

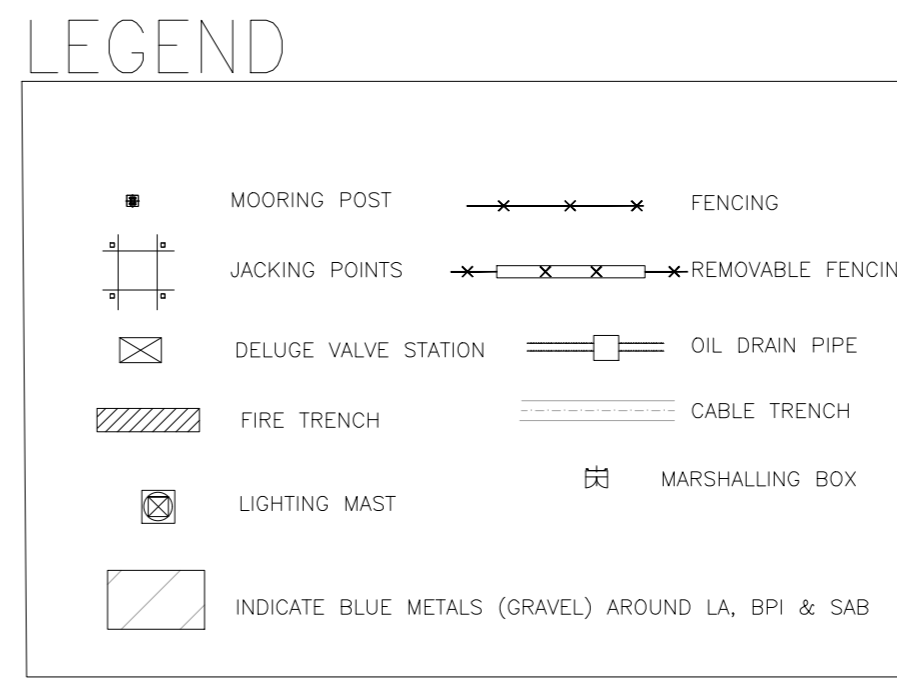
REFERENCE DRAWINGS FOR SWITCHYARD LAYOUT

Sl. No.	Drawing No.	Drawing Title
1	TB-378-510-003	Structure Loading Diagram for 400kV Switchyard
2	TB-378-510-007	Indoor Trench Layout for 400kV GIS Building
3	TB-378-510-008	Indoor Trench Layout for Switchyard Control Room
4	TB-378-510-009	Outdoor Cable Trench Layout FOR 400kV Switchyard
5	TB-378-510-010	Panel Layout for Switchyard Control Room
6	TB-378-510-013	EKD PLAN & SECTION for 400kV Switchyard
7	TB-378-510-014	DSLPL Layout for 400kV Switchyard
8	TB-378-510-031	Short Circuit Force Calculation
9	TB-378-510-032	Sag Tension Chart
10	TB-378-510-033	Earthmat Design Calculation for 400kV Switchyard
11	TB-378-316-101-02	400kV GIS SWITCHGEAR LAYOUT (PLAN VIEW)
12	TB-378-316-101-03	400kV GIS SWITCHGEAR LAYOUT (SECTION VIEW)
13	TB-378-316-102-02	400kV Control Panel - Drawing & Documents
14	TB-378-316-103-01	400kV Reactor - OGA & Part List
15	TB-378-316-106-01	Lightning Arrestor - Drawing & Documents
16	TB-378-316-107-01	400kV BPI - Drawings & Documents
17	TB-378-316-108-01	Clamps & Connectors - Drawings & Documents
18	TB-378-316-122-01	EOT crane - Drawing & Documents
19	TB-0-378-607-603	Foundation layout for 400kV yard.
20	TB-1-378-607-620-1	Architectural dwgs Contro Room Building (Plans)
21	TB-1-378-607-620-2	Architectural dwgs Contro Room Building (Elevations)
22	TB-1-378-607-620-3	Architectural dwgs Contro Room Building (Sections)
23	TB-1-378-607-607	CIVIL RCC DETAILS OF REACTOR FOUNDATION
24	TB-1-378-607-640-1	Architectural dwgs. GIS Building (Plans)
25	TB-1-378-607-640-2	Architectural dwgs. GIS Building (Elevations)
26	TB-1-378-607-640-3	Architectural dwgs. GIS Building (Sections)

- NOTE:**
- PLEASE REFER TB-378-316-101-02 400kV GIS - PLAN & SECTION VIEW INCLUDING GAS INSULATED BUS DUCT AS INSULATED BUS & GAS INSULATED BUS DUCT LAYOUT.
 - ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
 - DELETED.
 - DELETED.
 - SPACE AROUND GIS EQUIPMENT (MINIMUM CLEARANCE) 5 METER.
 - MINIMUM CLEARANCE OF 2550MM (AS PER CBIP) BETWEEN LOWEST PART OF THE INSULATOR & PLINTH LEVEL TO BE PROVIDED.
 - RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE BETWEEN LIVE TERMINALS = 1425 kVp.
 - RATED LIGHTNING IMPULSE WITHSTAND VOLTAGE ACROSS ISOLATING DISTANCES & EARTH = 1425 (+240) kVp.
 - TENSION STRING - 120KN POLYMER LONG ROD INSULATOR (DOUBLE TENSION) (31MM/KV).
 - SUSPENSION STRING - 120KN POLYMER LONG ROD INSULATOR (SINGLE SUSPENSION) (31MM / KV).
 - HORIZONTAL CLEARANCE BETWEEN GIS and GIS BUILDING / ANY OTHER BUILDING WALL SHALL BE MINIMUM THREE (3) METERS.
 - 400 kV ANCHORING POINT SHALL BE PROVIDED AT TG BUILDING AT THE HEIGHT OF 32.3 m FOR SHIELD WIRE. SHIELD WIRE SHALL BE TERMINATED AT A-ROW BUILDING AT FGL+32.500. HEIGHT AT 800Kv NORMAL TENSION. REFER STRUCTURE LOADING DIAGRAM DOC NO. TB-378-510-003. REFER ERECTION KEY DIAGRAM FOR TERMINAL, CONNECTOR DETAILS FOR SHIELD WIRE.
 - DELETED.
 - CAUSE LADDER AND MAINTENANCE WALKWAY TO BE PROVIDED IN GIS HALL. INSULATION MAT SHALL BE PROVIDED BLOW LCC PANEL IN GIS HALL.
 - ALL SWITCHGEAR ROOMS, GIS FLOOR AND CONTROL RELAY PANEL ROOM FLOOR SHALL BE OF EPOXY FLOORING. THE OUTDOOR SWITCHYARD SHALL BE OF PCC FLOORING.
 - BLUE METALS (GRAVELS) TO BE PROVIDED IN PLACE OF PCC NEAR OUTDOOR EQUIPMENT : LA, BPI & SF6 TO AIR BUSHINGS OF 400kV SWITCHYARD.
 - DETAILS OF BURNT OIL PIT FOR 400kV BUS REACTORS SHALL IS AS INDICATED IN DRAWING TB-378-316-103-17 & DRAWING TB-378-316-103-08 (400kV REACTOR FOUNDATION PLAN)
 - NO WORKING & 1 NO. STANDBY PUMP TO BE PROVIDED FOR BURNT OIL PIT FOR 400kV BUS REACTOR. DEPTH OF THE DISCHARGE PIPE CROSSING ROAD SHALL BE INDICATED LATER.
 - INCOMING CABLE FROM TRANSFORMER YARD TO SWITCHYARD COVERED IN OUTDOOR TRENCH LAYOUT. OUTDOOR CABLE TRENCH TOP SHALL BE AT LEAST 75mm ABOVE PAVED LVL. OF BLUE METAL (GRAVEL) TO PREVENT FLOW OF WATER INTO THE TRENCH.
 - CABLE TRENCH DRAIN PIT TO BE PROVIDED WITH PUMP.
 - INDOOR CABLE TRENCH TOP SHALL MATCH WITH FFL.
 - PLEASE REFER EKD & DSLPL LAYOUT FOR SHIELD WIRE ARRANGEMENT
 - ROOF TOP OF GIS HALL SHOULD BE SUITABLE FOR SOLAR CELL PLACEMENT IN FUTURE.
 - PLINTH HEIGHT OF TOWER AND EQUIPMENT FOUNDATIONS IS FGL + 300 MM.
 - 400kV BUS REACTOR RAIL GAUGE IS 1676 MM. REFER TB-1-378-607-607 CIVIL RCC DETAILS OF REACTOR FOUNDATION FOR DETAIL.
 - DIMENSION OF BUS REACTOR FIREWALL IS AS PER DOCUMENT TB-378-316-103-17.
 - PLEASE REFER DRAWING REF. TB-378-316-103-17 FOR BURNT OIL PIT AND SOAK PIT & REACTOR FIRE WALL SIZING.
 - INTERMEDIATE PIT IF REQUIRED IN DRAIN PIPE LINE BETWEEN REACTOR SOAK PIT & COMMON OIL PIT IN SWITCHYARD. WILL HAVE INNER CLEARANCE 600x600 MM AND LEVEL DIFFERENCE BETWEEN INLET PIPE AND OUTLET PIPE SHALL BE MINIMUM 200MM.
 - THE BURNT OIL SHALL BE PUMPED THE OIL WATER SEPARATOR LOCATED IN THE ETP WITH THE HELP OF 1 WORKING +1 STANDBY PUMP.
 - 400kV BPI & SURGE ARRESTOR NEAR GENERATOR TRANSFORMER ARE ON HOLD TILL FINALIZATION OF GENERATOR TRANSFORMER OGA AND GT AREA LAYOUT DRAWING.
 - LOCATION OF LIGHTING MAST, DRAIN FALL POINT ARE INDICATIVE.
 - POWER AND CONTROL CABLES IN THE CABLE TRENCH SHALL BE LAID IN SEPARATE TIERS. THE ORDER OF LAYING OF VARIOUS CABLES SHALL BE AS FOLLOWS -
 - HT CABLE ON TOP TIER
 - POWER CABLES ON SECOND TIER FROM TOP.
 - FOR FUTURE CABLES - THIRD TIER RESERVED.
 - CONTROL INSTRUMENTATION AND OTHER SERVICE CABLES IN BOTTOM (FOURTH) TIERS.
 - CABLE FOR ILLUMINATION / LIGHTING MAST SHALL BE DIRECTLY BERRIED TIER, ROUTE SHALL BE FINALIZED AFTER FINALIZATION OF ILLUMINATION DESIGN & CIVIL LAYOUT.
 - MINIMUM CLEARANCE BETWEEN EDGE OF THE REACTOR TO THE INNER FACE OF SOAK PIT IS 1600 MM FOR MAIN TANK & 700 MM FOR RADIATOR.
 - REFER DOCUMENT NUMBER TB-378-316-122-00 (DESIGN BASIS REPORT) FOR EOT CRANE AT 400kV GAS HALL.

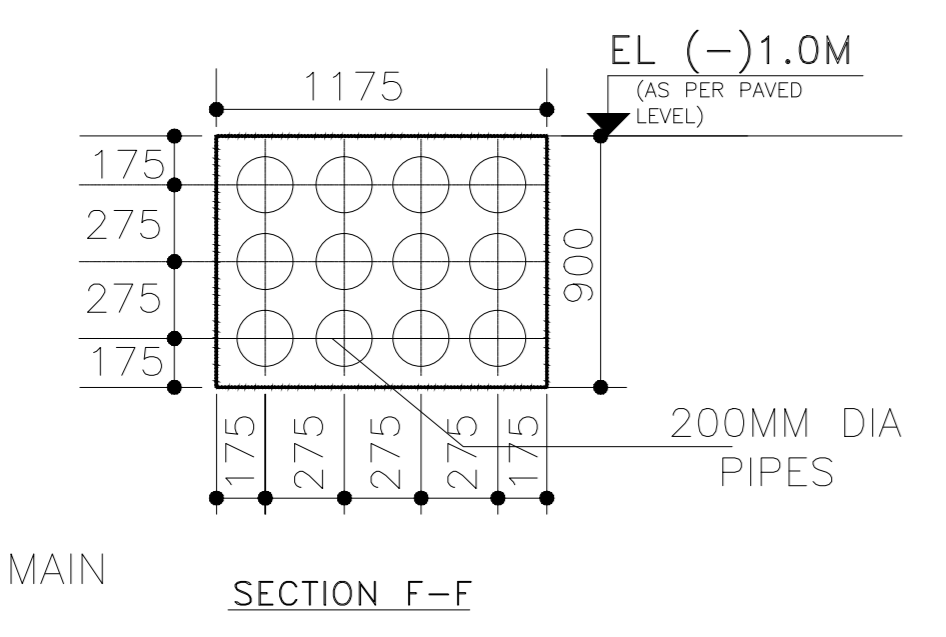
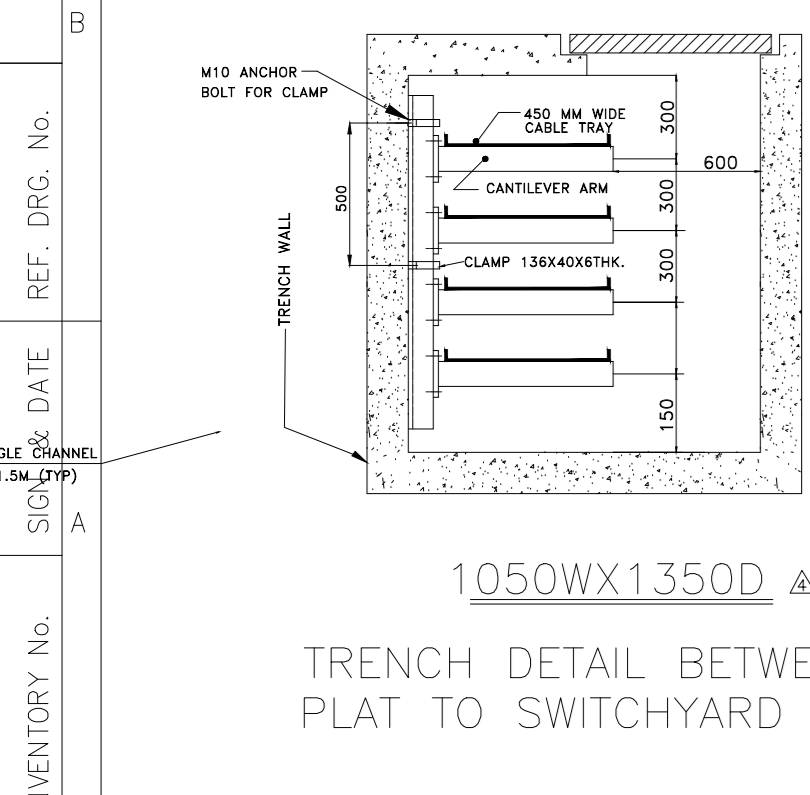
TECHNICAL PARAMETERS

01. DESIGN VOLTAGE LEVELS:	400 kV SYSTEM
a) HIGHEST SYSTEM VOLTAGE	420 kV (rms)
b) P.F. WITHSTAND VOLTAGE	a) 650 kV rms between five terminals and earth b) 815 kV rms across isolating distance
c) LIGHTING IMPULSE WITHSTAND LEVEL	1425 kVp
d) SWITCHING IMPULSE WITHSTAND LEVEL	a) 1575 kVp (between phases) b) 900 (+345) (across isolating distance) kVp
02. FAULT LEVELS	63 kA For 1 Sec
03. MINIMUM CREEPAGE DISTANCE	31 mm/kV
04. MINIMUM ELECTRICAL CLEARANCES:	
a) PHASE TO PHASE	4000 mm
b) PHASE TO EARTH	3500 mm
c) SECTION CLEARANCE	6500 mm
d) GROUND CLEARANCE	8000 mm



BILL OF QUANTITY - 400kV

S. NO.	DESCRIPTION	SYMBOL	QTY.
1	400 kV INDOOR GIS	--	01
2	SF6 TO AIR BUSHING - POLYMER TYPE	⊗	36
3	SURGE ARRESTER 360kV, 20KA, CLASS-IV	⊕	36
4	400 kV, 125 MVAR REACTOR	⊗	02
5	400 kV 8KN BUS POST INSULATOR	⊗	76
6	LIGHTING MAST (INDICATIVE)	⊗	6



REV.	DATE	ALTERED	BY	CHKD.	APPROVED	REV.	DATE	ALTERED	BY	CHKD.	APPROVED	REV.	DATE	ALTERED	BY	CHKD.	APPROVED
5	06.01.18		SAI	SKS	SKS	01	17.02.17		SAI	SKS	SKS	02	17.02.17		SAI	SKS	SKS

ADDITIONAL INFORMATION
W.O.No. 84007

STATUS OF DRAWING
DISTRIBUTION OF PRINTS

NAME OF CONSULTANT
DESIGN PRIVATE LIMITED, NEW DELHI.

NAME OF CUSTOMER/PROJECT
TAMILNADU GENERATION AND DISTRIBUTION CORPORATION (TANGEDCO)
400kV GIS AT 2 X 600 MW ENNORE SEZ SUPERCRITICAL THERMAL POWER PROJECT AT ASH DYKE OF NCTPS

SCALE
1:400

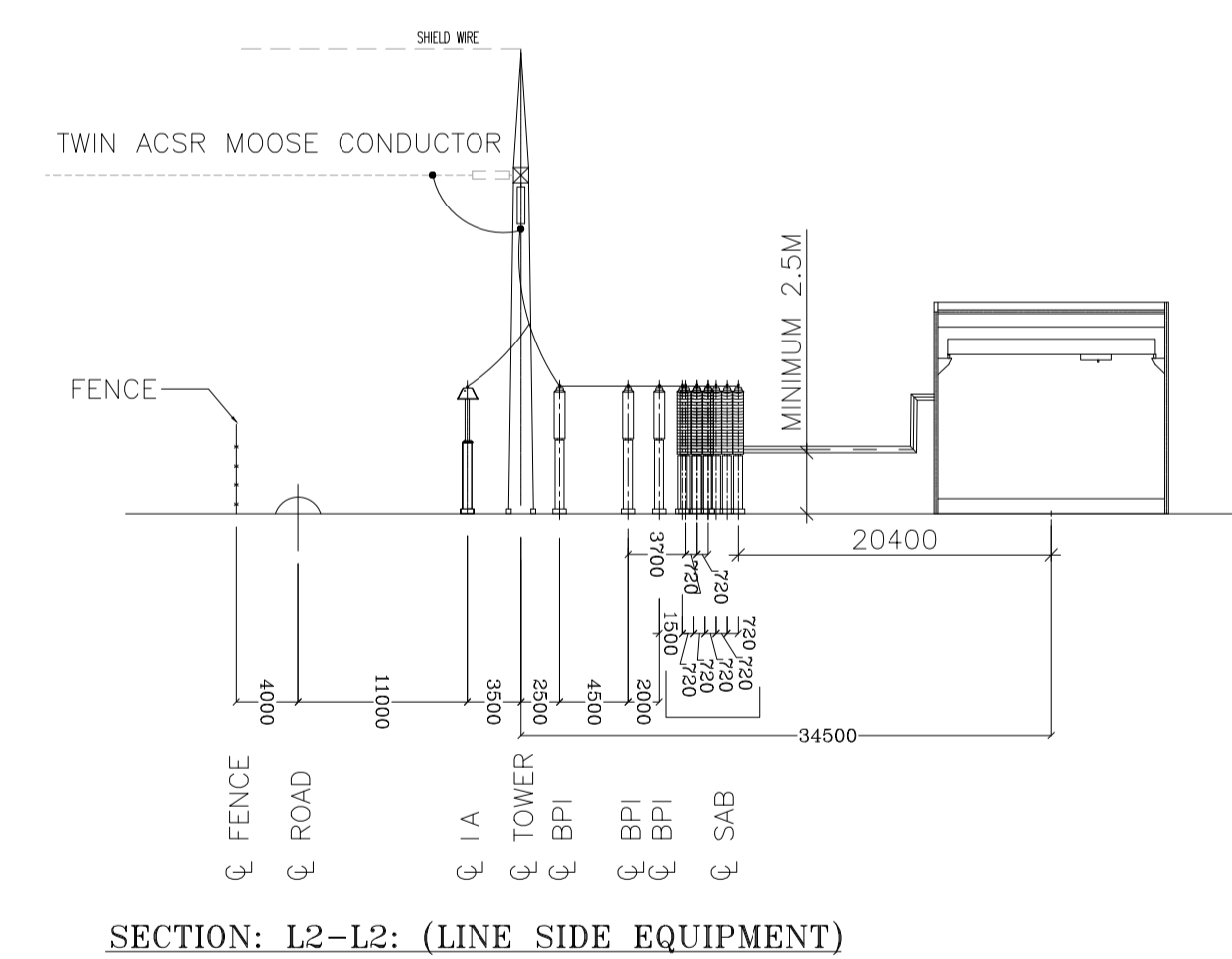
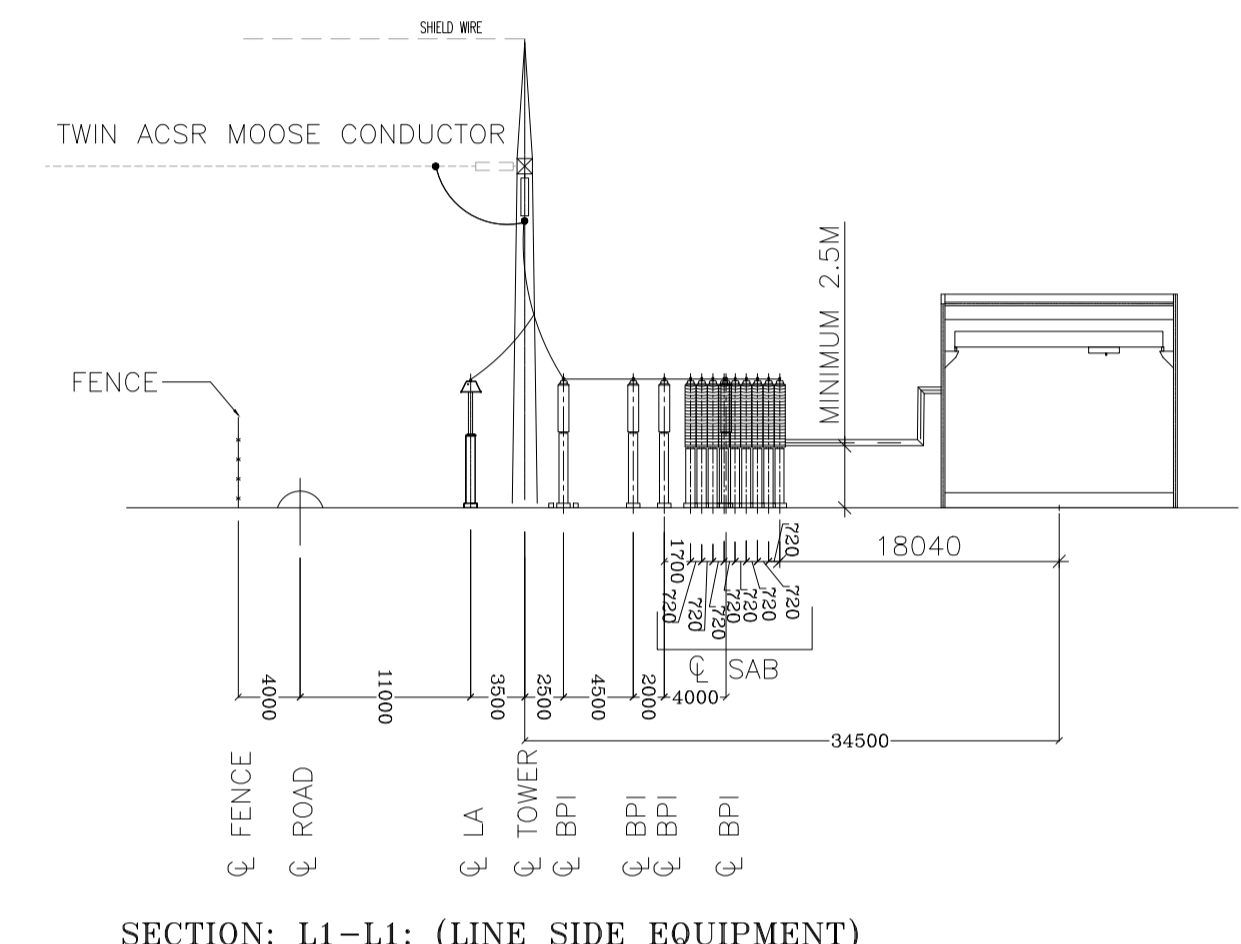
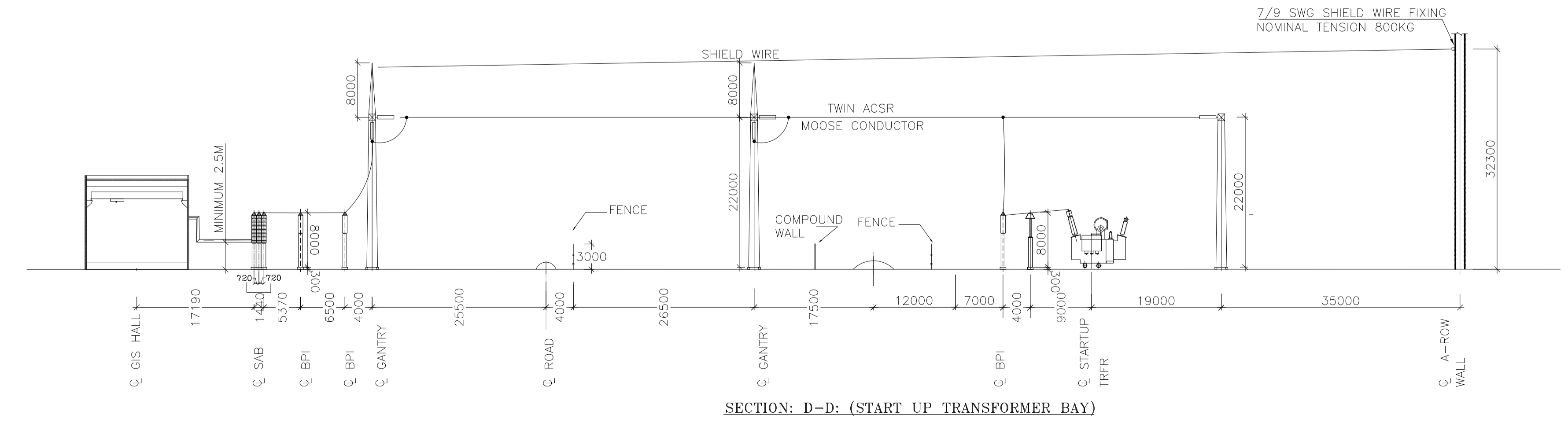
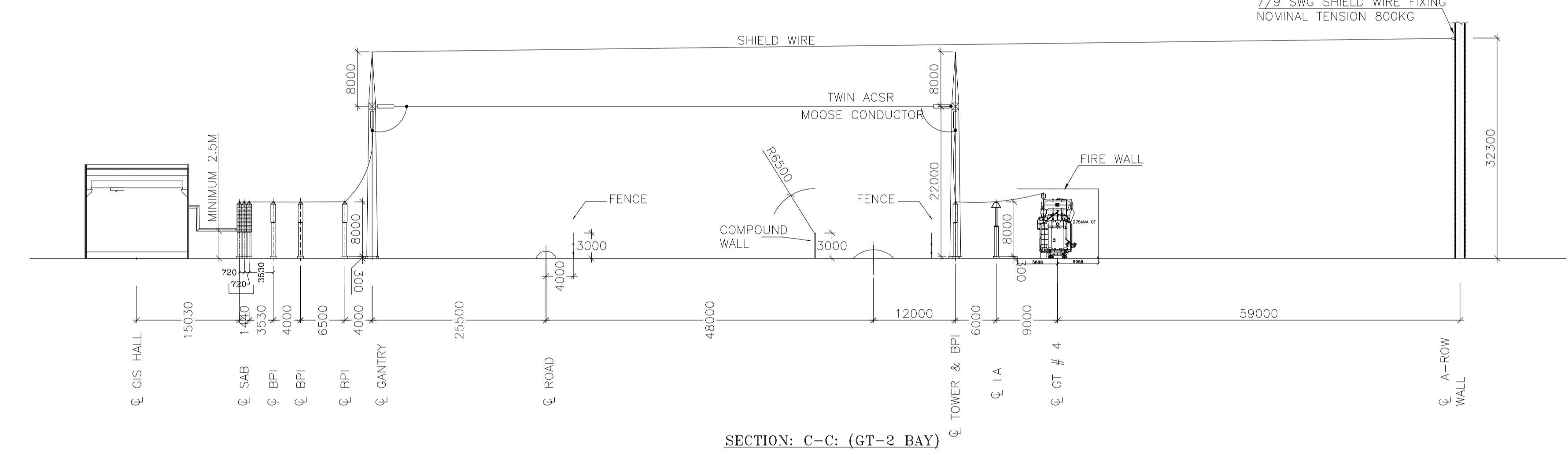
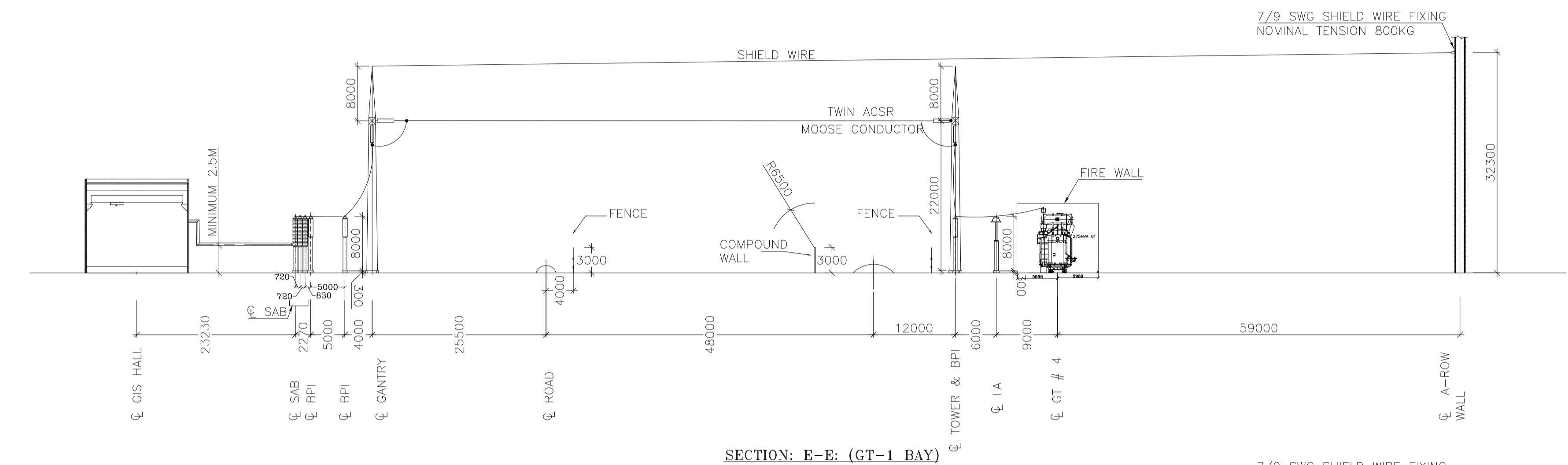
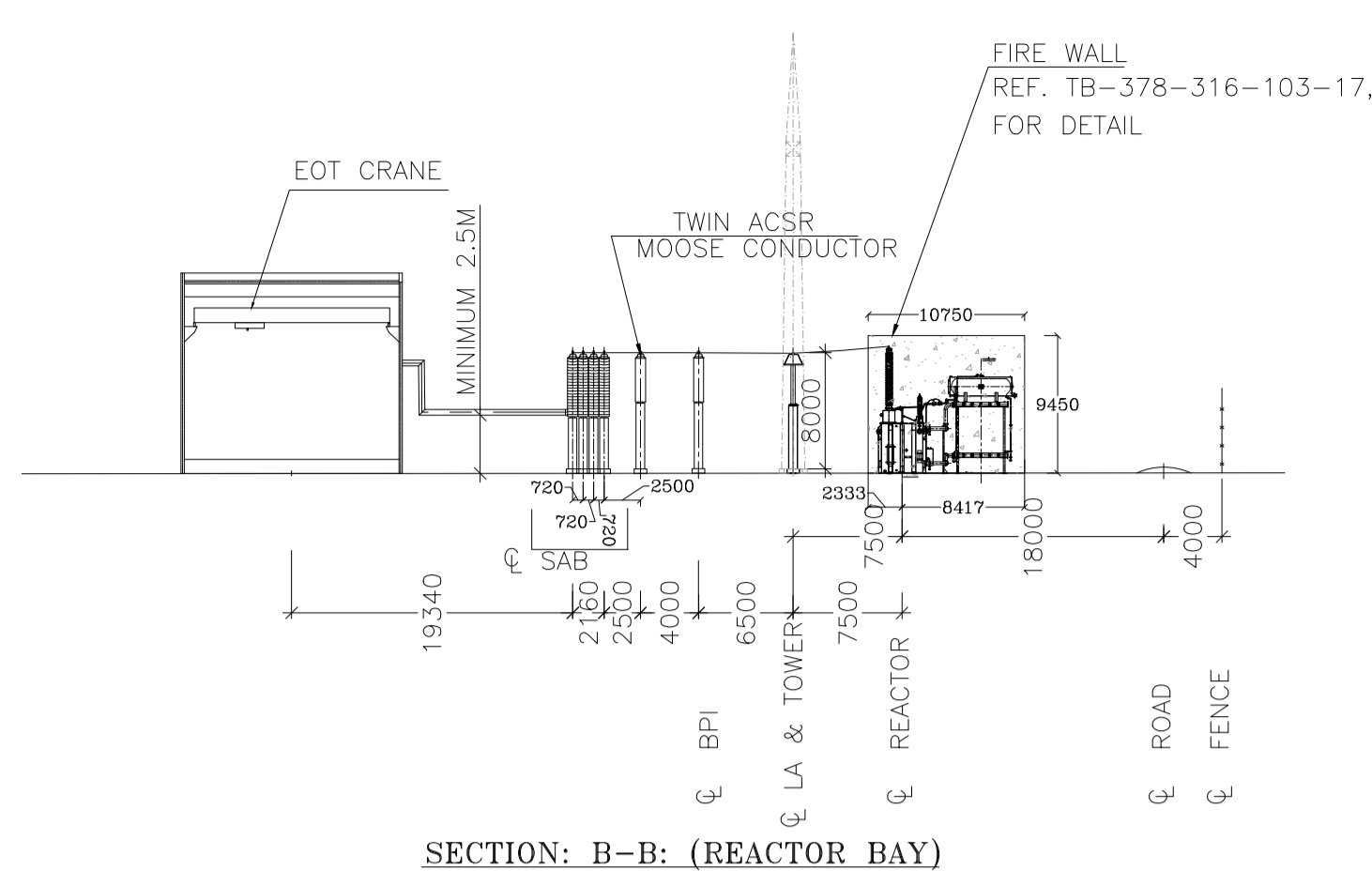
DATE
18.08.18

PROJECT/TITLE
400kV GIS AND POTHEAD YARD LAYOUT PLAN ENNORE

DRAWING NO.
TB-1-378-316-002

SHEET NO.
01

TOTAL SHEETS
02



INVENTORY No. SIGN & DATE REF. Dwg. No. COMPUTER Dwg. PATH NAME COPY RIGHT AND CONFIDENTIAL. This drawing is the property of Bharat Heavy Electricals Ltd. It must not be used, copied, or reproduced in any form without the written permission of the company.

ADDITIONAL INFORMATION W.G.No. 84997 STATUS OF DRAWING DISTRIBUTION OF PRINTS		TAMILNADU GENERATION AND DISTRIBUTION CORPORATION (TANGEDCO) 400KV GIS AT 2 X 660 MW ENNORE SUB SUPERCRITICAL THERMAL POWER PROJECT AT ASH DYKE OF NCTPS NAME OF CONSULTANT DESEIN PRIVATE LIMITED, NEW DELHI.	
REV. DATE ALTERED 6 03.02.18 ENGINEER APPROVED CHECKER APPROVED		REV. DATE ALTERED 6 03.02.18 ENGINEER APPROVED CHECKER APPROVED	
ZONE CUSTOMER COMMENT VIDE LETTER REF: 0564 DT: 30.01.2018 INCORPORATED		SHEET / NAME 11435 SCALE 1:1435 SHEET / NO. / DATE 6 / 03.02.18	
TITLE 400KV GIS AND POTHEAD YARD LAYOUT PLAN ENNORE		DRAWING NO. TB-1-378-316-002 SHEET NO. / SHEET TOTAL 02 / 03	