

CHAPTER-E-21

| SI No | Drawing Name | Drawing Number |
|--------------|---|-----------------------|
| 1 | Single Line Diagram (GIS S/s) | ODSSP/SS/SLD/1-REV-C |
| 2 | Single Line Diagram (Outdoor S/s) | ODSSP/SS/SLD/3 |
| 3 | Sub- station Layout for GIS Type | ODSSP/SS/SLY/1 |
| 4 | Sub- station Layout for Outdoor Type | ODSSP/SS/SLY/2 |
| 5 | T1 Column With Beam Arrangement in Substation | ODSSP/SS/3/ REV-A |
| 6 | T2 Column With Beam Arrangement in Substation | ODSSP/SS/4/ REV-A |
| 7 | G3 For 33 kV Incomer in Substation | ODSSP/SS/5 |
| 8 | 33 kV V Cross Arm for RS Joist in Substation | ODSSP/SS/6 |
| 9 | 33 kV SI Structure (Outdoor) in Substation | ODSSP/SS/7 |
| 10 | 33 kV CT Structure (Outdoor) in Substation | ODSSP/SS/8 |
| 11 | Earthmat Flat Jointing | ODSSP/SS/9 |
| 12 | Cable Trench for 1500 mm | ODSSP/SS/10-REV-B |
| 13 | 4 Bolted Tension Clamp | ODSSP/SS/11-REV-B |
| 14 | 33 kV 1250A Double Tandem Double Break Centre Rotating Isolator With one Earth Switch | ODSSP/SS/12 |
| 15 | 11 kV 1250A Double Tandem Double Break Centre Rotating Isolator With one Earth Switch | ODSSP/SS/13 |
| 16 | 33 kV 1250A Double Tandem Double Break Centre Rotating Isolator Without Earth Switch | ODSSP/SS/14 |
| 17 | 11 kV 1250A Double Tandem Double Break Centre Rotating Isolator Without Earth Switch | ODSSP/SS/15 |
| 18 | Structural Detail of 33kV Tower Type- T8 & T9 in Substation | ODSSP/SS/16 |
| 19 | Structural Detail of Girder Type G-4 | ODSSP/SS/17 |
| 20 | Structural Detail of Girder Type G-6 | ODSSP/SS/18 |

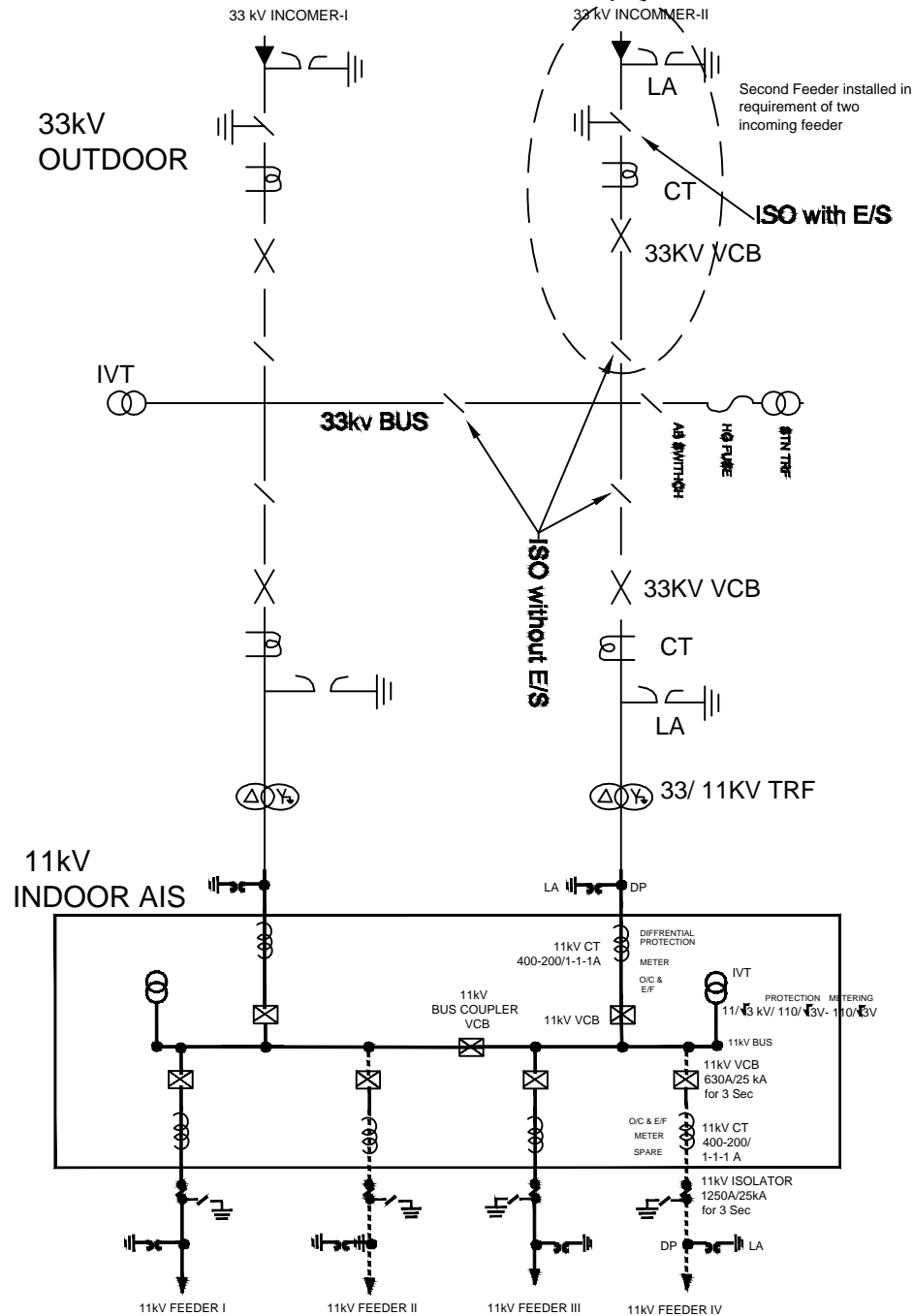
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| 21 | Structural Detail of 33kV Single Isolator without Earth Switch (OPTCL Sub-Station) | ODSSP/SS/19 |
| 22 | Structural Detail of 33kV Double Isolator with & without Earth Switch (OPTCL Sub-Station) | ODSSP/SS/20 |
| 23 | Structural Detail of 33kV CT & PI (OPTCL Sub-Station) | ODSSP/SS/21 |
| 24 | H type Pole Design | ODSSP/SS/22 |
| 25 | Foundation of H type Pole | ODSSP/SS/23/REV-A |
| 26 | Cross Sectional View of 33kV Cable, Un-Armoured, Single Core & 11kV Cable, Armoured, Three Core | ODSSP/SS/24-REV-C |
| 27 | Cable Trench for 750 mm | ODSSP/SS/25 |
| 28 | Cable Trench for 500 mm | ODSSP/SS/26 |
| 29 | 3 ½ C LT Power Cable | ODSSP/SS/27-REVA |
| 30 | T1A & T2A Column With Beam Arrangement in Substation | ODSSP/SS/28 |
| 31 | T3 Column With Beam Arrangement in Substation | ODSSP/SS/29 |
| 32 | Bolt Arrangement for 33kV Outdoor Substation. | ODSSP/SS/30 |
| 33 | G1, G2 & R1 For 33 kV Incomer in Substation | ODSSP/SS/31 |
| 34 | DP structure used for 11kV Gantry at S/s | ODSSP/SS/32 |
| 35 | DP structure for 33/0.4kV Station Transformer | ODSSP/SS/33 |
| 36 | DP structure in S/s and Line | ODSSP/LINE/1- REV-B |
| 37 | 300kg 10 Mtr PSC Pole | ODSSP/ LINE /3 |
| 38 | 11kV V Cross arm for RS Joist Pole | ODSSP/LINE /4 |
| 39 | 11kV V Cross arm for PSC Pole | ODSSP/ LINE /5-REV-A |
| 40 | Earthing Device | ODSSP/LINE/6 |
| 41 | Arrangements of Spikes with Column Structure | ODSSP/LINE/7 |
| 42 | Tension Assembly for Earth wire | ODSSP/LINE/8 |
| 43 | Suspension Assembly for Earth wire | ODSSP/LINE/9 |

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|----|---|-----------------------------------|
| 44 | +6M Extension to PC Tower Structure (River Crossing) | ODSSP/LINE/10 |
| 45 | Jointing of GI R.S Joist Pole | ODSSP/LINE/11 |
| 46 | 33 & 11 KV Danger Board | ODSSP/LINE/15 |
| 47 | PC Tower Structure Top | ODSSP/LINE/16 |
| 48 | PC Tower Structure Template | ODSSP/LINE/17 |
| 49 | PC Tower Structure Bottom | ODSSP/LINE/18 |
| 50 | Foundation of PC Tower Structure | ODSSP/LINE/19 |
| 51 | Single Tension Hardware Assembly | ODSSP/LINE/20 |
| 52 | Double Tension Hardware Assembly | ODSSP/LINE/21 |
| 53 | Cross Sectional View of 33kV Cable, Un-Armoured, Single Core & 11kV Cable, Armoured, Three Core | ODSSP/LINE/25-REV-C |
| 54 | 33kV Single Circuit Laying Arrangement | ODSSP/LINE/26-REV-A |
| 55 | 11kV Single Circuit Laying Arrangement | ODSSP/LINE/27-REV-A |
| 56 | Foundation for PSC Pole | ODSSP/ CIVIL /1-REV-A |
| 57 | Foundation for RS Joist Pole | ODSSP/ CIVIL /2-REV-B |
| 58 | Foundation For T1 & T2 Columns (Sub-Station) | ODSSP/CIVIL/3- REV-A |
| 59 | Foundation for Power Transformer | ODSSP/CIVIL/4- REV-C |
| 60 | Foundation for 100 KVA Station Transformer | ODSSP/CIVIL/5- REV-B |
| 61 | Retaining Wall for Switchyard | ODSSP/CIVIL/6- REV-A |
| 62 | Drain | ODSSP/CIVIL/7- REV-A |
| 63 | Foundation Plan for T1,T2,T1A, T2A, T3 Column with Foundation Bolt | ODSSP/CIVIL/8 |
| 64 | Foundation for 33kV VCB with CT (Outdoor) | ODSSP/CIVIL/9 |
| 65 | Road Inside Sub-Station | ODSSP/ CIVIL /11-REV-B |
| 66 | Layout Plan of Compound Wall | ODSSP/ CIVIL /12 |
| 67 | Structural Design & Detailing of Compound Wall (Pile Foundation) | ODSSP/ CIVIL /13, Sheet-1/2 |
| 68 | Structural Design & Detailing of Compound Wall (Open Foundation) | ODSSP/ CIVIL /13-REV-A, Sheet-2/2 |

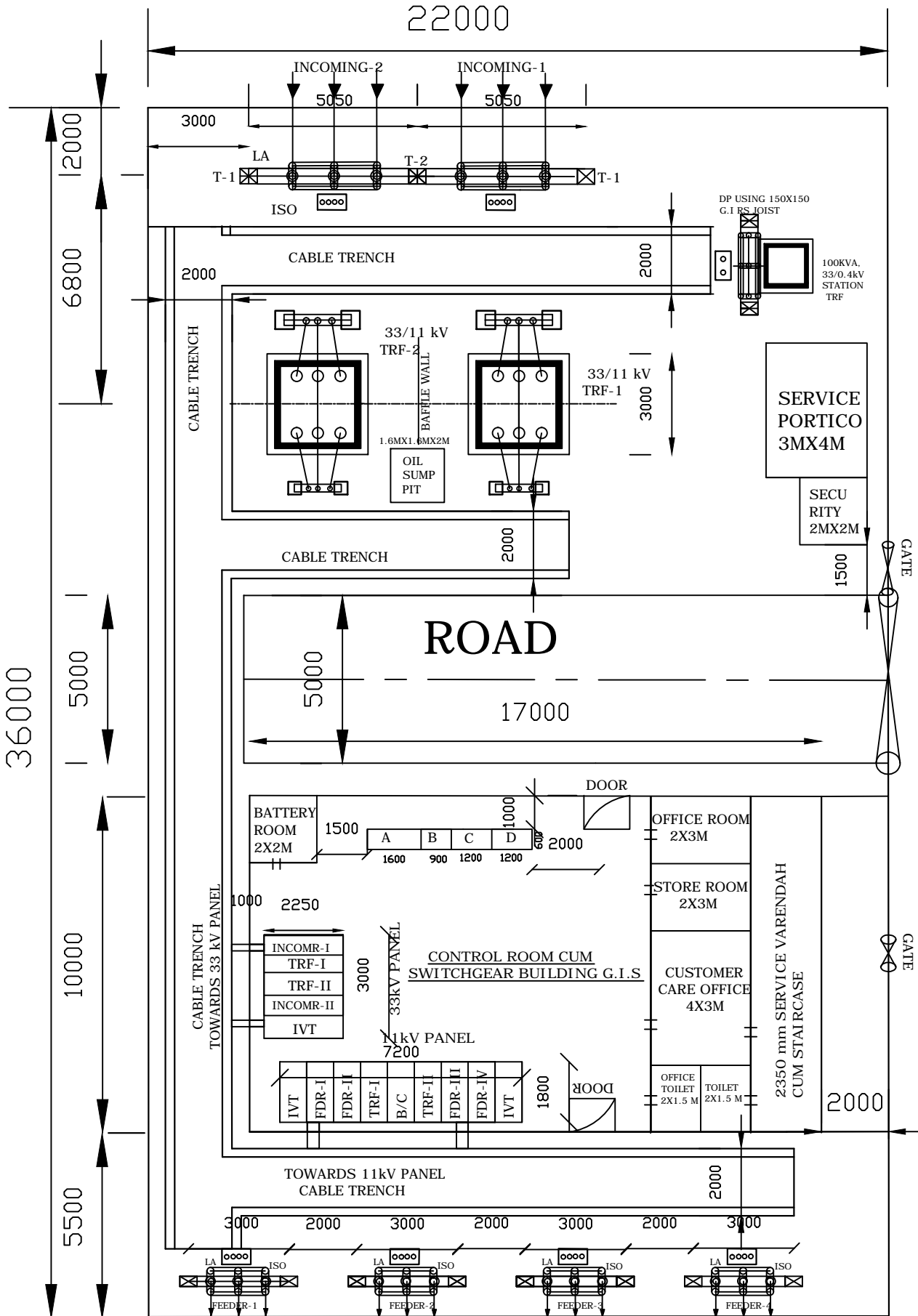
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| 69 | Culvert Drawing | ODSSP/ CIVIL /14 |
| 70 | Left Side & Front Side Elevation Drawing of Control Room Building for Flood Zone | ODSSP/ CIVIL /15-REV-A, Sheet-1/5 |
| 71 | Rear Side & Right Side Elevation Drawing of Control Room Building for Flood Zone | ODSSP/ CIVIL /15, Sheet-2/5 |
| 72 | Architectural Drawing for First Floor & Terrace Plan of Control Room Building for Flood Zone | ODSSP/ CIVIL /15, Sheet-3/5 |
| 73 | Architectural Drawing for Ground Floor and Sectional Plan of Control Room Building for Flood Zone | ODSSP/ CIVIL /15, Sheet-4/5 |
| 74 | Architectural Drawing for Lower Floor Plan of Control Room Building for Flood Zone | ODSSP/ CIVIL /15, Sheet-5/5 |
| 75 | First Floor Roof Beam Reinforcement Details of Control Room Building for Flood Zone | ODSSP/ CIVIL /16, Sheet-1/4 |
| 76 | Ground Floor Roof Beam Reinforcement Details of Control Room Building for Flood Zone | ODSSP/ CIVIL /16, Sheet-2/4 |
| 77 | Lower Floor Roof Beam and Lintel Reinforcement Details of Control Room Building for Flood Zone | ODSSP/ CIVIL /16, Sheet-3/4 |
| 78 | Staircase and other Misc. details of Control Room Building for Flood Zone | ODSSP/ CIVIL /16, Sheet-4/4 |
| 79 | Column & Foundation Reinforcement Details of Control Room Building for Flood Zone (Pile Foundation) | ODSSP/ CIVIL /17, Sheet-1/2 |
| 80 | Pile, Pile Cap & Grade Beam Reinforcement Details of Control Room Building for Flood Zone (Pile Foundation) | ODSSP/ CIVIL /17, Sheet-2/2 |
| 81 | Column & Foundation Reinforcement Details of Control Room Building for Flood Zone (Open Foundation) | ODSSP/ CIVIL /18, Sheet-1/2 |

| | | |
|----|--|-----------------------------|
| 82 | Plinth Beam & Lintel Reinforcement Details of Control Room Building for Flood Zone (Open Foundation) | ODSSP/ CIVIL /18, Sheet-2/2 |
| 83 | All Side Elevation & Sectional Drawing of Control Room Building for Non-Flood Zone | ODSSP/ CIVIL /19, Sheet-1/5 |
| 84 | Ground Floor & Terrace Plan for Non-Flood Zone | ODSSP/ CIVIL /19, Sheet-2/5 |
| 85 | Roof Beam Reinforcement Details of Control Room Building for Non-Flood Zone | ODSSP/ CIVIL /19, Sheet-3/5 |
| 86 | Plinth Beam & Lintel Reinforcement Details of Control Room Building for Non-Flood Zone | ODSSP/ CIVIL /19, Sheet-4/5 |
| 87 | Staircase and other Misc. details of Control Room Building for Non-Flood Zone | ODSSP/ CIVIL /19, Sheet-5/5 |
| 88 | Column & Foundation Reinforcement Details of Control Room Building(Open Foundation) for Non-Flood Zone | ODSSP/ CIVIL /20-REV-A |
| 89 | Column & Foundation Reinforcement Details of Control Room Building(Pile Foundation) for Non-Flood Zone | ODSSP/ CIVIL /21, Sheet-1/2 |
| 90 | Pile, Pile Cap & Grade Beam Reinforcement Details of Control Room Building(Pile Foundation) for Non-Flood Zone | ODSSP/ CIVIL /21, Sheet-2/2 |

PROPOSED SINGLE LINE DIAGRAM FOR 2X3.15/ 5/ 8 MVA,
33 kV OUTDOOR & 11kV INDOOR S/S

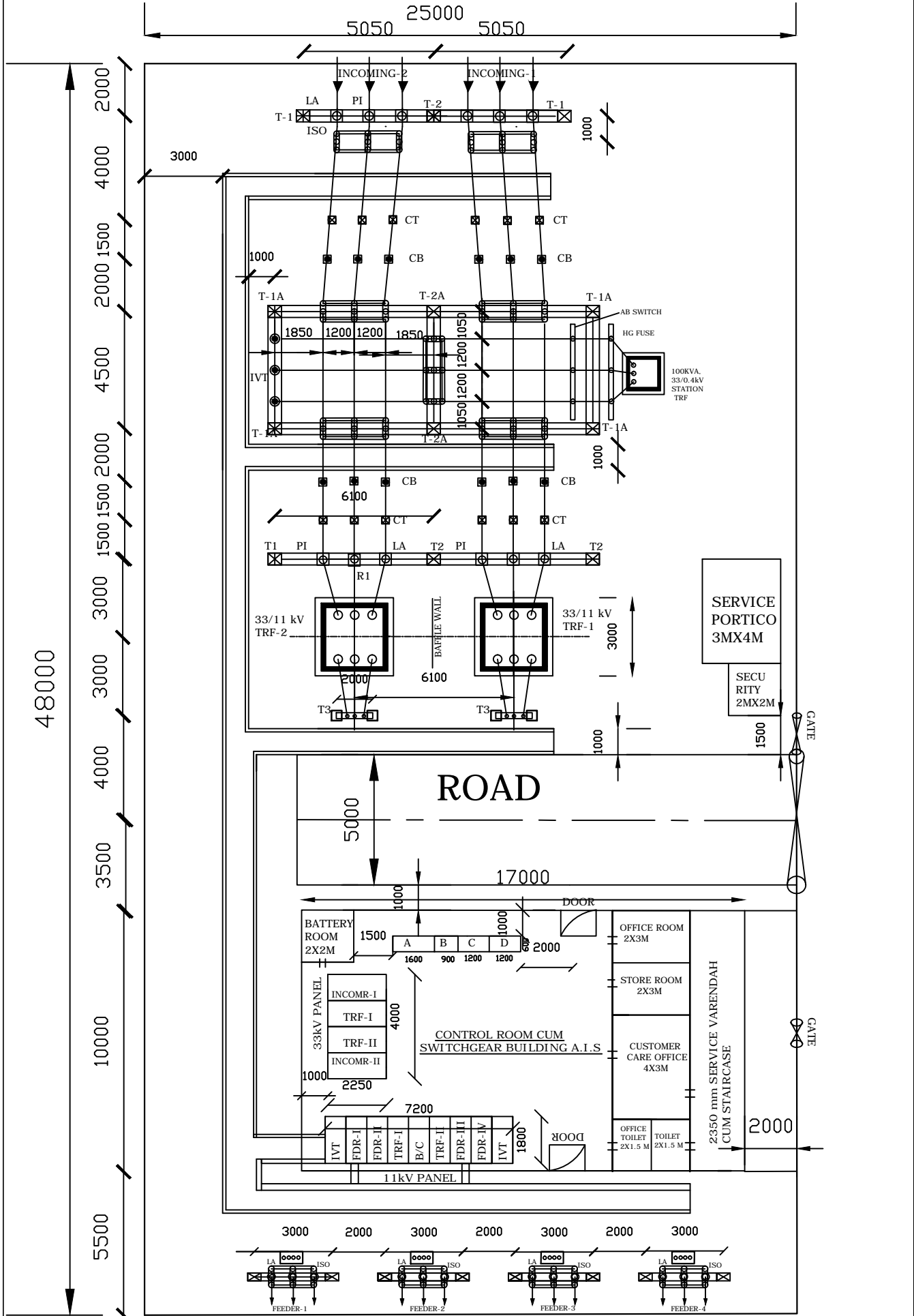


SUB-STATION LAYOUT (GIS)



NOTE:-
 A-CHARGER , B-ACDB , C-RTCC-1 & RTCC-2, D-RTU

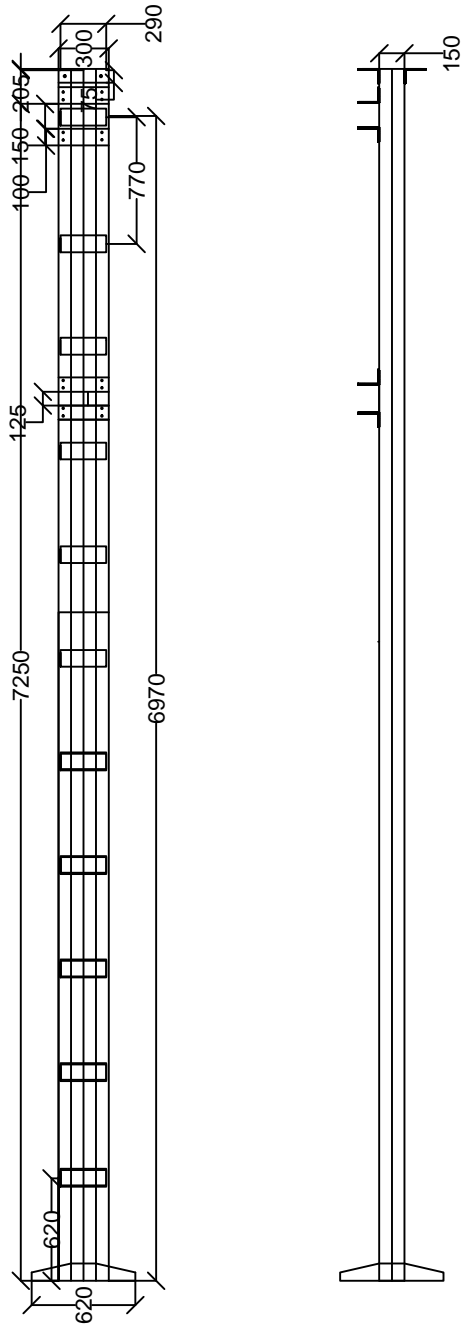
SUB-STATION LAYOUT (OUTDOOR)



NOTE: -
A-CHARGER ,B-ACDB , C-RTCC-1 & RTCC-2, D-RTU

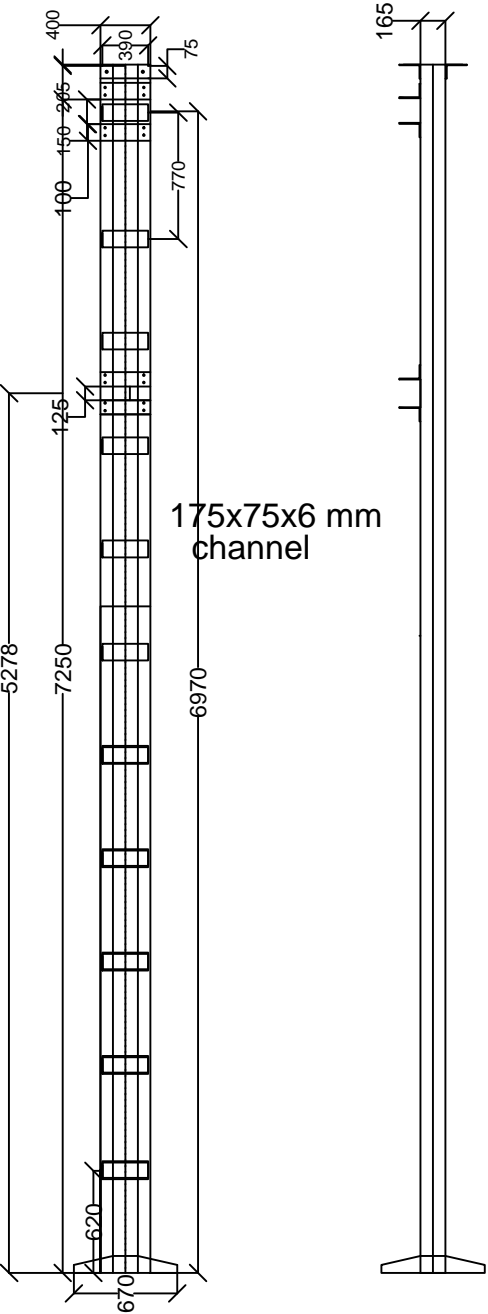
DRG NO .- ODSSP / SS / SLY/ 2

T1 COLUMN WITH BEAM ARRANGEMENT

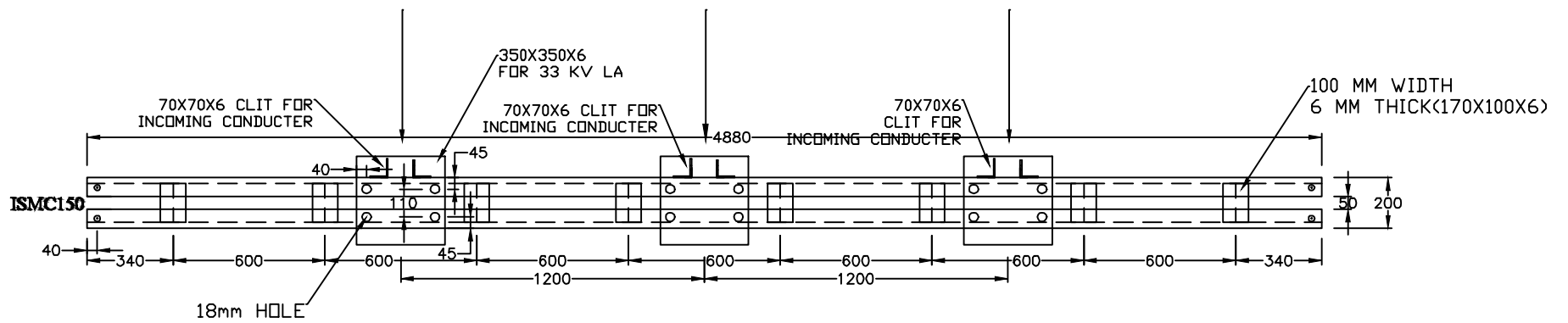


DRG NO-ODSSP/SS/3/REV-A

T2 COLUMN WITH BEAM ARRANGEMENT



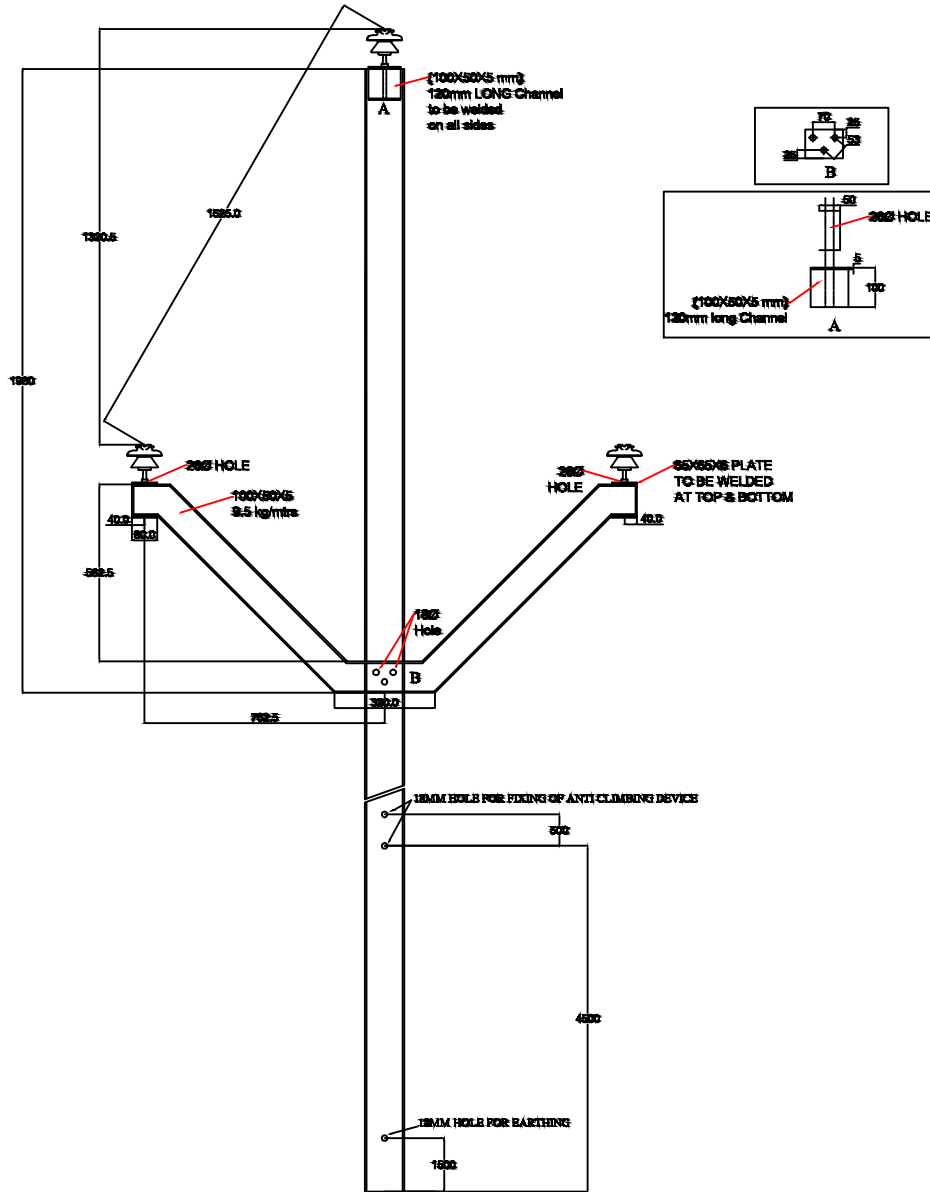
175x75x6 mm
channel



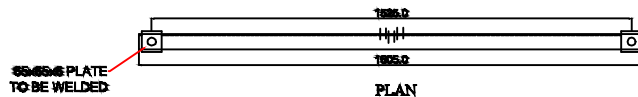
G3 FOR 33 KV INCOMMER.

DRG NO. - ODSSP / SS / 5

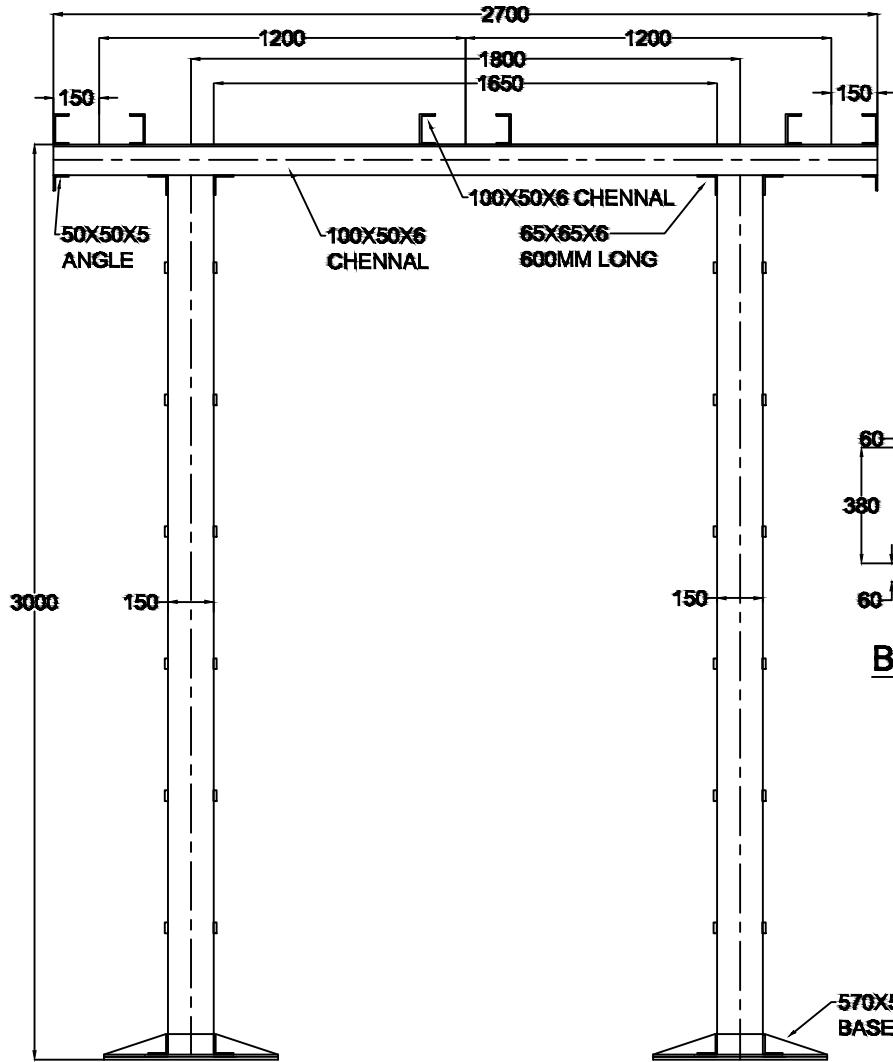
33Kv V-CROSS ARM FOR RS JOIST



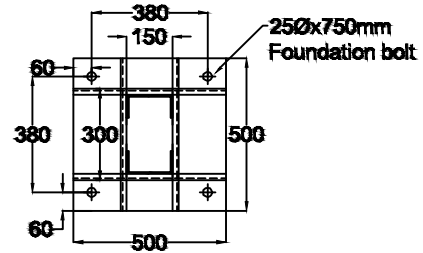
ELEVATION



PLAN



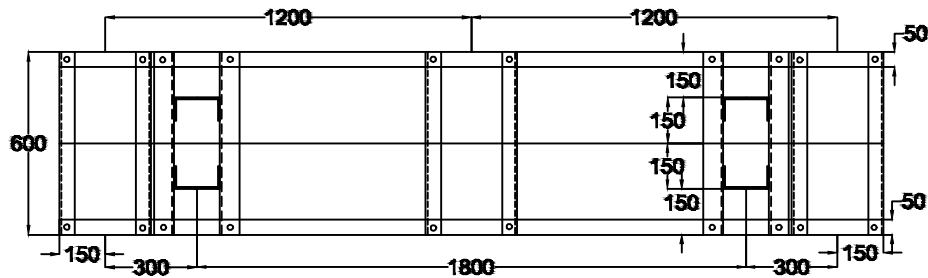
33 kV SI STRUCTURE
(OUTDOOR)



BASE PLATE

570x570x12
BASE PLATE

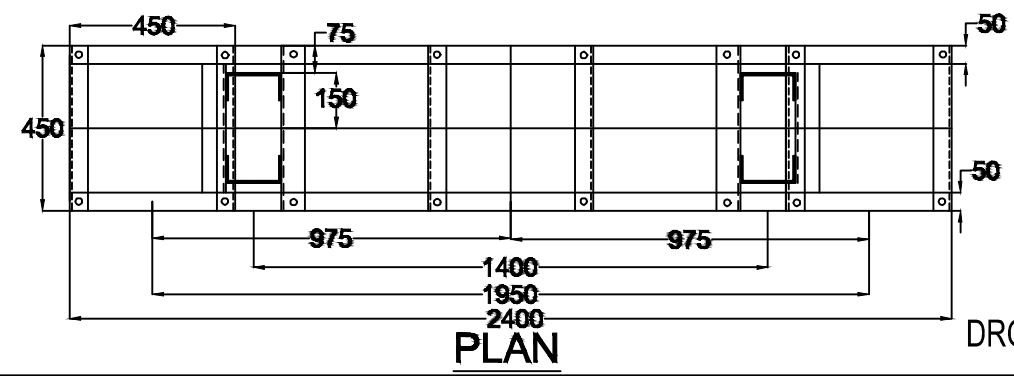
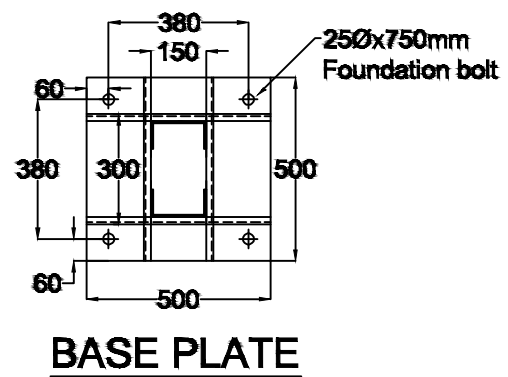
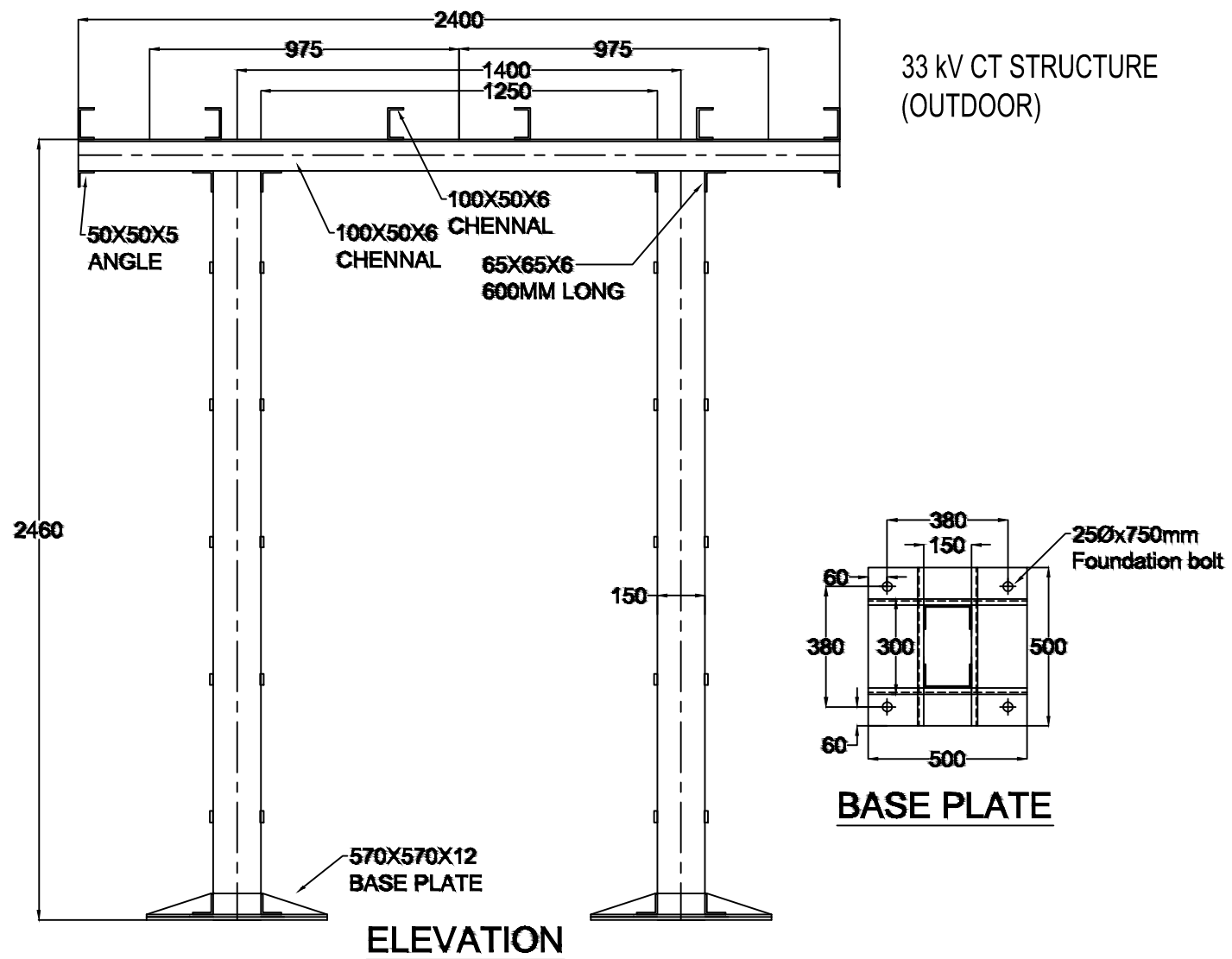
ELEVATION



PLAN

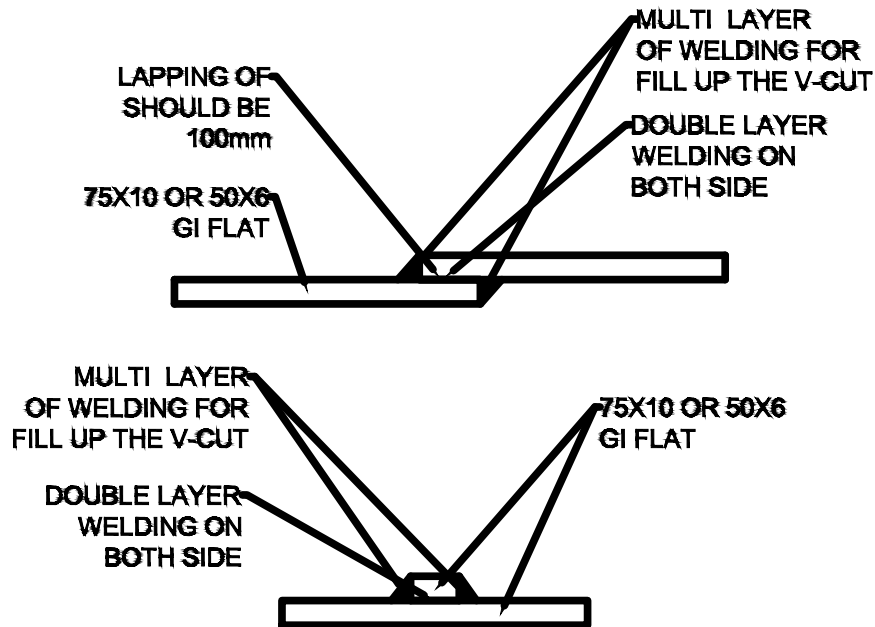
DRG NO .- ODSSP / SS / 7

33 kV CT STRUCTURE
(OUTDOOR)



DRG NO. - ODSSP / SS / 8

EARTHMAT FLAT JOINTING

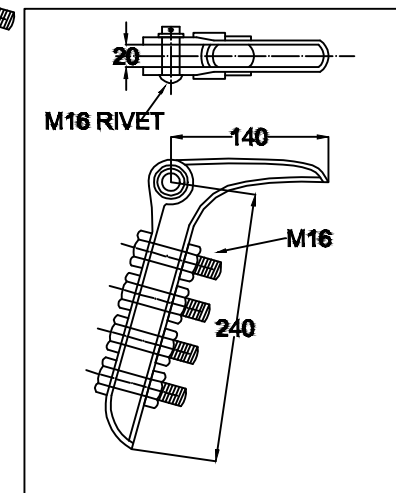
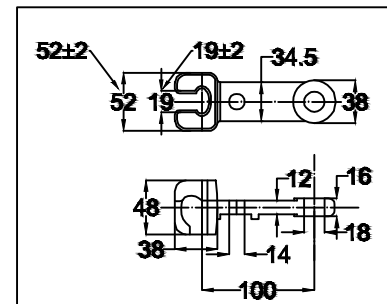
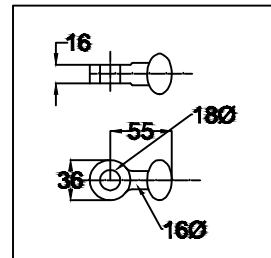
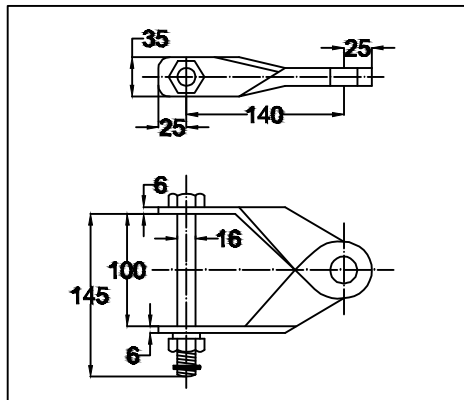
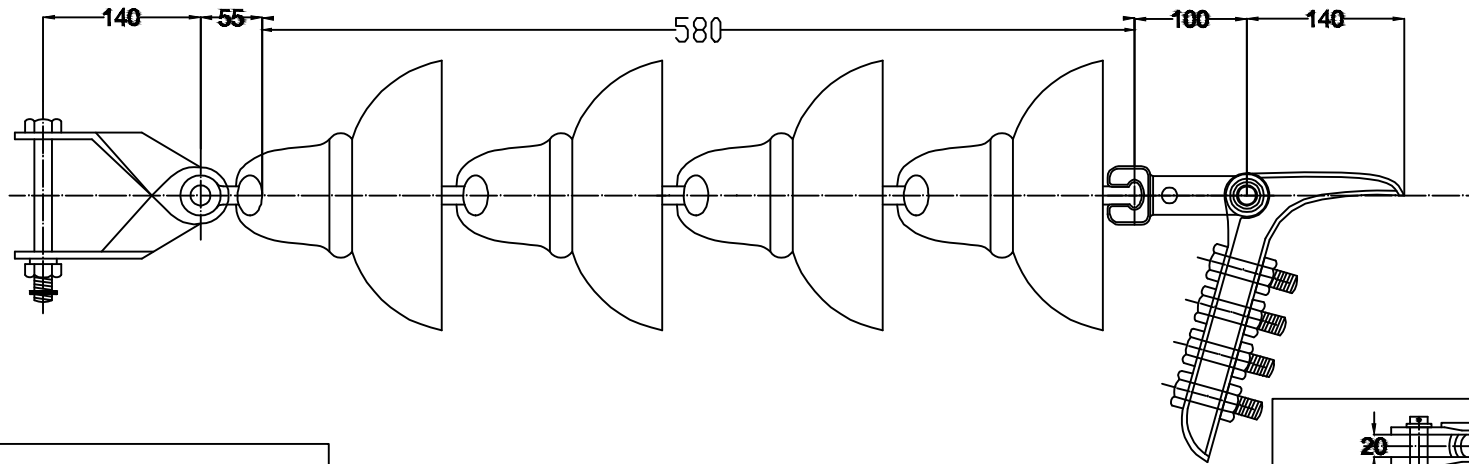


DRG NO .- ODSSP / SS / 9

NOTE:

1. ZINC TO BE REMOVED (THE JOINTING PORTION OF THE FLAT) PRIOR TO WELDING OF JOINT.
2. AFTER REMOVAL OF ZINC THE JOINTING PORTION SHOULD BE RIGIDLY HOLD BY USING "C" CLAMP THEN ONLY THE WELDING WAS SHOULD BE TAKEN UP.
3. THE FLUX SHOULD BE REMOVE BEFORE PUTTING THE SUCCESSIVE LAYERS OF THE WELDING.
4. AFTER COMPLETION OF WELDING WORK THE "C" CLAMP SHOULD BE REMOVED.
5. JUST AFTER COMPLETION OF WELDING WORK TWO LAYER OF ANTICORROSION PAINT SHOULD BE APPLIED IMMEDIATELY.
6. THEN DOUBLE LAYER OF BLACK BITUMINOUS PAINT SHOULD BE APPLIED OVER THE WELDING PORTION.
7. BEFORE BURRING THE FLAT INSIDE THE TRENCH EACH JOINT SHOULD BE COVERED WITH BLACK TAPE.
8. EACH JOINTING PORTION COVERED WITH CONCRETE MIX(1:2:4) ALL AROUND BEFORE FILLING OF SOIL.

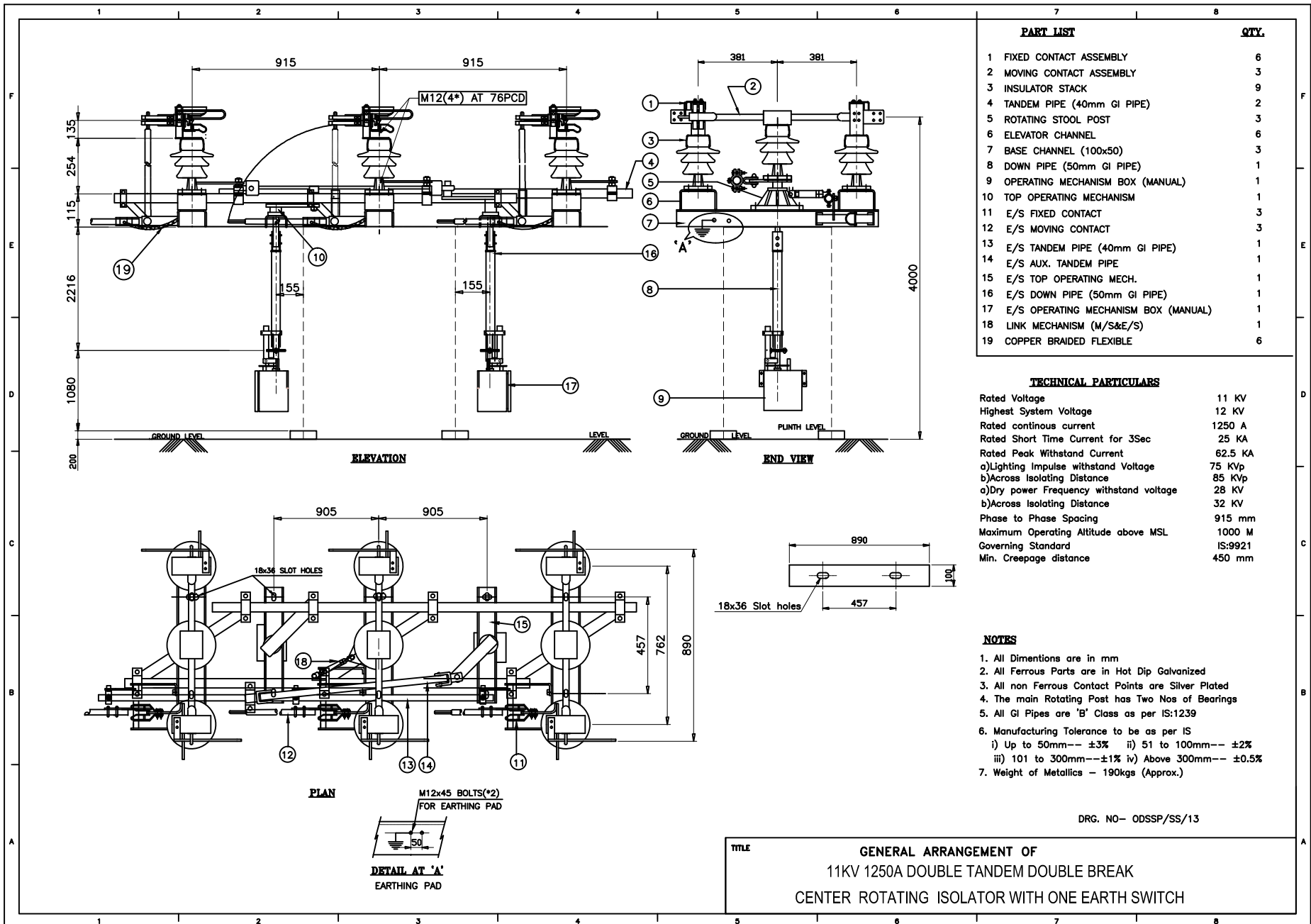
4 BOLTED TENSION CLAMP



NOTE:-

FOUR Nos. INSULATORS ARE USED ON 33KV SIDE & TWO Nos. INSULATORS ARE USED ON 11KV SIDE.

DRG NO .- ODSSP / SS / 11-REV-B



PART LIST

| | QTY. |
|----|-------------|
| 1 | 6 |
| 2 | 3 |
| 3 | 9 |
| 4 | 2 |
| 5 | 3 |
| 6 | 6 |
| 7 | 3 |
| 8 | 1 |
| 9 | 1 |
| 10 | 1 |
| 11 | 3 |
| 12 | 3 |
| 13 | 1 |
| 14 | 1 |
| 15 | 1 |
| 16 | 1 |
| 17 | 1 |
| 18 | 1 |
| 19 | 6 |

TECHNICAL PARTICULARS

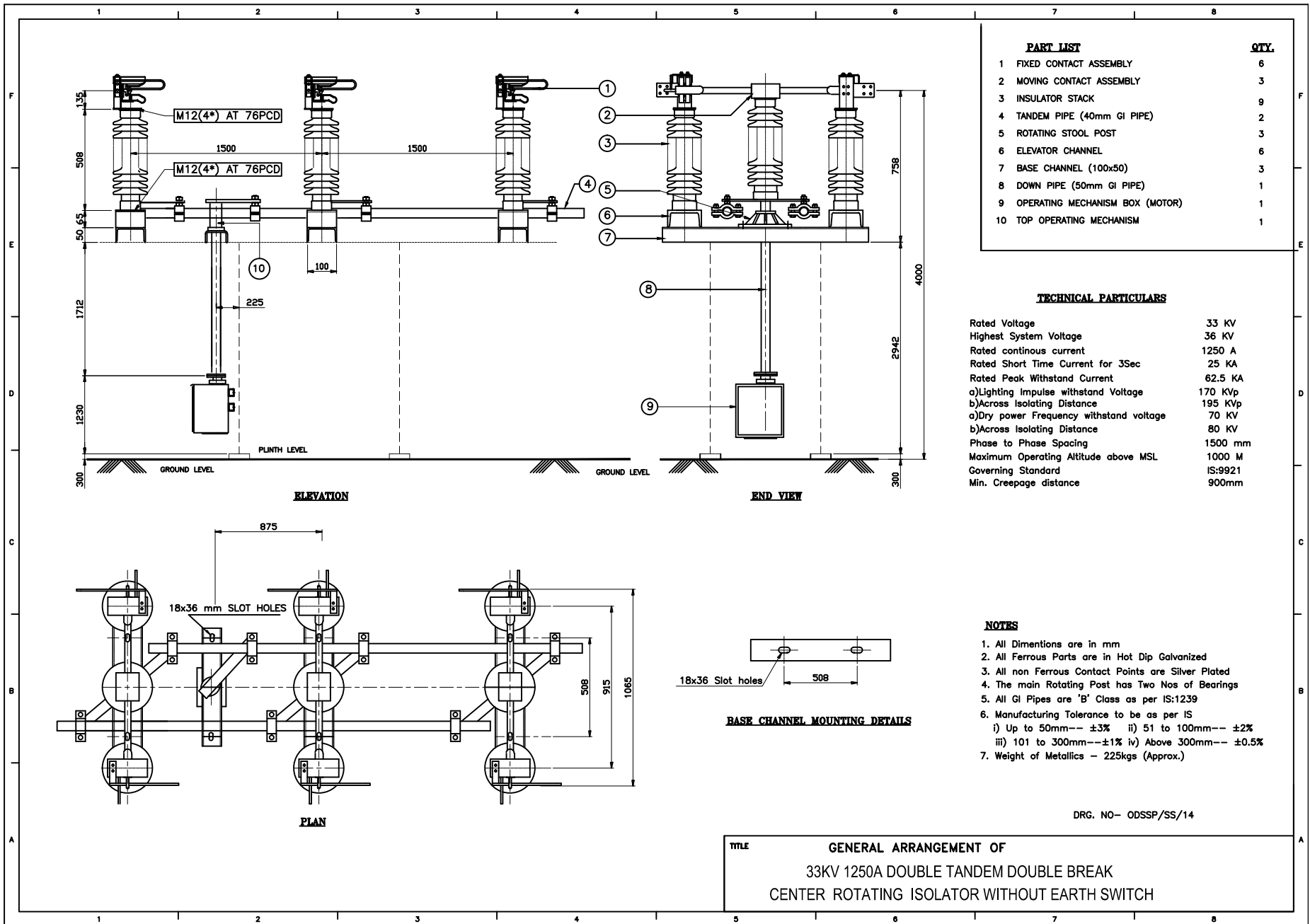
| | |
|---|---------|
| Rated Voltage | 11 KV |
| Highest System Voltage | 12 KV |
| Rated continuous current | 1250 A |
| Rated Short Time Current for 3Sec | 25 KA |
| Rated Peak Withstand Current | 62.5 KA |
| a)Lighting Impulse withstand Voltage | 75 KVp |
| b)Across Isolating Distance | 85 KVp |
| a)Dry power Frequency withstand voltage | 28 KV |
| b)Across Isolating Distance | 32 KV |
| Phase to Phase Spacing | 915 mm |
| Maximum Operating Altitude above MSL | 1000 M |
| Governing Standard | IS:9921 |
| Min. Creepage distance | 450 mm |

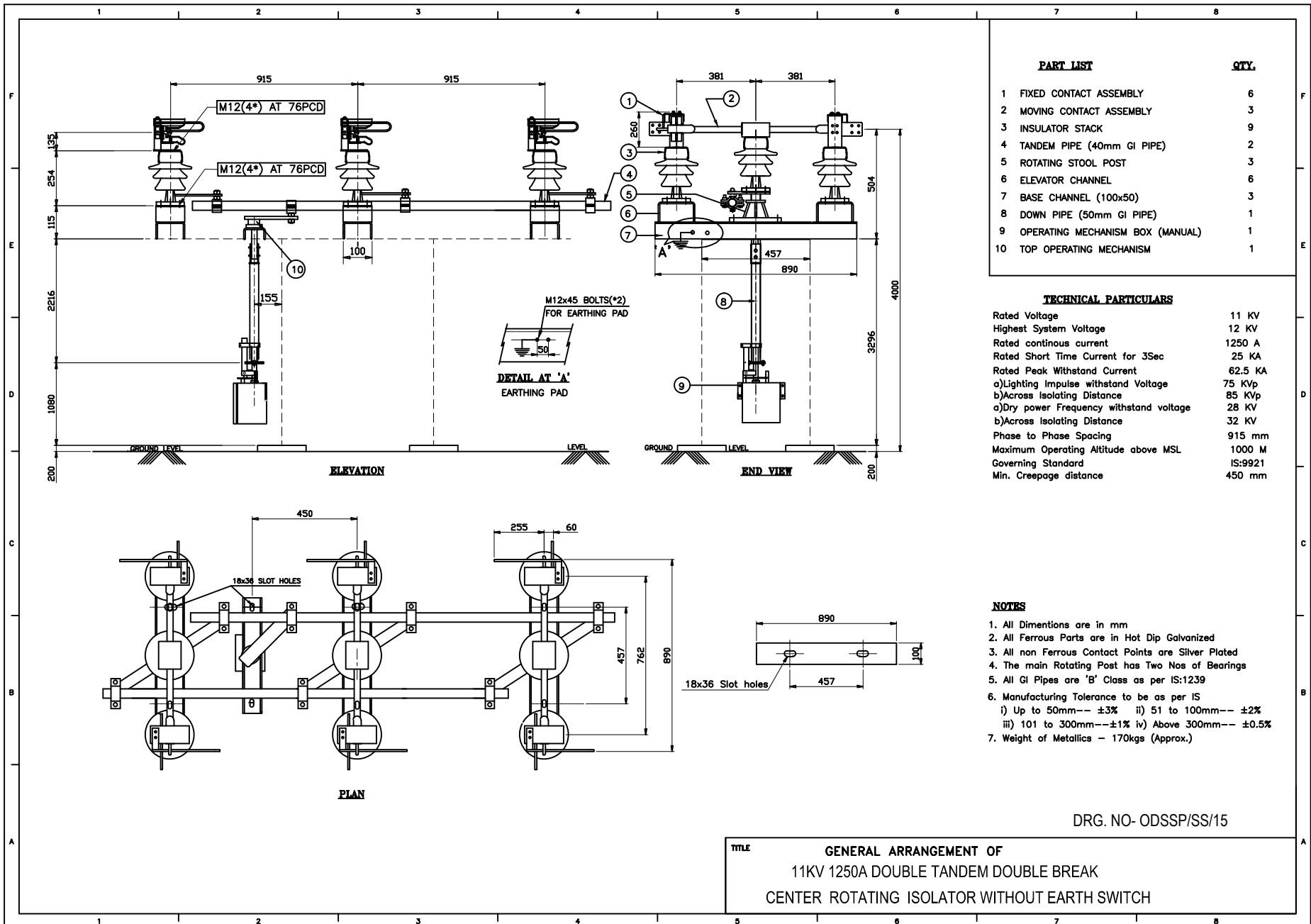
NOTES

1. All Dimensions are in mm
2. All Ferrous Parts are in Hot Dip Galvanized
3. All non Ferrous Contact Points are Silver Plated
4. The main Rotating Post has Two Nos of Bearings
5. All GI Pipes are 'B' Class as per IS:1239
6. Manufacturing Tolerance to be as per IS
 - i) Up to 50mm--- ±3%
 - ii) 51 to 100mm--- ±2%
 - iii) 101 to 300mm---±1%
 - iv) Above 300mm--- ±0.5%
7. Weight of Metallics - 190kgs (Approx.)

DRG. NO- ODSSP/SS/13

TITLE
**GENERAL ARRANGEMENT OF
 11KV 1250A DOUBLE TANDEM DOUBLE BREAK
 CENTER ROTATING ISOLATOR WITH ONE EARTH SWITCH**





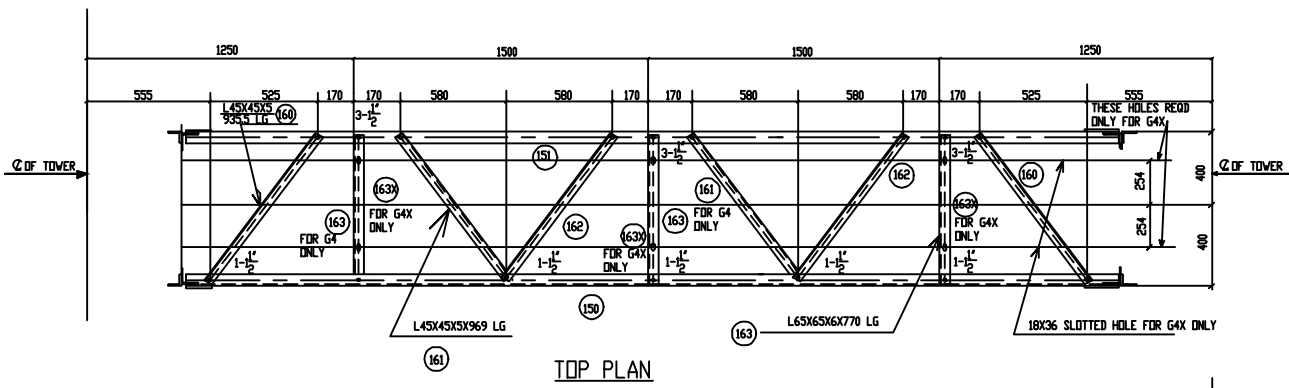
| PART LIST | | QTY. |
|-----------|----------------------------------|------|
| 1 | FIXED CONTACT ASSEMBLY | 6 |
| 2 | MOVING CONTACT ASSEMBLY | 3 |
| 3 | INSULATOR STACK | 9 |
| 4 | TANDEM PIPE (40mm GI PIPE) | 2 |
| 5 | ROTATING STOOL POST | 3 |
| 6 | ELEVATOR CHANNEL | 6 |
| 7 | BASE CHANNEL (100x50) | 3 |
| 8 | DOWN PIPE (50mm GI PIPE) | 1 |
| 9 | OPERATING MECHANISM BOX (MANUAL) | 1 |
| 10 | TOP OPERATING MECHANISM | 1 |

| TECHNICAL PARTICULARS | |
|---|---------|
| Rated Voltage | 11 KV |
| Highest System Voltage | 12 KV |
| Rated continuous current | 1250 A |
| Rated Short Time Current for 3Sec | 25 KA |
| Rated Peak Withstand Current | 62.5 KA |
| a)Lighting impulse withstand Voltage | 75 KVp |
| b)Across Isolating Distance | 85 KVp |
| a)Dry power Frequency withstand voltage | 28 KV |
| b)Across Isolating Distance | 32 KV |
| Phase to Phase Spacing | 915 mm |
| Maximum Operating Altitude above MSL | 1000 M |
| Governing Standard | IS:9921 |
| Min. Creepage distance | 450 mm |

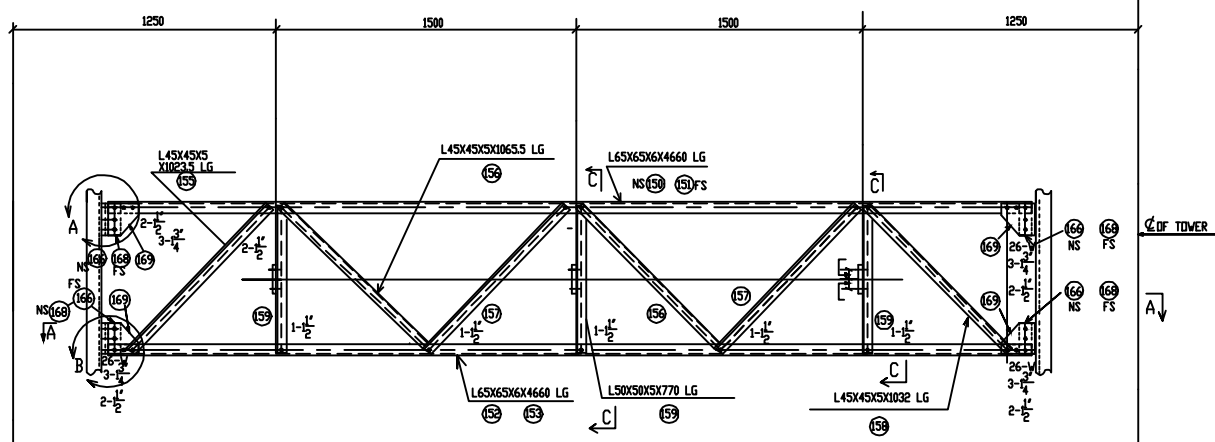
- NOTES**
- All Dimensions are in mm
 - All Ferrous Parts are in Hot Dip Galvanized
 - All non Ferrous Contact Points are Silver Plated
 - The main Rotating Post has Two Nos of Bearings
 - All GI Pipes are 'B' Class as per IS:1239
 - Manufacturing Tolerance to be as per IS
 - i) Up to 50mm--- ±3%
 - ii) 51 to 100mm--- ±2%
 - iii) 101 to 300mm---±1%
 - iv) Above 300mm--- ±0.5%
 - Weight of Metallics - 170kgs (Approx.)

DRG. NO- ODSSP/SS/15

TITLE
**GENERAL ARRANGEMENT OF
 11KV 1250A DOUBLE TANDEM DOUBLE BREAK
 CENTER ROTATING ISOLATOR WITHOUT EARTH SWITCH**

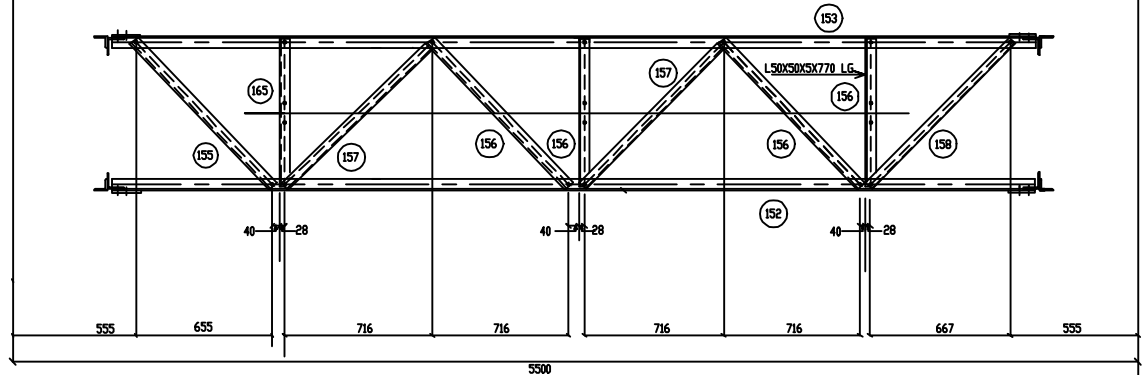


TOP PLAN



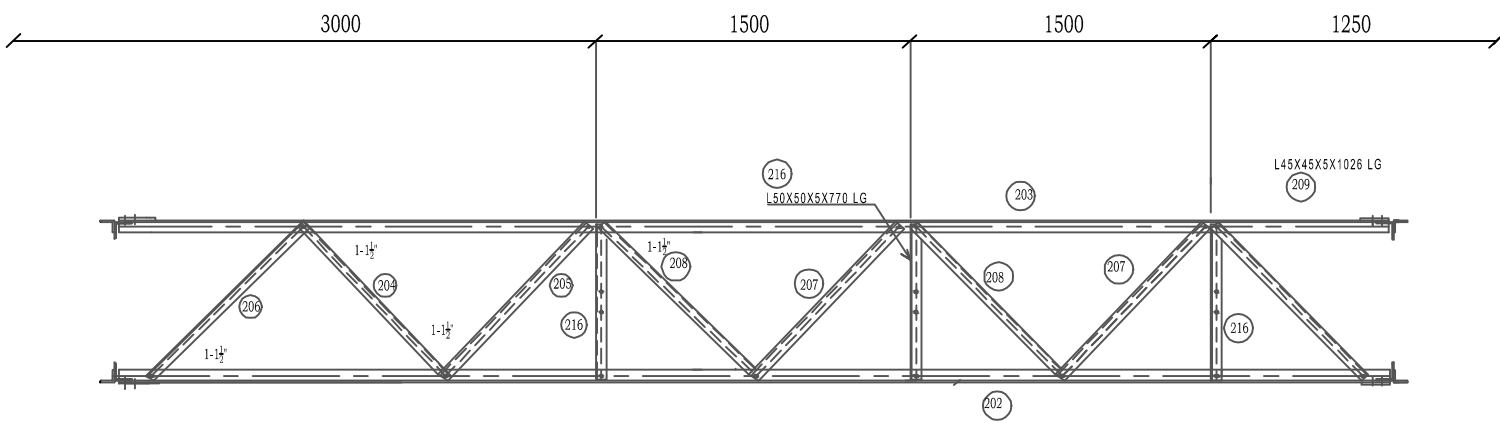
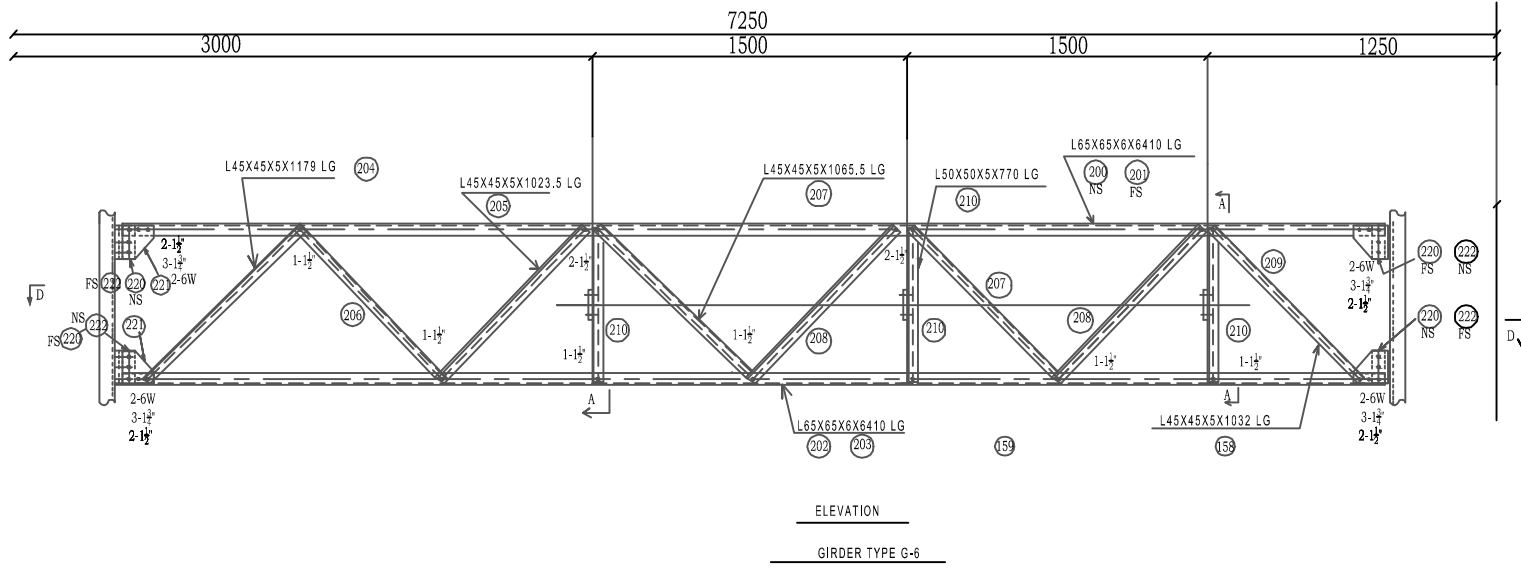
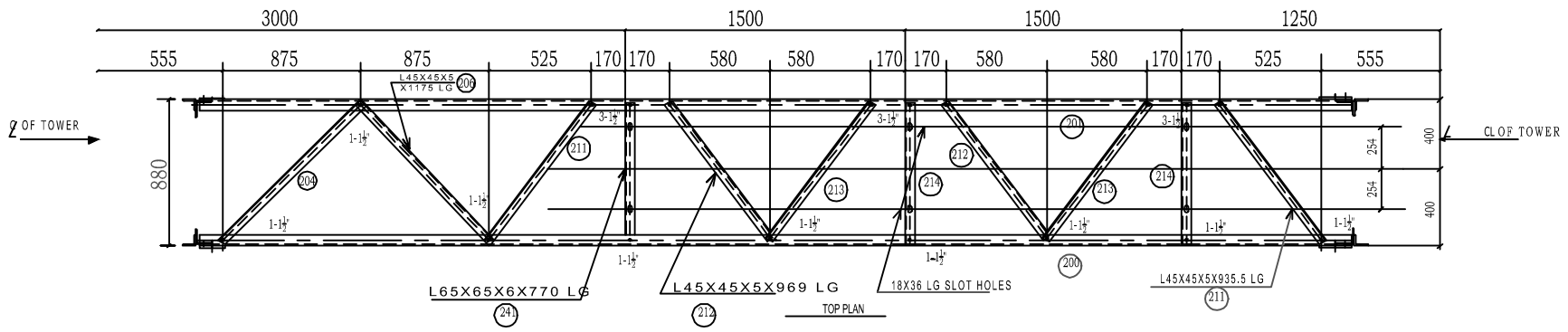
ELEVATION

GIRDER 'G4' WITH BOTH SIDE STRAIN PLATE AND SUSPENSION INSULATOR CONNECTION
 'G4' SAME AS 'G4' EXCEPT ISOLATOR CONNECTION OF TOP



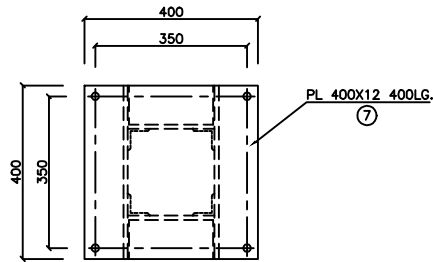
PLAN A-A

STRUCTURAL DETAIL OF BEAM TYPE G-4



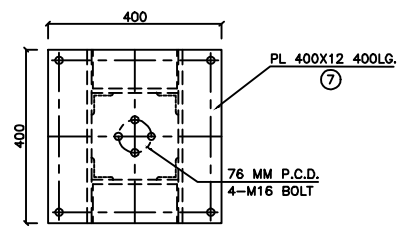
STRUCTURAL DETAIL OF GIRDER TYPE G-6

C.T.

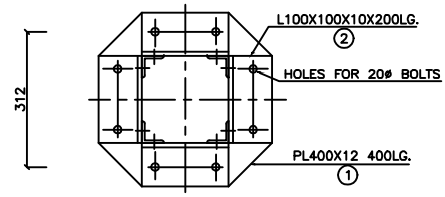
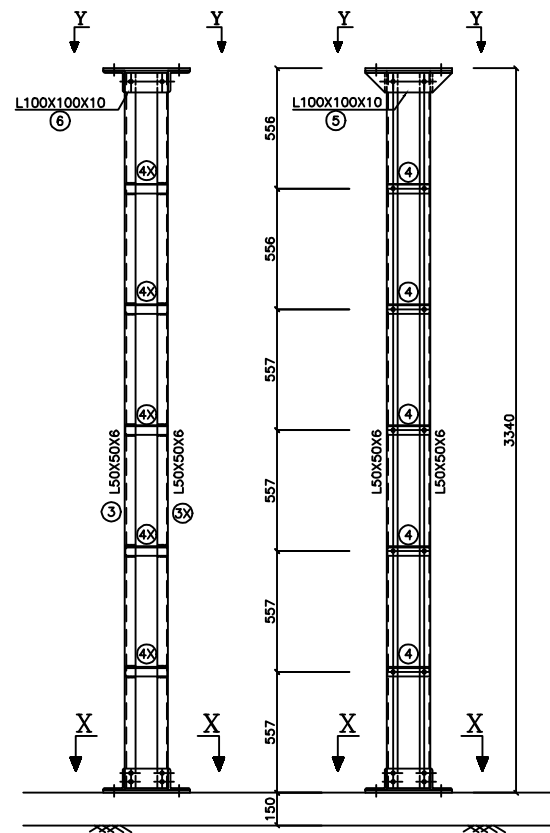
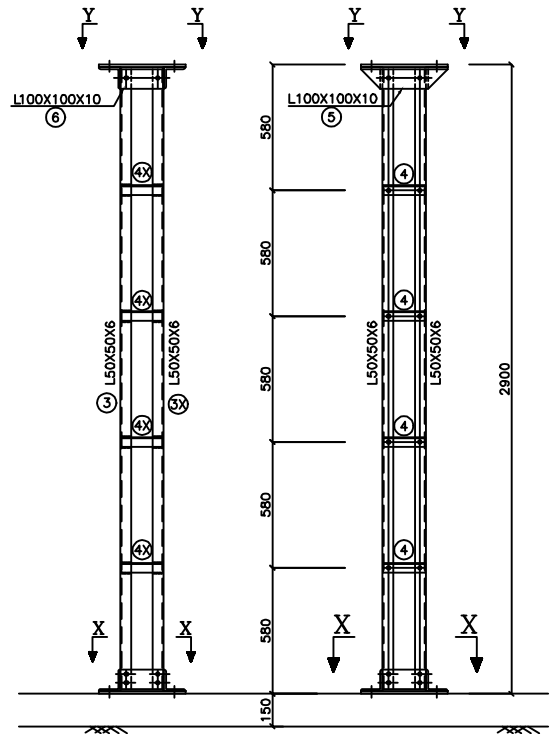


SECTION-Y Y

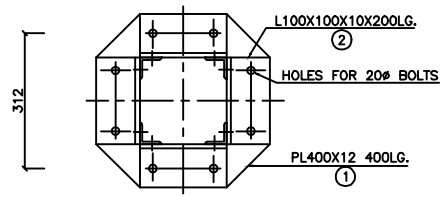
P.I.



SECTION-Y Y



SECTION-XX

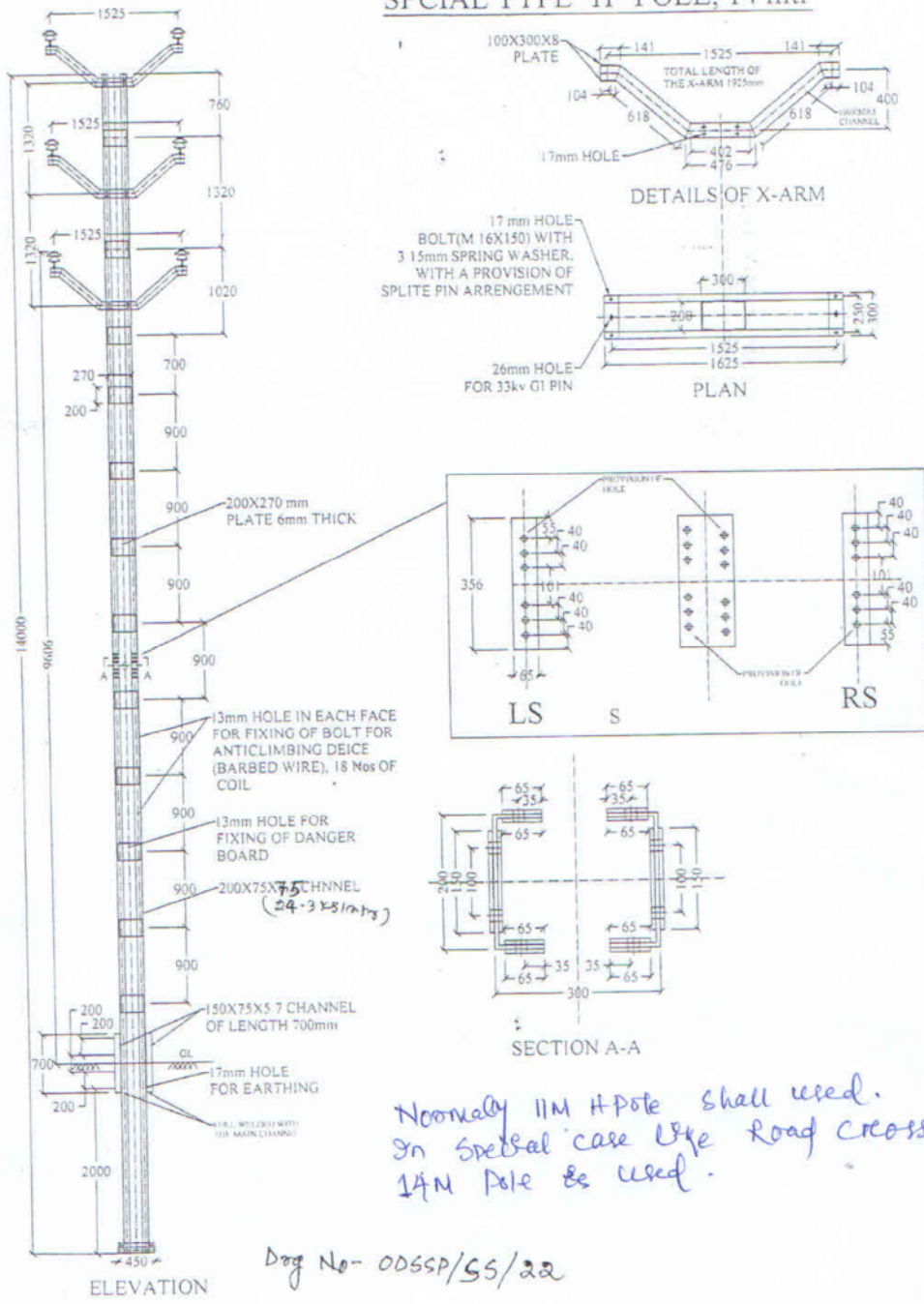


SECTION-XX

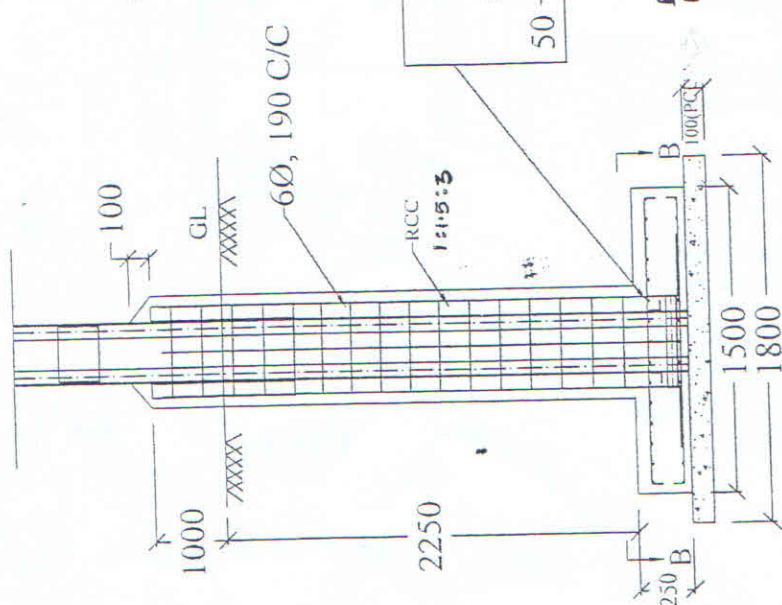
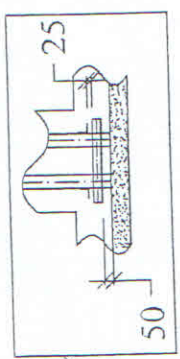
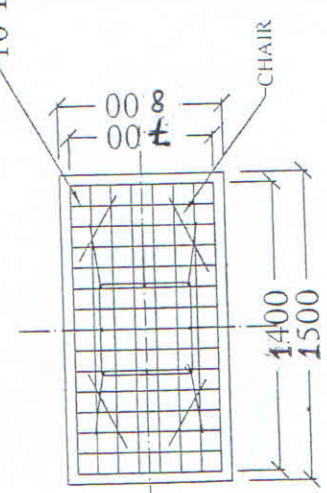
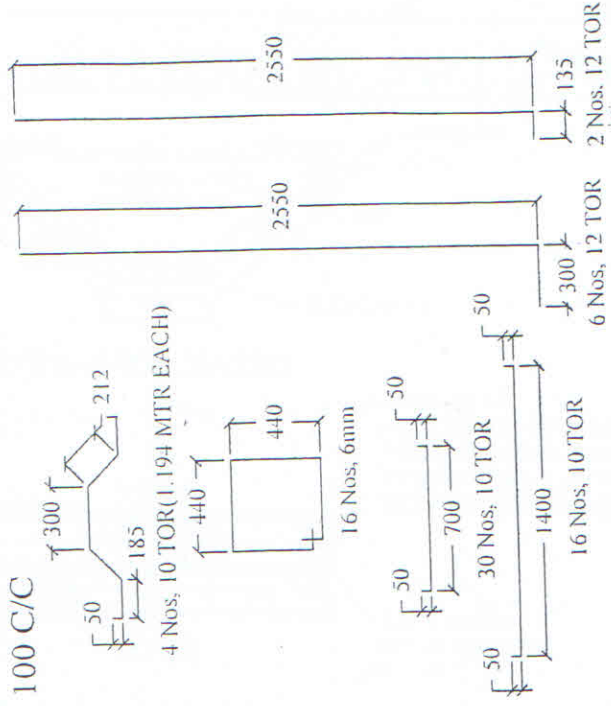
STRUCTURAL DETAIL OF 33kV CT & PI

DRG NO-ODSSP/SS/21

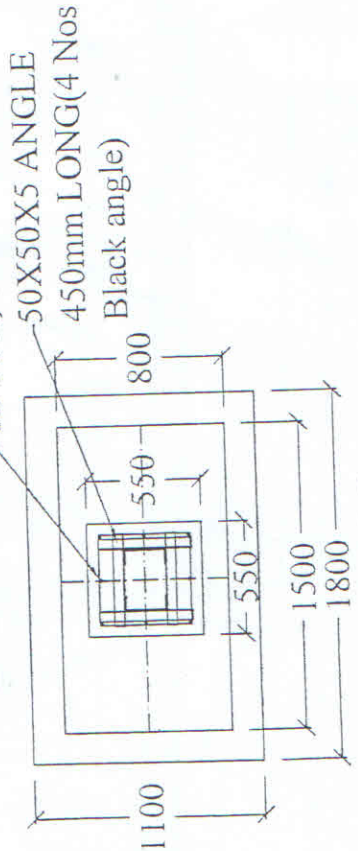
SPECIAL TYPE "H" POLE, 14 mtr



FOUNDATION OF SPECIAL TYPE "H" POLE, 14 mtr



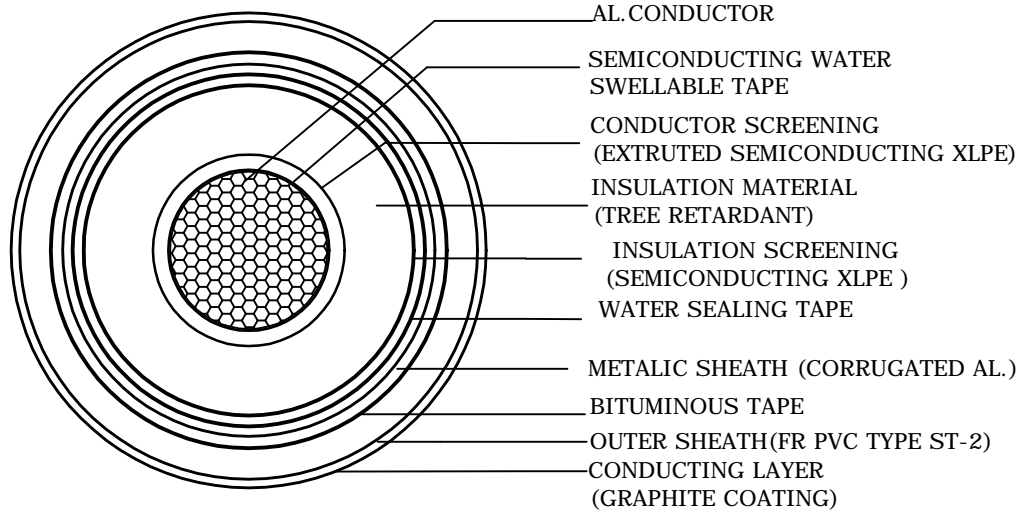
ELEVATION 12 TOR, 8 Nos



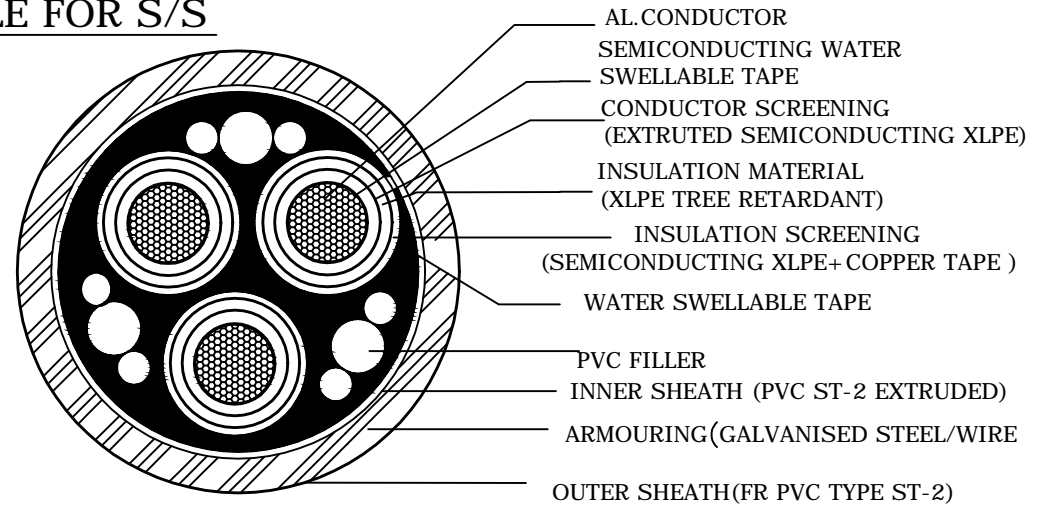
SECTION B-B

Drawing No- ODSSP/SS/23/REV-A

CROSS-SECTIONAL VIEW OF 33kV & 11kV CABLE FOR S/S



CROSS-SECTIONAL VIEW OF 33 kV 1C,
UN-ARMOURED CABLE



CROSS-SECTIONAL VIEW OF 11kV 3C,
ARMOURED CABLE

Drg No. -ODSSP/SS/24/REV-C