TB-1-301-316-002

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COMPUTER DRG. PATH NAME :

INVENTORY NO. SIGN & DATE

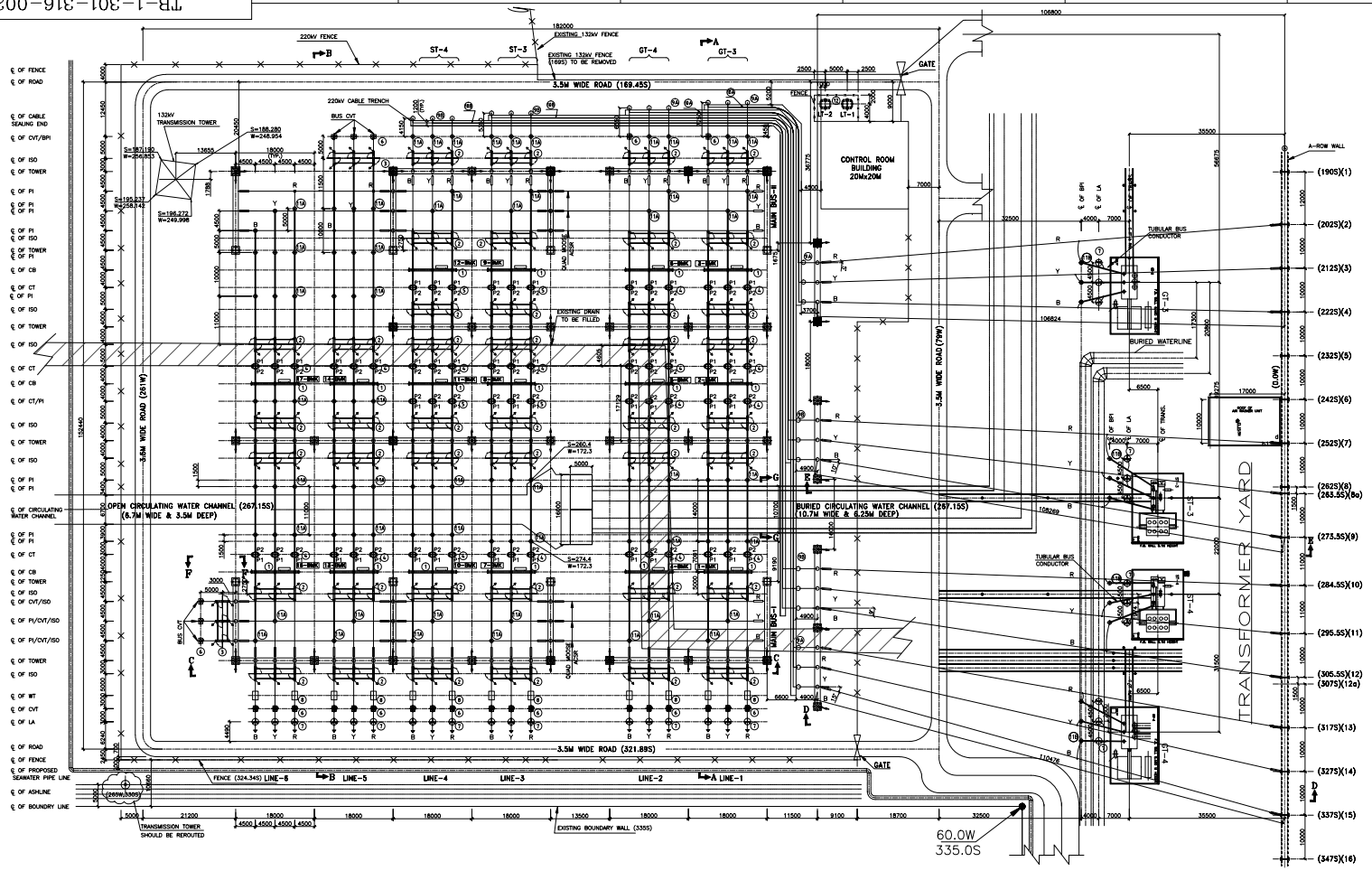

TABLE 1

S.NO.	ITEM DESCRIPTION	SYMBOL	QTY.
1.	220kV, 2000A, SF6 CIRCUIT BREAKER		16NOS.
2.	220kV, 1600A, DOUBLE BREAK MOTOR OPERATED,MECHANICALLY GANGED ISOLATOR WITH MANUALLY OPERATED ONE E/S		42NOS.
3.	220kV, 1600A, DOUBLE BREAK MOTOR OPERATED,MECHANICALLY GANGED ISOLATOR WITH MANUALLY OPERATED TWO E/S		2NOS.
4.	220kV, 1600-800-400/1/1/1/1/1 5-CORE CTs		48NOS.
5.	220kV CTs FOR ST BAYS		12NOS.
6.	220kV, 220kV /110V / 110V / 110V, 8800pF CVTs		26NOS.
7.	198kV SURGE ARRESTORS		30NOS.
8.	1600A, 0.5mH WAVE TRAPS		12NOS.
9A.	220kV CABLE SEALING END FOR 1CX1200 SQ.MM CU CABLE (SINGLE PHASE) (NOT IN BHEL SCOPE OF SUPPLY)		12NOS.
9B.	220kV CABLE SEALING END FOR 1CX300 SQ.MM CU CABLE (SINGLE PHASE) (NOT IN BHEL SCOPE OF SUPPLY)		12NOS.
10A.	220kV 1CX1200 SQ.MM CU CABLE (SINGLE PHASE) (NOT IN BHEL SCOPE OF SUPPLY)		1LOT
10B.	220kV 1CX300 SQ.MM CU CABLE (SINGLE PHASE) (NOT IN BHEL SCOPE OF SUPPLY)		1LOT
11A.	220kV BUS POST INSULATORS 5.9M HEIGHT		90NOS.
11B.	220kV BUS POST INSULATORS 8.7M HEIGHT		12NOS.
12.	630kVA 6.6/0.433kV LT TRANSFORMER		2NOS.

LEGEND:

——— INDICATES 4" IPS AL. TUBE
——— INDICATES QUAD. MOOSE CONDUCTOR
——— INDICATES TWIN MOOSE CONDUCTOR

MINIMUM CLEARANCE TABLE	220kV
PHASE TO PHASE (PP) (mm)	2100
PHASE TO EARTH (PE) (mm)	2100
SECTION CLEARANCE (SC) (mm)	5000
CREEPAGE DISTANCE (MIN.)	31mm/kV 7595mm
HEIGHT OF TUBE CENTRE LINE OF FIRST LEVEL (MIN.) mm. (FROM PLINTH LEVEL)	5900
TO NEAREST PART AT EARTH POTENTIAL OF AN INSULATOR SUPPORTING LIVE CONDUCTOR (mm)	2440

NOTES:-

01. DIMENSIONS INDICATED IN THE DRAWING ARE IN MM.
02. POSITIONS OF LINE TRAPS INDICATED IS TENTATIVE.
03. PARAMETERS FOR WHICH THE SYSTEM SHALL BE DESIGNED ARE :
    (a) SYSTEM VOLTAGE — 245kV
    (b) LIGHTNING IMPULSE WITHSTAND VOLTAGE: — 1050kVP
    (c) POWER FREQUENCY WITHSTAND VOLTAGE: — 460kV RMS
    (d) MAXIMUM FAULT LEVEL — 40kA FOR 1 SEC.
    (e) CREEPAGE : — 31mm/kV
04. (a) DESIGN WIND SPEED — 50M/SEC.
    (b) SYSTEM EARTHING — SOLIDLY EARTHED
    (c) MAX. TEMP. RISE FOR ALL CURRENT CARRYING COND. ABOVE AMBIENT TEMP. — 30 DEG. C ABOVE 50 DEG. C AMBIENT
05. (a) MAIN BUS-I — QUAD MOOSE ACSR CONDUCTOR
    (b) MAIN BUS-II — QUAD MOOSE ACSR CONDUCTOR
    (c) EQUIPMENT INTER CONNECTION — 4" EH IPS AL. TUBE/TWIN MOOSE
    (d) ALL 220kV JACK BUS/DROPPERS — TWIN MOOSE
    (e) SHIELD WIRE — 7/8 SWG DIA 12MM
06. THIS DRAWING HAS BEEN PREPARED ON THE BASIS OF PLOT PLAN DRAWING NO. PE-DG-281-100-M001.
07. LA PRESSURE RELIEF VALVE SHALL NOT BE TOWARDS TRANSFORMER SIDE / ANY EQUIPMENT KEPT NEAR LA.
08. BPI EQUIPMENT FOUNDATIONS COMING NEAR THE WALL OF CIRCULATING WATER CHANNEL AT CO-ORDINATES (260.4S, 172.3W) & (274.4S, 172.3W) WOULD BE SUITABLY DESIGNED BY BHEL CIVIL GROUP.

REV.	STATUS	TYPE	REASONS FOR REVISION	PREPARED BY	CHECKED BY	APPROVED BY	DATE
08			REVISED AS PER CUSTOMER COMMENTS DATED 01.10.10 & 08.10.10	KAPIL	SKS/DS	SN	11.10.10
07			REVISED AS PER CUSTOMER COMMENTS DATED 26.07.10	KAPIL	SKS/DS -SD-	SN -SD-	20.09.10
06			REVISED AS PER CUSTOMER COMMENTS DATED 03.07.09	KAPIL	SKS/DS -SD-	SN -SD-	16.09.09
05			REVISED AS PER CUSTOMER COMMENTS DATED 25.03.09	KAPIL	SKS/DS -SD-	SN -SD-	28.05.09
04			REVISED AS PER CUSTOMER COMMENTS DATED 05.01.09	KAPIL	SKS/DS -SD-	SN -SD-	27.02.09
03			REVISED AS PER CUSTOMER COMMENTS DATED 22.08.08	KAPIL	SKS/MK -SD-	SN -SD-	15.12.08
02			REVISED AS PER CUSTOMER COMMENTS DATED 25.07.08	KAPIL	SKS/MK -SD-	SN -SD-	04.08.08
B (1)			REVISED AS PER CUSTOMER COMMENTS DATED 05.03.08	KAPIL	SKS/MK -SD-	SN -SD-	14.07.08
A (0)			FIRST ISSUE	HONEY	SKS/MK -SD-	SN -SD-	28.01.08

GSECL — GUJARAT STATE ELECTRICITY CORPORATION LTD.

परियोजना का नाम / NAME OF PROJECT: 2x250MW SIKKA THERMAL POWER PROJECT EXTENSION UNITS 3 & 4, DIST JAMNAGAR

TCE CONSULTING ENGINEERS LTD.
DRAWING TCE REF. No. : TCE 5084A-EPC-SH-(UNIT)-0001

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रान्समिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

DEPT.	TBEM
CODE	452
SCALE	1:470
W.O. No.	5084
DRWG. NO:	TB-1-301-316-002

DRAWING TITLE: PLAN LAYOUT FOR 220kV S/S AT SIKKA

FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM)

TB-0-301-316-003

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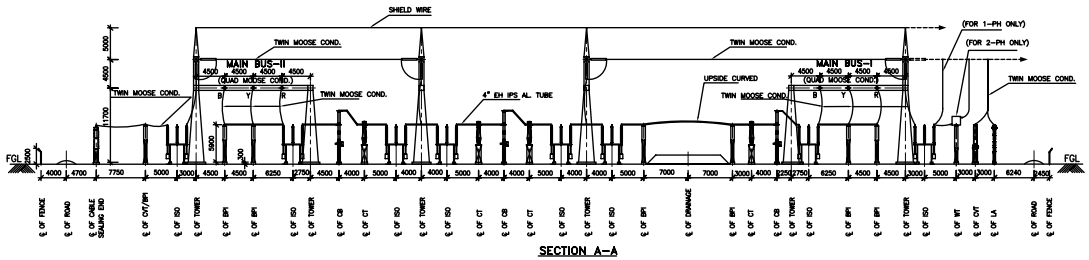
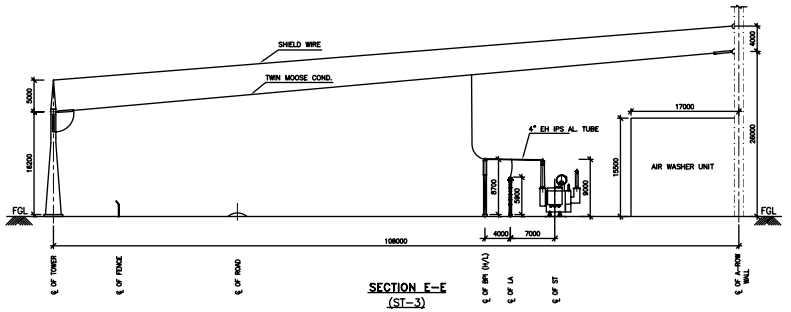
COMPUTER DRG. PATH NAME :

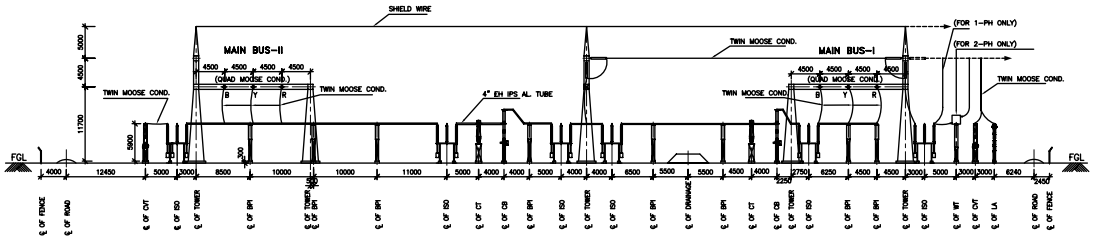
INVENTORY NO. SIGN & DATE



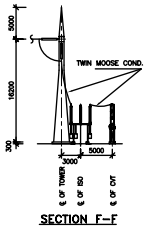
SECTION A-A
(220kV GT BAY)



SECTION E-E
(ST-3)

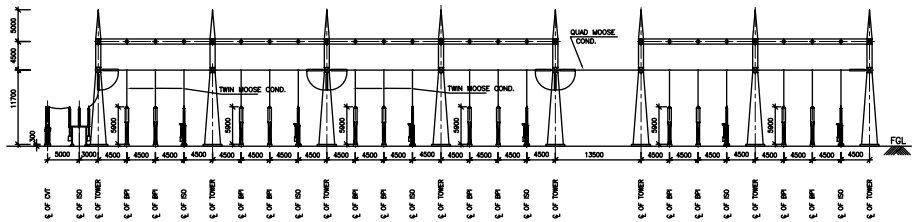


SECTION B-B
(220kV LINE BAY)



SECTION F-F
(BUS-I CVT)

MINIMUM CLEARANCE TABLE	220kV
PHASE TO PHASE (PP) (mm)	2100
PHASE TO EARTH (PE) (mm)	2100
SECTION CLEARANCE (SC) (mm)	5000
CREEPAGE DISTANCE (MIN.)	31mm/kV 7595mm
HEIGHT OF TUBE CENTRE LINE OF FIRST LEVEL (MIN.) mm. (FROM PLINTH LEVEL)	5900
TO NEAREST PART AT EARTH POTENTIAL OF AN INSULATOR SUPPORTING LIVE CONDUCTOR (mm)	2440



SECTION C-C
(MAIN BUS-I)

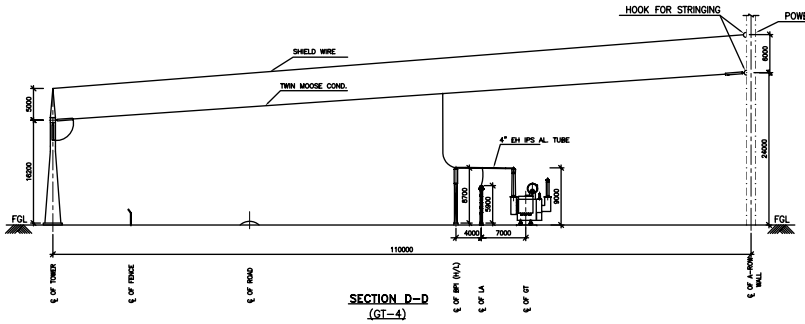
NOTES:-

01. DIMENSIONS INDICATED IN THE DRAWING ARE IN MM.
02. POSITIONS OF LINE TRAPS INDICATED IS TENTATIVE.
03. PARAMETERS FOR WHICH THE SYSTEM SHALL BE DESIGNED ARE :
- (a) SYSTEM VOLTAGE — 245kV
- (b) LIGHTNING IMPULSE WITHSTAND VOLTAGE: — 1050kVP
- (c) POWER FREQUENCY WITHSTAND VOLTAGE: — 460kV RMS
- (d) MAXIMUM FAULT LEVEL — 40kA FOR 1 SEC.
- (e) CREEPAGE : — 31mm/kV

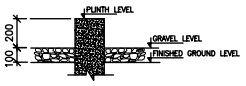
04. (a) DESIGN WIND SPEED — 50M/SEC.
- (b) SYSTEM EARTHING — SOLIDLY EARTHED
- (c) MAX. TEMP. RISE FOR ALL CURRENT CARRYING COND. ABOVE AMBIENT TEMP. — 30 DEG. C ABOVE 50 DEG. C AMBIENT

05. (a) MAIN BUS-I — QUAD MOOSE ACSR CONDUCTOR
- (b) MAIN BUS-II — QUAD MOOSE ACSR CONDUCTOR
- (c) EQUIPMENT INTER CONNECTION — 4" EH IPS AL. TUBE/TWIN MOOSE
- (d) ALL 220kV JACK BUS/DROPPERS — TWIN MOOSE
- (e) SHIELD WIRE — 7/8 SWG DIA 12MM

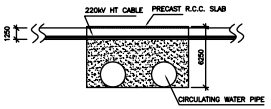
06. THIS DRAWING HAS BEEN PREPARED ON THE BASIS OF PLOT PLAN DRAWING NO. PE-DG-281-100-M001.
07. FOR DETAILS OF AIR WASHER UNIT, PL. SEE PEM DRAWINGS.
08. BPI (H/L) REPRESENTS HIGH LEVEL BPI.



SECTION D-D
(GT-4)



TYPICAL PLINTH LEVEL



SECTION G-G
(CIRCULATING WATER PIPE
CROSSING BY 220kV TRENCH)

REV.	STATUS	TYPE	REASONS FOR REVISION	PREPARED BY	CHECKED BY	APPROVED BY	DATE
08			REVISED AS PER CUSTOMER COMMENTS DATED. 01.10.10 & 05.10.10	KAPIL	SKS/DS -SD-	SN -SD-	11.10.10
07			REVISED AS PER CUSTOMER COMMENTS DATED. 26.07.10	KAPIL	SKS/DS -SD-	SN -SD-	20.09.10
06			REVISED AS PER CUSTOMER COMMENTS DATED. 16.09.09	KAPIL	SKS/DS -SD-	SN -SD-	16.09.09
05			REVISED AS PER CUSTOMER COMMENTS DATED. 13.05.09	KAPIL	SKS/DS -SD-	SN -SD-	28.05.09
04			REVISED AS PER CUSTOMER COMMENTS DATED. 09.01.09	KAPIL	SKS/DS -SD-	SN -SD-	27.02.09
03			REVISED AS PER CUSTOMER COMMENTS DATED. 24.06.08	KAPIL	SKS/MK -SD-	SN -SD-	15.12.08
02			REVISED AS PER CUSTOMER COMMENTS DATED. 28.07.08	KAPIL	SKS/MK -SD-	SN -SD-	04.08.08
B (1)			REVISED AS PER CUSTOMER COMMENTS DATED. 05.03.08	KAPIL	SKS/MK -SD-	SN -SD-	14.07.08
A (0)			FIRST ISSUE	KAPIL	SKS/MK -SD-	SN -SD-	28.01.08

GSECL GUJARAT STATE ELECTRICITY CORPORATION LTD.

परियोजना का नाम NAME OF PROJECT: 2x250MW SIKKA THERMAL POWER PROJECT EXTENSION UNITS 3 & 4, DIST JAMNAGAR

TCE CONSULTING ENGINEERS LTD.
DRAWING TCE REF. No. : TCE 5064A-EPC-BH-(UNIT)-0001

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

DEPT.	TBEM
CODE	422
SCALE	1:250
W.O. No.	87004
DRWG. NO :	TB-0-301-316-003

DRAWING TITLE : SECTION ELEVATION FOR 220kV S/S AT SIKKA

COMPUTER DRG. PATH NAME :

INVENTORY NO. SIGN & DATE

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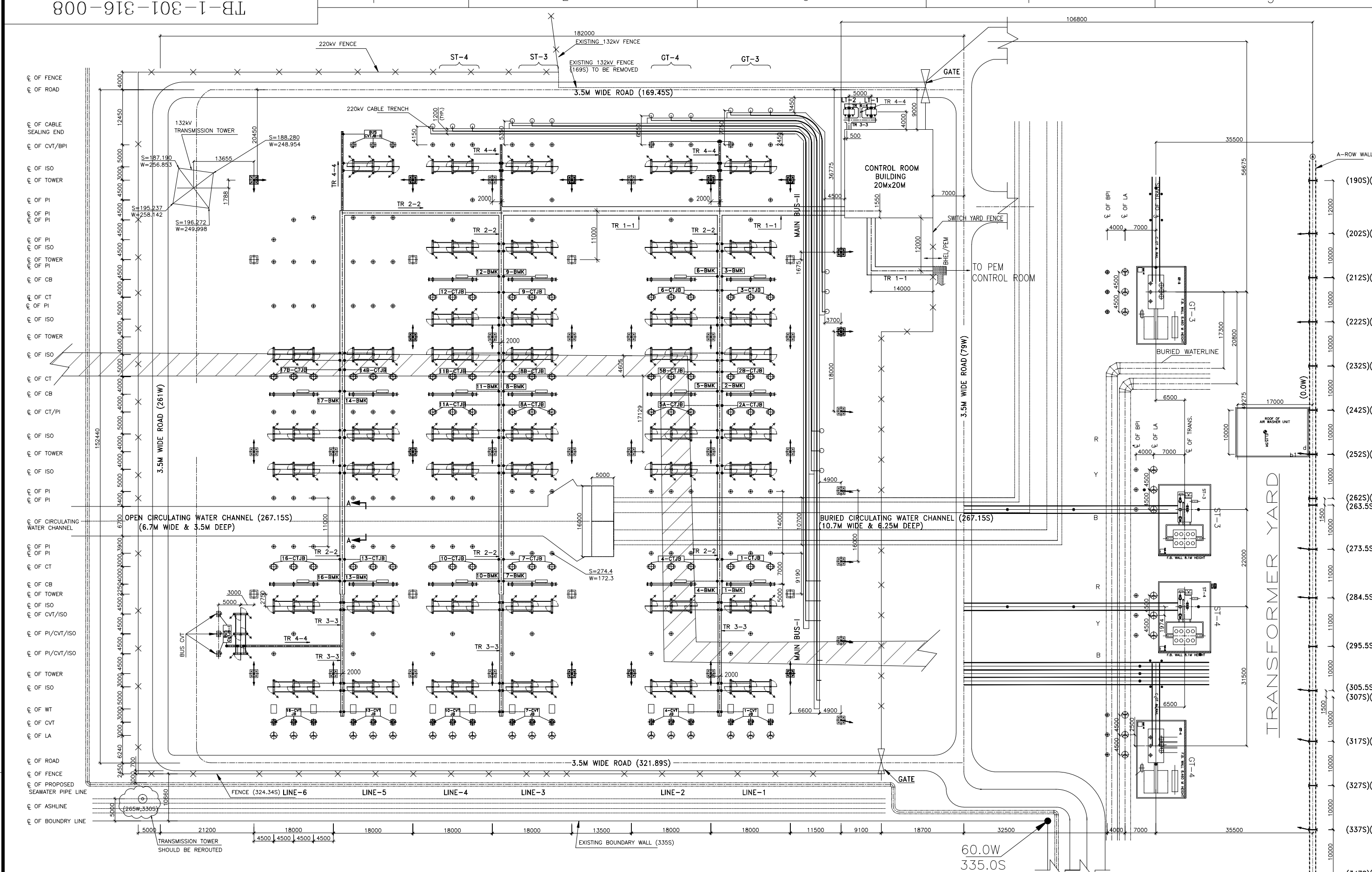
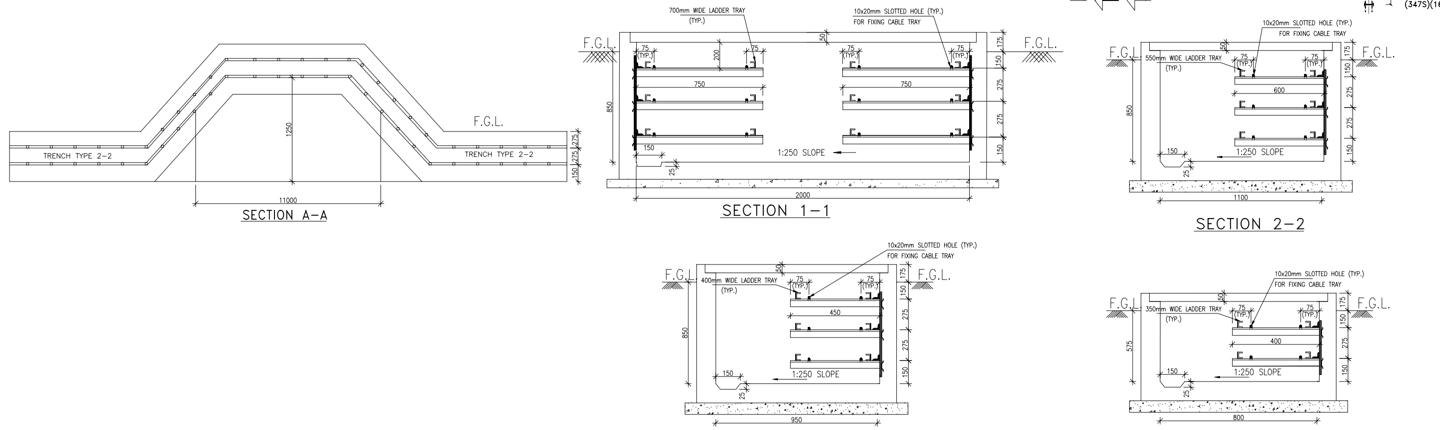
FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM)

TB-1-301-316-008





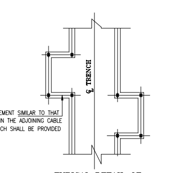
- ×—×—× INDICATES FENCE
- INDICATES 3.5M WIDE CONCRETE ROAD
- INDICATES BOUNDARY WALL
- INDICATES GI PIPE

NORTH

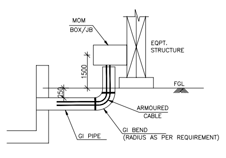
GI PIPES						
FOR 220 KV EQUIPMENTS						
S.NO.	FROM	TO	POWER CABLE		CONTROL CABLE	
			50MM OD	100MM OD	50MM OD	100MM OD
1.	TRENCH	JB (CVT/CT)	1	–	–	1
2.	JB (CVT/CT)	CVT / CT	–	–	–	1
3.	TRENCH	ISO/ES MOM	1	–	–	1
4.	TRENCH	MB (CIRCUIT BREAKER)	1	–	–	1
5.	MB (CIRCUIT BREAKER)	CIRCUIT BREAKER	–	–	–	1

NOTES:

1. ——— INDICATES CABLES LAID IN GI PIPES OF 50/100mm OUTER DIA AT DEPTH OF 300mm (MAX.) CABLE FROM EQUIPMENT TO CABLE TRENCH SHALL RUN IN GI PIPES.
2. MARKED THUS (●) INDICATES CABLE ENTRY/EXIT FROM TRENCH TO GI PIPE.
3. INSERTS SHALL BE EMBEDDED AT EVERY 1.5m INTERVAL FOR CABLE SUPPORTS IN OUTDOOR CABLE TRENCH.
4. ALL OTHER DETAILS PERTAINING TO CIVIL WORKS SHALL BE REFLECTED IN THE RESPECTIVE CIVIL DRAWINGS.
5. AUXILIARY POWER CABLES SHALL BE LAID IN TOP TIERS AND CONTROL CABLES IN BOTTOM TIERS.
6. GI PIPES SHALL BE SECURELY FIXED AT BOTH ENDS, EITHER EMBEDDED IN CONCRETE OR PROPERLY CLAMPED.
7. AFTER LAYING THE CABLES THE ENDS OF PIPES SHALL BE FULLY SEALED TO PREVENT INGRESS OF WATER INSIDE THE PIPE.
8. CONTROL CABLES & POWER CABLES MUST BE LAID IN SEPARATE GI PIPES.
9. EARTHING CONDUCTOR SHALL BE WELDED ON THE CABLE SUPPORTING STRUCTURE BEFORE INSTALLATION OF CABLE.
10. HORIZONTAL BENDS IN CONDUITS TO BE AVOIDED. CONDUITS TO BE RUN STRAIGHT FROM EQUIPMENT TO TRENCH/MK/JB. CONDUITS SHALL BE BENT AT SITE BY FILLING SAND AND MODERATELY HEATING THE SAME. NO BENDS SHALL BE USED.
11. CABLE TRENCH SHALL BE PROVIDED ON MARSHALLING BOX SIDE OF EQUIPMENT.
12. THE PURPOSE OF TRENCH LAYOUT DRAWING IS FOR USE AS FOLLOWS:
    - TO BE USED AS CIVIL INPUT FOR CABLE TRENCHES.
    - FOR ERECTION OF CABLE RACKS AT SITE.
    - FOR CABLE LAYING AND ROUTING AT SITE.
13. CIVIL DETAILS OF TRENCH WITH LOCATION OF EQUIPMENT FOUNDATIONS WILL BE SHOWN IN A SEPARATE CIVIL DRAWING.
14. THE CABLE RACKS SHALL BE EARTHED BY A 65x8MM FLAT RUNNING ON THE CABLE TIERS WHICH SHALL BE CONNECTED TO EARTH AT EVERY 30 mts. INTERVAL AND AT THE ENDS. THIS FLAT SHALL BE CONNECTED TO EACH OF THE RACKS
15. CABLE SHALL BE LAID AS PER IS : 1255.
16. CABLE TRENCH LAYOUT FOR CONTROL ROOM SHALL BE SUBMITTED SEPARATELY.
17. SIZE OF PIPES/CONDUITS SHALL BE SELECTED ON 40% FILL CRITERIA.
18. CABLES SHALL BE LAID IN 3-TIER LAYING SYSTEM.



TYPICAL DETAIL OF MK FDN W.R.T. CABLE TRENCH



DETAIL SHOWING ROUTING OF CABLE INSIDE GI PIPE – CABLE TRENCH TO EQUIPMENT

REV.	STATUS	TYPE	REASONS FOR REVISION	PREPARED BY	CHECKED BY	APPROVED BY	DATE
3			REVISED AS PER CONTROL ROOM TRENCH LAYOUT	SSR	SKS	DS	31.12.10
2			REVISED AS PER APPROVED LAYOUT REV.-08	RAJESH	SKS/DS -SD-	SN -SD-	10.11.10
1			REVISED AS PER CUSTOMER COMMENTS DATED 22.10.09	JOGINDER	SKS/DS -SD-	SN -SD-	24.11.09
0			FIRST ISSUE	KAPIL	SKS/DS -SD-	SN -SD-	16.09.09

GUJARAT STATE ELECTRICITY CORPORATION LTD.

परियोजना का नाम / NAME OF PROJECT: **2x250MW SIKKA THERMAL POWER PROJECT EXTENSION UNITS 3 & 4, DIST JAMNAGAR**

TCE CONSULTING ENGINEERS LTD.
DRAWING TCE REF. No. : TCE 5064A-EPC-BH-(UNIT)-0001

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
ट्रांसमिशन परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

DEPT.	TBEM
CODE	422
SCALE	1:470
W.O. No.	87004
DRWG. NO :	TB-1-301-316-008
DRAWING TITLE :	CABLE TRENCH LAYOUT FOR 220kV S/S AT SIKKA