



## KEY PLAN

SINGLE LINE DIAGRAM DWG. NO. TB-1-400-316-001-REV 09  
ARCHITECTURAL DRAWING CONTROL ROOM BUILDING (PLAN) DWG. NO. TB-1-400-607-620-1-REV 01  
CONCEPTUAL GIS BUILDING LAYOUT DWG. NO. TB-1-400-316-005-R2  
GIS LAYOUT DWG. NO. 1HYG900056-2-REV AD  
PLOT PLAN DWG. NO. PE-DG-435-100-M001-REV 04  
INSTALLATION DETAILS FOR CABLE SUPPORT SYSTEM (BOLTABLE TYPE) DWG. NO. PE-DG-435-507-E006 REV 01  
TYPICAL DETAILS OF CABLE TRAYS AND ACCESSORIES GS AND FRP TYPE DWG. NO. PE-DG-435-507-E005 REV 02, SHEET 1 TO 14 OF 34

THIS DRAWING SHOULD BE REFERRED ONLY FOR TRENCH/CONDUIT ROUTING/DETAIL IN SWITCHYARD, GIS BUILDING & CONTROL ROOM BUILDING.


THIS DRAWING WILL BE APPROVED IN CAT-2 FOR PROCEEDING WITH CIVIL DESIGN. FINAL APPROVAL SHALL BE GIVEN AFTER CIVIL DRAWINGS ARE RELEASED AND ALL TRAY AND TRENCH DETAILS ARE INCORPORATED IN THE DRAWING.


 <b>UNDAWI'S SURVIVAL CRITICAL THERMAL POWER PROJECT (2 x 640 MW)</b> 	
<input type="checkbox"/> <b>CAT-1</b>	Drawings/Documents approved by final distribution, BHEL will proceed with manufacturing.
<input checked="" type="checkbox"/> <b>CAT-2</b>	Drawings/Documents cleared for manufacturing/ fabrication/ construction subject incorporating the comments given. BHEL to resubmit the drawing for Approval. Category 2 Comments will be incorporated.
<input type="checkbox"/> <b>CAT-3</b>	Drawing document of this category are for information only and not for approval. Information limited on the drawings.


Approval/ consent between either respective or Vice/President/Chair of the contract agreements and the responsibilities for the drawings, documents, materials and components shall be assigned to the respective parties. The conformity to the relevant standards and specifications shall be confirmed by the respective parties. The conformity to the relevant code standards shall be confirmed by the respective parties. The conformity to the relevant code standards shall be confirmed by the respective parties.





**NOTE**

- It is mandatory to sign documents with Code 2 & 3 to CAT in agreed contract period of 2 weeks after approval.
- Any other comments/modification required to be carried out in Code 4 Documents shall be in the responsibility of BHEL. BHEL to submit/ finalize the Design Change for Information.


**TATA Consulting Engineers Ltd.**



**TATA Consulting Engineers Ltd.**


**PROFESSOR TATA CONSULTING ENGINEERS LTD.**

PROJECT	2X660 MW UDANGUDI SUPERCRITICAL TPS, STAGE-1				
CUSTOMER	 TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED (TANGEDCO)				
CONSULTANT	 TATA TATA ENGINEERS LIMITED BENGALURU				
 BHARAT HEAVY ELECTRICALS LTD TRANSMISSION BUSINESS GROUP NOIDA	BHARAT HEAVY ELECTRICALS LTD TRANSMISSION BUSINESS GROUP NOIDA				
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DEPT CODE	NAME	SIGN	DATE		
E	DRN	SS		11.02.2020	
	DESIN	SS		11.02.2020	
	CHB	SKS		11.02.2020	
	APPD	AG		11.02.2020	
TITLE TRENCH LAYOUT FOR 400KV SWITCHYARD					
DEPT. SCALE : 1:300		DRAWING NO.			
SIGN		TB-2-400-316-010 			
SHEET		01	OF	04	REV. 01

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S	TITLE	TRENCH LAYOUT FOR 400KV SWITCHYARD
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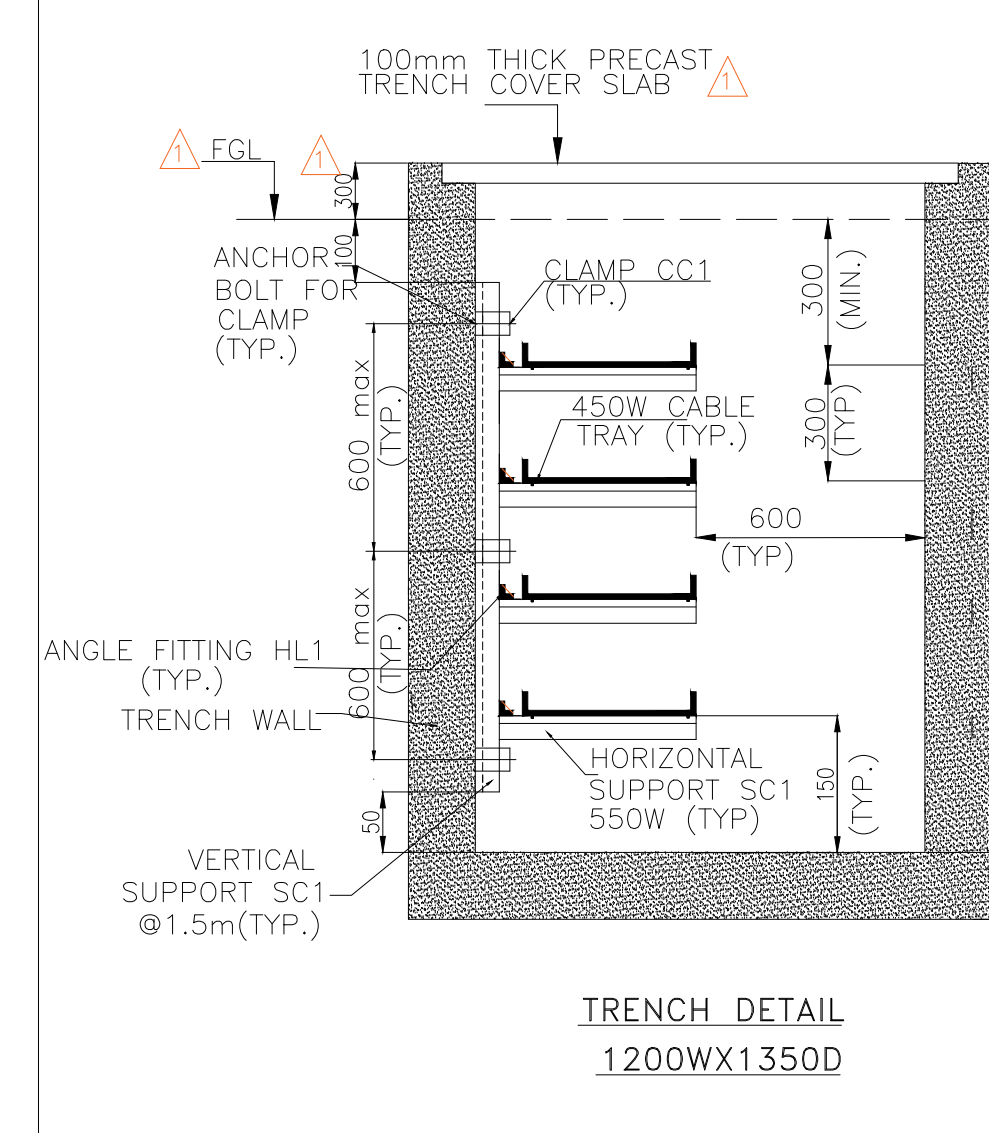
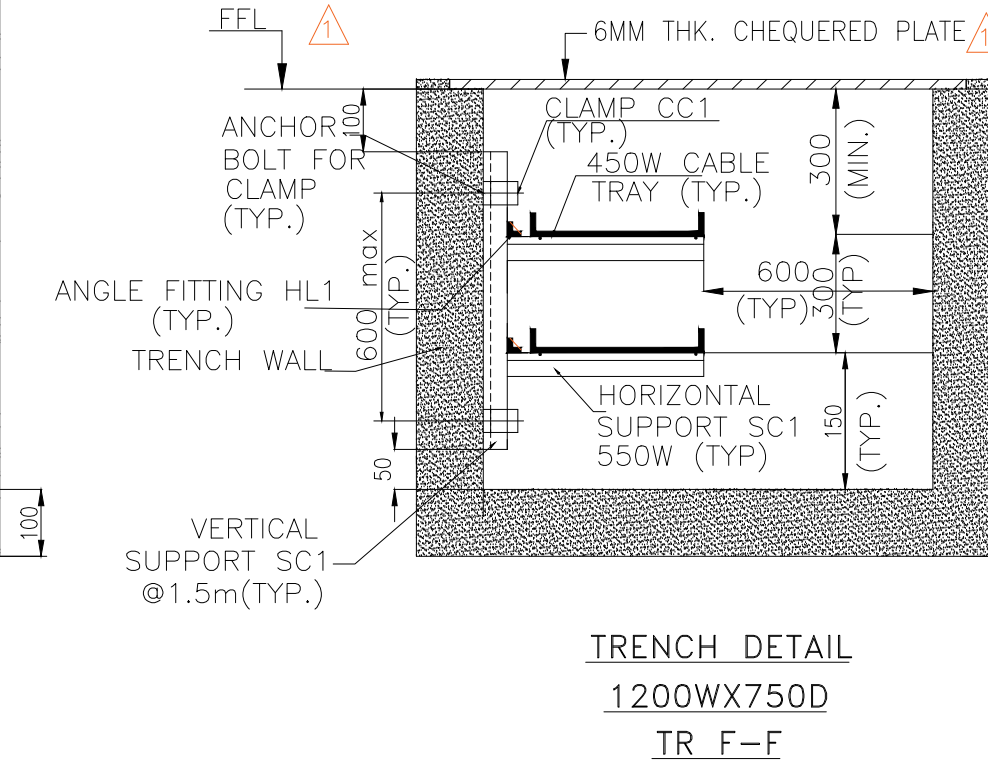
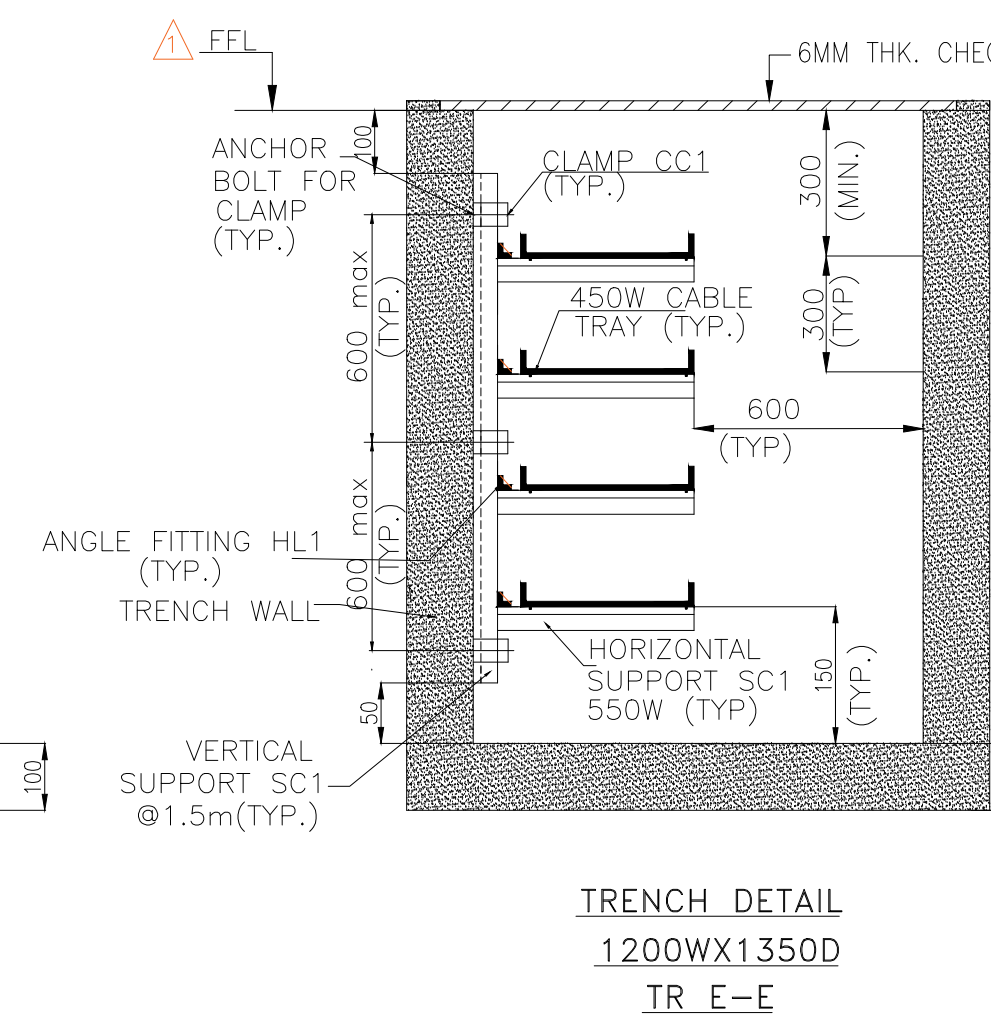
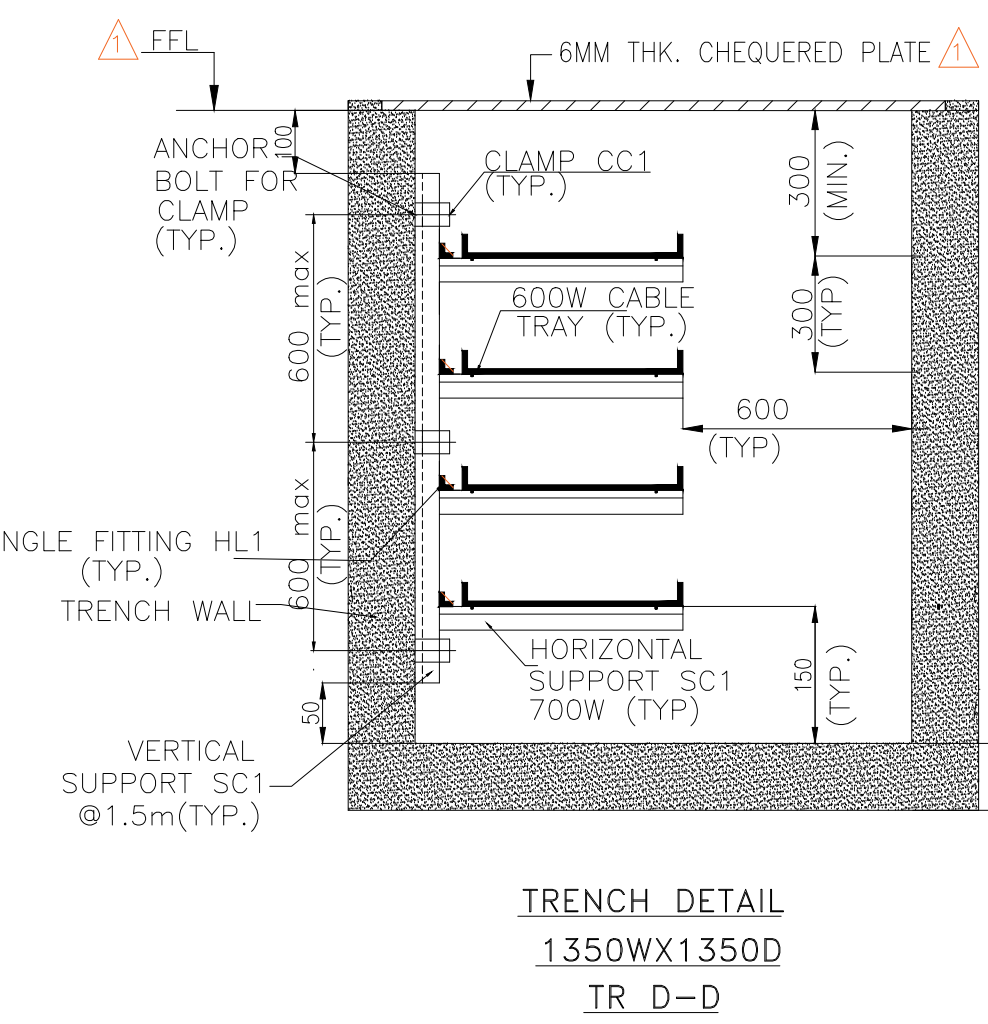
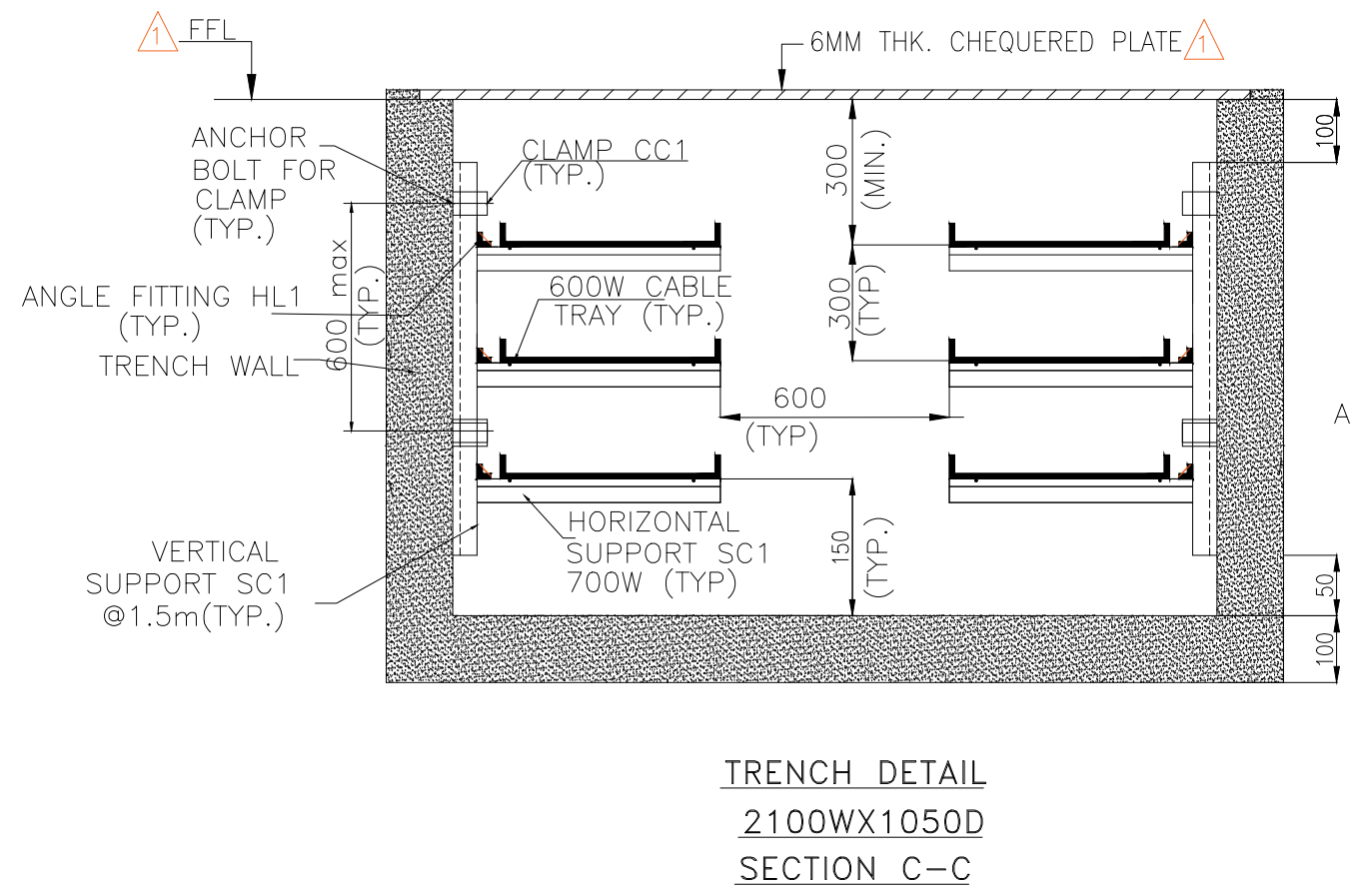
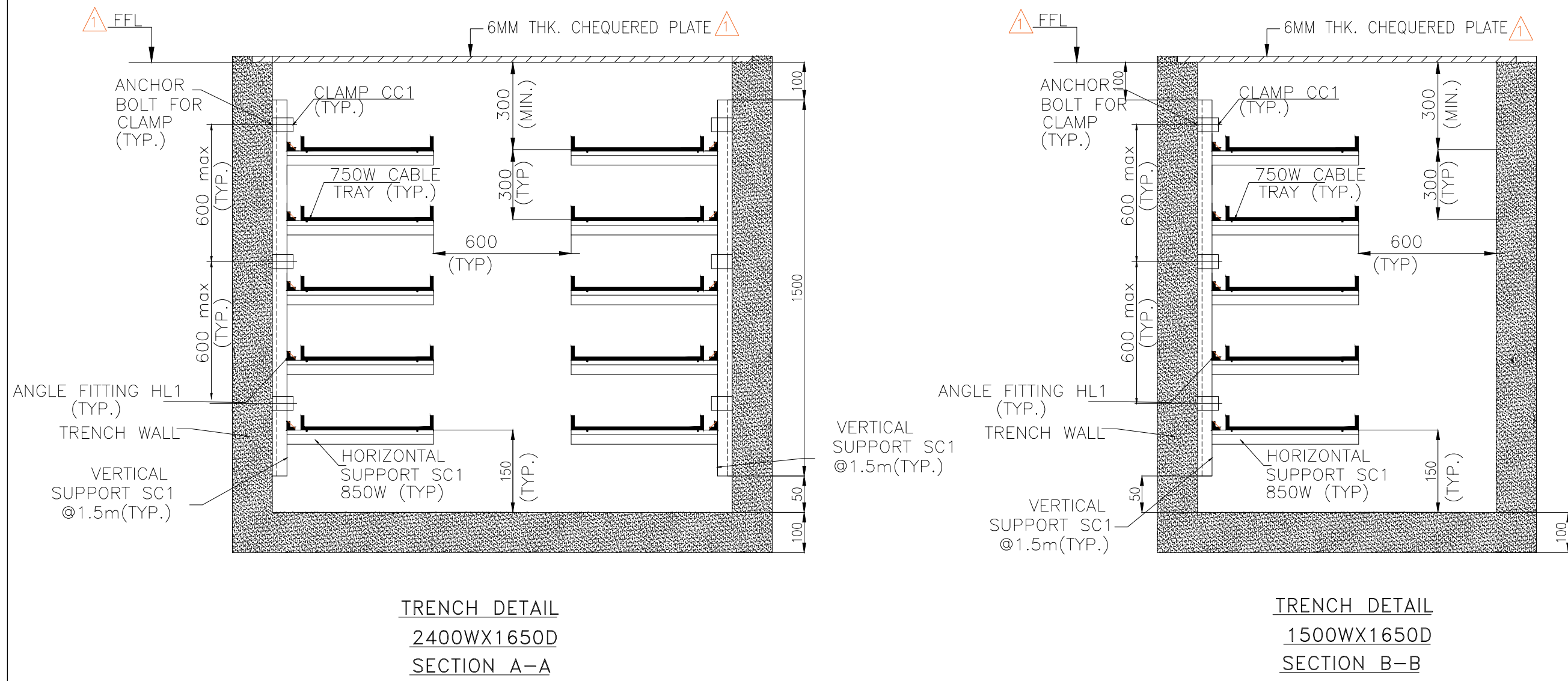
					DEPT.	SCALE 1:300	DRAWING NO. TB-2-400-316-010
					SIGN		SHEET 01 OF 04 REV. 01



TRENCH SECTION

INDOOR

OUTDOOR



A. CABLE TRAYS SUPPORT SYSTEM

- CABLE TRAYS SHALL BE BOLTED TO TRAY MOUNTING SUPPORTS WITH A MINIMUM CLEARANCE OF 300MM BETWEEN CABLE TRAY TIERS / AS SHOWN IN THE DRAWINGS.
- CABLE TRAYS SHALL BE SUPPORTED AT AN INTERVAL OF 2000MM FOR INDOOR HORIZONTAL RUNS, 1500MM FOR OUTDOOR HORIZONTAL RUNS AND 1000MM FOR VERTICAL CABLE RISERS/SHAFTS.
- CABLE TRAY SUPPORT SYSTEM SHALL BE SO DESIGNED THAT IT IS ABLE TO WITHSTAND WEIGHT OF THE CABLE TRAYS, WEIGHT OF THE CABLES (75 KG/METRE RUN OF EACH CABLE TRAY), CONCENTRATED LOAD OF 75 Kg BETWEEN EVERY SUPPORT SPAN WITHOUT ANY PERMANENT DEFLECTION.
- FOR SUPPORTING CABLE TRAYS, EMBEDDED STEEL INSERTS IF PROVIDED ON WALL/FLOOR/CEILING SURFACES SHALL BE UTILISED. IN CASE OF NON-AVAILABILITY OF EMBEDDED STEEL INSERTS OF EMBEDDED STEEL INSERTS THE CONTRACTOR SHALL HAVE TO SECURE THE SUPPORTS ON WALL/FLOOR/CEILING SURFACES BY PROVIDING SUITABLE ANCHORING SYSTEM/STEEL INSERTS HAVING ADEQUATE LOAD BEARING CAPABILITY.
- FOLLOWING DRAWINGS SHALL BE REFERRED FOR INSTALLATION:
  - INSTALLATION DETAILS FOR CABLE SUPPORT SYSTEM (BOLTABLE TYPE) DWG. NO. PE-DG-435-507-E006 REV 01
  - TYPICAL DETAILS OF CABLE TRAYS AND ACCESSORIES GS AND FRP TYPE DWG. NO. PE-DG-435-507-E005 REV 02, SHEET 1 TO 14 OF 34

B. CABLE INSTALLATION

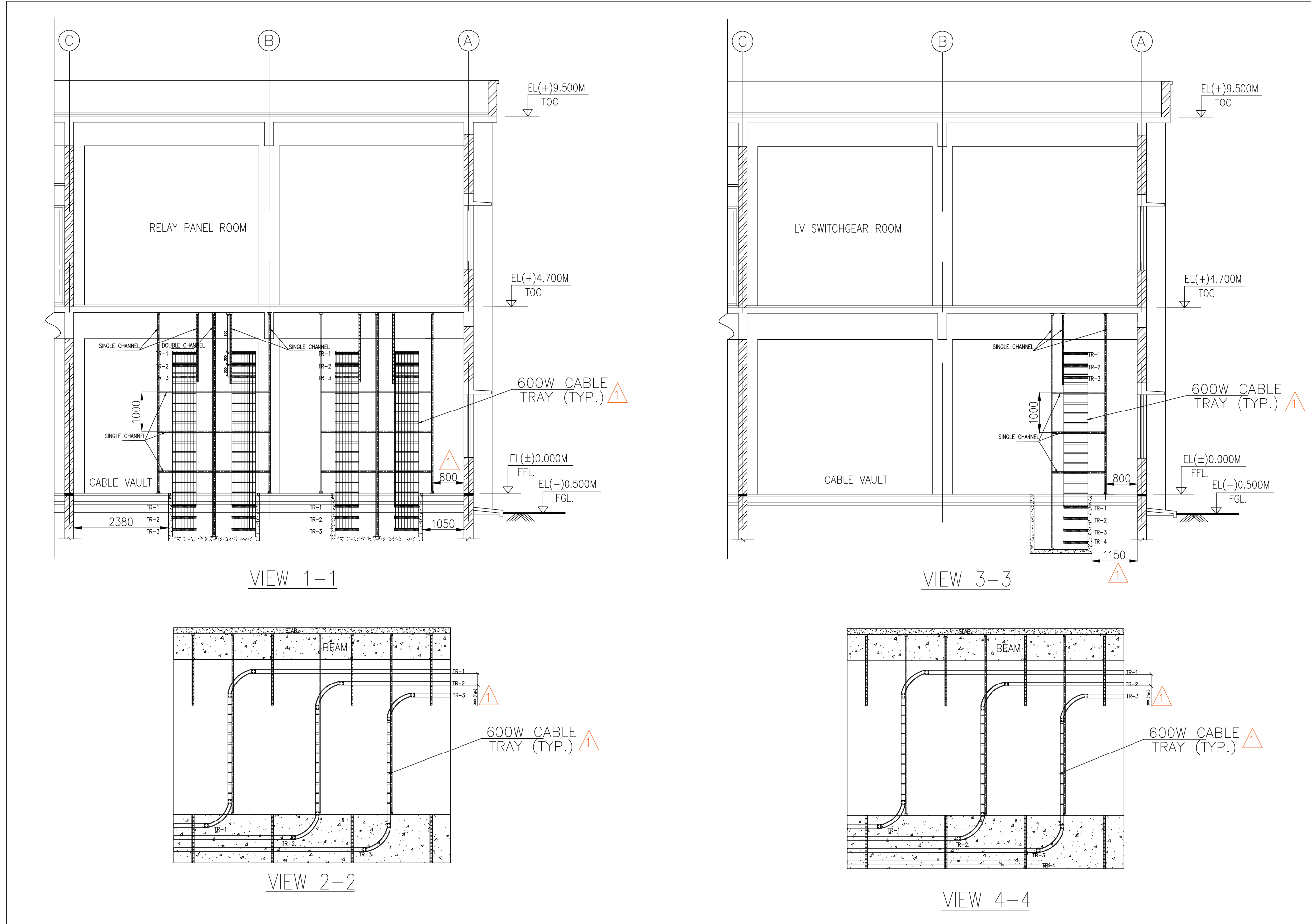
- CABLE INSTALLATION SHALL BE CARRIED OUT AS PER IS: 1255 AND OTHER APPLICABLE STANDARDS.
- POWER CABLE AND CONTROL CABLE SHALL GENERALLY BE TAKEN THROUGH SEPARATE TRAYS. IN CASE BOTH OF THE CABLES SHOULD BE UNAVOIDABLY ACCOMMODATED IN THE SAME TRAY. A SEPARATOR OR A GAP IN BETWEEN SHALL BE PROVIDED.
- THE ALLOCATION OF CABLES IN TRAYS SHALL BE IN THE FOLLOWING ORDER FROM THE TOP MOST TIER:
  - HT POWER CABLE (HT)
  - LT POWER CABLE (LV)
  - CONTROL CABLE
  - SIGNAL CABLE
- MULTICORE HT POWER CABLES SHALL BE LAID IN SINGLE LAYER ONLY IN TOUCHING FORMATION. HT/LT SINGLE CORE CABLES TO BE LAID IN TREFOIL FORMATION WITH A CLEAR SPACING EQUAL TO DIAMETER OF THE TREFOILS.
- LV POWER CABLES OF ABOVE 25 SQ.MM. SHALL BE LAID IN SINGLE LAYER ONLY. SMALLER SIZE CABLES CAN BE LAID IN 2 LAYERS.
- CONTROL AND INSTRUMENTATION CABLES MAY BE LAID UPTO A MAXIMUM OF THREE LAYERS IN EACH TRAY.
- ATLEAST 250 MM SPACING SHALL BE MAINTAINED BETWEEN TOP OF THE TRAYS AND BEAMS/PIPING ETC.

- POWER AND CONTROL CABLES SHALL BE SECURELY FIXED TO TRAYS/SUPPORTS WITH SELF LOCKING TYPE NYLON CABLE STRAP WITH DEINTERLOCKING FACILITY AT EVERY 5 METER INTERVAL FOR HORIZONTAL RUN AND CABLES LAID IN VERTICAL RUN OF TRAYS SHALL BE SECURELY FIXED TO TRAYS/SUPPORTS AT EVERY ONE METRE INTERVAL. SINGLE CORE CABLES SHALL BE LAID IN TREFOIL FORMATION USING TREFOIL CLAMPS AT EVERY 2M INTERVAL.
- ALL POWER CABLES SHOULD BE CLAMPED INDIVIDUALLY. THE SCREEN OF SINGLE CORE CABLES WILL BE BONDED TO EARTH AT ONE END ONLY. PREFERABLY AT SWITCHGEAR END.
- IN GENERAL. POWER AND CONTROL CABLES SHALL BE LAID IN LADDER TYPE TRAYS.
- BENDING RADIUS FOR CABLES SHALL BE AS PER MANUFACTURER RECOMMENDATION.
- WHERE CABLES CROSS ROADS/RAIL TRACKS. THE CABLES SHALL BE LAID IN HUME PIPES EMBEDDED IN GROUND WITH A MINIMUM COVER OF 1 METRE OR WITH PVC DUCT BANK HAVING RCC COVERING FOR LOWER DEPTH.
- IN EACH CABLE RUN WITH A ROUTE LENGTH OF MORE THAN 250M AND FOR ALL HT CABLES. SOME EXTRA LENGTH SHALL BE KEPT AT SUITABLE POINT/CABLE PULL PIT TO ENABLE ONE STRAIGHT THROUGH JOINTS TO BE MADE. SHOULD THE CABLE DEVELOP FAULT AT A LATER STAGE. CONTROL CABLE TERMINATION INSIDE EQUIPMENT ENCLOSURE SHALL HAVE SUFFICIENT LENGTHS SO THAT SHIFTING OF TERMINATION IN TERMINAL BLOCKS CAN BE DONE WITHOUT REQUIRING ANY SPLICING.
- FOR COOROSIVE AREA PVC CONDUIT AND FOR ALL OTHER AREA GI CONDUIT SHALL BE USED FOR INTERCONNECTION WITH TRENCH. CONDUITS/PIPES WITH REQUIRED BENDING RADIUS SHALL BE USED FOR ROUTING OF CABLES FROM CABLE TRAYS TO EQUIPMENT/JUNCTION BOXES. PIPE SLEEVES SHALL BE USED FOR ROUTING OF CABLES BETWEEN FLOORS, ROAD CROSSING. ENTRY/EXIT FROM OUTSIDE OF BUILDING ETC. ALL CONDUITS/PIPE SHALL HAVE THEIR ENDS CLOSED BY CAPS TILL THE CABLES ARE PULLED. AFTER THE CABLES ARE PULLED. THE ENDS SHALL BE SEALED BY SUITABLE SEALING COMPOUND.
- EACH CABLE SHALL BE TAGGED WITH NUMBERS. CABLES SHALL BE TAGGED AT THEIR ENTRANCE AT EVERY 30M AND EXIT FROM ANY EQUIPMENT, JUNCTION BOX. THE TAGS SHALL BE OF ALUMINIUM OR OTHER APPROVED MEANS WITH THE NUMBER PUNCHED ON IT AND SECURELY ATTACHED TO THE CABLE THE LOCATION OF CABLE JOINTS, IF ANY, SHALL BE CLEARLY INDICATED WITH CABLE MARKER WITH AN ADDITIONAL INSCRIPTIONS "CABLE-JOINT" AND "CABLE NUMBER".
- FERRULES SHALL BE PROVIDED ON ALL CONTROL CABLE CORES IN ALL JUNCTION BOXES AND AT ALL TERMINATIONS. THE FERRULES SHALL CARRY TERMINAL NUMBERS AS PER DRAWINGS. ALL FERRULES SHALL BE COLOURED. PLASTIC & INTERLOCKED TYPE.
- OUTDOOR TO INDOOR OPENING IN THE WALL OF CABLE VAULT, CONTROL ROOM BUILDING FOR CABLE ACCESS SHALL BE SEALED WITH FIRE PROOF MORTAR SEALING COMPONENT AFTER INSTALLATION OF THE CABLE SYSTEM.
- THE TERMINATION AND CONNECTION OF CABLES SHALL BE DONE STRICTLY IN ACCORDANCE WITH CABLE TERMINATION KIT MANUFACTURERS INSTRUCTIONS/DRAWINGS.

C. RCC CABLE TRENCH

- PROPER SLOPE SHALL BE ENSURED IN THE CABLE TRENCHES IN LONGITUDINAL AND ALSO IN TRANSVERSE DIRECTION FOR DRAINING OF WATER.
- EARTHING CONDUCTOR SHALL BE RUN ALONG THE CABLE TRENCH BY CLAMPING OR WELDING TO TRAY SUPPORTS. CABLE TRAYS SHALL BE EARTHED TO THE EARTHING CONDUCTOR AT 30M INTERVAL.

VERTICAL CABLE RISER



PROJECT	2X660 MW UDANGUDI SUPERCRITICAL TPS, STAGE-I		
CUSTOMER	TAMILNADU GENERATION AND DISTRIBUTION CORPORATION LIMITED (TANGEDCO)		
CONSULTANT	TATA CONSULTING ENGINEERS LIMITED BENGALURU		
	BHARAT HEAVY ELECTRICALS LTD TRANSMISSION BUSINESS GROUP NOIDA		



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STATUS CONTRACT

DISTRIBUTION

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TITLE TRENCH LAYOUT FOR 400KV SWITCHYARD

DEPT.	SCALE 1:300	DRAWING NO.
SIGN		TB-2-400-316-010
SHEET	02 OF 04	REV. 01

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD

REVISED AS PER TCE COMMENTS VIDE TCE/11403A-EL-VDT-407 DATED 12.03.2020







