



NEPAL ELECTRICITY AUTHORITY
(An Undertaking of Government of Nepal)
PROJECT MANAGEMENT DIRECTORATE

TAMAKOSHI – KATHMANDU 220/400 KV TRANSMISSION LINE PROJECT

Addendum – 1

IFB No.: ICB-PMD-TKTLP-075/76-01-R: Procurement of Plant for New Khimti-Barhabise 220/400 kV Transmission line (Design, Supply and Install)

Pursuant to ITB 8, the following Addendum-1 has been issued in response to the queries received during pre-bid meeting:

S. No	Clause of Reference	Existing	Amendment
1	Volume II, Section 7A	Standard Technical Particulars values for Composite Long Rod Insulator is not provided.	Standard Technical Particulars for Composite Long Rod Insulator enclosed in Annexure-II of this addendum shall be added to 7A.
2	Volume II, Section 4 & ANNEXURE-2	Load trees for 400 kV D/C Quad Moose DBH & DDH Towers	Notes regarding Load Tree and Load Tree for DB & DD enclosed in Annexure-III of this addendum shall be added to ANNEXURE-2.
3	Volume II, Section 4, Cl. No. 1.4.4	Table 1.2 “Live Metal Clearance”	Table 1.2 shall be replaced by the revised details as enclosed in Annexure-I of this addendum.
4	Volume III, SCHEDULE-1	TOTAL (Total of column 8 to be carried forward to Schedule No. 5: Grand Summary)	Total of Column 9 is to be carried forward to Schedule No. 5.
5	Volume III, SCHEDULE-2	TOTAL (Total of column 8 to be carried forward to Schedule No. 5: Grand Summary)	Total of Column 9 is to be carried forward to Schedule No. 5.
6	Volume III, SCHEDULE-3	Total	Please add “Total of Columns 7 and 8 to be carried forward to Schedule No. 5”.
7	Volume III, SCHEDULE-4(e)	TOTAL (Total of column 7 to be carried forward to Schedule No. 5: Grand Summary)	Total of Column 8 is to be carried forward to Schedule No. 5.
8	Volume II, ANNEXURE-1	Sag Tension Calculation of ACSR MOOSE(Snow Zone)	Sag Tension Calculation of ACSR MOOSE (Snow Zone) shall be replaced by Annexure-IV of this addendum.
9	Volume II, ANNEXURE-1	Sag Tension Calculation of Earthwire (7/3.66), Snow Zone	Sag Tension Calculation of Earthwire (7/3.66), Snow Zone shall be replaced by Annexure-V of this addendum.
10	Volume II, SECTION-XI	Drawing for Leg Scheme	Existing drawing shall be added by drawing enclosed in Annexure-VI of this addendum.
11	Volume II, Section IV, Cl. No. 1.5.5.1 and 1.5.5.2	“both sub-conductors”	Text “both sub-conductors” shall be replaced by “ all four sub-conductors”
12	Volume II, Section I, Cl. No. 3.3.1	“for 400 kV A.C. Transmission Lines with Triple Snow Bird Conductor”	Text “for 400 kV A.C. Transmission Lines with Triple Snow Bird Conductor” stands deleted.
13	Volume III, Schedule 4(e), Sl. No. 3	“7/3.35 mm GS Earthwire”	“7/3.35 mm GS Earthwire” shall be replaced by “7/3.66 mm GS Earthwire”

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Annexure-I

TABLE 1.2 (refer clause 1.4.4 of Section-IV of technical specification)

(400kV)

DESCRIPTION	SWING ANGLE	LIVE METAL CLEARENCE
-----	-----	-----
Suspension String	NIL	3620 mm
(Single / Double)	15 Degree	3620 mm
	25 Degree	3620 mm
	40 Degree	2210 mm
Tension String	--	3620 mm
(Single / Double)		
Jumper	NIL	3620 mm
	25 Degree	3620 mm
	40 Degree	2210 mm

Annexure-II

Standard Technical Particulars for Composite Insulators

- 1.0 The Standard Technical Particulars of the various items which the bidder has to guarantee are specified in Section-II of this volume. The Bidder shall furnish any other information as in their opinion is needed to give full description and details to judge the item(s) offered by them.

1.1 Technical Information

For 400 kV transmission line

1.	Nominal Voltage	kV	400
2.	Maximum system voltage	kV	420
3.	BIL (Impulse)	kV (Peak)	1550
4.	Power frequency withstand voltage (Wet)	kV (rms)	680
5.	Switching surge withstand voltage (Wet)	kV (peak)	1050
6.	Minimum Corona extinction voltage at 50 Hz AC system under dry condition	kV (rms) phase to earth.	320
7.	Maximum Radio interference voltage at one MHz for phase to earth voltage of 305 KV under dry condition.	Micro Volts	1000

1.2 Standardized Technical Particulars of 400 kV D/C (Quad Moose) Insulator strings

Sl. No.	Description	Unit	Standard Technical Particular value			
			Double 'T' Suspension	Single 'T' Suspension PILOT	Single Tension	Quadruple Tension
1.0	No. of Insulator Units	Nos.	2 x 1	1 x 1	1 x 1	4 x 1
2.0	pf withstand voltage under wet condition	kV (rms)	680			
3.0	Switching withstand voltage (dry)					
a)	Positive (Peak)	kV	1050			
b)	Negative (Peak)	kV	1050			
4.0	Impulse withstand voltage (dry)					
a)	Positive (Peak)	kV	1550			
b)	Negative (Peak)	kV	1550			
5.0	Dry Arcing distance	mm	3050			
6.0	Mechanical strength	kN	2X120	120	120	4X160

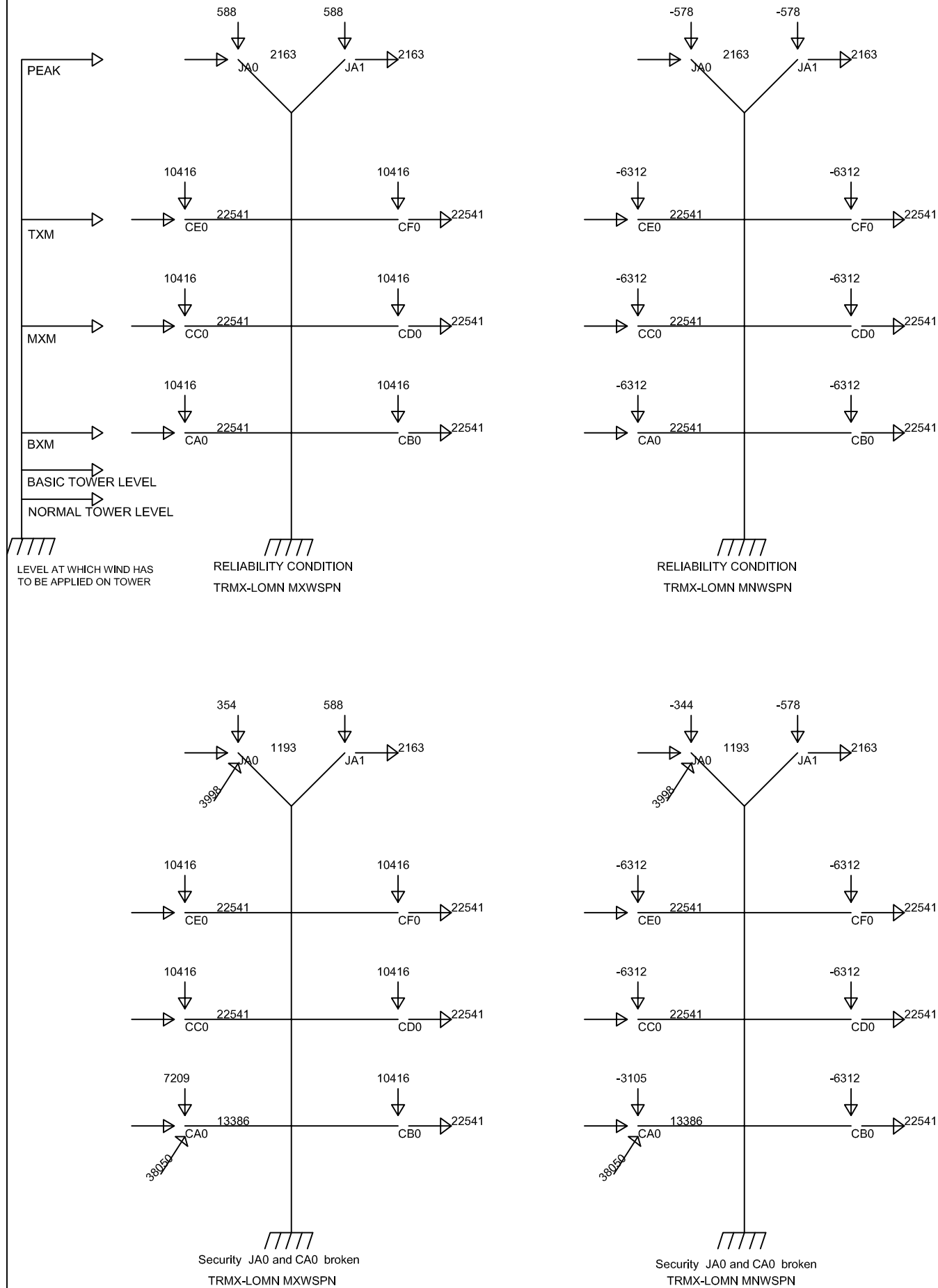
Annexure-III

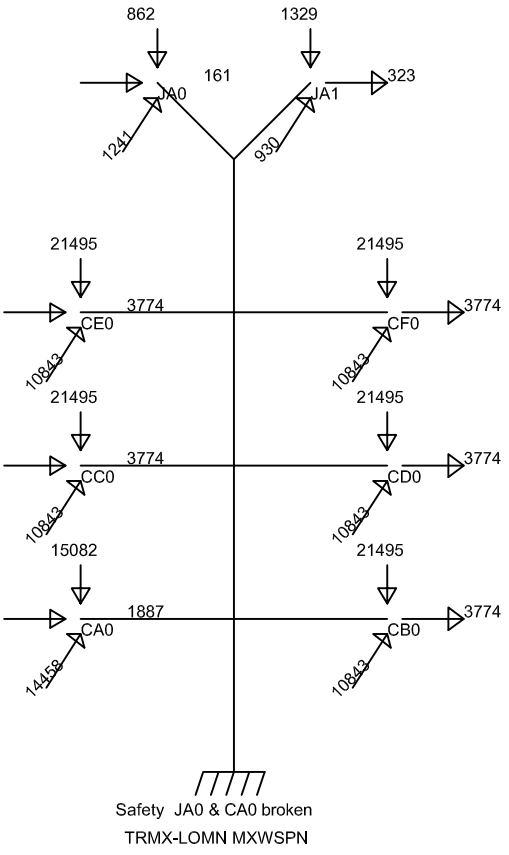
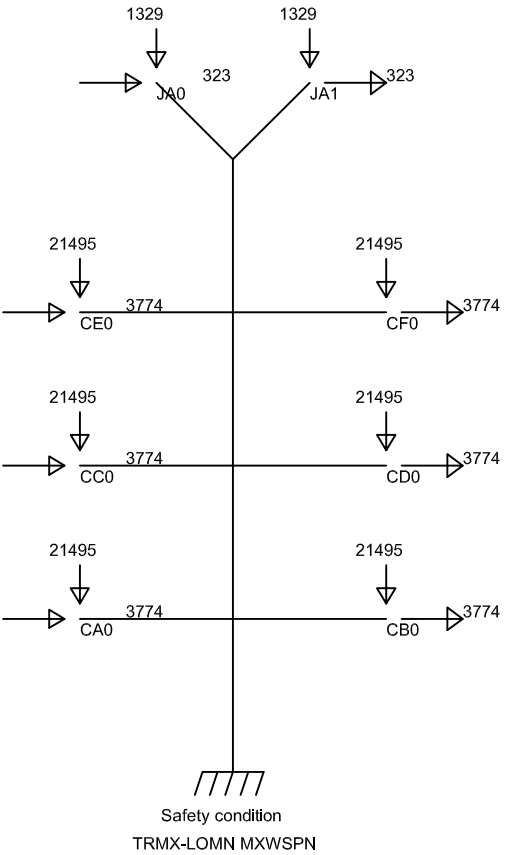
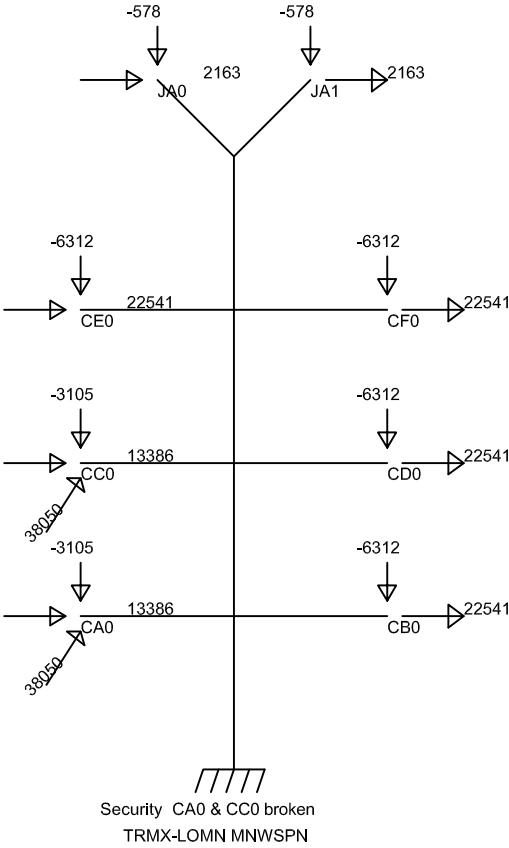
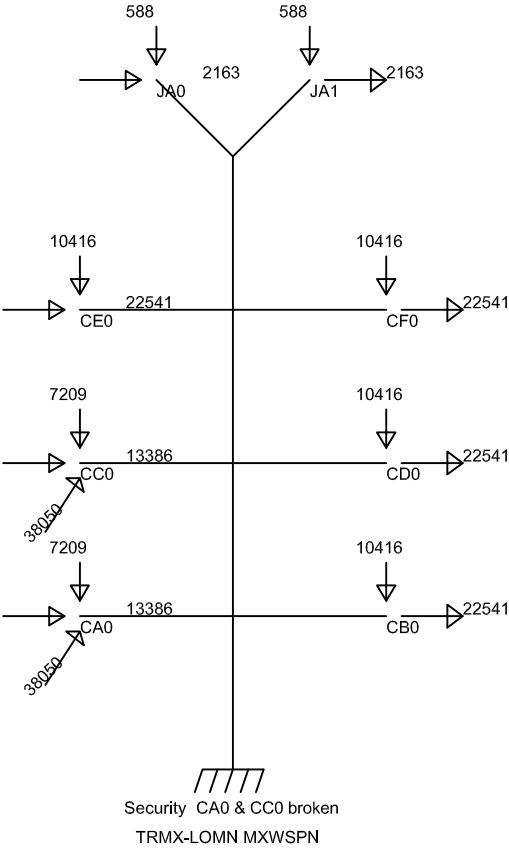
NOTES FOR THE LOAD TREE

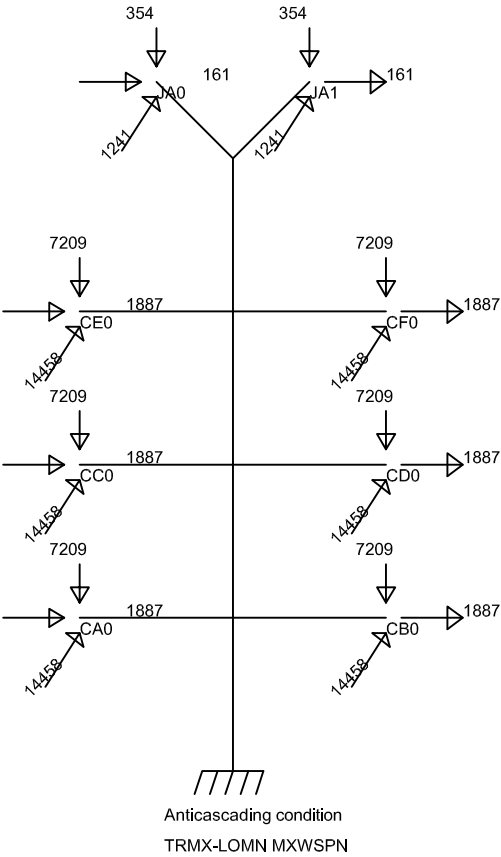
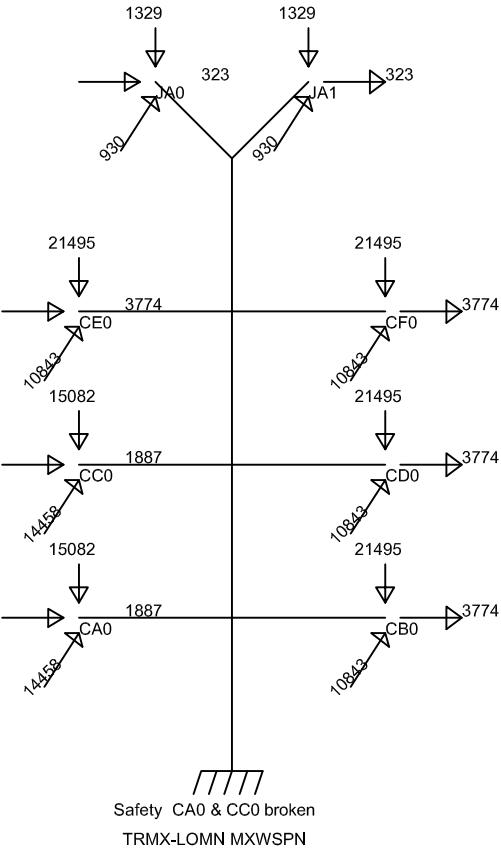
1. ALL ULTIMATE LOADS ARE IN kg.
2. WIND LOAD ON TOWER BODY SHALL BE CONSIDERED IN RELIABILITY AND SECURITY CONDITIONS.
3. SELF WEIGHT OF TOWER SHALL BE CONSIDERED EXTRA.
4. INSULATOR STRING WEIGHT AND WIND ON STRINGS IS INCLUDED IN THE LOADS.
5. WIND AND WEIGHT SPANS ARE AS PER THE VALUES MENTIONED IN TECHNICAL SPECIFICATION.
6. ADDITIONAL LOAD CASES FOR SNOW LOADING CONDITION (10 mm radial ice) ARE PROVIDED. THE DBH AND DDH TYPE TOWERS SHALL BE DESIGNED FOR ALL THE LOAD CASES APPLIED ON DB AND DD TOWERS RESPECTIVELY, AS WELL AS THE ADDITIONAL SNOW LOADING CONDITIONS.

WIND ON TOWER

- 1) FOR RELIABILITY CONDITION FULL WIND HAS TO BE APPLIED
- 2) FOR SECURITY CONDITION FULL WIND HAS TO BE APPLIED
- 3) FOR SAFETY CONDITION NO WIND HAS TO BE APPLIED

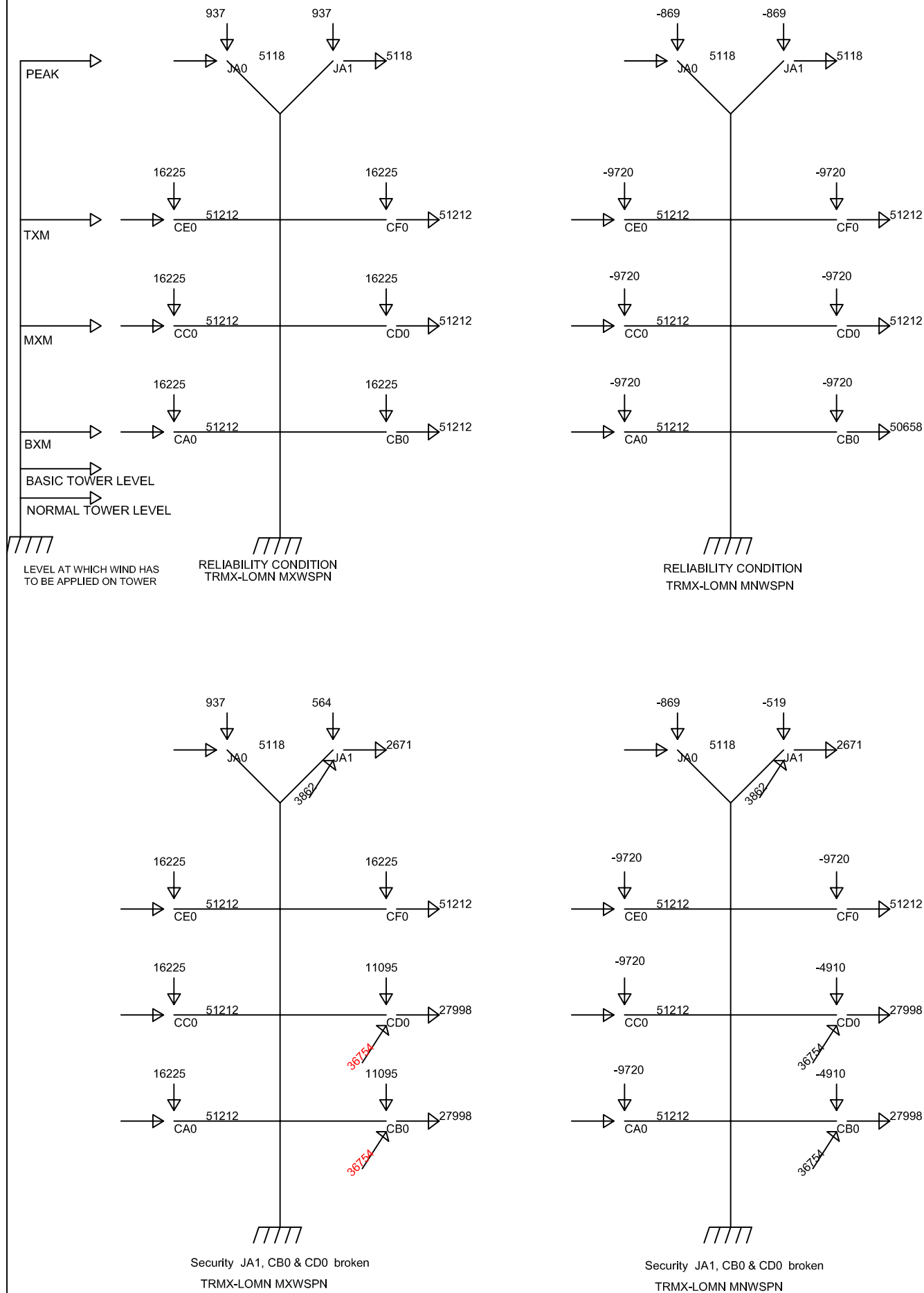


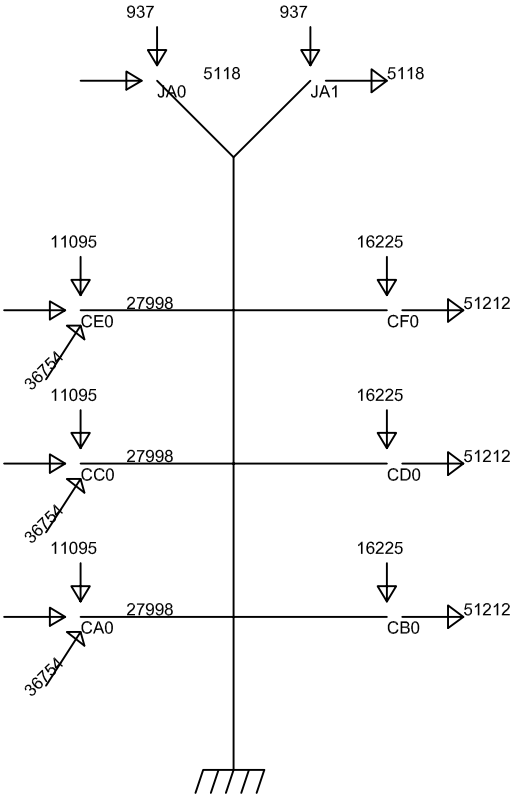




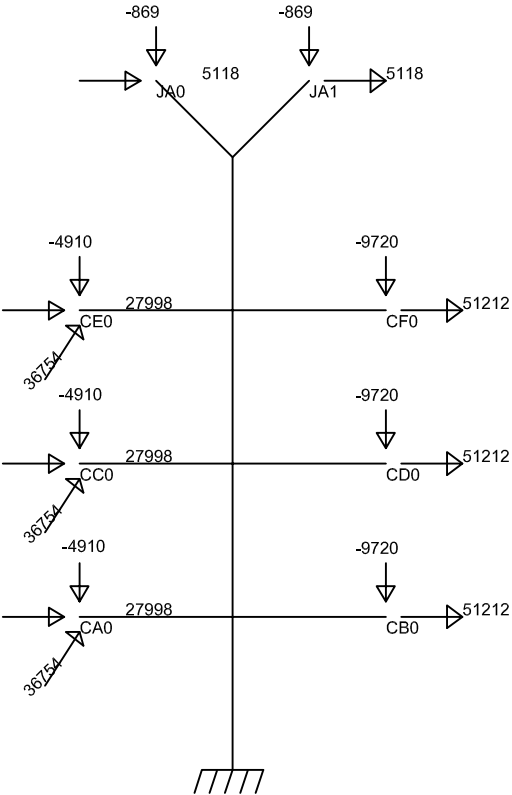
WIND ON TOWER

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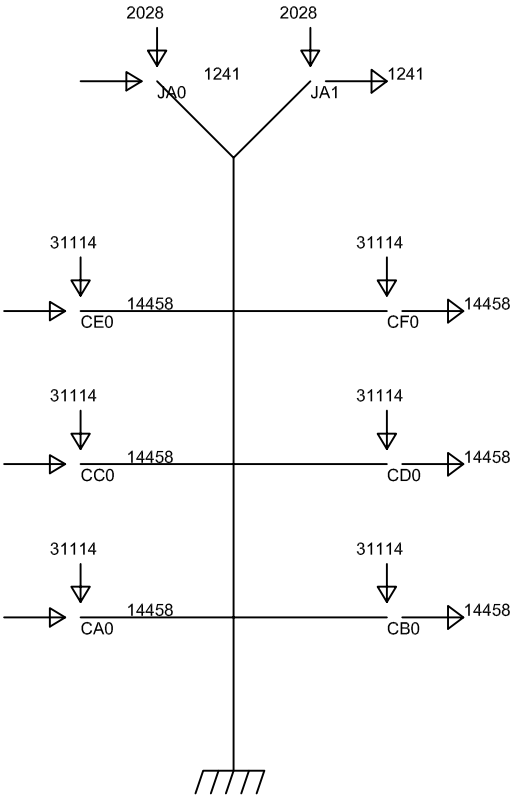




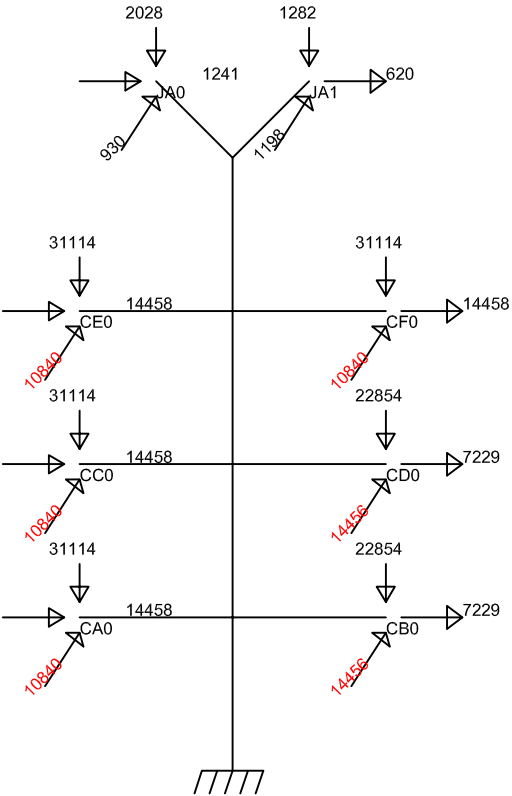
Security CA0, CC0 & CE0 broken
TRMX-LOMN MXWSPN



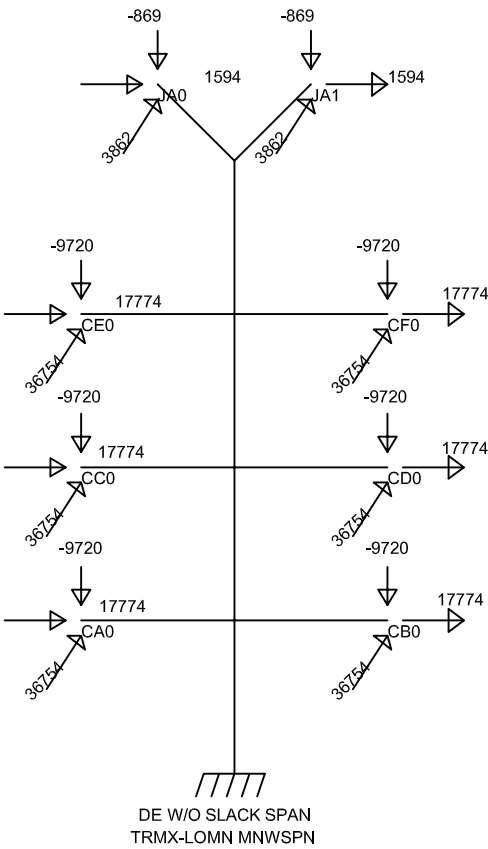
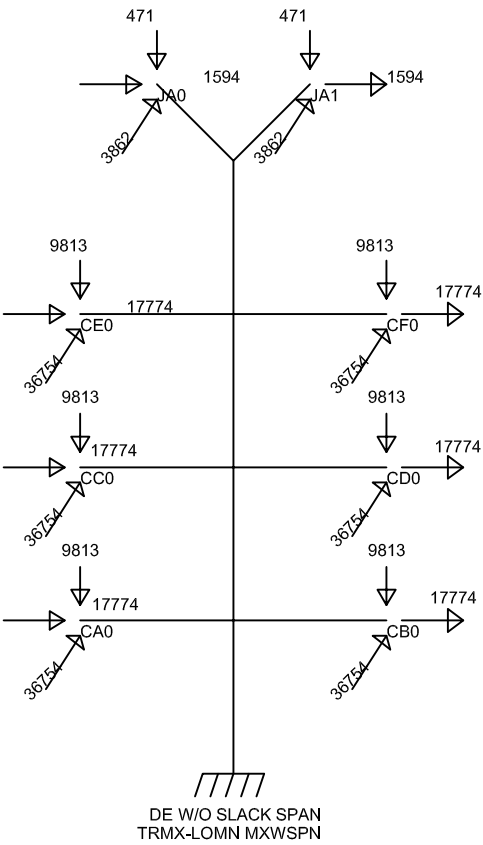
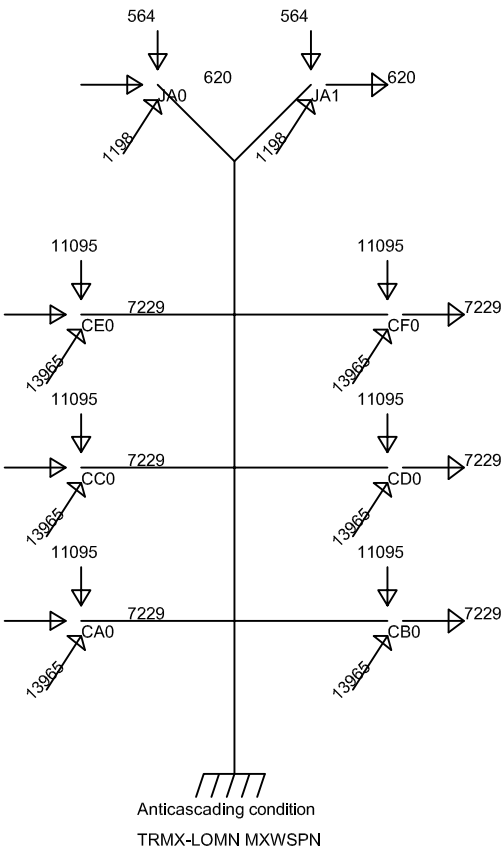
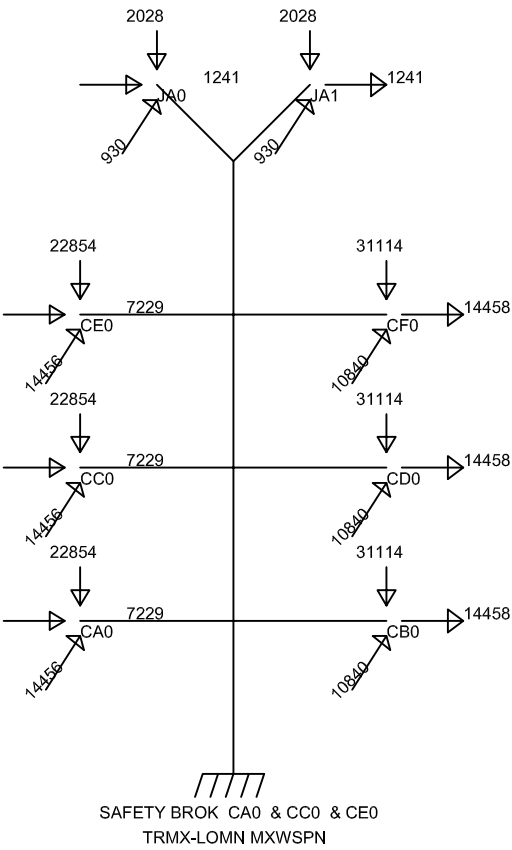
Security CA0, CC0 & CE0 broken
TRMX-LOMN MNWSPN

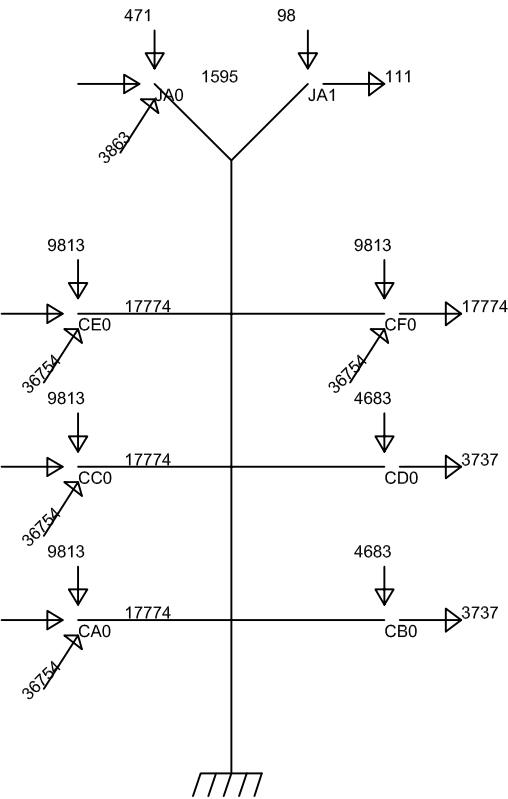


Safety condition
TRMX-LOMN MXWSPN

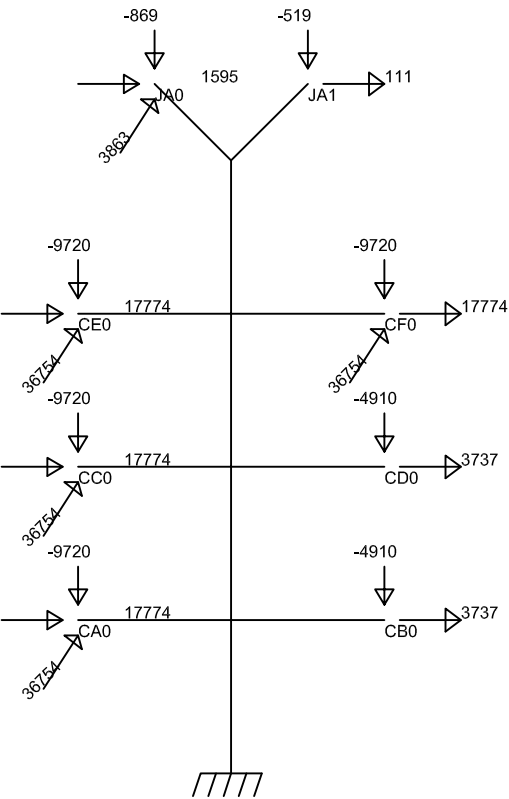


Safety JA1, CD0 & CB0 broken
TRMX-LOMN MXWSPN

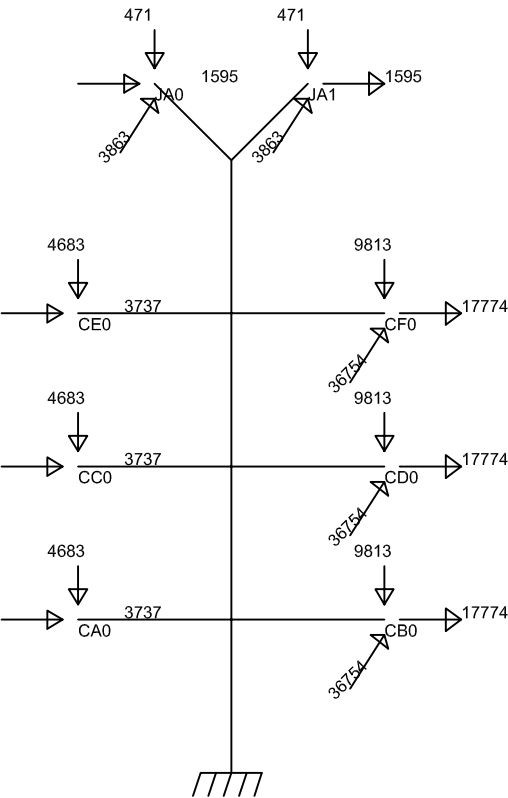




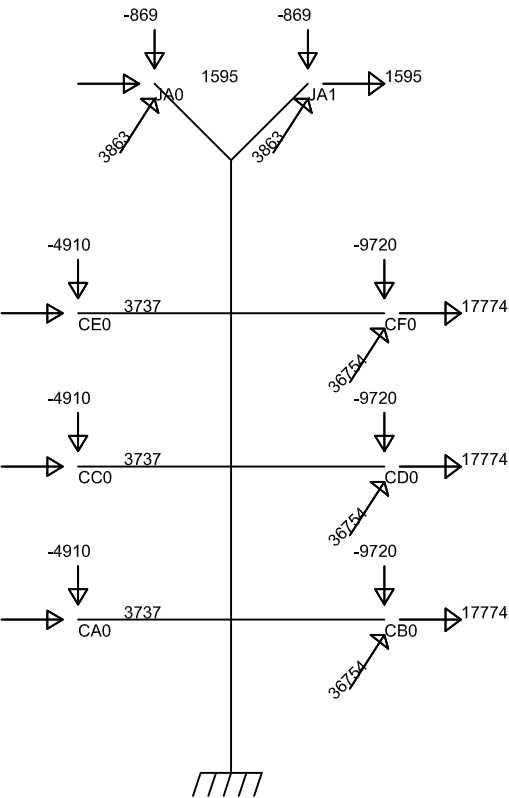
DE W/O SLACK SPAN BROK JA1, CD0 & CB0
TRMX-LOMN MXWSPN



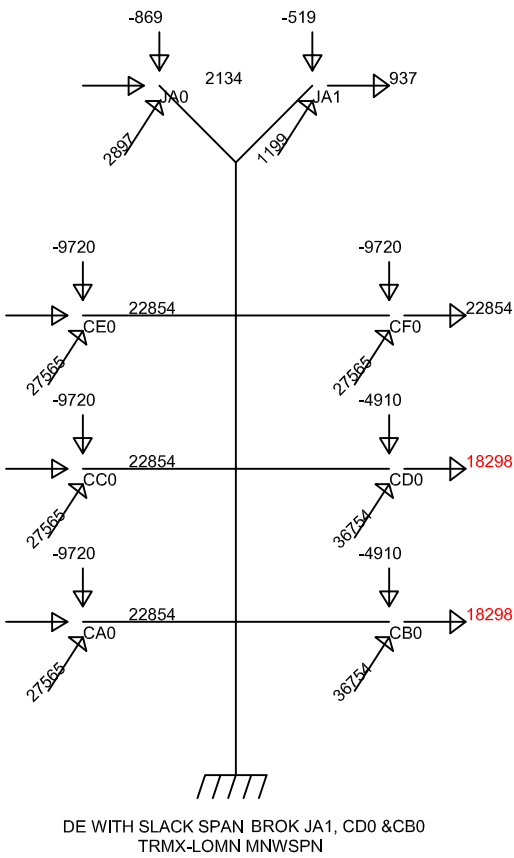
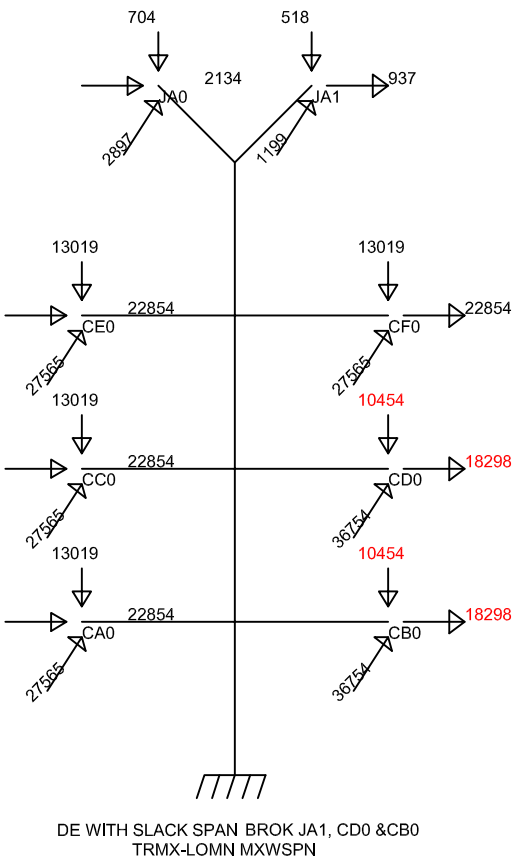
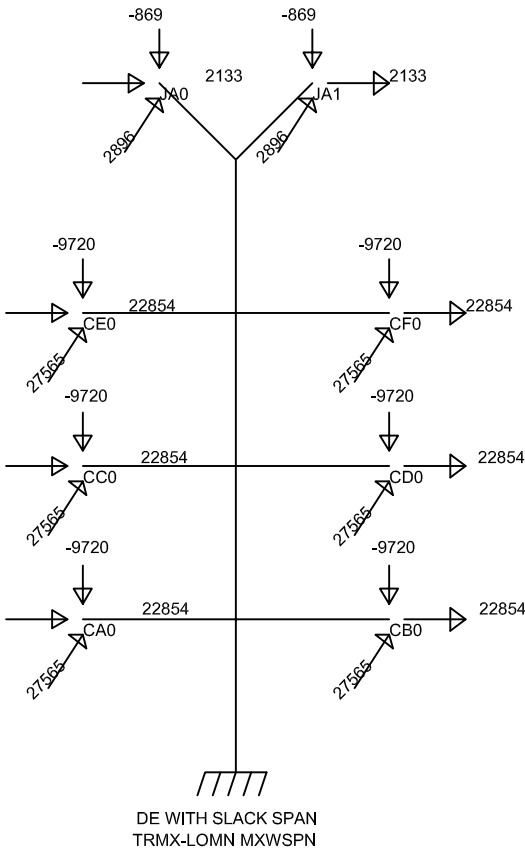
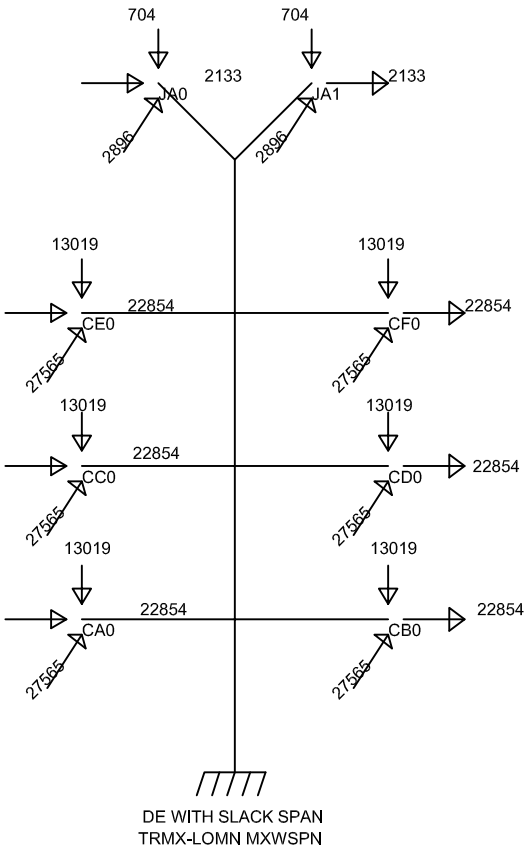
DE W/O SLACK SPAN BROK JA1, CD0 & CB0
TRMX-LOMN MNWSPN



DE W/O SLACK SPAN BROK CE0, CC0 & CA0
TRMX-LOMN MXWSPN



DE W/O SLACK SPAN BROK CE0, CC0 & CA0
TRMX-LOMN MNWSPN





Annexure-IV

Sag-Tension Calculation of ACSR MOOSE (Snow Zone)

Conductor Properties

Conductor Name	ACSR MOOSE
UTS(kg)	16428
Area of Conductor (sqmm)	597
Wt. Of Conductor (Kg/m)	2.004
Dia. Of Conductor (mm)	31.77
Modulus of Elasticity (Kg/sqmm)	7034
Coeff. Of Linear Expansion (per deg. C)	0.0000193

Note: The tension should be below 22% of UTS in day to day Condition and should not exceed 70% of UTS in any condition

22% of UTS = 3614.16 Kg	70% of UTS = 11499.6 Kg
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Initial Condition

Normal Span (m)	400
Wind Pressure on Cond (Kg/sqm)	206
Initial Cond. Temp. (deg C)	32
Initial Wind %	0
Thickness of ICE (mm)	0
Initial Cond tension at above temp and wind condition (% of UTS OR value in Kg)	3614

Initial Sag, Ten at 32 deg C, 0% wind		
Ten (% of UTS)	Ten (Kg)	Sag (mts)
22	3614	11.09

	Final Conditions							
Temperature (deg C)	32	-5	-15	0	-5	80	-5	32
Pressure (% of full wind)	0	0	0	100	28	0	28	100
Thickness of ICE (mm)	0	10	0	0	10	0	0	0
Resultant Tension (Kg)	3614	6002.96	4462.05	10204.14	7519.74	3067.12	5315.01	9511.94
Resultant Sag (mts)	11.09	10.69	8.982	#	#	13.068	#	#

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* Tension BEYOND Indian Standard Limits

Annexure-V

Sag-Tension Calculation of Earthwire (7/3.66) (Snow Zone)

Conductor Properties

Conductor Name	Earthwier (7/3.66)
UTS(kg)	6972
Area of Conductor (sqmm)	73.65
Wt. Of Conductor (Kg/m)	0.583
Dia. Of Conductor (mm)	10.98
Modulus of Elasticity (Kg/sqmm)	19361
Coeff. Of Linear Expansion (per deg. C)	0.0000115

Note: The tension should be below 22% of UTS in day to day Condition and should not exceed 70% of UTS in any condition

20% of UTS = 1394.4 Kg	70% of UTS = 4880.4 Kg
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Initial Condition

Normal Span (m)	400
Wind Pressure on Cond (Kg/sqm)	254.8224
Initial Cond. Temp. (deg C)	-5
Initial Wind %	0
Thickness of ICE (mm)	10
Initial Cond tension at above temp and wind condition (% of UTS OR value in Kg)	35.5

Initial Sag, Ten at -5 deg C, 0% wind		
Ten (% of UTS)	Ten (Kg)	Sag (mts)
35.5	2475.06	4.71

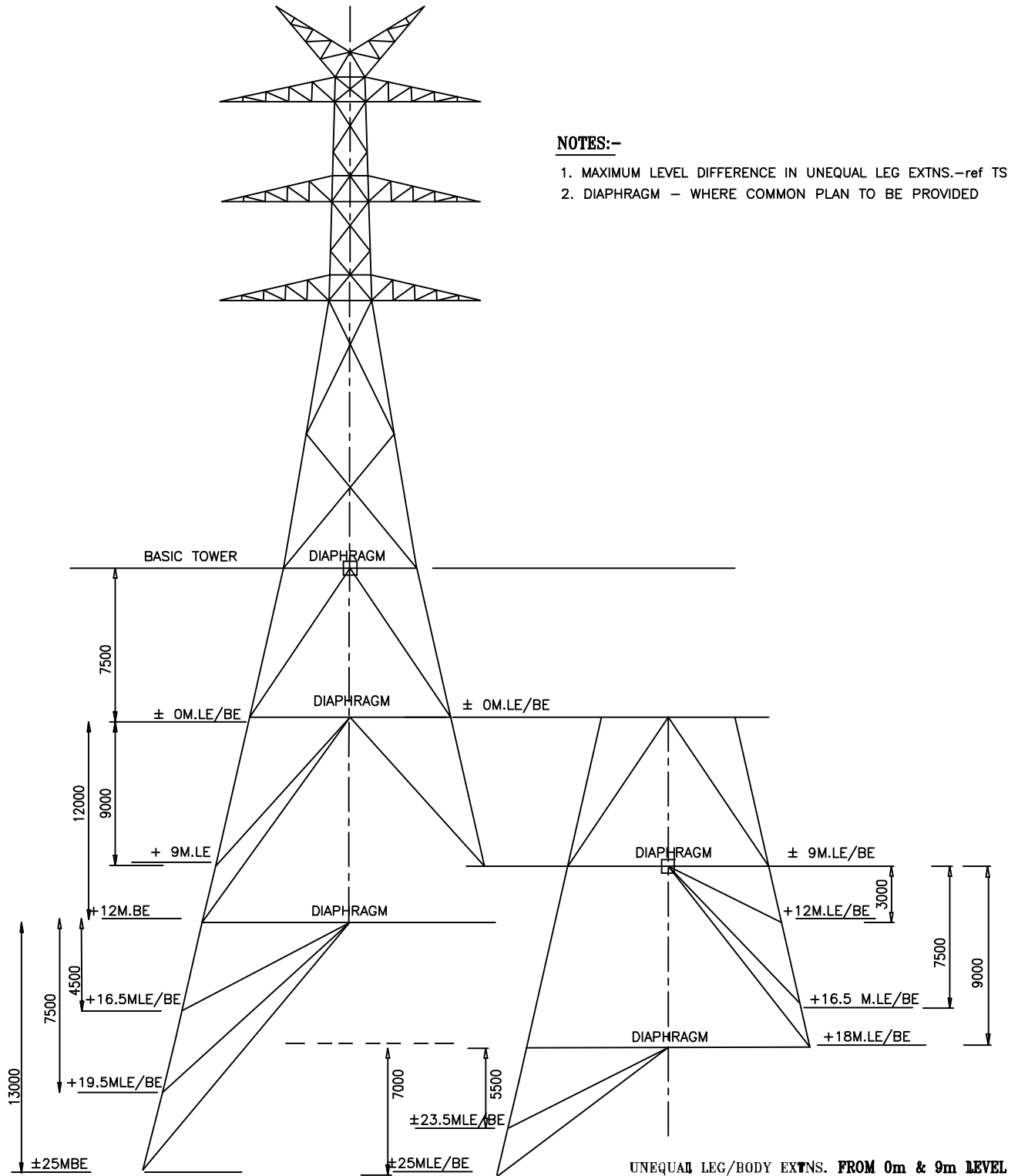
	Final Conditions							
Temperature (deg C)	32	-5	-15	0	-5	53	-5	32
Pressure (% of full wind)	0	0	0	100	28	0	28	100
Thickness of ICE (mm)	0	10	0	0	10	0	0	0
Resultant Tension (Kg)	1378.44	2475.06	1644.07	4334.93	4009.18	1286.33	2184.48	4161.59
Resultant Sag (mts)	8.459	9.6	7.092	#	#	9.065	#	#

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* Tension BEYOND Indian Standard Limits

Annexure-VI

TYPE "DD" TOWER
KEY SKETCH FOR LEG/BODY EXTENSIONS



NOTES:-

1. MAXIMUM LEVEL DIFFERENCE IN UNEQUAL LEG EXTNS.-ref TS
2. DIAPHRAGM - WHERE COMMON PLAN TO BE PROVIDED

UNEQUAL LEG /BODY EXTNS. FROM 12 m LEVEL

UNEQUAL LEG/BODY EXTNS. FROM 0m & 9m LEVEL

SL.NO.		DATE	REVISION	INITIALS	SCALE	SHEET NO. 1 OF 1	DRAWING NO:-	TS/400KV/110/QUAD ACSR MOOSE/	REV. 0

NEPAL ELECTRICITY AUTHORITY	
PROJECT	400 KV D/C KHIMTI-BARABHISE (TRANSMISSION LINE QUAD ACSR)
SPECNN NO:-	
DESIGNED BY	
DRAWN BY	
CHECKED BY	
APPROVED BY	
TYPICAL KEY TOWER COMBINATION SKETCH FOR "DD" TYPE TOWER	