

संदर्भ/Ref : CC-ENGG-TR202112-1001509-SS1612-EARTHMAT -LAYOUT

Date : 07/07/2022

**From :** Atul Mathur  
DGM

**To :** Toshiba T & D Systems (Ind) Pvt.  
Rudramam Village, Patancheru Mandal  
Hyderabad 502329  
502329

**Cc :** CGM (Engineering), RHQ, WR-II

**Subject :** Transformer Package TR 34

**LOA Ref :** 5002001872/TRANSFORMER/DOM/A03-CC CS-4/NOA-I/NR1-150014 Dated 28/01/2022

Please find enclosed following drawings/ documents for necessary action at your end.

**Vendor Drg. No. :** 01DFA22-TM-7100-Q-0206  
**Orgn. Drg. No. :** TR202112-1001509-SS1612-EARTHMAT -LAYOUT  
**Revision No. :** 01  
**Drg. Title :** SHUJALPUR S/S- EARTHMAT LAYOUT (OUTDOOR )  
**App. Category :** CAT-I  
**Release Date :** 07/07/2022



Scan to verify

**Comments :** Generally in order.

**अनुमोदित श्रेणी/App. Category:**

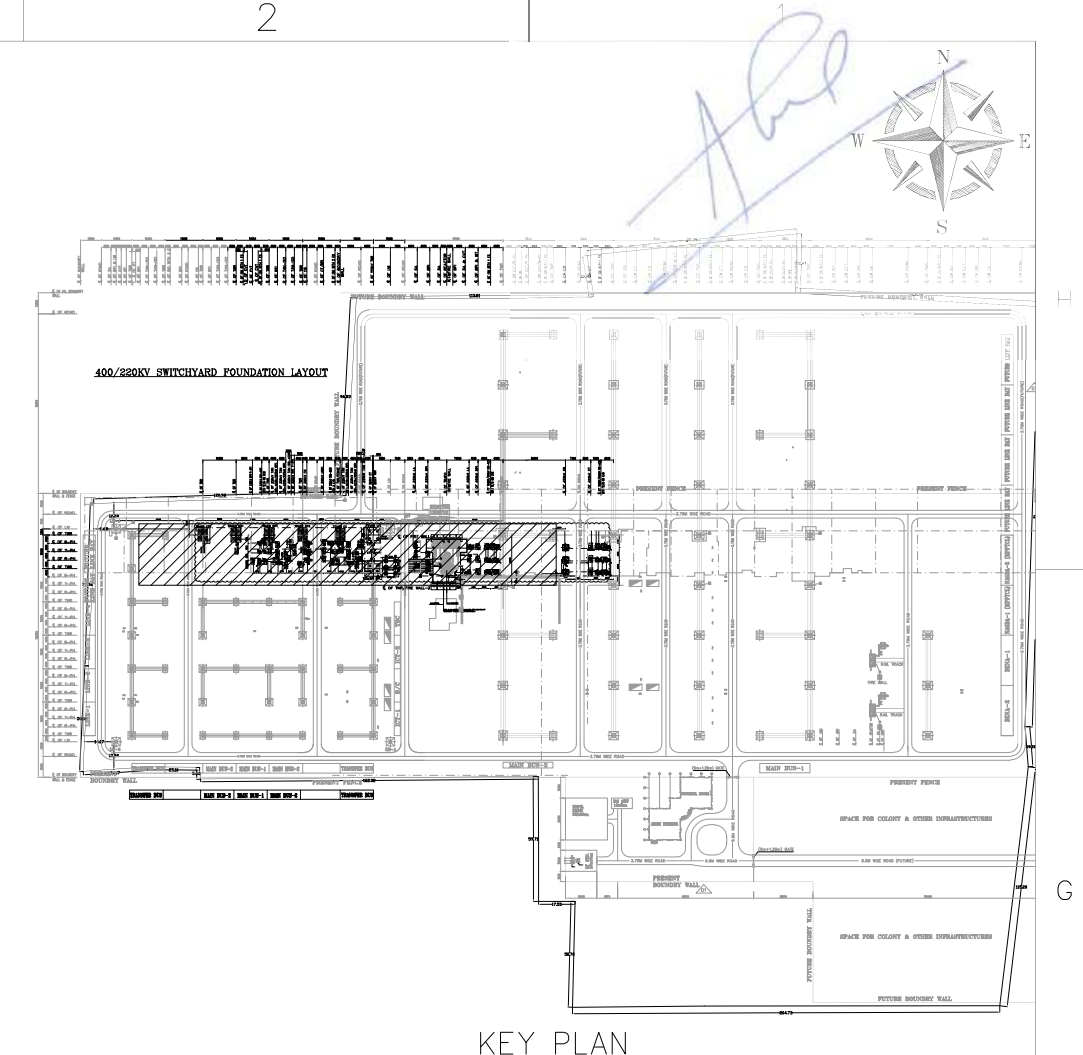
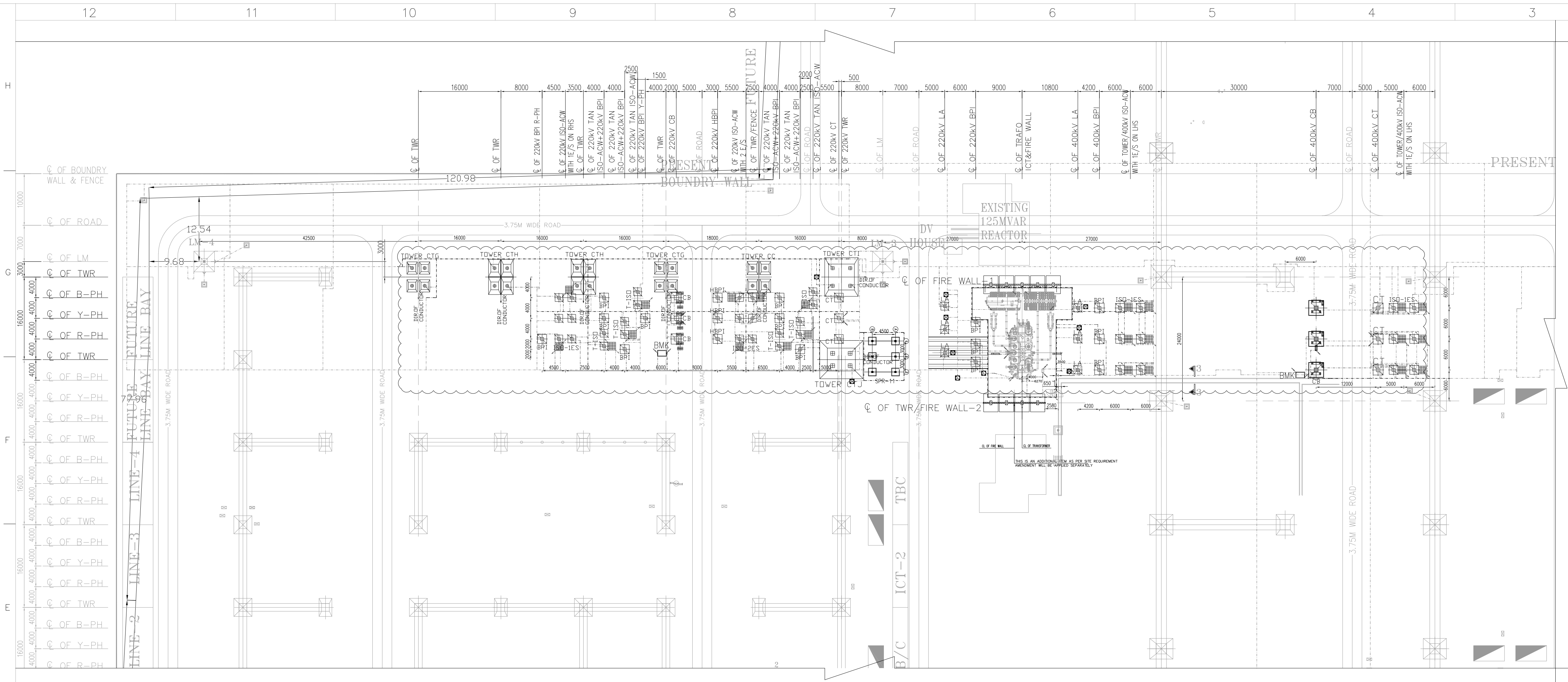
- I. फेब्रिकेशन/निर्माण/टाइप टेस्टिंग हेतु जारी।  
**Approved/released for fabrication/construction.**
  - II. फेब्रिकेशन/निर्माण/टाइप टेस्टिंग हेतु अनुमोदित/जारी बशर्ते दिए गए टिप्पणियाँ एवं आशोधनों की सम्मिलित किया जाये। कृपया रिवाइज्ड दस्तावेज अनुमोदनार्थ प्रस्तुत करें।  
**Approved/released for fabrication/ construction subject to incorporation of comments and modification as noted. Revised drawing required for approval.**
  - III. टिप्पणियाँ सम्मिलित करने के उपरांत दस्तावेज को अनुमोदनार्थ प्रस्तुत करें।  
**To be resubmitted for approval after incorporating the comments.**
  - IV. सूचनार्थ एवं रिकार्ड हेतु।  
**For information and record.**
- REL-CON निर्माण हेतु जारी।  
**Released for construction.**

**नोट/Note:**

1. Approval/Comments conveyed herein neither relieve the contractor of his contractual obligations and his responsibilities, weights, quantities, design details assemble fits, performance particulars and conformity of the supplies with the Indian Statutory Laws as may be applicable, nor does it limits the purchaser's right under the contract.
2. The approval conveyed vide this letter does not cover the approval of make for sub-vendor items.

<b>PROJECT NAME</b>	Transformer Package TR 34 for: a) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Bhadla pooling S/s including associated bays, b) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Shujalpur S/s including associated bays. c) Extension of 220kV Shajhanpur S/s. d) Implementation of 1X 80 MVAR , 765kV Spare Reactor at Bhadla S/s e) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Kohchi S/s f) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Hiriyur S/s.					
<b>NOA No.</b>	NOA Ref: 5002001872/TRANSFORMER/DOM/A03-CC CS-4/NOA-I/NR1-150014 Dated:28/01/2022 for Supply Contract NOA Ref: 5002001872/TRANSFORMER/DOM/A03-CC CS-4/NOA-II/NR1-150013 Dated:28/01/2022 for Services Contract					
<b>CUSTOMER</b>	POWER GRID CORPORATION OF INDIA LIMITED.					
<b>SUBSTATION</b>	400/220kV SHUJALPUR SUBSTATION					
<b>PGCIL DOC NO.</b>	TR202112-1001509-SS1612-EARTHMAT -LAYOUT					
<b>TTDI DOC NO.</b>	01DFA22-TM-7100-Q-0206					
<b>DOC NAME</b>	SHUJALPUR S/S- EARTHMAT LAYOUT (OUTDOOR )					
<b>VENDOR NAME</b>	TOSHIBA TRANSMISSION AND DISTRIBUTION SYSTEMS (INDIA) PVT. LTD.					
<b>S.NO.</b>	<b>DRAWINGS/DOCUMENTS DETAILS</b>	<b>PGCIL Drawing No.</b>	<b>REV</b>	<b>Category</b>	<b>APPROVAL REFERENCE</b>	<b>REMARKS</b>
1	SHUJALPUR S/S- EARTHMAT LAYOUT (OUTDOOR )	TR202112-1001509-SS1612-EARTHMAT -LAYOUT	1	-	-	-

<b>PROJECT NAME</b>	Transformer Package TR 34 for: a) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Bhadla pooling S/s including associated bays, b) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Shujalpur S/s including associated bays. `c) Extension of 220kV Shajhanpur S/s. d) Implementation of 1X 80 MVAR , 765kV Spare Reactor at Bhadla S/s e) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Kohchi S/s f) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Hiriya S/s.			
<b>CUSTOMER</b>	POWER GRID CORPORATION OF INDIA LIMITED.			
<b>SUBSTATION</b>	400/220kV SHUJALPUR SUBSTATION			
<b>PGCIL DOC NO.</b>	TR202112-1001509-SS1612-EARTHMAT -LAYOUT			
<b>TTDI DOC NO.</b>	01DFA22-TM-7100-Q-0206			
<b>DOC NAME</b>	SHUJALPUR S/S- EARTHMAT LAYOUT (OUTDOOR )			
<b>VENDOR NAME</b>	TOSHIBA TRANSMISSION AND DISTRIBUTION SYSTEMS (INDIA) PVT. LTD.			
<b>Compliance Sheet for Comments on Dwg. No.TR202112-1001509-SS1612-EARTHMAT -LAYOUT, Rev 0 (SHUJALPUR S/S- EARTHMAT LAYOUT (OUTDOOR ) )</b>				
<b>S.NO.</b>	<b>Drawing / Document details</b>	<b>PGCIL (Customer) Comments</b>	<b>TTDI reply</b>	<b>REMARKS</b>
1	TR202112-1001509-SS1612-EARTHMAT -LAYOUT	All the earthing shall be done as per cl.no. 9 of swichyard erection document	Noted .	
2	TR202112-1001509-SS1612-EARTHMAT -LAYOUT	please separate the Main earth mat , Riser, Auxillary Mat QTY.	Noted and corected the same.	



- LEGEND**
- PRESENT SCOPE
  - 40MM DIA MS ROD(MAIN EARTH MAT)
  - 40MM DIA MS ROD(EQUIPMENT RAISER)
  - FUTURE/EXISTING
  - CABLE TRENCH
  - ROD ELECTRODE
  - PIPE ELECTRODE
  - AUXILIARY EARTH MAT (MS ROD)
  - 50x6 mm GS FLAT RISER
  - 75x12 mm GS FLAT RISER

- NOTES:-**
1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE SPECIFIED.
  2. THE EARTHING SYSTEM INSTALLATION WORK SHALL CONFORM TO THE REQUIREMENT OF LATEST EDITION OF THE FOLLOWING STANDARDS/ CODES.
    - a) IS 3043
    - b) IEEE 80
  3. EARTH ROD / EARTH PIT LOCATION SHOWN IN THE DRAWING IS DIAGRAMATIC ONLY. THE PIPE ELECTRODE AND EARTH ROD SPACING CAN BE CHANGED SLIGHTLY TO SUIT THE SITE CONDITION.
  4. AN ADDITIONAL AUXILIARY GRID OF 1500MM x 1500MM CLOSELY SPACED (300MM X 300MM), 40# MAIN CONDUCTOR AT A DEPTH OF 600MM FROM THE FINISHED GROUND LVL. SHALL BE PROVIDED UNDER ISOLATOR MAIN SWITCH & EARTH SWITCH OPERATING MECHANISM THIS GRID SHALL ALSO BE CONNECTED TO MAIN GROUND GRID.
  5. DOWN CONDUCTOR OF TOWER WITH PEAK SHALL BE CONNECTED TO EARTH ELECTORDE IN A PIT WITH TEST LINK IN TEST PIT, EARTHING TERMINAL OF EACH. LINGHTNING ARRESTOR SHALL BE DIRECTLY CONNECTED TO ROD ELECTORDE. THESE ELECTRODE, IN TURN, SHALL BE CONNECTED TO MAIN GROUND MAT.
  6. CONTINUOUS RUNNING OF EARTH MAT SHALL BE FORMED AS REQUIRED WITH STRAIGHT JOINTS OF STANDARD LENGTH OF EARTH FLATS.SUCH STRAIGHT JOINTS SHALL BE MADE WITH THE MINIMUM OVER EQUAL TO THE WIDTH OF THE FLAT. THE OVERLAP PORTION SHALL BE WELDED ON ALL FOUR SIDES BY CONTINUOUS. AND THICK COAT OF ANT BITUMINOUS PAINT TO BE APPLIED.ALL THE PERPENDICULAR CROSSINGS OF FLATS SHALL BE WELDED AND APPLIED WITH THICK COAT OF ACB PAINT.
  7. ALL NON CURRENT CARRYING METAL PART SUCH AS BODY OF CIRCUIT BREAKERS, INSTRUMENT TRANSFORMERS, OUTDOOR STRUCTURES / ISOLATOR STRUCTURE ETC. ARE TO THE DIRECTLY CONNECTED TO THE EARTH MATE USING GS FLATS WITH TO DISTINCT CONNECTIONS RUN IN OPPOSITE DIRECTIONS.
  8. WHENEVER EARTH CONDUCTORS CROSSING CABLE TRENCHES UNDER GROUND SERVICE DUCTS. PIPE TUNNELS, ROAD ETC. IT SHALL BE LAID MINIMUM 300MM BELOW THEM AND SHALL BE REROUTED IN CASE IT FOULS EQUIPMENT/ STRUCTURES FOUNDATION.
  9. 50x6MM MS FLAT SHALL BE RUN THAT TOP TIER AND ALONG THE CABLE TRENCHES AND THE SAME SHALL BE WELDED TO EACH OF THE RACKS FURTHER THIS FLAT SHALL BE EARTHED AT BOTH ENDS.
  10. RAISER CONNECTION DETAILS REFER DRAWINGS ENCLOSED WITH TS.
  11. FOR NUMBER OF RISERS, DRAWING NO,C/ENG/STD/EARTHINGS/09,ENCLOSED. WITH THE TECHNICAL SPECIFICATION SHALL BE FOLLOWED.
  12. LOCATION OF AXULIARY EARTHMAT (1500x1500) IS INDICATIVE ONLY. THE SAME SHALL BE LAID BASED ON ACTUAL LOCATION OF EQUIPMENT MARSHALLING BOX.
  13. INCASE OF EXISTING MAIN EARTHMAT WHICH ARE ALREADY LAID IN THE PRESENT SCOPE AREA, COMING ON THE WAY OF NEW EQUIPMENT FOUNDATION TO BE ERECTED, SHALL BE RE-ROUTED WITH NECESSARY CUTTING AND RE JOINING.
  14. [\*]-- TRAF0, 400 & 220 kv EQUIPMENT EARTHING POSITION WILL VARY AS PER SITE CONDITION.

All earthing shall be done as per clause 9.0 of section-switchyard erection.

**BILL OF MATERIAL: B**

SI.NO	DESCRIPTION	SYMBOL	QTY.
01(a).	40mm DIA M.S ROD FOR EQUIPMENT, STRUCTURE EARTHING, JB EARTHING, TRANSFORMER EARTHING (BELOW GROUND). (Riser)	-----	930 M
01(b).	40mm DIA M.S. ROD FOR MAIN EARTH MAT, TRANSFORMER, SPR ROOM	-----	470 M
01(c).	40mm DIA M.S ROD FOR AUX. EARTH MAT	-----	414 M
02.	75 x 12mm GS FLAT FOR TRANSFORMER EARTHING, EQUIPMENT & STRUCTURE EARTHING (ABOVE GROUND)	↗	498 M
03.	50 x 6mm GS FLAT FOR OUTDOOR JB,BMK, MB EARTHING, CONTROL PANELS & LIGHTING PANELS (ABOVE GROUND)	↗	281 M
04.	50 x 6mm MS FLAT FOR CABLE TRENCH EARTHING	↗	87 M
05.	40mm DIA 3 MTR LONG MS ROD ELECTRODE WITH UNTREATED EARTH PITS FOR LA, TOWER WITH PEAK.	⊗	08 Nos.
06.	40mm DIA 3 MTR LONG G.S. PIPE ELECTRODE WITH TREATED EARTH PITS FOR TRANSFORMER NEUTRAL EARTHING	⊗	02 Nos.
07.	75 x 12mm GI FLAT FOR PYLON SUPPORT EARTHING	↗	80 M
08.	50 x 6 GI FLAT FOR PYLON SUPPORT EARTHING	↗	45 M

**REFERENCE DRAWINGS:**

1. ELECTRICAL SWITCHYARD EARTHING LAYOUT (400KV SHUJALPUR NEW S/S):ECI-ELE-0209-SUJ-1007
2. ELECTRICAL SWITCHYARD EARTHING LAYOUT (220KV SHUJALPUR NEW S/S):ECI-ELE-0209-SUJ-1008
3. STANDARD EARTHING DETAILS: C/ENG/STD/EARTHINGS/09
4. SHUJALPUR SUBSTATION - OUTDOOR CABLE TRENCH LAYOUT: TR202112-1001509-SS1612-CABLETRENCH-LAY
5. SHUJALPUR SUBSTATION - FOUNDATION LAYOUT: TR202112-1001509-SS1612-CIVIL-FDN-LAY

B	REVISED AS PER COMMENTS	BS	MVS	RK
A	FOR APPROVAL	BS	MVS	RK
Rev. No	Description	PRPD. BY:	CHK. BY:	APRD. BY:
Revisions				
<b>CLIENT :</b>	Power Grid Corporation of India Limited (A Government of India Enterprises)			
<b>PROJECT:</b>	Transformer Package TR 34 for: a) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Bhadra pooling S/S including associated bays, b) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Shujalpur S/S including associated bays, c) Extension of 220kV Shahjahanpur S/S, d) Implementation of 1X 80 MVAR, 765kV Spare Reactor at Bhadra S/S, e) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Kohchi S/S, f) Supply of 1X 500MVA, 420/220/33kV Auto transformer at Hiriyur S/S.			
<b>LOA NO:</b>	NOA Ref: 5002001872/TRANSFORMER/DOM/A03-CC CS-4/NOA-I/NR1-150014 Dated:28/01/2022 for Supply Contract NOA Ref: 5002001872/TRANSFORMER/DOM/A03-CC CS-4/NOA-II/NR1-150013 Dated:28/01/2022 for Services Contract			
<b>SUBSTATION:</b>	420/220kV SHUJALPUR SUBSTATION			
<b>CONTRACTOR:</b>	Toshiba Transmission & Distribution Systems (India) Pvt.Ltd			
<b>Drawing No:</b>	TR202112-1001509-SS1612-EARTHMAT -LAYOUT			
<b>DATE:</b>	PRPD. BY:	CHK. BY:	APRD. BY:	Sheet 1 of 1
24.06.2022	BS	MVS	RK	
<b>TITLE:</b>	SHUJALPUR SUBSTATION - EARTHMAT LAYOUT (OUTDOOR)			Rev No: B