COMMENT RESOLUTION SHEET			
DRG / DOC TITLE	**400 KV Layout Plan & Section**		
NTPC DRG / DOC NO.	**9585-001-572-PVE-F-0013**		
Revision	**0**		
Reviewed By	**NTPC**		
Review Date / Location	**21-08-2018/NTPCEOC**		
400kV GIS SWITCHYARD			
SR. No.	**Page No. / Clause No. / Sheet No.**	**NTPC Observations / Comments**	**BHEL Reply**
1	1	BHEL requested to resubmit the drawing after discussion with Custodian.	Drawing revised as per dicussion dated 06-03-2019 and revised GIS layout (plan and section).
2	1	On Hold as GT , ST UAT area will be finalized after the Finalisation of ACC .	Noted. Incorporated in the drawing.
3	1	i) Mark the various height of trestle coming between main plant & switch yard under crossing the O/H conductor or any pipe rack trestle. ii) Indicate the roads & any major facilities coming in between after ACC & switchyard.	Shall be as per approved trench layout and road layout respectively.
4	1	Mark the co-ordinate of towers & clerances, angle of deviaition of conductors etc	Incorporated.
5	1	Mark the coordinate of towers & clearances, angle of deviation of conductors etc.	Incorporated.
6	1	Bus reactor #1	Incorporated.
7	1	mark as GT#1 & so on for other bays	Incorporated.
8	1	mention the equipment	Incorporated.
9	1	Mark Coordinate of all corners of switchyard fencing area	Incorporated.
10	1	mark as future	Incorporated.
11	1	indicate the distance b/w the GIS ducts	Incorporated. Shown typical dimension in GT3 interconnecting GIB.
12	1	In GIS Building indicate space for mintenance bay, clear space on either side of GIS as per the spec. clause no:1.01.08	Incorporated. As per revised GIS layout (plan and section).

Signature Not Verified

Digitally signed by R K Niranjan
Date: 2019.04.08 17:02:42 IST
Reason: CAT II
Location: NTPCEOC

COMMENT RESOLUTION SHEET			
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400kV GIS SWITCHYARD			
SR. No.	**Page No. / Clause No. / Sheet No.**	**NTPC Observations / Comments**	**BHEL Reply**
13	1	i) superimpose all switchyard facilities in this lay out drawing i.e main roads, interconnecting roads for equipment s & peripheral roads and other facilities etc. ii) Mark the Co-ordinate of All Towers and its clearances, angle of deviation of conductors. iii) show GIS switchyard in side fence area drawings separately. For showing the layout & sectional drawings etc after superimpose all facilities. iv) Mark the location of LMs(Lightning Mast) as per the approved DSLP location . v) The line take off gantry location as per the dead end tower location . The same will be finalised later as per the clause no 1.01.07 vi) The clearance will be finalised as per the approval of clerance check diagram. vii) Show the location of sump pit to drain water . Vii(Reactor oil pit , with drawl direction & its connected roads, etc shall be shown	i). Incorporated. ii). Incorporated. iii). Sheet 2 added. Incorporated facilities in sections in sheet 3. iv). Lightning protection of switchyard and buildings is through shield wires as per approved DSLP layout. v). Noted. However indicative deadend tower coordinates shown on the layout which will provide optimum interconnection. NTPC to confirm. Tentat vi) Noted. vii). Shall be shown in civil foundation layout. viii). Incorporated.
14	1	Bus reactor #2	Incorporated.
15	1	Mark as Line #1 & so an for other bays	Incorporated.
16	1	1) Indicate road layout inside the switchyard. 2) Indicate coordinates of all the towers, gantries, Bus reactor and GIS building.	Incorporated.
17	1	Mark Co-ordinate	Incorporated.
18	2	mention Size of IPS tube	Incorporated.
19	2	Ground wire	Incorporated.
20	2	Typical Stringing from Switchyard to GT shall be shown.	The sections of ACC shall be finalized after finalization of ACC yard.

ON HOLD AS GT , ST UAT AREA WILL BE FINALIZED AFTER THE FINALIZATION OF ACC.

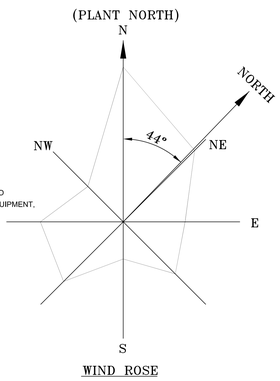
NORTHING COORDINATE OF T1 TOWERS UNDER HOLD. SHALL BE FINALIZED AFTER ACC INPUTS.

CONDUCTOR & STRINGING DETAILS :-

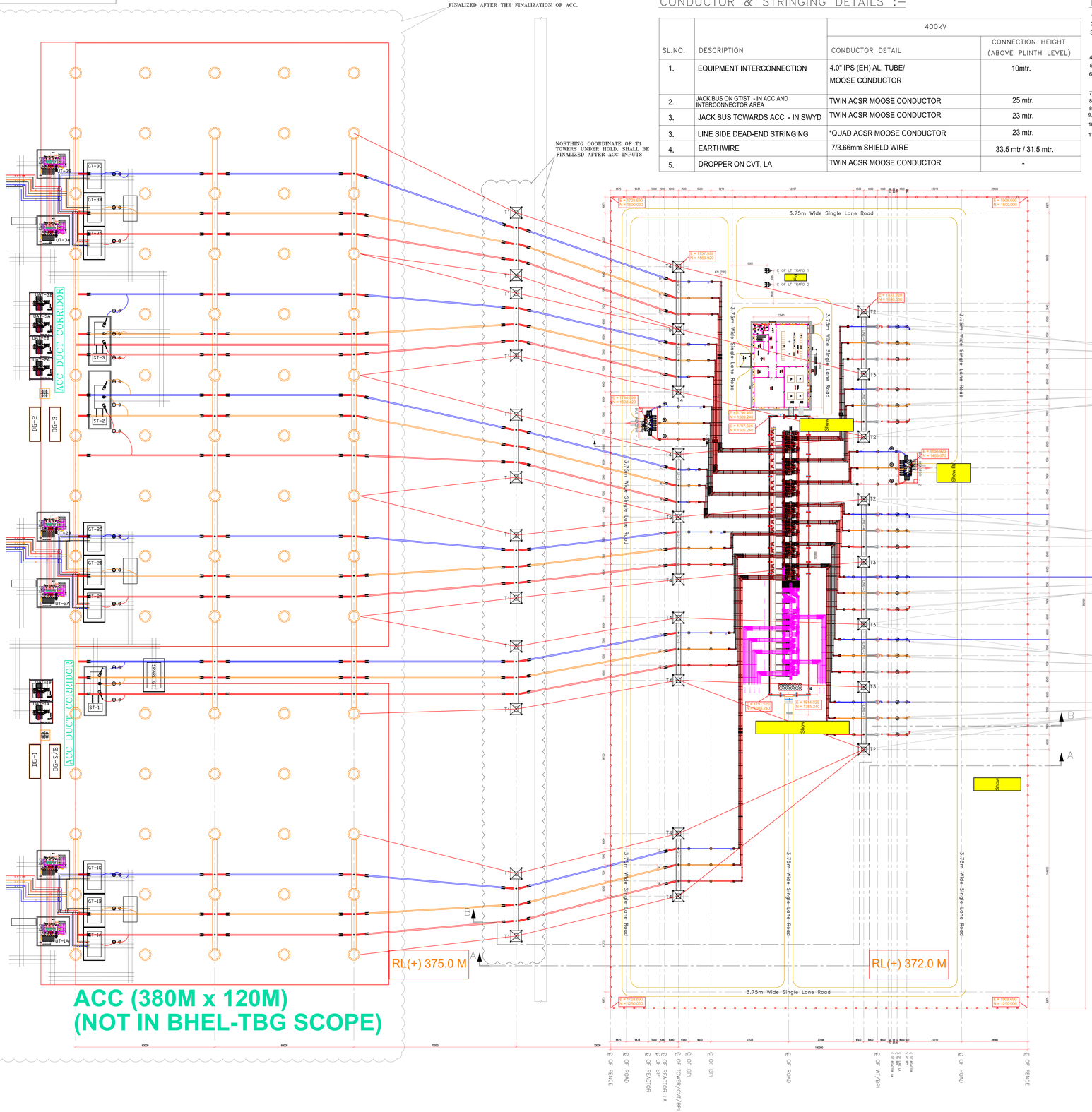
SL.NO.	DESCRIPTION	400kV	
		CONDUCTOR DETAIL	CONNECTION HEIGHT (ABOVE PLINTH LEVEL)
1.	EQUIPMENT INTERCONNECTION	4.0" IPS (EH) AL. TUBE/ MOOSE CONDUCTOR	10mtr.
2.	JACK BUS ON GT/ST - IN ACC AND INTERCONNECTOR AREA	TWIN ACSR MOOSE CONDUCTOR	25 mtr.
3.	JACK BUS TOWARDS ACC - IN SWYD	TWIN ACSR MOOSE CONDUCTOR	23 mtr.
3.	LINE SIDE DEAD-END STRINGING	*QUAD ACSR MOOSE CONDUCTOR	23 mtr.
4.	EARTHWIRE	7/3.66mm SHIELD WIRE	33.5 mtr / 31.5 mtr.
5.	DROPPER ON CVT, LA	TWIN ACSR MOOSE CONDUCTOR	-

NOTES:

1. ALL DIMENSIONS ARE IN MM.
2. ALL STRUCTURE/CONDUCTOR HEIGHTS ARE ABOVE PLINTH LEVEL. PLINTH LEVEL IS 300 MM ABOVE F.G.L.
3. WAVE TRAP FOUNDATION SHALL BE PROVIDED FOR ALL THREE PHASE OF THE LINE AND SHALL BE SUITABLE FOR BPI ALSO. HOWEVER WAVE TRAP SHALL BE INSTALLED ON TWO PHASES ONLY. STRING INSULATR SHALL BE PROVIDED FOR ONE PHASE WHEREVER WAVETRAP IS NOT INSTALLED.
4. TYPE OF GANTRY STRUCTURES SHALL BE AS PER APPROVED STRUCTURAL LAYOUT DRAWING.
5. SWITCHYARD LIGHTNING PROTECTION IS ACHIEVED THROUGH SHIELD WIRES AS PER APPROVED DSLP.
6. SA PRESSURE RELIEF VALVE SHALL NOT BE TOWARDS TRANSFORMER SIDE / ANY EQUIPMENT KEPT NEAR LIGHTING ARRESTER AND BHEL SHALL ENSURE THE SAME DURING ERECTION AT SITE.
7. FOR GIS SWITCHYARD IN FENCE AREA, REFER SHEET No. 02
8. FOR SECTION DETAILS, REFER SHEET No. 03.
8. STRINGING UPTO GT & ST BAYS SHOWN IS TENTATIVE.
9. SIZE OF GIS AND CONTROL ROOM BUILDING IS AS PER RESPECTIVE APPROVED LAYOUTS.
10. DEAD END TOWERS LOCATION TO BE CONFIRMED BY NTPC.
11. SUPPLY AND STRINGING OF 400kV LINE CONDUCTOR, SHIELD WIRE, INSULATOR AND HARDWARE BETWEEN 400kV DEAD END TOWER AND SWITCHYARD TERMINAL GANTRY ARE NOT IN BHEL SCOPE. HOWEVER, JUMPERING FOR THE RESPECTIVE EQUIPMENT, JUMPERS & HARDWARE REQUIRED FOR JUMPERS ARE IN SCOPE OF BHEL.



WIND ROSE



400kV SYSTEM PARAMETERS

Sl.No.	DESCRIPTION OF PARAMETER	
1	SYSTEM OPERATING VOLTAGE	400kV
2	MAX. OPERATING VOLTAGE OF THE SYSTEM (rms)	420kV
3	RATED FREQUENCY	50Hz
4	NO. OF PHASES	3
5	RATED INSULATION LEVELS	
	i) FULL WAVE IMPULSE WITHSTAND VOLTAGE (1.2/50microsec.)	± 1425kVp
	ii) SWITCHING IMPULSE WITHSTAND VOLTAGE (250/2500microsec.)	± 1050kVp
	iii) ONE MINUTE POWER FREQUENCY WITHSTAND VOLTAGE (rms)	630kV (rms)
6	CORONA EXTINCTION VOLTAGE (MIN)	320kV (rms)
7	MAX. RADIO INTERFERENCE VOLTAGE FOR FREQUENCY BETWEEN 0.5MHz & 2MHz AT 266KV rms	1000 microV
8	MIN. CREEPAGE DISTANCE	25MM/kV (10500 MM)
9	MIN. CLEARANCE	
	i) PHASE TO PHASE	4000MM
	ii) PHASE TO EARTH	3500MM
	iii) SECTIONAL CLEARANCE	6500MM
10	RATED SHORT CIRCUIT CURRENT FOR 1SEC DURATION	63kA
11	SYSTEM NEUTRAL EARTHING	EFFECTIVELY EARTHED
12	SUB CONDUCTOR SPACING	450MM
13	CONDUCTOR STATIC TENSION	
	400kV TWIN	6T PER PHASE
	400kV QUAD	6T PER PHASE

LEGEND:

———	FUTURE/ NOT IN BHEL SCOPE.
———	PRESENT/ BHEL SCOPE
*	TO BE CONFIRMED BY CUSTOMER

DSLP

REFERENCE DRGS.

SN	NTPC Drg. No.	DESCRIPTION
1	9585-001-999-POC-F-001	PLOT PLAN
2	9585-001-572-PVE-P-0002	400kV SWITCHYARD SINGLE LINE DIAGRAM
3	9585-001-572-PVE-F-0283	GIS Layout (Plan and Section View)

NOA NO. 01/PVUNL-CS-9585-001-2/NOA-FC DATED 08/03/2018
01/PVUNL-CS-9585-001-2/NOA-SC DATED 08/03/2018
01/PVUNL-CS-9585-001-2/NOA-TC DATED 08/03/2018

ADDITIONAL INFORMATION W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

ग्राहक/परियोजना का नाम NAME OF CUSTOMER/PROJECT: PATRATU VIDYUT UTPADAN NIGAM LTD. PATRATU SUPER THERMAL POWER PROJECT EXPANSION PHASE-I (3x800 MW)

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

	नाम /NAME	हस्ता./SIGN.	दि./DATE
बनाया/DRAWN	NS	-SGD-	10-08-18
जांचा/CHECKED	SKS	-SGD-	10-08-18
स्वीकृत/APPROVED	AG	-SGD-	10-08-18

VENDOR

REV.	DATE	ALTERED	CHECKED	APPROVED
01	05-04-19	NS	SKS	AG

ZONE: REVISED AS PER NTPC'S COMMENTS DATED 21.08.18 AND REVISED GIS LAYOUT.

विभाग/DEPT.
कोड/CODE
अनुपात / SCALE
कार्ड कोड/CARD CODE

शीर्षक/TITLE: 400 kV LAYOUT PLAN & SECTION

ड्रॉइंग सं./DRAWING NO.: NTPC DRG NO. 9585-001-572-PVE-F-0013; BHEL DRG NO. TB-0-397-316-002

पृष्ठ/REV.: 01

पृष्ठ सं./SHEET No. 01 अगला पृष्ठ/NEXT SHEET 02

COMPUTER DRG. PATH NAME :
REF. DRG. No.
SIGN. & DATE
INVENTORY No.

DRAWING No. 9585-001-572-PVE-F-0013

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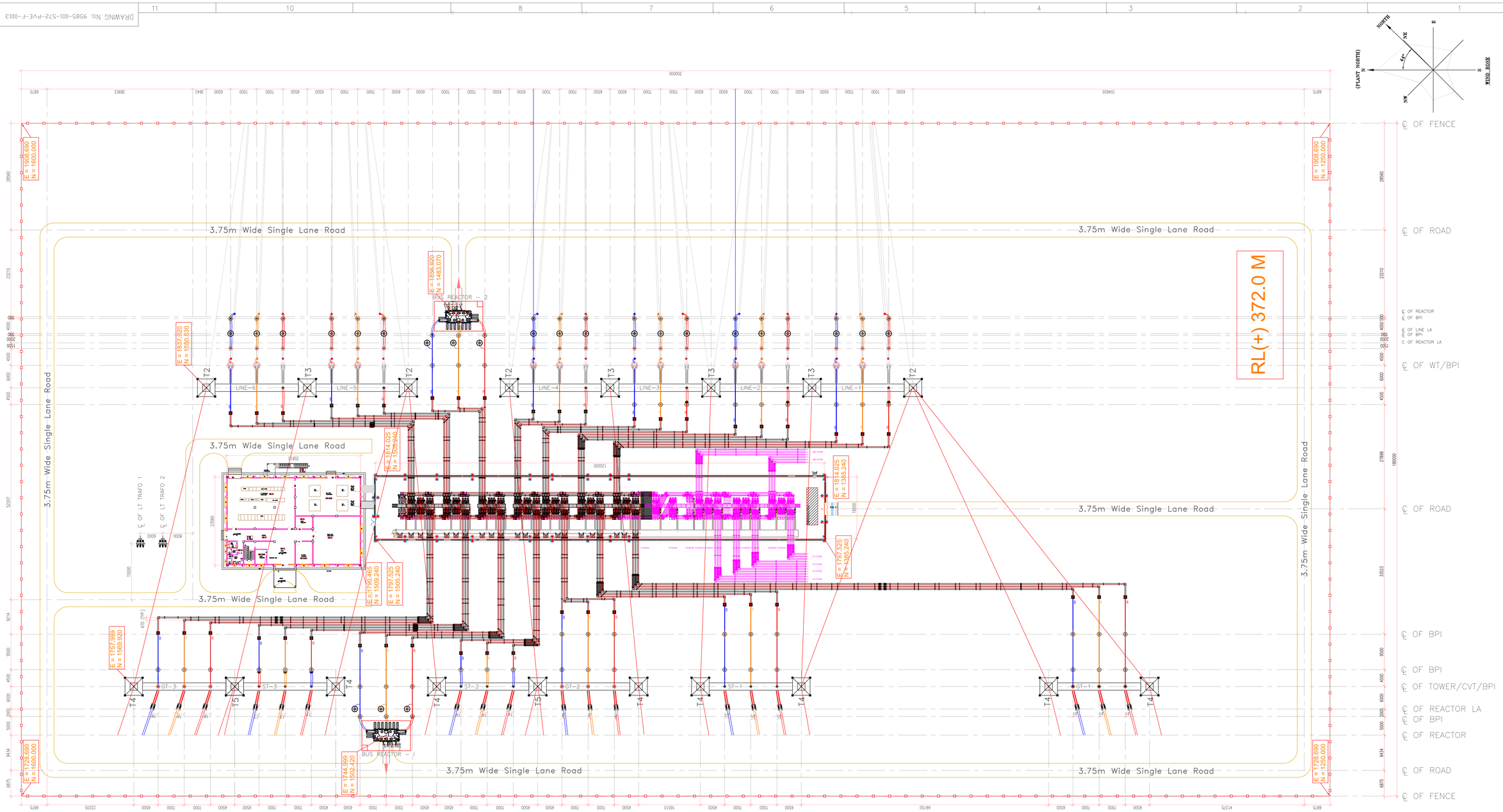

400kV OUTDOOR EQUIPMENT

S.NO.	DESCRIPTION	SYMBOL	UNIT	QUANTITY
1	125 MVAr, 400kV SHUNT REACTOR - 3PH		NOS.	2
2	336 kV LIGHTNING ARRESTER - INCLUDING GT/ST LIGHTNING ARRESTER - 1PH		NOS.	42
3	400kV, 8800pF LINE CAPACITIVE VOLTAGE TRANSFORMER - 1PH.		NOS.	18
4	400kV, 4400pF CAPACITIVE VOLTAGE TRANSFORMER FOR GT BAYS - 1PH		NOS.	9
5	400kV, 3150A 0.5mH* PEDESTAL MOUNTED WAVE TRAP - 1PH		NOS.	12
6	400kV, 8000 N BUS POST INSULATOR - INCLUDING GT/ST YARD INSULATORS - 1PH		NOS.	84

REV.	DATE	ALTERED / CHECKED / APPROVED	ZONE
01	05-04-19	ALTERED NS; CHECKED SKS; APPROVED AG	REVISED AS PER NTPC'S COMMENTS DATED 21.08.18 AND REVISED GIS LAYOUT.

NOA NO.	01/PVUNL-CS-9585-001-2/NOA-FC DATED 08/03/2018 01/PVUNL-CS-9585-001-2/NOA-SC DATED 08/03/2018 01/PVUNL-CS-9585-001-2/NOA-TC DATED 08/03/2018
ADDITIONAL INFORMATION W.O.No.	
STATUS OF DRAWING	
DISTRIBUTION OF PRINTS	
ग्राहक/परियोजना का नाम NAME OF CUSTOMER/PROJECT	PATRATU VIDYUT UTPADAN NIGAM LTD. PATRATU SUPER THERMAL POWER PROJECT EXPANSION PHASE-I (3x800 MW)
	BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION

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स्वीकृत APPROVED	AG	-SGD-	10-08-18

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शीर्षक/TITLE: 400 kV LAYOUT PLAN & SECTION

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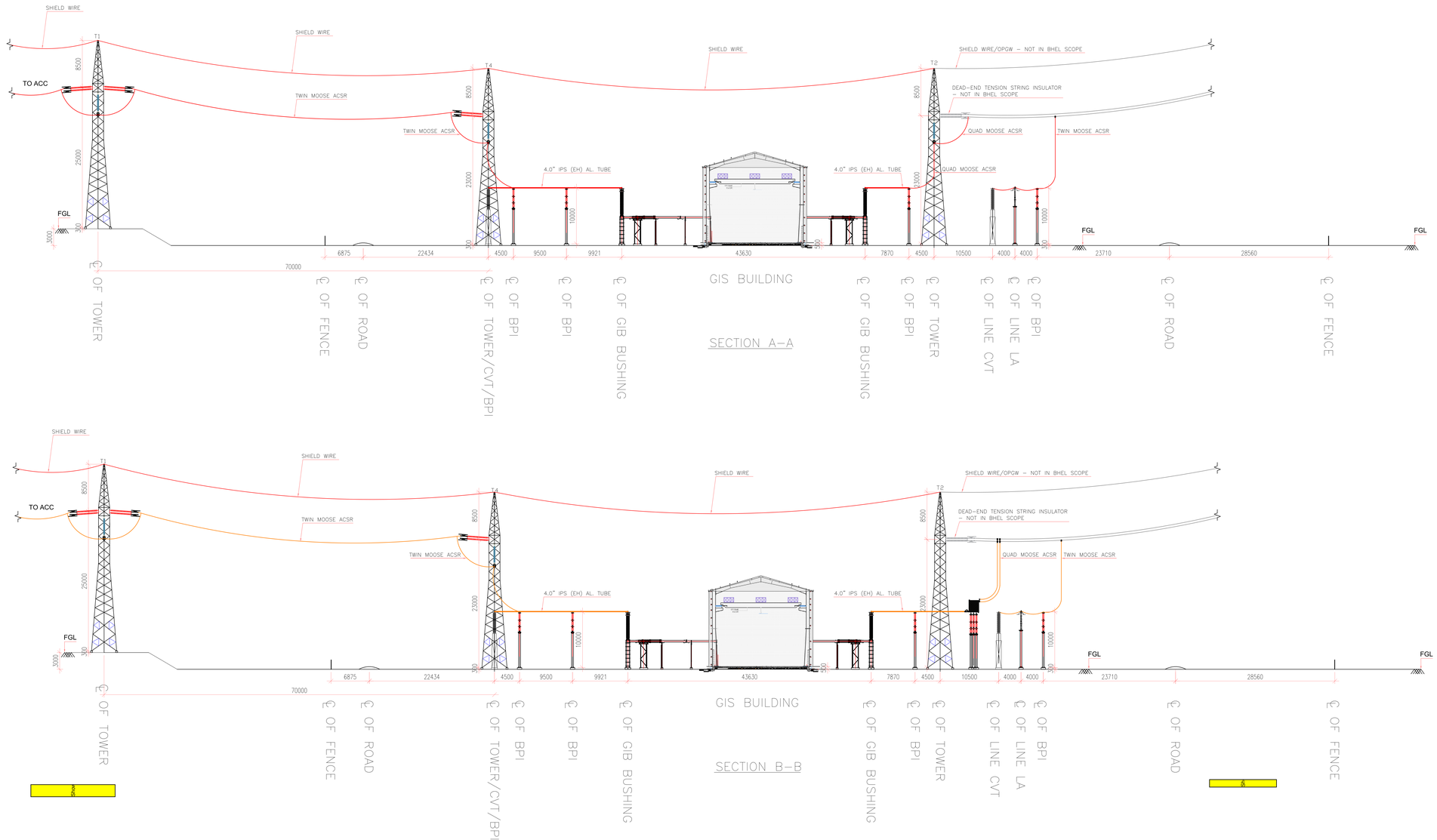
NTPC DRG NO. 9585-001-572-PVE-F-0013 — पुनः/REV. 01
BHEL DRG NO. TB-0-397-316-002
पृष्ठ सं./SHEET No. 02 | अगला पृष्ठ /NEXT SHEET 03

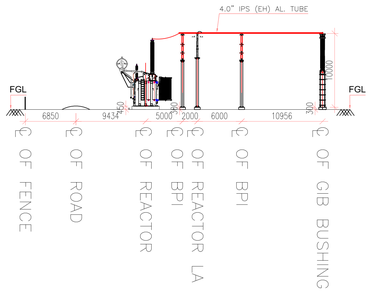
COMPUTER DRG. PATH NAME : | REF. DRG. No. | SIGN. & DATE | INVENTORY No.

DRAWING No. 9585-001-572-PVE-F-0013

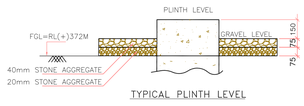


SECTION A–A

SECTION B–B



SECTION C–C



TYPICAL PLINTH LEVEL

*NOTE: THE SECTIONS OF ACC SHALL BE FINALIZED AFTER FINALIZATION OF ACC YARD.

NOA NO.	01/PVUNL-CS-9585-001-2/NDA-FC DATED 08/03/2018 01/PVUNL-CS-9585-001-2/NDA-SC DATED 08/03/2018 01/PVUNL-CS-9585-001-2/NDA-TC DATED 08/03/2018
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शीर्षक/TITLE: 400 kV LAYOUT PLAN & SECTION

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BHEL DRG NO. TB-0-397-316-002
पृष्ठ/REV. 01
पृष्ठ क्र./SHEET No. 03 अगला पृष्ठ/NEXT SHEET --

COMPUTER DRG. PATH NAME :
REF. DRG. No.
SIGN. & DATE
INVENTORY No.

REV.	DATE	ALTERED / CHECKED / APPROVED	ZONE