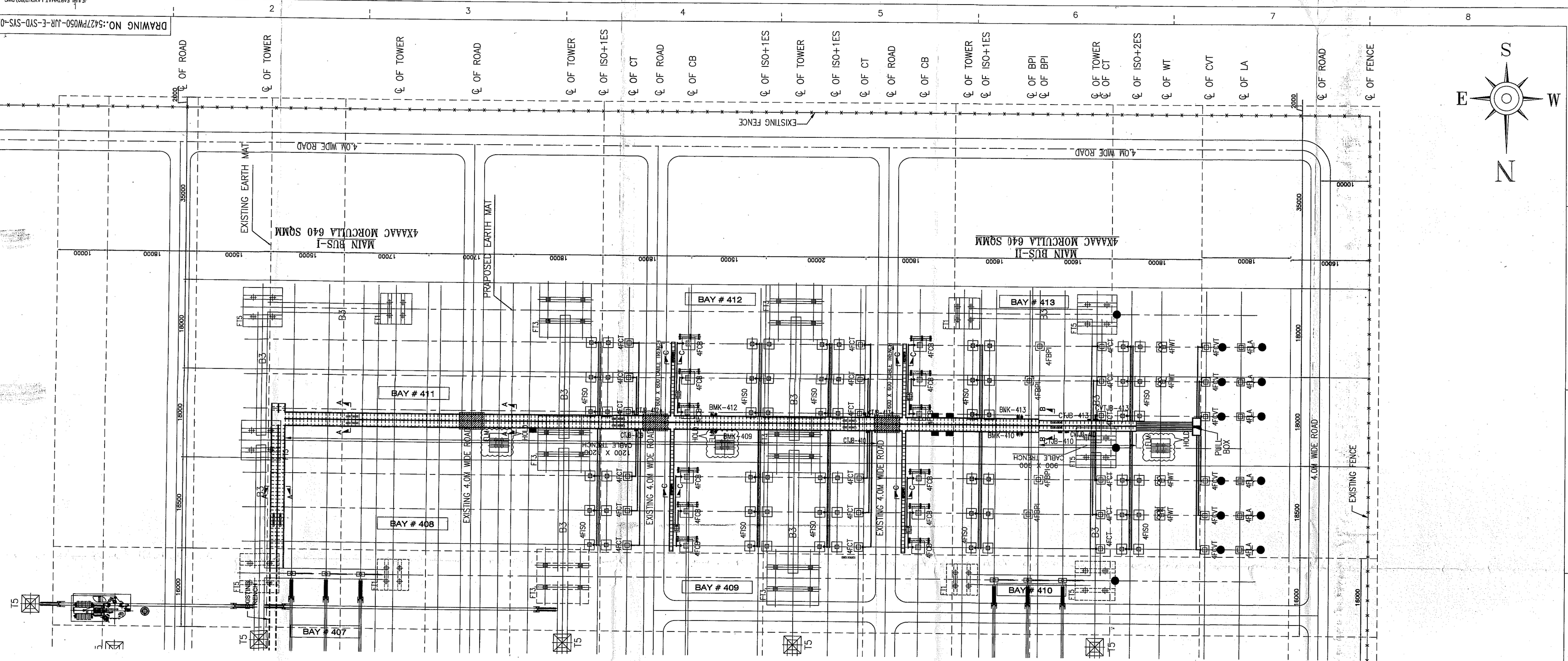


NOTES

1) ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2) LA EARTHING SHALL BE TERMINATED DIRECTLY ON EARTHING ELECTRODES AND IN TURN SHALL BE CONNECTED TO MAIN EARTHMAT.
3) DEPTH OF EARTHMAT SHALL NOT BE LESS THAN 600MM BELOW GROUND LEVEL.
4) EARTHING ELECTRODE – 150mm dia, 10mm THICK, 3mtrs LONG C.I. PIPE
5) EVERY EQUIPMENT SHALL BE PROVIDED WITH TWO SEPARATE EARTHING CONNECTIONS.
6) AUXILIARY MAT OF MS FLAT SIZE 75X12MM SIZE 1.5MX1.5M FOR ISOLATORS SHALL BE LAID 300MM BELOW GROUND LEVEL
7) MAIN EARTH MAT CONDUCTOR SHALL BE OF 75X12MM MS FLAT & SHALL BE CONNECTED TO EXISTING EARTH MAT.
8) THE LOCATION OF THE MAIN EARTHING CONDUCTORS, EARTH ELECTRODES SHOWN IN THE DRAWING ARE DIAGRAMATIC ONLY. IT MAY BE CHANGED TO SUIT SITE CONDITIONS.
9) RISERS FOR EQUIPMENT SHALL BE OF SIZE 50X8 GI FLAT.
10) THE EARTHING CONDUCTORS CROSSING TRENCHES / PIPES SHALL BE LAID 300 mm BELOW THEM.
11) CABLE TRAYS SHALL BE CONNECTED TO MAIN EARTHING CONDUCTOR AT EVERY 30M INTERVAL.

BOQ FOR EARTH ELECTRODE

SR.NO	DESCRIPTION	QTY.
1.	150MM NOMINAL DIA C.I. PIPE	15 NOS.

LAYOUT IS APPROVED. HOWEVER THERE MAY BE VARIATION AT THE TIME OF EXECUTION AT SITE.

Recommended

Superintending Engineer
MSETCL., EHVCC, Pune.

ALSTOM REFERENCE. DRG. NO. :–
(1.) 5427PW050-JJR-E-SYD-SYS-0001-GA
(2.) 5427PW050-AKD-E-SYD-SYS-0201-EW

MSETCL REF. DRG.. :–
(1.) DRG. NO. 015.1306

DESCRIPTION :–
400kV SWITCHYARD LAYOUT PLAN & SECTION FOR LINE BAY EQUIPMENT EARTHING DETAILS SH 1 OF 43

DESCRIPTION :–
EARTHING LAYOUT FOR 400&220KV JEJURI S/S DT: 15/02/02

LEGENDS:–
● ELECTRODES
——— PRAPOSED EARTH MAT 75X12MM MS
- - - - - EXISTING EARTH MAT

REFR. DRG. NO.	DESCRIPTION

REV.	DESCRIPTION	DRAWN	SIGN.	CHECKED	SIGN.	APPROVED	SIGN.	STATUS
REV5		Date / Name		Date / Name		Date / Name		
REV4		Date / Name		Date / Name		Date / Name		
REV3		Date / Name		Date / Name		Date / Name		
REV2		Date / Name		Date / Name		Date / Name		
REV1		Date / Name		Date / Name		Date / Name		
REV0	FOR CLIENT APPROVAL	Date 24.04.15 PMD		Date 24.04.15 CKM		Date 24.04.15 MNH/BB		

OWNER: MAHARASHTRA STATE ELECTRICITY TRANS.CO.LTD.
MAHATRANSCO

PROJECT : 400kV SUB-STATION-LINE BAYS EXTN. JEJURI, DIST. PUNE

LOA REF CE/C&M/Contracts/TKC-I/T-1414/SS/Supply&Civil&ETC/ALSTOM/10440&10441&10442 DATED:-27/08/2014

TITLE : EARTH MAT EXTENSION LAYOUT FOR 400KV LINE BAY SWITCHYARD

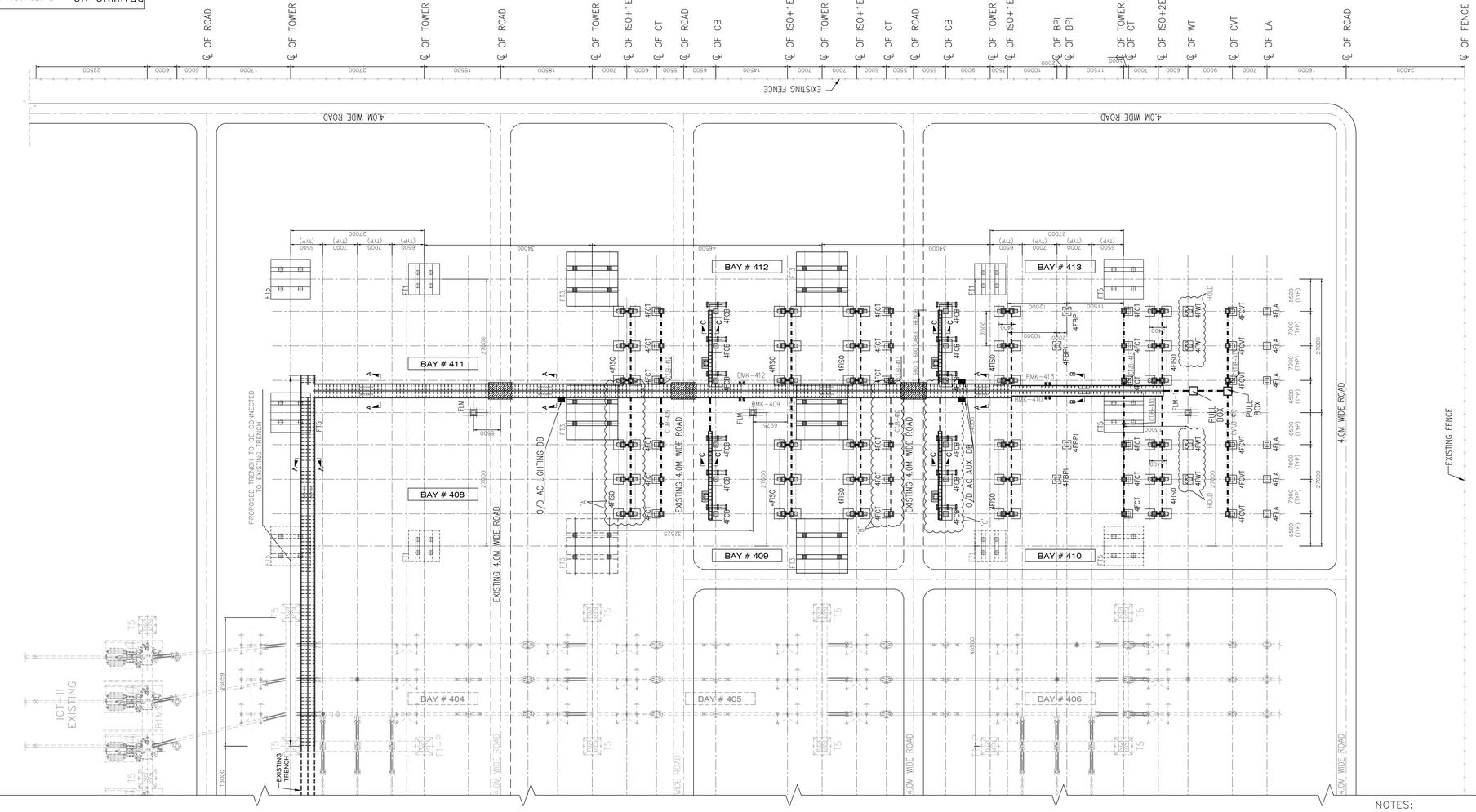
A1 ALSTOM T&D INDIA LTD VEKOM INSURANCE BLDG (3RD FL) VEER NARIMAN ROAD, CHURCHGATE MUMBAI – 400 020

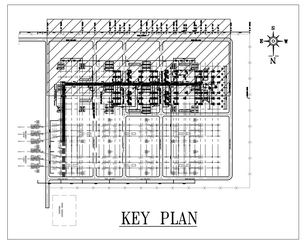
DRAWING NO. 5427PW050-JJR-E-SYD-SYS-0202-EW

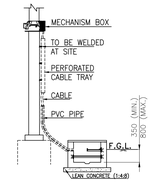
TOTAL SH.	SH.No.	REV.
1	1	0

SCALE 1:400

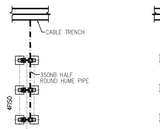
DRAWING NO. : 5427PW050-JJR-C-SYD-SYS-1102-GA



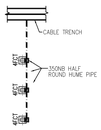




TYPICAL DETAIL (FOR REFERENCE) FOR CABLE FROM EQUIPMENT MB TO CABLE TRENCH
(SCALE:-1:700)

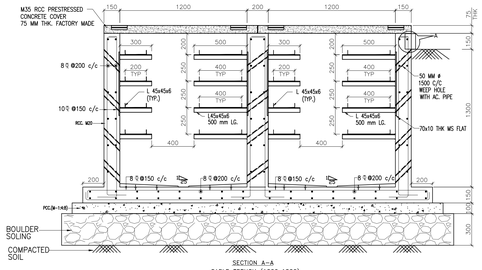


DETAIL-A
FOUNDATION PLAN SHOWING TYP. CABLE ROUTING FOR 400kV ISO
(SCALE:-1:500)

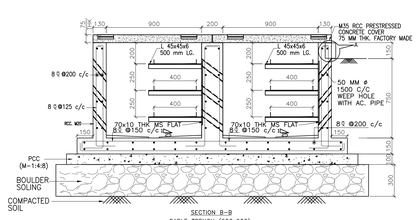


DETAIL-B
FOUNDATION PLAN SHOWING TYP. CABLE ROUTING FOR 400kV CT
(SCALE:-1:500)

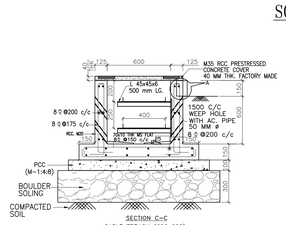
DETAIL-C
FOUNDATION PLAN SHOWING TYP. CABLE ROUTING FOR 400kV CB
(SCALE:-1:500)



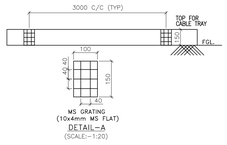
SECTION A-A
CABLE TRENCH (1200x1200)
(SCALE:-1:20)



SECTION B-B
CABLE TRENCH (900x900)
(SCALE:-1:20)

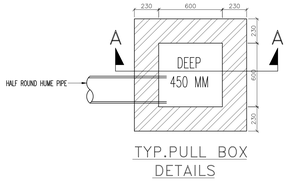


SECTION C-C
CABLE TRENCH (600x600)
(SCALE:-1:20)

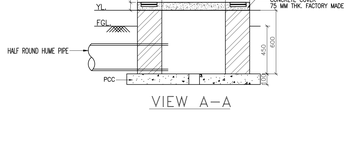


MS GRATING (10x4mm MS FLAT)
DETAIL-A
(SCALE:-1:20)

SECTION C-C
TYPICAL ARRANGMNET FOR CABLE LAYING TROUGH 350NB HALF ROUND HUME PIPE
(SCALE:-1:20)



TYP.PULL BOX DETAILS



VIEW A-A

SCHEDULE OF TOWER & EQUIPMENT FOUNDATION

FOR DEPTH OF FOUNDATION REFER NOTE 7.

400kV SWITCHYARD

SR. NO.	TYPE OF TOWER	FDN MARK	QTY. NOS.
1.	T1	FT1	2
2.	T3	FT3	5
3.	T5	FT5	4

400kV SWITCHYARD

SR. NO.	TYPE OF TOWER	FDN MARK	QTY. NOS.
1.	LM	FLM	03

400kV SWITCHYARD

SR. NO.	TYPE OF EQPT.	FDN MARK	QTY. NOS.
1.	LA (1ø)	4FLA	6 NOS.
2.	CVT (1ø)	4FCVT	6 NOS.
3.	CT (1ø)	4FCT	18 NOS.
4.	ISO (3ø)	4FISO	10 SET
5.	WT (1ø)	4FWT	4 NOS.
6.	CB (3ø)	4FCB	4 SET
7.	BPI (1ø)	4FBPI	4 NOS.

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. PLINTH HEIGHT OF FOUNDATION WILL BE +450MM FROM THE FINISHED GROUND LEVEL (F.G.L.) GRAVEL THICKNESS SHALL BE 150mm FROM FGL.
3. NO FOUNDATION SHALL REST IN FILLED UP SOIL. MINIMUM DEPTH OF FOUNDATIONS BELOW NATURAL SOIL SHALL BE 500mm FOR TOWER & 300mm FOR EQUIPMENTS.
4. THE LOCATION OF FOUNDATION BOLTS SHALL BE VERIFIED WITH RESPECTIVE TO STRUCTURE DRAWINGS BEFORE PLACING THE BOLTS.
5. LOCATION OF FOUNDATIONS FOR CONTROL CUBICLE AND PLATFORM FOR CB FOUNDATIONS SHALL MATCH WITH FINAL EQUIPMENT DRAWING.
6. LOCATION OF FOUNDATIONS FOR 400KV ISOLATORS FOUNDATIONS SHALL MATCH WITH FINAL EQUIPMENT DRAWING.
7. FOR ANCHOR BOLTS DETAILS REFER SEPARATE DWG.
8. MINIMUM SBC AS PER SOIL INVESTIGATION REPORT 10 T/M.
9. NOS. & POSITION OF LIGHTING MAST ARE FINALISED AS PER APPROVRD LIGHTING DESIGN AND DSLP CALCULATIONS DRG NO: -5427PW050-JJR-E-SYD-0806-GA.
10. LV POWER & CONTROL CABLE RUNNING UNDERGROUND SHALL BE LAID IN ø350mm HALF ROUND HUME PIPE COVERED WITH ø350mm HALF ROUND HUME PIPE UPTO MAIN TRENCH.
11. THE CTMB, CVTMB & BAY MB SHALL BE LOCATED IN A WAY THAT IT DOES NOT FOUL WITH ANY OTHER FOUNDATION AND CABLE ENTRY IS NOT RESTRICTED.
12. 110mmø PVC SLEEVES SHOULD BE KEPT IN CABLE TRENCH FOR THREE NOS. CB, TWO NOS. FOR ISOLATOR, FIVE NOS. FOR BAY MB, & THREE NOS. FOR CTJB, CVTJB, AT RESPECTIVE EQUIPMENT LOCATIONS.
13. FOR BAY MB, JB FOUNDATION DETAILS REFER SEPARATE DWG.
14. TYPICAL CABLE TRAYS SUPPORT INSERTS ARRANGEMENT IS SHOWN IN CABLE TRENCH TO LAY CABLE TRAY.
15. WAVE TRAP FOUNDATIONS TO BE CONSTRUCTED AT SITE TO SUIT AS PER I/C. LINE WAVE TRAP PHASE SEQUENCE POSITION.
16. LOCATION OF OUTDOOR AC AUX. DB, AC LIGHTING DB SHOWN IN LAYOYT

REFERENCE. DRG. NO. :-

(1.) 5427PW050-JJR-E-SYD-SYS-0001-GA

DESCRIPTION :-

400kV SWITCHYARD LAYOUT PLAN & SECTION FOR LINE BAY

REFR. DRG. NO. | DESCRIPTION

LEGEND:-

- 1200 x 1200 WIDE CABLE TRENCH
- 900 x 600 WIDE CABLE TRENCH
- 600 x 600 WIDE CABLE TRENCH
- HOLD MARK
- ø350NB HALF ROUND HUME PIPE
- FENCE
- CABLE TRENCH CROSSING ROAD (CULVERT)

REV.	DESCRIPTION	DRAWN	SIGN.	CHECKED	SIGN.	APPROVED	SIGN.	STATUS
REV5		Name / Date		Name / Date		Name / Date		
REV4		Name / Date		Name / Date		Name / Date		
REV3	DRG. REVISED AS PER VERBAL DISCUSSION HAD WITH MSETCL DATED :-23/07/15	Name: HDP / Date: 23.07.15		Name: SYP/CKM / Date: 23.07.15		Name: BB/MNH / Date: 23.07.15		
REV2	DRG. REVISED AS PER THE DISCUSSION HAD WITH MSETCL AT JEJURI SITE DATED :-16/06/15	Name: PMD / Date: 20.06.15		Name: SYP/CKM / Date: 23.06.15		Name: BB/MNH / Date: 23.06.15		
REV1	DRG. REVISED AS PER THE DISCUSSION HAD WITH MSETCL DT: 31/03/15 LETTER REF:EE/EHV/ConstnDN-II/PN/Tech/465	Name: HDP / Date: 16.04.15		Name: SYP/CKM / Date: 16.04.15		Name: BB/MNH / Date: 16.04.15		
REV0	FOR CLIENT APPROVAL	Name: HDP / Date: 10.02.15		Name: SYP/CKM / Date: 10.02.15		Name: BB/MNH / Date: 10.02.15		

OWNER: MAHARASHTRA STATE ELECTRICITY TRANS.CO.LTD.

PROJECT : 400/220kV SUB-STATION JEJURI, DIST. PUNE

LOA REF CE/C&M/Contracts/TKC-I/T-1414/SS/Supply&Civil&ETC/ALSTOM/10440&10441&10442 DATED: -27/08/2014

TITLE : FOUNDATION CABLE TRENCH LAYOUT FOR 400KV SWITCHYARD

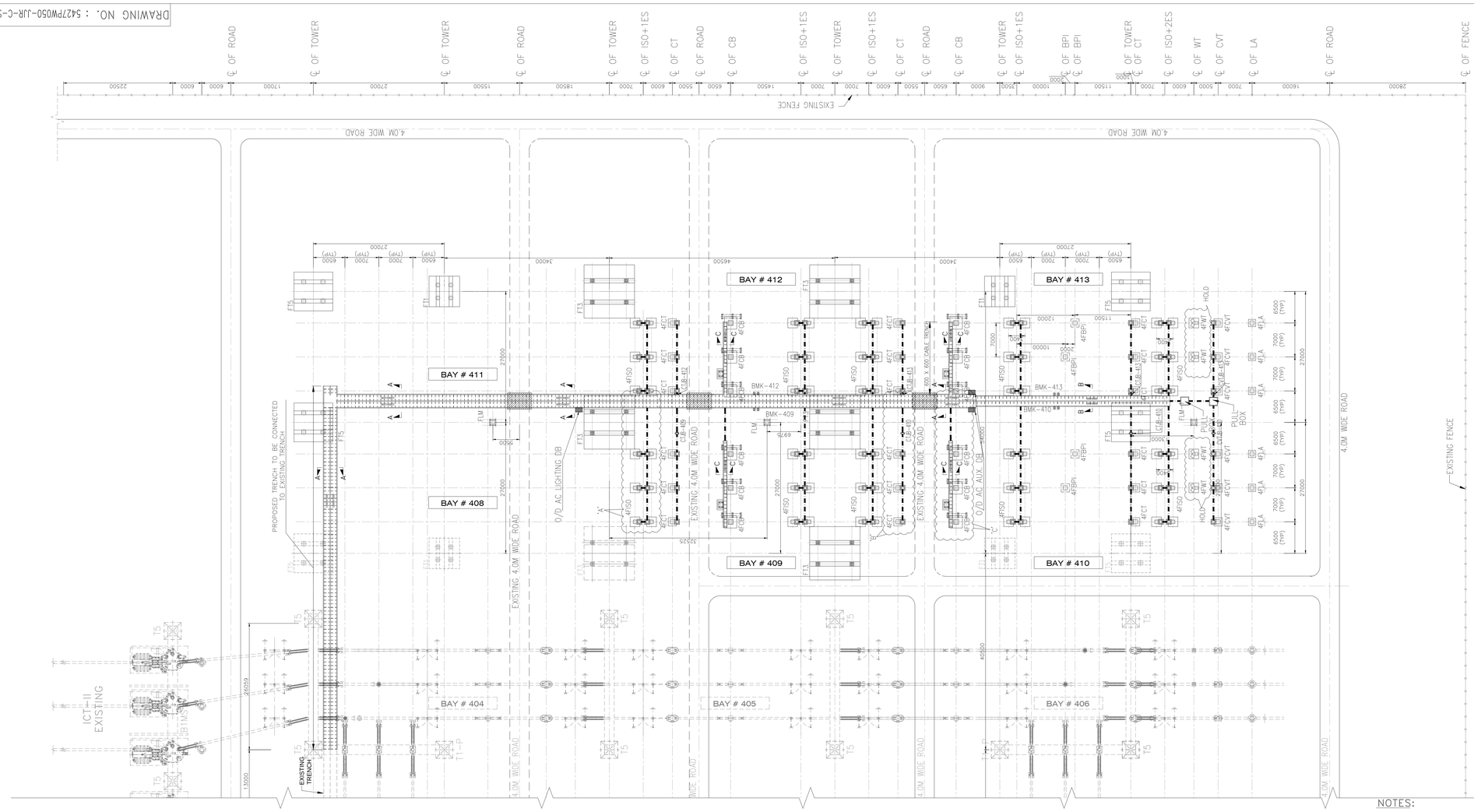
A0 | ALSTOM T&D INDIA LTD (FORMERLY AREVA T&D INDIA LTD) VULCAN INSURANCE BLDG (3RD. FL) MUMBAI - 400 020

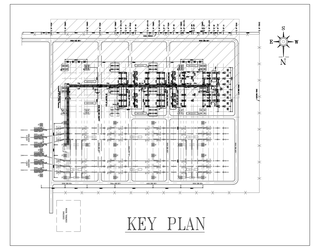
DRAWING NO. 5427PW050-JJR-C-SYD-SYS-1102-GA

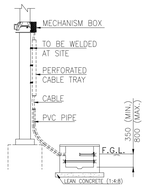
TOTAL SH. 01 | SH.No. 1 | REV. 3

SCALE 1:350

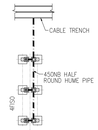
DRAWING NO. : 5427PW050-JJR-C-SYD-SYS-1102-GA



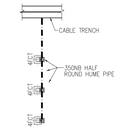




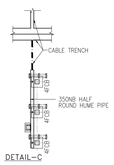
TYPICAL DETAIL (FOR REFERENCE) FOR CABLE FROM EQUIPMENT MB TO CABLE TRENCH
(SCALE:-1:700)



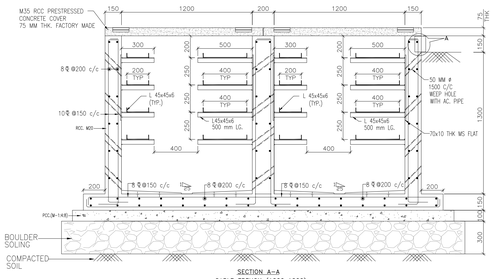
DETAIL-A
FOUNDATION PLAN SHOWING TYP. CABLE ROUTING FOR 400kV ISO
(SCALE:-1:500)



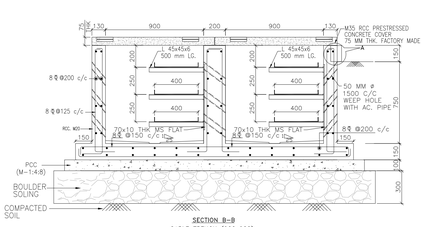
DETAIL-B
FOUNDATION PLAN SHOWING TYP. CABLE ROUTING FOR 400kV CT
(SCALE:-1:500)



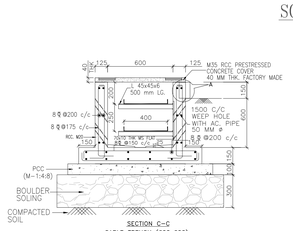
DETAIL-C
FOUNDATION PLAN SHOWING TYP. CABLE ROUTING FOR 400kV CB
(SCALE:-1:500)



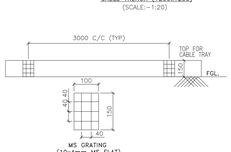
SECTION A-A
CABLE TRENCH (1200x1200)
(SCALE:-1:20)



SECTION B-B
CABLE TRENCH (900x900)
(SCALE:-1:20)

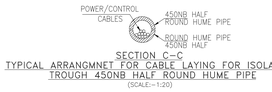


SECTION C-C
CABLE TRENCH (600x600)
(SCALE:-1:20)

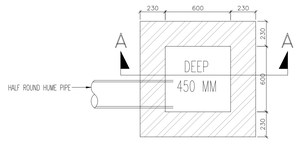


DETAIL-A
(SCALE:-1:20)

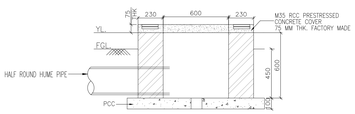
SECTION C-C
TYPICAL ARRANGMNET FOR CABLE LAYING TROUGH 350NB HALF ROUND HUME PIPE
(SCALE:-1:20)



SECTION C-C
TYPICAL ARRANGMNET FOR CABLE LAYING FOR ISOLATOR TROUGH 450NB HALF ROUND HUME PIPE
(SCALE:-1:20)



TYP.PULL BOX DETAILS



VIEW A-A

SCHEDULE OF TOWER & EQUIPMENT FOUNDATION

FOR DEPTH OF FOUNDATION REFER NOTE 7.

400kV SWITCHYARD

SR. NO.	TYPE OF TOWER	FDN MARK	QTY. NOS.
1.	T1	FT1	2
2.	T3	FT3	5
3.	T5	FT5	4

400kV SWITCHYARD

SR. NO.	TYPE OF TOWER	FDN MARK	QTY. NOS.
1.	LM	FLM	03

400kV SWITCHYARD

SR. NO.	TYPE OF EQPT.	FDN MARK	QTY. NOS.
1.	LA (1ø)	4FLA	6 NOS.
2.	CVT (1ø)	4FCVT	6 NOS.
3.	CT (1ø)	4FCT	18 NOS.
4.	ISO (3ø)	4FISO	10 SET
5.	WT (1ø)	4FWT	4 NOS.
6.	CB (3ø)	4FCB	4 SET
7.	BPI (1ø)	4FBPI	4 NOS.

NOTES:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.
2. PLINTH HEIGHT OF FOUNDATION WILL BE +450MM FROM THE FINISHED GROUND LEVEL (F.G.L.) GRAVEL THICKNESS SHALL BE 150mm FROM FGL.
3. NO FOUNDATION SHALL REST IN FILLED UP SOIL. MINIMUM DEPTH OF FOUNDATIONS BELOW NATURAL SOIL SHALL BE 500mm FOR TOWER & 300mm FOR EQUIPMENTS.
4. THE LOCATION OF FOUNDATION BOLTS SHALL BE VERIFIED WITH RESPECTIVE TO STRUCTURE DRAWINGS BEFORE PLACING THE BOLTS.
5. LOCATION OF FOUNDATIONS FOR CONTROL CUBICLE AND PLATFORM FOR CB FOUNDATIONS SHALL MATCH WITH FINAL EQUIPMENT DRAWING.
6. LOCATION OF FOUNDATIONS FOR 400KV ISOLATORS FOUNDATIONS SHALL MATCH WITH FINAL EQUIPMENT DRAWING.
7. FOR ANCHOR BOLTS DETAILS REFER SEPARATE DWG.
8. MINIMUM SBC AS PER SOIL INVESTIGATION REPORT 10 T/M.
9. NOS. & POSITION OF LIGHTING MAST ARE FINALISED AS PER APPROVRD LIGHTING DESIGN AND DSLP CALCULATIONS DRG NO:-5427PW050-JJR-E-SYD-0806-GA.
10. LV POWER & CONTROL CABLE RUNNING UNDERGROUND SHALL BE LAID IN ø350mm & ø450mm HALF ROUND HUME PIPE COVERED WITH ø350mm & ø450mm HALF ROUND HUME PIPE RESPECTIVELY UPTO MAIN TRENCH.
11. THE CTMB, CVTMB & BAY MB SHALL BE LOCATED IN A WAY THAT IT DOES NOT FOUL WITH ANY OTHER FOUNDATION AND CABLE ENTRY IS NOT RESTRICTED.
12. 110mmø PVC SLEEVES SHOULD BE KEPT IN CABLE TRENCH FOR THREE NOS. CB, TWO NOS. FOR ISOLATOR, FIVE NOS. FOR BAY MB, & THREE NOS. FOR CTJB, CVTJB, AT RESPECTIVE EQUIPMENT LOCATIONS.
13. FOR BAY MB, JB FOUNDATION DETAILS REFER SEPARATE DWG.
14. TYPICAL CABLE TRAYS SUPPORT INSERTS ARRANGEMENT IS SHOWN IN CABLE TRENCH TO LAY CABLE TRAY.
15. WAVE TRAP FOUNDATIONS TO BE CONSTRUCTED AT SITE TO SUIT AS PER i/C. LINE WAVE TRAP PHASE SEQUENCE POSITION.
16. LOCATION OF OUTDOOR AC AUX. DB, AC LIGHTING DB SHOWN IN LAYOYT
17. CENTER LINES OF CVT & LA SHALL BE MATCHED WITH EXISTING SWITCHYARD

REFERENCE. DRG. NO. :-

(1.) 5427PW050-JJR-E-SYD-SYS-0001-GA

DESCRIPTION :-

400kV SWITCHYARD LAYOUT PLAN & SECTION FOR LINE BAY

LEGEND:-

- 1200 x 1200 WIDE CABLE TRENCH
- 900 x 900 WIDE CABLE TRENCH
- 600 x 600 WIDE CABLE TRENCH
- HOLD MARK
- Ø350NB HALF ROUND HUME PIPE
- FENCE
- CABLE TRENCH CROSSING ROAD (CULVERT)

REFR. DRG. NO.	DESCRIPTION

REV.	DESCRIPTION	DRAWN	SIGN.	CHECKED	SIGN.	APPROVED	SIGN.	STATUS
REV5		Name / Date		Name / Date		Name / Date		
REV4		Name / Date		Name / Date		Name / Date		
REV3	DRG. REVISED AS PER VERBAL DISCUSSION HAD WITH MSETCL DATED :-23/07/15 & 28/07/15	Name HDP / Date 23.07.15		Name SYP/CKM / Date 23.07.15		Name BB/MNH / Date 23.07.15		
REV2	DRG. REVISED AS PER THE DISCUSSION HAD WITH MSETCL AT JEJURI SITE DATED :-16/06/15	Name PMD / Date 20.06.15		Name SYP/CKM / Date 23.06.15		Name BB/MNH / Date 23.06.15		
REV1	DRG. REVISED AS PER THE DISCUSSION HAD WITH MSETCL DT. 31/03/15 LETTER REF:EE/EHV/ConstnDN-II/PN/Tech/465	Name HDP / Date 16.04.15		Name SYP/CKM / Date 16.04.15		Name BB/MNH / Date 16.04.15		
REV0	FOR CLIENT APPROVAL	Name HDP / Date 10.02.15		Name SYP/CKM / Date 10.02.15		Name BB/MNH / Date 10.02.15		

OWNER: MAHARASHTRA STATE ELECTRICITY TRANS.CO.LTD.

PROJECT : 400/220kV SUB-STATION JEJURI, DIST. PUNE

LOA REF CE/C&M/Contracts/TKC-I/T-1414/SS/Supply&Civil&ETC/ALSTOM/10440&10441&10442 DATED:-27/08/2014

TITLE : FOUNDATION CABLE TRENCH LAYOUT FOR 400KV SWITCHYARD

A0 | ALSTOM T&D INDIA LTD, MAGNET HOUSE BLDG (3RD FL) N. M. ROAD, BALLARD ESTATE MUMBAI - 400 001

DRAWING NO. 5427PW050-JJR-C-SYD-SYS-1102-GA

TOTAL SH. 01 | SH.No. 1 | REV. 3

SCALE 1:350

CONTROLLED COPY

☑ APPROVAL ☐ AS BUILT
☐ PROTO ☑ CONSTRUCTION
☐ PLANNING ☐ REFERENCE
☐ MANUFACTURING ☐ INDENT
☐ RECORD ☐ EXECUTION

ALSTOM T&D INDIA LTD.
DT. 5/5/15 AUTH. SIG.

APPROVED
Executive Engineer (D&E-S2)
Projects & Design Section
M.S.E.T.C.L. "Prakashganga "
BKC, Bandra (East),Mumbai - 51

28-Apr-15	0	FOR APPROVAL	CM	KS	TS
Date	Rev. No.	Description	Drawn	Checked	Approved

REVISIONS

CLIENT :

MAHARASHTRA STATE ELECTRICITY TRANS. CO.LTD.

PROJECT : 400kV LINE BAY EXTENSION AT JEJURI, DIST. PUNE

LOA REF: CE/C&M/Contracts/TKC-I/T-1414/SS/Supply&Civil&ETC/ALSTOM/10440&10441&10442 DATED:-27/08/2014

CONTRACTOR.: ALSTOM T&D INDIA LTD., NOIDA

TITLE :

ILLUMINATION DESIGN CALCULATIONS

FOR 400KV OUTDOOR SWITCHYARD

ALSTOM
ALSTOM T&D INDIA LIMIED
3rd. Flr., VULCAN INSURANCE BLDG.
Veer Nariman Road,
Churchgate Mumbai 400020

DRAWING NO. 5427PW050-JJR- E - SYD - SYS-0802-CN	REV.
5427PW050-JJR-E-SYD-SYS-0802-CN	0

400KV LINE BAY EXTENSION AT JEJURI, DIST. PUNE

ILLUMINATION DESIGN CALCULATIONS FOR 400KV OUTDOOR SWITCHYARD
DOCUMENT No.- 5427PW050-JJR- E - SYD - SYS-0802-CN

THE LIGHTING CLACULATION ARE ENCLOSED CONSIDERING BAJAJ FITTINGS, ACTUAL SUPPLIED SHALL BE OF EQUIVALENT FITTING, IF OTHER VENDORS ARE OPTED.

REFERENCE DRAWING:-
1.5427PW050-JJR-E-SYD-SYS-0001-GA (REV.0) 400 kV SWITCHYARD LAYOUT PLAN & SECTION FOR LINE BAY

2.5427PW050-JJR-C-SYD-SYS-1102-GA (REV.1) FOUNDATION CABLE TRENCH LAYOUT FOR 400KV OUTDOOR SWITCHYARD

CLIENT: MAHARASHTRA STATE ELECTRICITY TRANS. CO.LTD.
PROJECT: 400KV LINE BAYS EXTENSION AT JEJURI, DIST. PUNE
CONTRACTOR: ALSTOM T&D INDIA LTD., NOIDA

Date: 28.04.2015
Operator:

Operator
Telephone
Fax
e-Mail

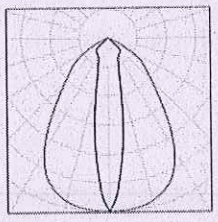
Table of contents

Operator
Telephone
Fax
e-Mail

400KV LINE BAY EXTENSION AT JEJURI, DIST. PUNE / Luminaire parts list

15 Pieces BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC
Article No.:
Luminous flux (Luminaire): 68160 lm
Luminous flux (Lamps): 96000 lm
Luminaire Wattage: 892.0 W
Luminaire classification according to CIE: 100
CIE flux code: 77 96 99 100 72
Fitting: 1 x 2 X 400W SV T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.

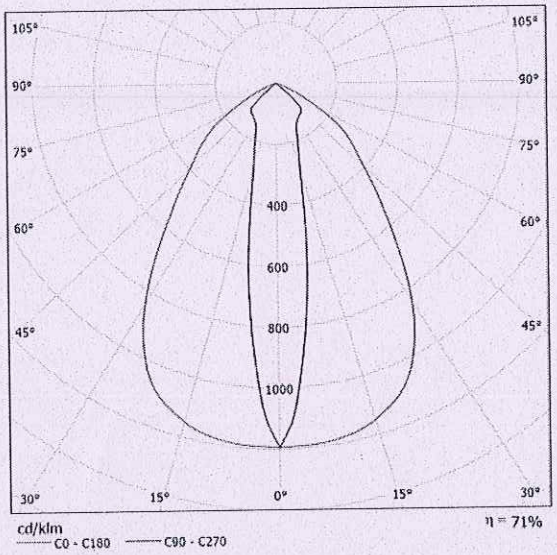


Operator
Telephone
Fax
e-Mail

BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC / Luminaire Data Sheet

See our luminaire catalog for an image of the luminaire.

Luminous emittance 1:



Luminaire classification according to CIE: 100
CIE flux code: 77 96 99 100 72

Luminous emittance 1:

Glare Evaluation According to UGR

ρ Ceiling		70	70	50	50	30	70	70	50	50	30
ρ Walls		50	30	50	30	30	50	30	50	30	30
ρ Floor		20	20	20	20	20	20	20	20	20	20
Room Size X	Y	Viewing direction at right angles to lamp axis					Viewing direction parallel to lamp axis				
2H	2H	21.9	22.8	22.2	23.0	23.3	7.7	8.6	8.0	8.8	9.0
	3H	22.8	23.6	23.1	23.8	24.1	8.8	9.6	9.1	9.8	10.1
	4H	22.8	23.6	23.2	23.9	24.1	9.3	10.1	9.6	10.3	10.6
	6H	22.8	23.5	23.1	23.8	24.1	9.9	10.6	10.2	10.9	11.1
	8H	22.8	23.5	23.1	23.8	24.1	10.1	10.8	10.5	11.1	11.4
	12H	22.8	23.4	23.1	23.7	24.0	10.5	11.1	10.8	11.4	11.7
4H	2H	21.7	22.5	22.0	22.8	23.0	8.8	9.6	9.1	9.8	10.1
	3H	22.6	23.2	22.9	23.5	23.9	9.9	10.6	10.3	10.9	11.2
	4H	22.7	23.3	23.1	23.6	23.9	10.5	11.0	10.9	11.4	11.7
	6H	22.7	23.2	23.1	23.5	23.9	11.1	11.6	11.5	11.9	12.3
	8H	22.7	23.1	23.1	23.5	23.9	11.5	11.9	11.9	12.3	12.7
	12H	22.6	23.0	23.1	23.4	23.9	11.8	12.2	12.3	12.6	13.0
8H	4H	22.6	23.0	23.0	23.4	23.8	10.9	11.3	11.3	11.7	12.1
	6H	22.6	22.9	23.0	23.4	23.8	11.6	12.0	12.1	12.4	12.8
	8H	22.6	22.9	23.0	23.3	23.8	12.0	12.3	12.5	12.8	13.2
	12H	22.5	22.8	23.0	23.3	23.8	12.5	12.8	13.0	13.2	13.7
12H	4H	22.6	22.9	23.0	23.3	23.8	11.0	11.3	11.4	11.7	12.2
	6H	22.6	22.8	23.0	23.3	23.8	11.7	12.0	12.2	12.4	12.9
	8H	22.5	22.8	23.0	23.2	23.7	12.1	12.4	12.6	12.8	13.3

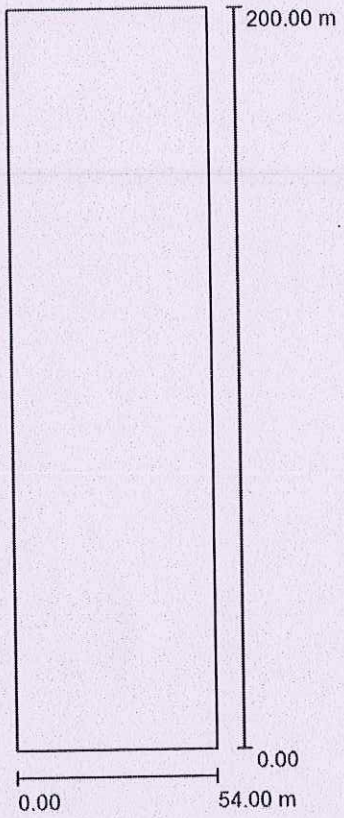
Variation of the observer position for the luminaire distances S

S = 1.0H	+2.2 / -2.9	+2.3 / -7.6
S = 1.5H	+3.9 / -3.9	+3.7 / -8.5
S = 2.0H	+5.6 / -6.3	+5.4 / -9.1
Standard table	BK00	BK01
Correction Surround	-9.1	-14.5

Corrected Glare Indices referring to 96000lm Total Luminous Flux

Operator
Telephone
Fax
e-Mail

400KV OUTDOOR SWITCHYARD JEJURI / Planning data



Maintenance factor: 0.70, ULR (Upward Light Ratio): 22.5%

Scale 1:1855

Luminaire Parts List

No.	Pieces	Designation (Correction Factor)	I (Luminaire) [lm]	I (Lamps) [lm]	P [W]
1	15	BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC (1.000)	68160	96000	892.0
			Total: 1022400	Total: 1440000	13380.0

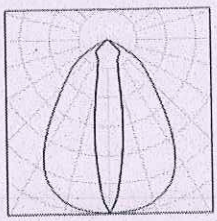
Operator
Telephone
Fax
e-Mail

400KV OUTDOOR SWITCHYARD JEJURI / Luminaire parts list

15 Pieces

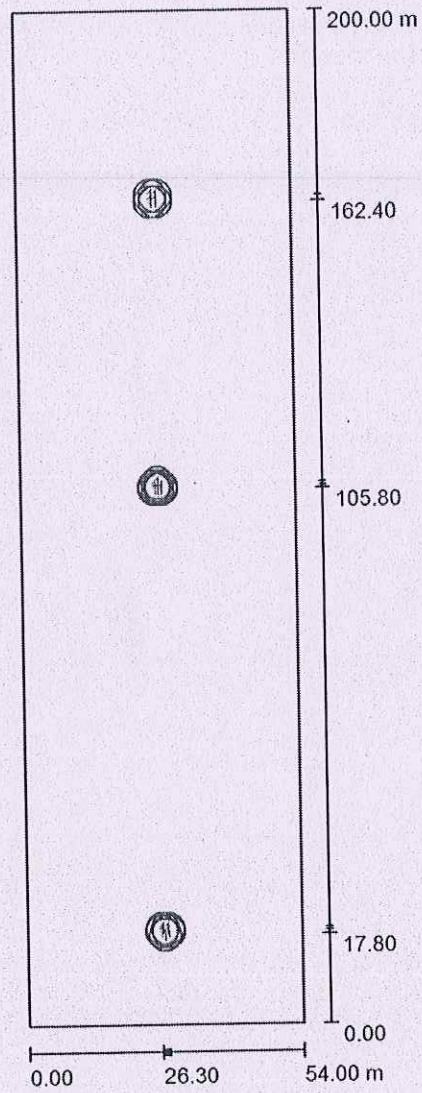
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC
Article No.:
Luminous flux (Luminaire): 68160 lm
Luminous flux (Lamps): 96000 lm
Luminaire Wattage: 892.0 W
Luminaire classification according to CIE: 100
CIE flux code: 77 96 99 100 72
Fitting: 1 x 2 X 400W SV T (Correction Factor 1.000).

See our luminaire catalog for an image of the luminaire.



Operator
Telephone
Fax
e-Mail

400KV OUTDOOR SWITCHYARD JEJURI / Luminaires (layout plan)



Scale 1 : 1353

Luminaire Parts List

No.	Pieces	Designation
1	15	BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC

Operator
Telephone
Fax
e-Mail

400KV OUTDOOR SWITCHYARD JEJURI / Luminaires (coordinates list)

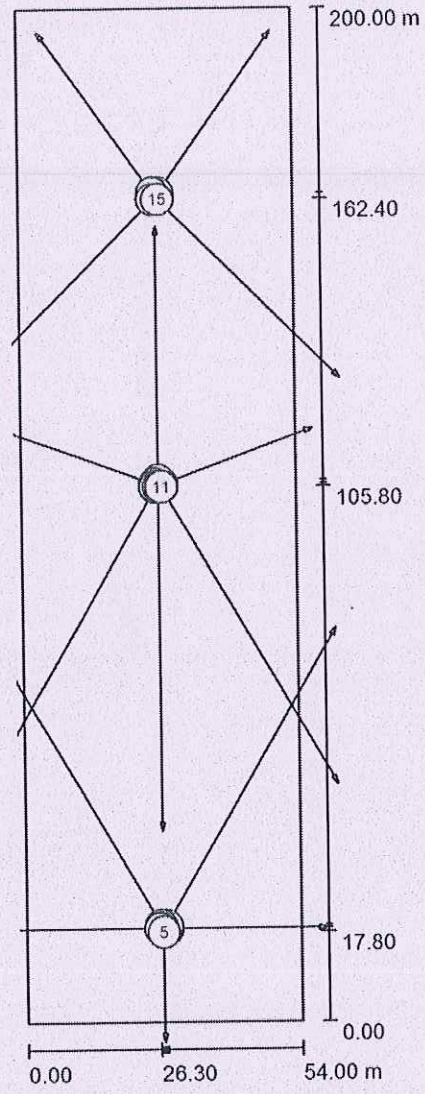
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC

68160 lm, 892.0 W, 1 x 1 x 2 X 400W SV T (Correction Factor 1.000).

No.	Position [m]			Rotation [°]		
	X	Y	Z	X	Y	Z
1	27.700	18.500	18.200	0.0	-60.0	0.0
2	27.500	19.100	18.200	0.0	-75.0	60.0
3	26.500	19.100	18.200	0.0	-75.0	120.0
4	26.300	18.500	18.200	0.0	-60.0	180.0
5	27.000	17.800	18.200	0.0	-50.0	-90.0
6	27.700	106.400	18.200	0.0	-60.0	20.0
7	27.000	107.100	18.200	0.0	-70.0	90.0
8	26.300	106.400	18.200	0.0	-60.0	160.0
9	26.400	105.800	18.200	0.0	-75.0	-120.0
10	27.000	105.800	18.200	0.0	-75.0	-90.0
11	27.600	105.800	18.200	0.0	-75.0	-60.0
12	27.500	163.600	18.200	0.0	-65.0	55.0
13	26.500	163.600	18.200	0.0	-65.0	125.0
14	26.500	162.400	18.200	0.0	-70.0	-135.0
15	27.500	162.400	18.200	0.0	-70.0	-45.0

Operator
Telephone
Fax
e-Mail

400KV OUTDOOR SWITCHYARD JEJURI / Sport Luminaires (Coordinates List)



Scale 1 : 1353

List of the Sport Luminaires

Luminaire	Index	Position [m] X	Y	Z	Aiming Point [m] X	Y	Z	Angle [°]	Alignment	Pole
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	1	27.700	18.500	18.200	59.223	18.500	0.000	30.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	2	27.500	19.100	18.200	61.462	77.923	0.000	15.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	3	26.500	19.100	18.200	-7.462	77.923	0.000	15.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	4	26.300	18.500	18.200	-5.223	18.500	0.000	30.0	(C 0.0°, G 0.0°)	/

Operator
Telephone
Fax
e-Mail

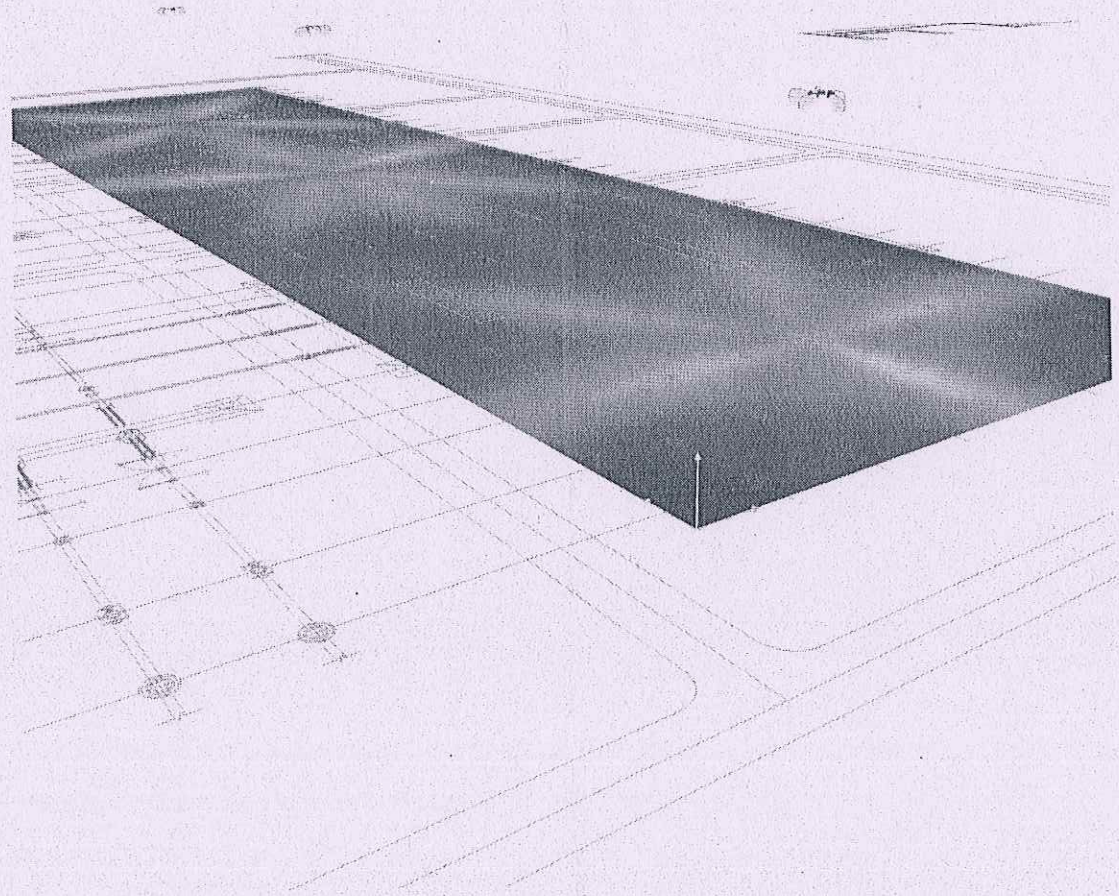
400KV OUTDOOR SWITCHYARD JEJURI / Sport Luminaires (Coordinates List)

List of the Sport Luminaires

Luminaire	Index	Position [m] X	Y	Z	Aiming Point [m] X	Y	Z	Angle [°]	Alignment	Pole
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	5	27.000	17.800	18.200	27.000	-3.890	0.000	40.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	6	27.700	106.400	18.200	57.322	117.182	0.000	30.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	7	27.000	107.100	18.200	27.000	157.104	0.000	20.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	8	26.300	106.400	18.200	-3.322	117.182	0.000	30.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	9	26.400	105.800	18.200	-7.562	46.977	0.000	15.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	10	27.000	105.800	18.200	27.000	37.877	0.000	15.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	11	27.600	105.800	18.200	61.562	46.977	0.000	15.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	12	27.500	163.600	18.200	49.887	195.572	0.000	25.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	13	26.500	163.600	18.200	4.113	195.572	0.000	25.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	14	26.500	162.400	18.200	-8.858	127.042	0.000	20.0	(C 0.0°, G 0.0°)	/
BAJAJ BJENF 24 (2 X 400 SV T) 1x2 X 400W SV T MAGNETIC	15	27.500	162.400	18.200	62.858	127.042	0.000	20.0	(C 0.0°, G 0.0°)	/

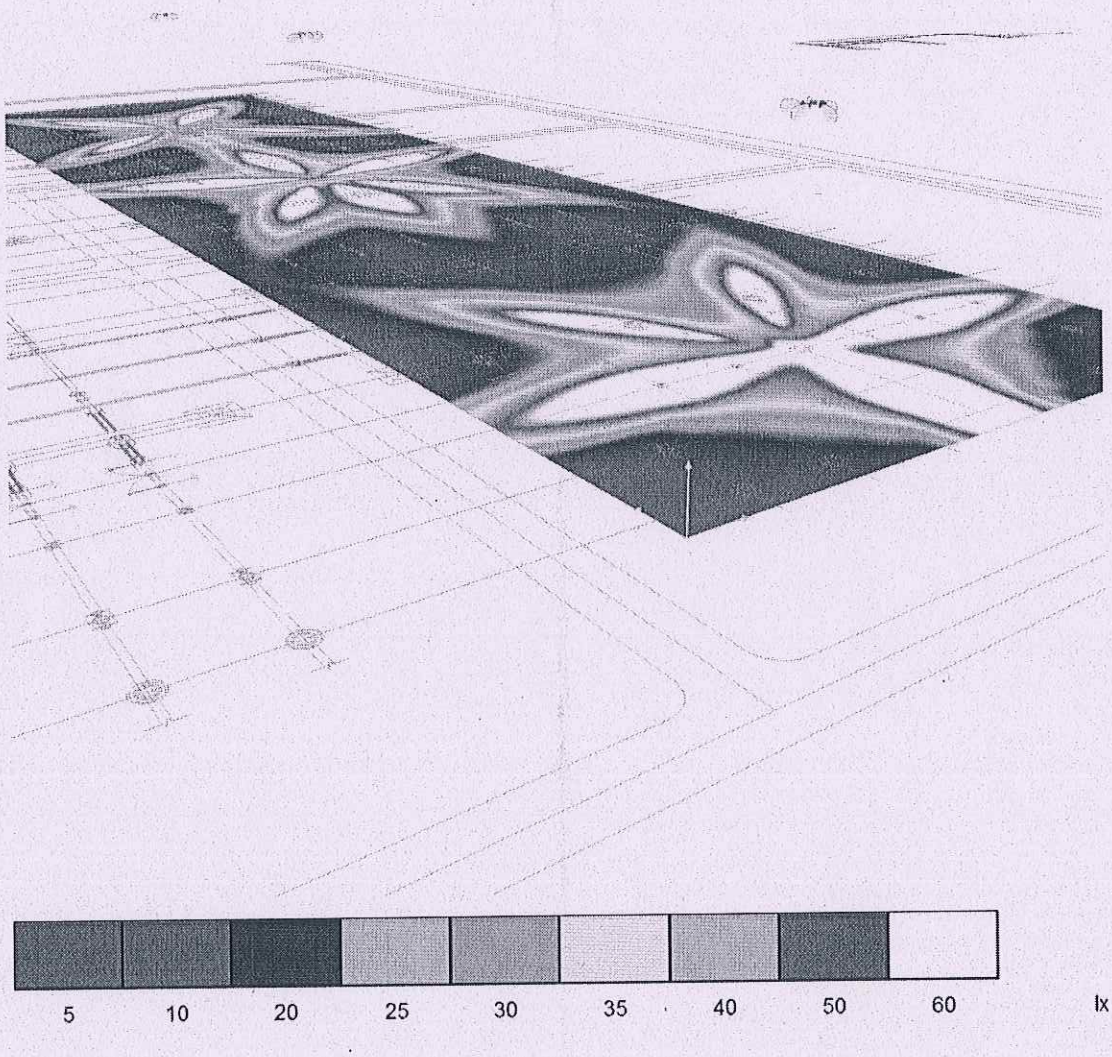
Operator
Telephone
Fax
e-Mail

400KV OUTDOOR SWITCHYARD JEJURI / 3D Rendering



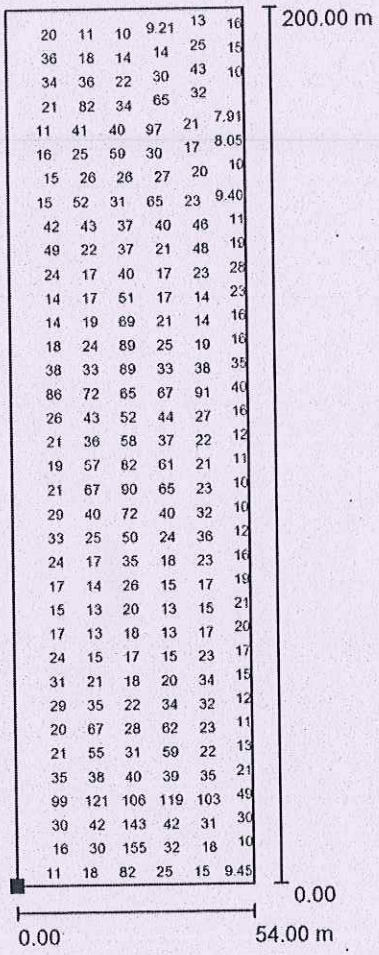
Operator
Telephone
Fax
e-Mail

400KV OUTDOOR SWITCHYARD JEJURI / False Colour Rendering



Operator
Telephone
Fax
e-Mail

400KV OUTDOOR SWITCHYARD JEJURI / SWITCHYARD AREA / Value Chart (E, Perpendicular)



20	11	10	9.21	13	16
36	18	14	14	25	15
34	36	22	30	43	10
21	82	34	65	32	
11	41	40	97	21	7.91
16	25	59	30	17	8.05
15	26	28	27	20	10
15	52	31	65	23	9.40
42	43	37	40	46	11
49	22	37	21	48	19
24	17	40	17	23	28
14	17	51	17	14	23
14	19	69	21	14	16
18	24	89	25	19	16
38	33	89	33	38	35
86	72	65	67	91	40
26	43	52	44	27	16
21	36	58	37	22	12
19	57	82	61	21	11
21	67	90	65	23	10
29	40	72	40	32	10
33	25	50	24	36	12
24	17	35	18	23	16
17	14	26	15	17	19
15	13	20	13	15	21
17	13	18	13	17	20
24	15	17	15	23	17
31	21	18	20	34	15
29	35	22	34	32	12
20	67	28	62	23	11
21	55	31	59	22	13
35	38	40	39	35	21
99	121	106	119	103	49
30	42	143	42	31	30
16	30	155	32	18	10
11	18	82	25	15	9.45

Values in Lux, Scale 1 : 1565

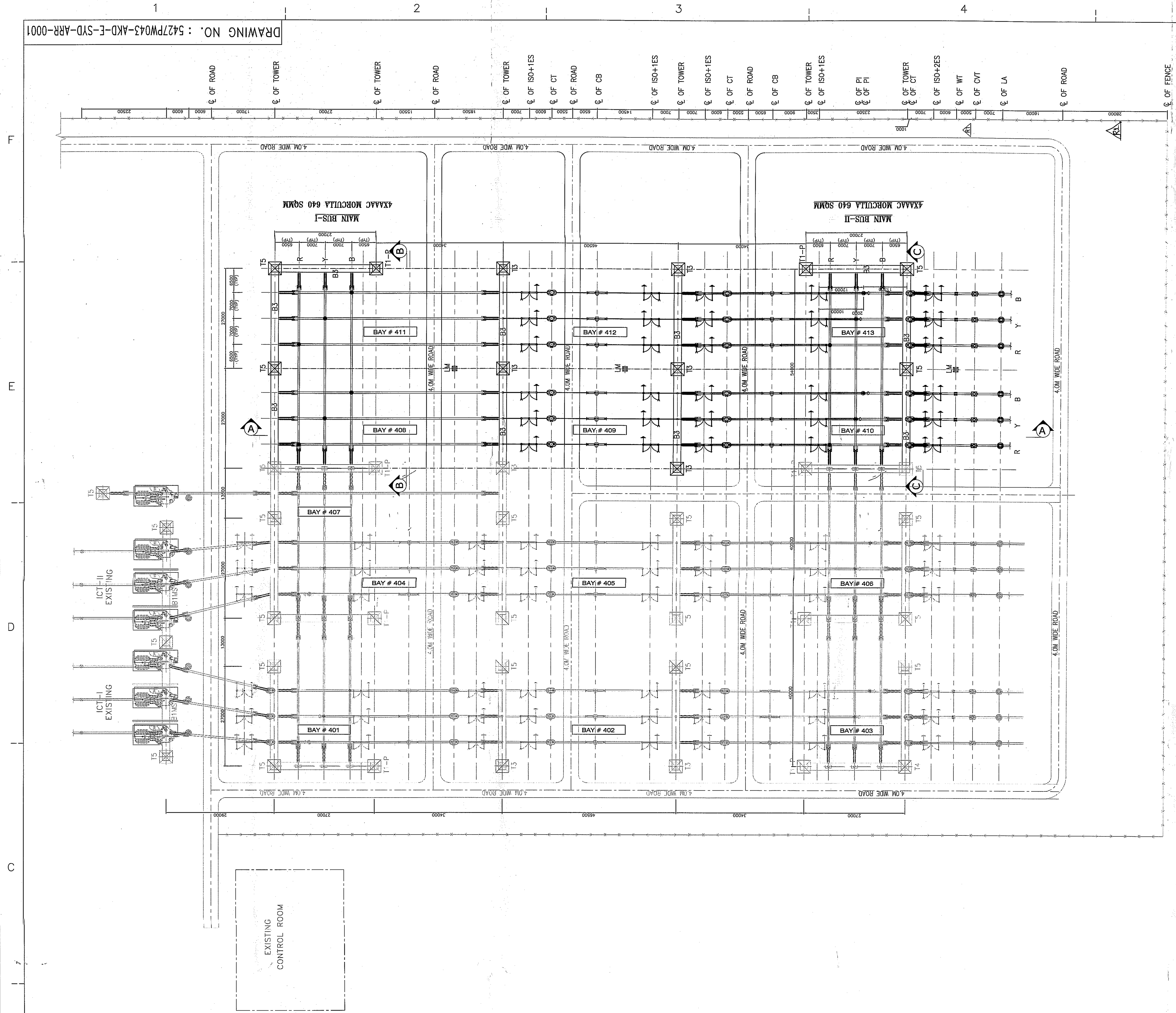
Not all calculated values could be displayed.

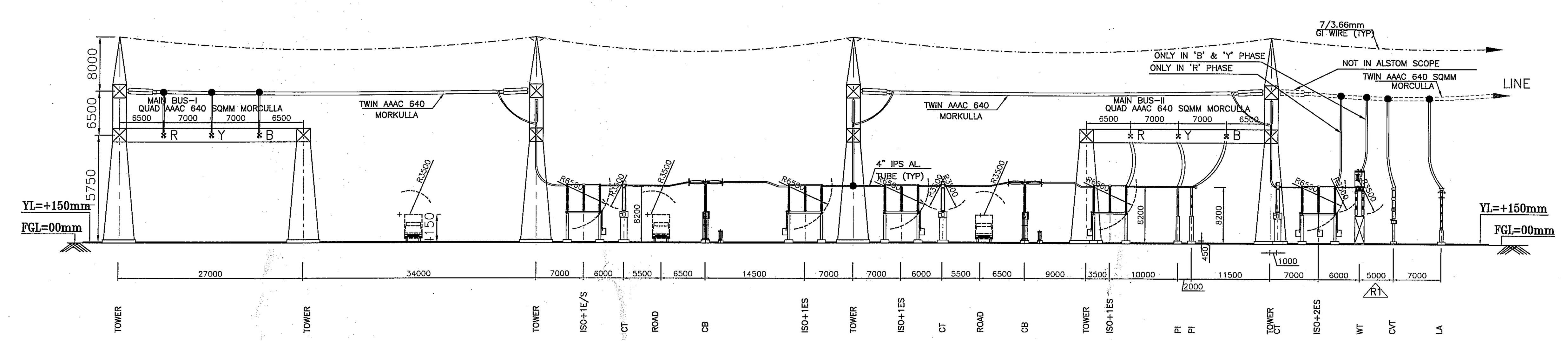
Position of surface in external scene:
Marked point:
(0.000 m, 0.000 m, 0.300 m)

Grid: 512 x 128 Points

E_{av} [lx]	E_{min} [lx]	E_{max} [lx]	u0	E_{min} / E_{max}
30	5.80	166	0.191	0.035

DRAWING NO. : 5427PW043-AKD-E-SYD-ARR-0001



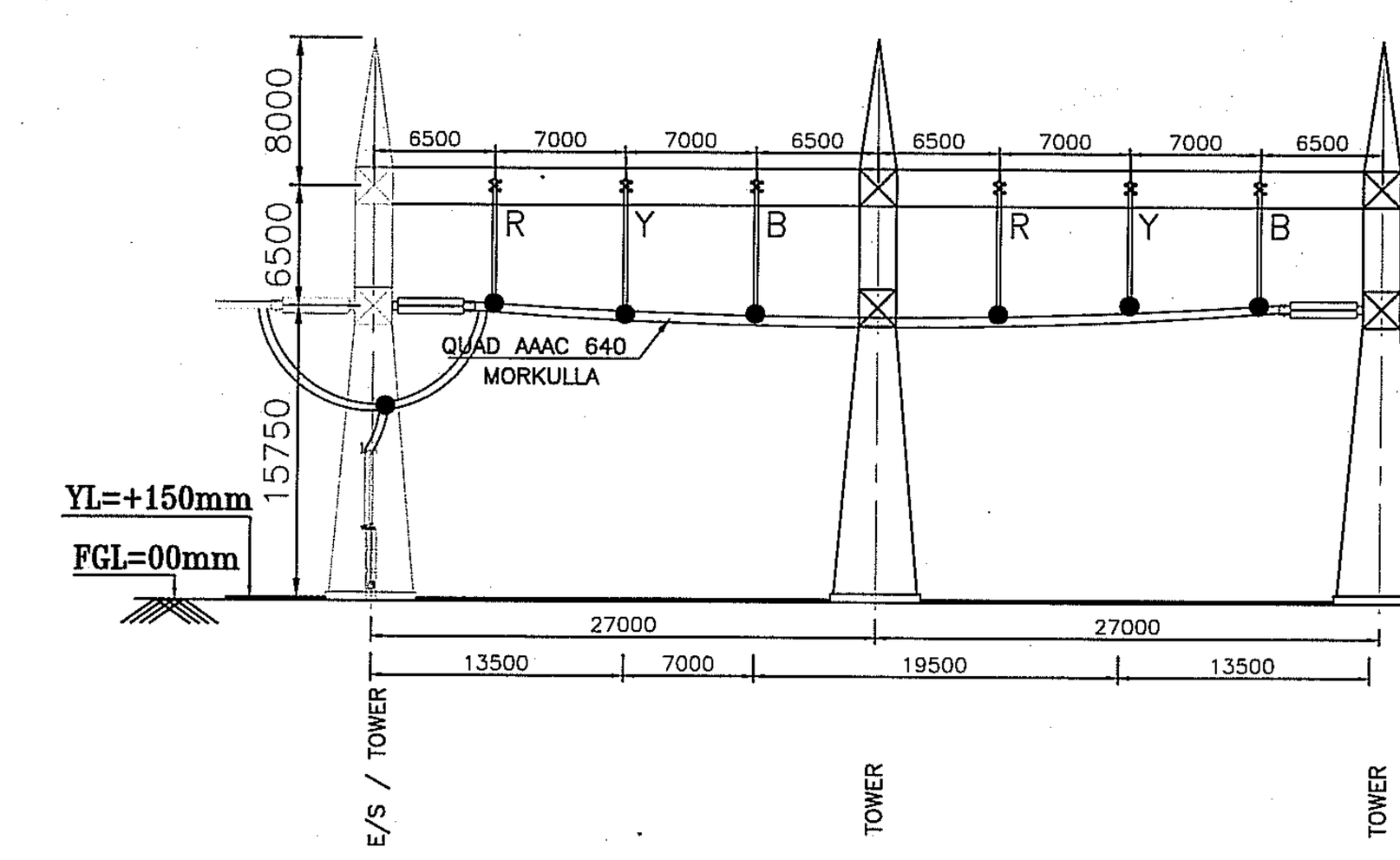


SECTION A–A

400kV (LINE BAY)

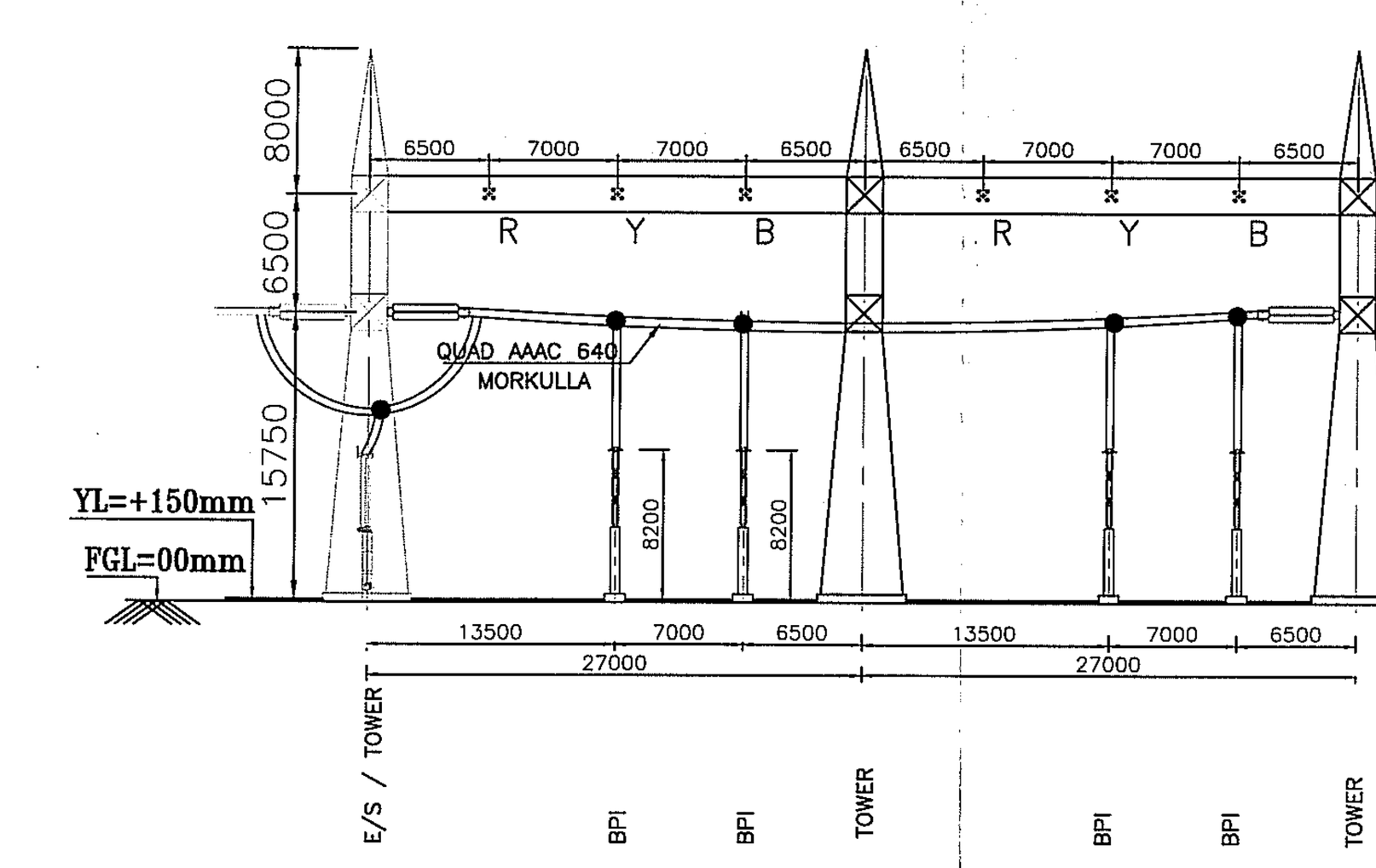
APPROVED
Executive Engineer (D&E-S2)
Projects & Design Section
M.S.E.T.C.L. "Prakashganga"
BKC, Bandra (East), Mumbai - 51

CONTROLLED COPY
APPROVAL / AS BUILT
PROTO / CONSTRUCTION
PLANNING / REFERENCE
MANUFACTURING / INDENT
RECORD / EXECUTION
ALSTOM T&D INDIA LTD.
Dt. 27/07/15 AUTH. SIG.



SECTION B–B

400kV MAIN BUS–I



SECTION C–C

400kV MAIN BUS–II

E S W N

BILL OF QUANTITY OF 400kV EQUIPMENTS

ITEM No.	DESCRIPTION	IDENTIFICATION	SYMBOL AS PER IEC	TOTAL QTY
1.	400kV,3150A,50kA/3sec, 3-PHASE C2-M2 CLASS CIRCUIT BREAKER WITHOUT PIR & WITHOUT CSD	409-52. 410-52, 412-52, 413-52		4 SETS
2.	400kV,3150A, 50kA/3sec, 3-PHASE, HCB ISOLATOR WITH 1 E/S	40989A/89AE, 40989B/89BE, 41089A/89AE, 41089B/89BE 41289A/89AE, 41289B/89BE 41389A/89AE, 41389B/89BE		8 SETS
3.	400kV, 3150A, 50kA/3sec, 3-PHASE, HCB ISOLATOR WITH 2 E/S	41089L/89LE1/89LE2 41389L/89LE1/89LE2		2 SETS
4.	400kV, CURRENT TRANSFORMER 3000A-1500-750/1-1-1-1-1A, CORE 1,2,4,5-PS CORE 3-0.2, 50kA/1sec, 120% EXTENDED CURRENT RATING	409-CTR, 409-CTY,409-CTB, 410-CT-1R, 410-CT-1Y,410-CT-1B, 410-CT-2R, 410-CT-2Y,410-CT-2B, 412-CTR, 412-CTY,412-CTB, 413-CT-1R, 413-CT-1Y,413-CT-1B, 413-CT-2R, 413-CT-2Y,413-CT-2B,		18 NOS.
5.	$\frac{400KV}{\sqrt{3}} / \frac{0.11}{\sqrt{3}} - \frac{0.11}{\sqrt{3}} - \frac{0.11}{\sqrt{3}}$ KV , 1-PH CVT (4400pF) (IN EACH PHASE PER CIRCUIT)	410CVTR, 410CVTY, 410CVTB, 413CVTR, 413CVTY, 413CVTB,		6 NOS.
6.	400kV,WAVE TRAP PEDASTAL TYPE 3150A, 1mH, 50KA/1S	410WTB, 410WTY 413WTB, 413WTY,		4 NOS.
7.	390kV, 10KA, CLASS III LIGHTNING ARRESTER (1-ø)	410LAR,410LAY,410LAB 413LAR,413LAY,413LAB		6 NOS.
8.	SUPPORT INSULATORS 8KN ALONG WITH GRADING RING (1-ø)	410PIY, 410PIB 413PIY, 413PIB	O	4 NOS.

BILL OF QUANTITY FOR 400KV TOWER & BEAM

ITEM No.	TOWER'S TYPE	TOTAL QTY.	BEAM TYPE	TOTAL QTY.
1.	T1-P	02 NOS.	B3	10 NOS.
2.	T3	05 NOS.		
3.	T5	04 NOS.		
4.	LM(18M.)	03 NOS.		

A. SYSTEM PARAMETERS:–

Sl.No.	DESCRIPTION OF PARAMETER	400kV
1	SYSTEM OPERATING VOLTAGE	400kV
2	HIGHEST SYSTEM VOLTAGE	420kV
3	RATED FREQUENCY	50Hz
4	NO. OF PHASES	3
5	BASIC INSULATION LEVELS	1425KV
6	SHORT CIRCUITS LEVELS	50KA/1SEC
7	PHASE TO PHASE CLEARANCE (AS PER IEC 61936-1)	4200 mm
8	PHASE TO EARTH CLEARANCE (AS PER IEC 61936-1)	3500 mm
9	GROUND CLEARANCE MINIMUM (AS PER CBIP)	8.0M
11	SECTIONAL CLEARANCE (AS PER CBIP)	6.5M
12	SAFETY CLEARANCE (AS PER IE RULES 1956 AMD 2005 RULE 64)	6.5M
13	SYSTEM NEUTRAL EARTHING	SOLIDLY EARTH
14	NOMINAL CREEPAGE DISTANCE (25MM/kV)	10500 mm
15	INSULATORS	
	a) TENSION DISC INSULATOR	120KN
	b) SUSPENSION DISC INSULATOR	120KN
	c) BPI FOR CONDUCTOR SUPPORT	8KN
	d) PI FOR ISOLATORS	8KN
	e) PI FOR WAVE TRAP	8KN
16	NO. OF DISC INSULATORS	
	a) TENSION STRING HARDWARE	24 NOS.
	b) SUSPENSION STRING HARDWARE	23 NOS.

B. 400kV CONDUCTOR & STRINGING DETAILS

SL.NO.	DESCRIPTION	CONDUCTOR CONFIFURATION	TENSION INSULATOR STRING/PHASE
1.	MAIN BUS-I & II	QUAD AAAC 640 MORCULLA CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	DOUBLE TENSION 120 kN DISC
2.	JACKBUS FOR LINES	TWIN AAAC 640 MORCULLA CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	DOUBLE TENSION 120 kN DISC
3.	DROPPERS FOR LINES,	TWIN AAAC 640 MORCULLA CONDUCTOR WITH 450MM SUB-CONDUCTOR SPACING	SINGLE SUSPENSION 120kN DISC
4.	EQUIPMENT INTERCONNECTION	4.0" IPS AL. TUBE/TWIN AAAC 640 MORCULLA CONDUCTOR WITH 450MM SPACING	–
5.	EARTHWIRE	7/3.66mm GI WIRE (10.98mm DIA)	–

NOTES:–

1. ALL DIMENSIONS ARE IN MM UNLESS OTHERWISE SPECIFIED.
2. ALL BUS HEIGHT REFER FROM YARD LEVEL.
3. EQUIPMENT SHOWN AS "FUTURE"/EXISTING ARE NOT IN ALSTOM SCOPE OF WORK.
4. PLINTH HEIGHT OF FOUNDATION WILL BE +450MM FROM THE FINISHED GROUND LEVEL (FGL) & GRAVEL THICKNESS i.e. YARD LEVEL SHALL BE 150mm FROM FGL.
5. TERMINATION OF LINE SIDE SHIELD WIRE, TENSION CLAMP, INSULATOR STRING WITH HARDWARE AND CONDUCTORS ARE NOT IN ALSTOM SCOPE OF WORK
6. SHIELD WIRES WILL BE USED FOR DIRECT STROKE LIGHTNING PROTECTION WHEREVER THEY ARE AVAILABLE.
7. RESPECTIVE EQUIPMENT DRAWINGS SHALL BE REFERRED FOR EQUIPMENT DIMENSIONS AND DETAILS.
8. ALL CONTROL & RELAY PANELS ARE MOUNTED IN MAIN CONTROL ROOM
9. ROAD, FENCE & DRAIN ARE NOT IN ALSTOM SCOPE OF WORK.
10. LM LOCATION WILL BE FINALISED AFTER APPROVAL OF LIGHTING DESIGN AND LAYOUT.

MSETCL REFERENCE DRG.:–

1. SWITCHYARD LAYOUT & ERECTION KEY DIAGRAM OF 400KV JEJURI S/DS :– 015.1292c

REV.	DESCRIPTION	DRAWN		SIGN.	CHECKED		SIGN.	APPROVED		SIGN.	STATUS
REV6		Name / Date			Name / Date			Name / Date			
REV5		Name / Date			Name / Date			Name / Date			
REV4		Name / Date			Name / Date			Name / Date			
REV3		Name / Date			Name / Date			Name / Date			
REV2		Name / Date			Name / Date			Name / Date			
REV1	DRG. REVISED TO MATCH THE EXISTING DIMENSIONS FOR WAVE TRAP AND CVT AS PER EXISTING SWITCHYARD CENTRE LINE	Name / Date	PMD / 27.07.15		Name / Date	CKM / 27.07.15		Name / Date	MNH/BB / 27.07.15		
REV0	FOR CLIENT APPROVAL	Name / Date	PMD / 17.12.14		Name / Date	CKM / 19.12.14		Name / Date	MNH/BB / 19.12.14		

REFR. DRG. NO. | DESCRIPTION

OWNER: MAHATRANSCO

MAHARASHTRA STATE ELECTRICITY TRANS.CO.LTD.

PROJECT : 400kV LINE BAY EXTENSION SUB–STATION AT JEJURI, DIST. PUNE

LOA REF CE/C&M/Contracts/TKC–I/T–1414/SS/Supply&Civil&ETC/ALSTOM/10440&10441&10442 DATED:–27/08/2014

TITLE : 400 kV SWITCHYARD LAYOUT PLAN & SECTION FOR LINE BAY

A0 ALSTOM — ALSTOM T&D INDIA LTD, MAGNET HOUSE BLDG (1ST FL) N. M. ROAD BALLARD ESTATE MUMBAI – 400 001

DRAWING NO. 5427PW050–JJR–E–SYD–SYS–0001–GA

TOTAL SH. 1 | SH.No. 1 OF 1 | REV. 1 | SCALE 1:1000