHASE PLATES) TOTAL WT / TOWER=							01.41

DRG NO:- RECTPCL/PIA/DRG/LILO/04

NOTES:–

1. ALL DIMENSIONS ARE IN MM.
2. MATERIALS :
   MILD STEEL – IS2062:2006 E250 (fy=250N/sqmm)
   BOLTS & NUTS 16ø – GRADE 5.6/5 (IS: 12427–1988)
   BOLT SET: ONE BOLT+ONE NUT+ONE SPRING WASHER.
3. DRAWING IS MADE AS PER IS:5613 (PART2/SEC I) –1985.
4. SIZE OF PLATE SHALL BE 88mm X 75mm X 2mm.
5. TWO SETS EACH CONSISTING OF 3 PLATES HAVING RED, BLUE & YELLOW COLOURS FOR D/C LINE.
6. FRONT: WITH COLOUR AS PER NOTE 5.
7. BACK/REAR: BLACK VITREOUS ENAMELLED.

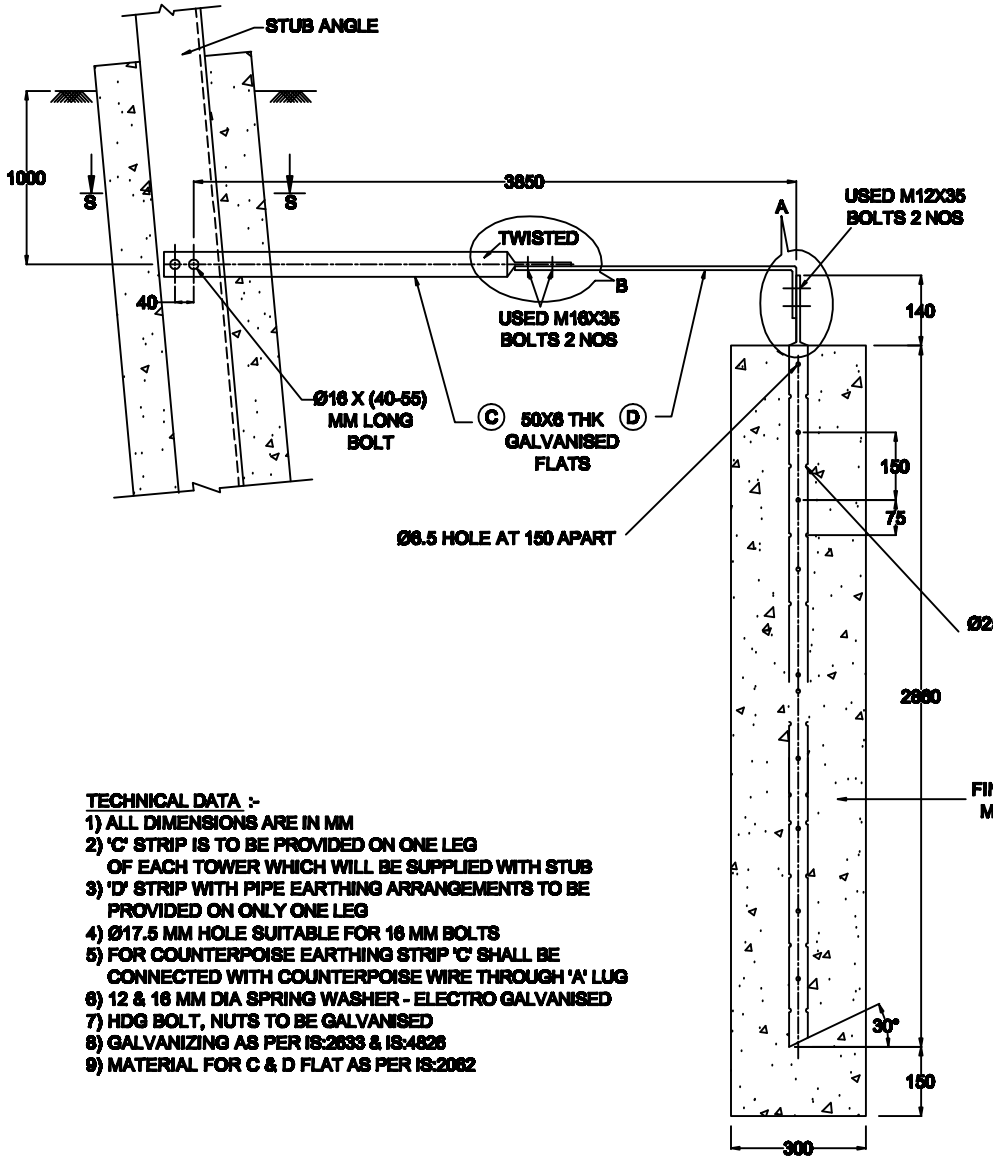
FOR TENDER PURPOSE ONLY

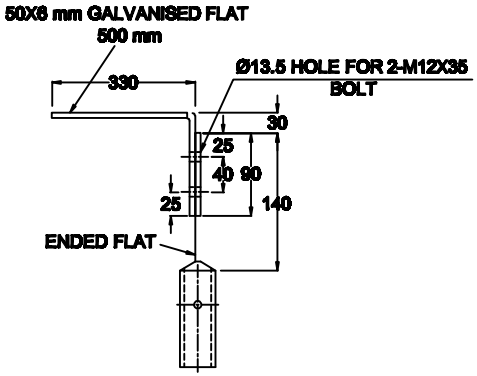
REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : LILO associated with 2x50 MVA, 220/33 KV Nagrota Substation

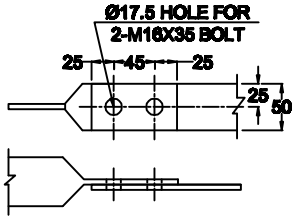
TITLE : PHASE PLATE

SHEET. NO. : 1/1





DETAIL AT - 'A'



DETAIL AT- 'B'

TECHNICAL DATA :-

1) ALL DIMENSIONS ARE IN MM
2) 'C' STRIP IS TO BE PROVIDED ON ONE LEG OF EACH TOWER WHICH WILL BE SUPPLIED WITH STUB
3) 'D' STRIP WITH PIPE EARTHING ARRANGEMENTS TO BE PROVIDED ON ONLY ONE LEG
4) Ø17.5 MM HOLE SUITABLE FOR 16 MM BOLTS
5) FOR COUNTERPOISE EARTHING STRIP 'C' SHALL BE CONNECTED WITH COUNTERPOISE WIRE THROUGH 'A' LUG
6) 12 & 16 MM DIA SPRING WASHER - ELECTRO GALVANISED
7) HDG BOLT, NUTS TO BE GALVANISED
8) GALVANIZING AS PER IS:2633 & IS:4826
9) MATERIAL FOR C & D FLAT AS PER IS:2062

LIST OF BOLTS & NUTS / TOWER		
SL NO.	SIZE	QTY.
1	16X35 LG	2
2	12X35 LG	2
3	16 MM DIA SPRING WASHER	2
4	12 MM DIA SPRING WASHER	2

SHEET NO. : 1/1

DRG NO:- RECTPCL/PIA/DRG/LILO/05

FOR TENDER PURPOSE ONLY

REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT : LILO associated with 2x50 MVA, 220/33 KV Nagrota Substation

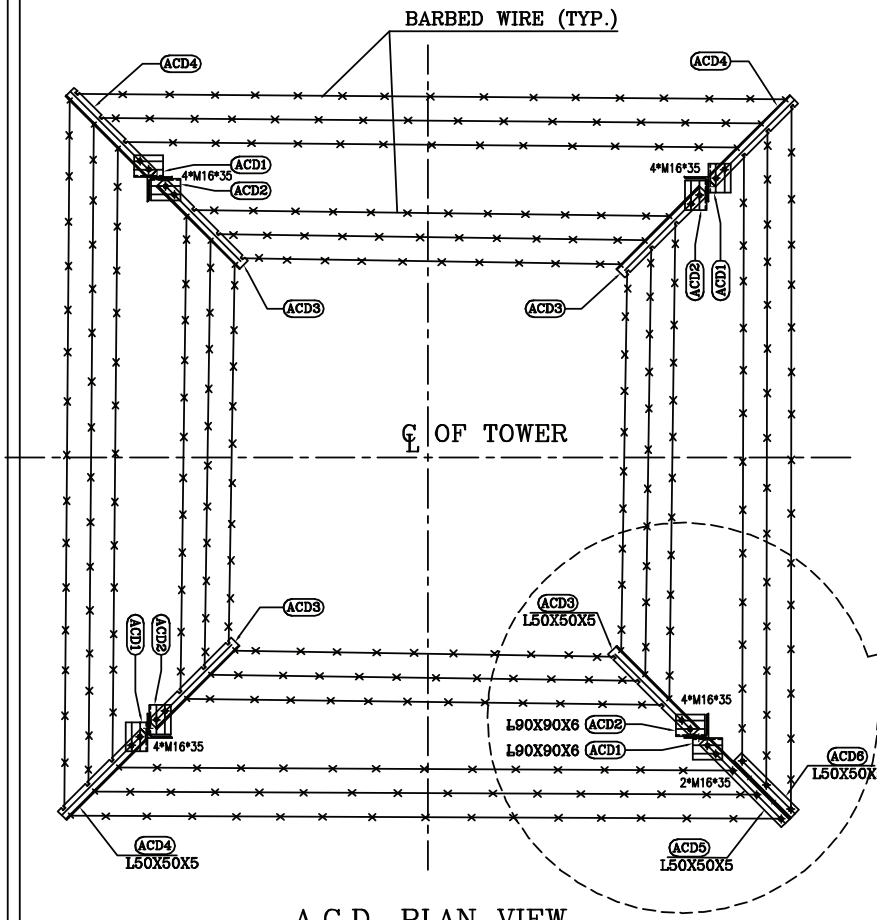
TITLE : PIPE EARTHING ARRANGEMENT

NOTE :-

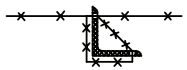
1. ALL DIMENSIONS ARE IN MM.
2. STEP-BOLT SHALL BE HOT-DIP GALVANISED AS PER IS:1367(P.13)-1963.
3. WEIGHT/PIECE WITH TWO NUTS AND ONE SPRING WASHER=0.417 Kg
4. THREADS TO BE UNDER CUT BY 0.3MM.
5. THE STEP-BOLT SHALL BE CAPABLE OF WITHSTANDING A VERTICAL LOAD NOT LESS THAN 1.5KN.
6. SPRING WASHER SHALL CONFORM TO IS:3063 & ELECTRO GALVANIZED AS PER IS: 1573 SERVICE CONDITION 4.
7. GENERAL REQUIREMENT SHALL CONFORM TO IS 10238.
8. MECHANICAL PROPERTIES SHALL CONFORM TO CLASS 4.6 AS PER IS:1367(PART-3) FOR BOLT & CLASS 5 AS PER IS:1367 (P-VI) FOR NUT.
9. THE STEP BOLT SHALL WITH STAND CANTILEVER TEST AS PER IS:10238

DRG NO:- RECTPCL/PIA/DRG/LILO/06

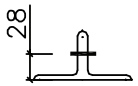
FOR TENDER PURPOSE ONLY
REC TRANSMISSION PROJECTS COMPANY LTD.
PROJECT LILO Line associated with Nagrota Substation
TITLE : STEP BOLT



A.C.D. PLAN VIEW

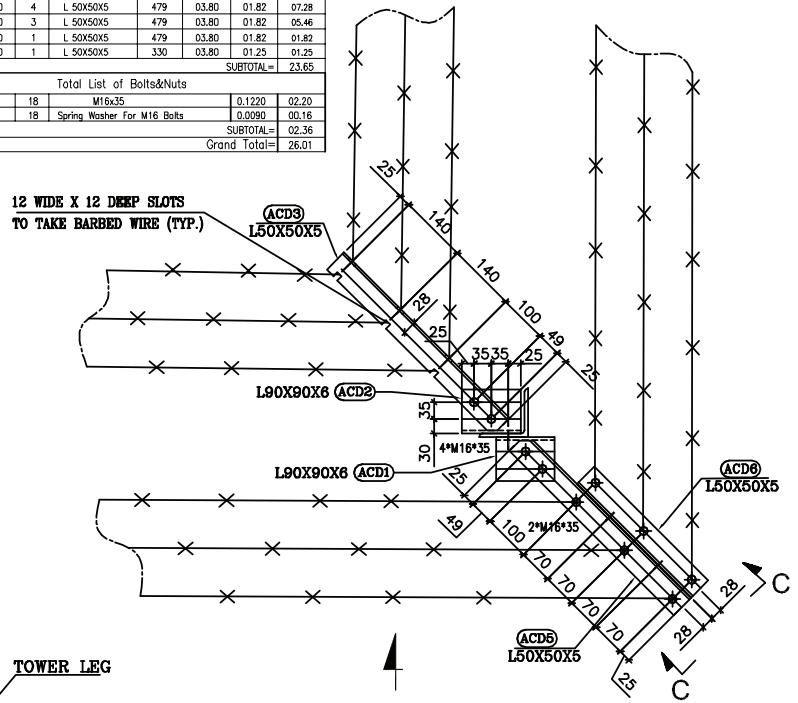


SECTION B–B
(BARBED WIRE WRAPPING METHOD)



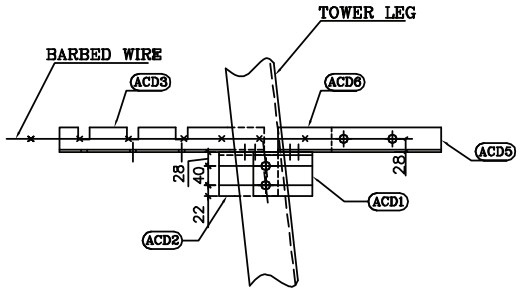
SECTION C–C

BILL OF MATERIALS/TOWER								
Sl. NO.	Mark No	Material Grade	Qty (Nos)	Section (mmxmmxmm)	Length (mm)	U/wt (kg)	Wt/Pc (kg)	Total Wt (kg)
1	ACD1	E250	4	L 90X90X6	120	08.20	00.98	03.92
2	ACD2	E250	4	L 90X90X6	120	08.20	00.98	03.92
3	ACD3	E250	4	L 50X50X5	479	03.80	01.82	07.28
4	ACD4	E250	3	L 50X50X5	479	03.80	01.82	05.46
5	ACD5	E250	1	L 50X50X5	479	03.80	01.82	01.82
6	ACD6	E250	1	L 50X50X5	330	03.80	01.25	01.25
							SUBTOTAL=	23.65
Total List of Bolts&Nuts								
7	M16	5.6	18	M16x35			0.1220	02.20
8	M16		18	Spring Washer For M16 Bolts			0.0090	00.16
							SUBTOTAL=	02.36
							Grand Total=	26.01



ELEVATION VIEW

DETAIL 'A' (GATE DETAILS)



ELEVATION FOR A.C.D.

MARK NOS. ACD1 TO ACD6

NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. MATERIALS :
   HIGH TENSILE STEEL – IS2062:2006 E350 (fy=350N/sqmm)
   MILD STEEL – IS2062:2006 E250 (fy=250N/sqmm)
   BOLTS & NUTS 16ø – GRADE 5.6/5 (IS: 12427–1988)
   BOLT SET: ONE BOLT+ONE NUT+ONE SPRING WASHER.
3. ALL STEEL MEMBERS SHALL BE HOT DIP GALVANIZED AS PER IS:2629.
4. BLANK HOLES ARE PROVIDED AT GATE TO RECEIVE BARBED WIRE.
5. ⊕ INDICATES HOLES OF 17.5mm DIA FOR 16mm DIA BOLTS.
6. THE BARBED WIRE SHALL CONFORM TO A–1, IS:278.
7. THE BARBED WIRE SHALL BE GIVEN CHROMATING DIP AS PER PROCEDURE LAID DOWN IN IS:1340.
8. DRAWING IS MADE AS PER IS:5613 (PART2/SEC I) –1985.

SPECIAL NOTES:–

#. NOMINAL LENGTH OF BARBED WIRE SHALL BE WORKED OUT AS PER FOLLOWING FORMULAE:

$L = B + (X-H) \times 2 \times \tan\phi \times N$

B = B/B WIDTH AT CL FOR NORMAL TOWER IN m.
X = ALT. HEIGHT OF BODY EXTN IF ANY IN m.
H = ALT. HEIGHT FROM CL TO ACD LEVEL IN m.
ø = TOWER SLOPE
N = NUMBER OF BARBED WIRE TURNS.

DRG NO:- RECTPCL/PIA/DRG/LILO/07

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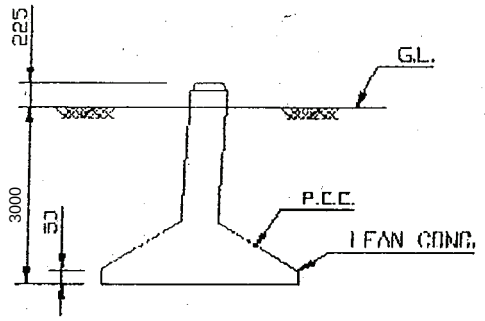
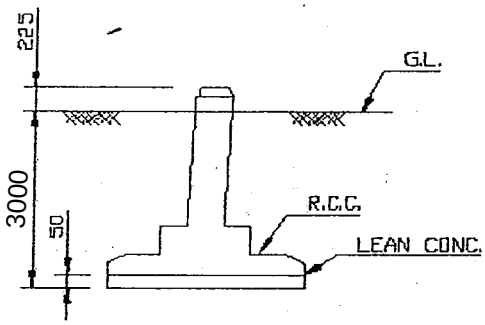
REC TRANSMISSION PROJECTS COMPANY LTD.

PROJECT LILO Line associated with 2x50 MVA, 220/33 KV Nagrota substation

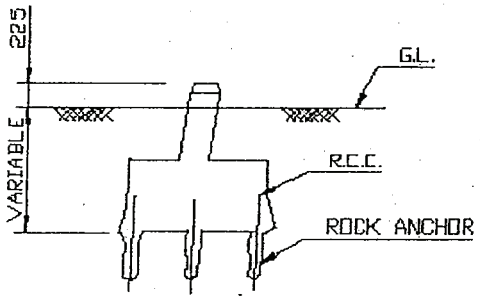
TITLE : ACD(BARBED WIRE TYPE)



TYP. FOUNDATION SHAPE FOR P.C.C. TYPE



TYP. FOUNDATION SHAPE FOR R.C.C. TYPE



TYP. FOUNDATION SHAPE FOR HARD ROCK

DRG NO:- RECTPCL/PIA/DRG/LILO/08

FOR TENDER PURPOSE ONLY
REC TRANSMISSION PROJECTS COMPANY LTD
PROJECT: 220/33kV NAGROTA GIS SUBSTATION
TITLE : TENTATIVE SHAPE OF TOWER FOOTING

NOTES

1. ALL DIM. ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. WEEP HOLES SHOULD BE OF SIZE 100mm x 100mm OR 150mm x 150mm IN CASE OF LARGE SIZE REVETMENT.
3. WEEP HOLES SHOULD BE 2.5M C-C APART HORIZONTAL
4. CENTER OF TOP MOST WEEP HOLES TO BE NOT LESS THAN 300 mm BELOW TOP
5. THE MIN. DEPTH OF REVETMENT WALL BELOW G.L. WILL BE 600mm
6. DIM 'B' ARE VALID ONLY FOR 'H' NOT EXCEEDING 5.00 METER.
7. SIZE OF STONE FOR MASONARY WORK 300 x 150 x 150 & BELOW
8. THE MASONRY WORK SHOULD BE CARRIED OUT IN 1:6 CEMENT MORTAR
9. SIZE OF STONE PACKING AT WEEP HOLE 75 mm TO 150mm

DRG NO:- RECTPCL/PIA/DRG/LILO/09

FOR TENDER PURPOSE ONLY
REC TRANSMISSION PROJECTS COMPANY LTD
PROJECT:220/33kV NAGROTA SS
TITLE : TOWER FOOTING