





BOLTS / NUTS STATEMENT		
X-ARM		
TYPE	SIZE (length in mm)	TOTAL QTY.
		HEXAGONAL ANTI THEFT
	M12 X 30 MM	76
	M12 X 35 MM	15
SPRING WASHER	M12 X 2.5 THK	91
PACK WASHER	M12 X 5 THK	2
	M16 X 35 MM	72
	M16 X 40 MM	50
	M16 X 45 MM	31
	M16 X 50 MM	8
	M16 X 55 MM	4
SPRING WASHER	M16 X 3.5 THK	185
PACK WASHER	M16 X 6 THK	2

NOTES:-

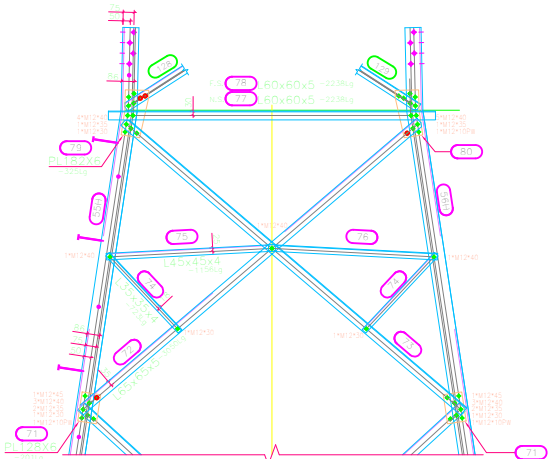
- ALL DIMENSIONS ARE IN MM.
- MATERIALS :
"h" INDICATES HIGH TENSILE STEEL - IS2062:2006 E350 (fy=350N/sqmm)
MILD STEEL - IS2062:2006 E250 (fy=250N/sqmm)
BOLTS & NUTS - 120 & 160 - GRADE 5.6/5 (ISO:898) OR EQUIVALENT.
BOLT SET: ONE BOLT+ONE NUT+ONE SPRING WASHER.
STEP BOLT SET: ONE BOLT+TWO NUT+TWO SPRING WASHER.
- ALL STEEL MEMBERS SHALL BE HOT DIP GALVANIZED.
- THE PROCEEDING LETTER WILL BE "T43 SB3".
- ◆ INDICATES HOLES OF 17.5mm DIA FOR 16mm DIA BOLTS.
◆ INDICATES HOLES OF 13.5mm DIA FOR 12mm DIA BOLTS.
◆ INDICATES HOLES OF 17.5mm DIA FOR 16mm DIA STEP BOLTS.
§ INDICATES ANTI THEFT BOLTS.

MARK NOS.
BOTTOM X-ARM:-200H TO 244
TOP X-ARM:-250H TO 278

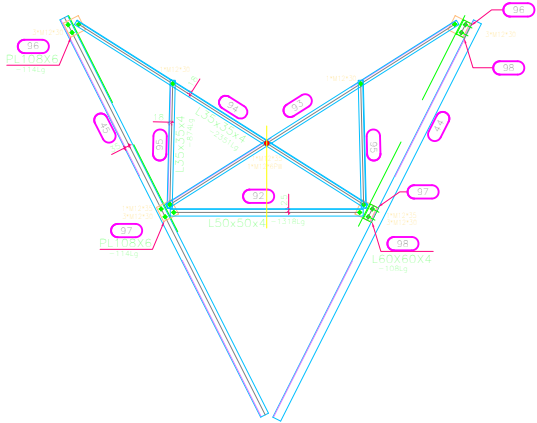
REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
1	06.07.13	CROSS ARM CONNECTION REVISED.	WS	WS	MKM

CLIENT :		KETRACO KENYA ELECTRICITY TRANSMISSION CO. LTD., KENYA		
CONSULTANT :		ELECTRO CONSULTANT.		
CONTRACTOR :		TATA PROJECTS LIMITED, NEW DELHI, INDIA		
Contract :	XVIII: KPLC1/6E/2/A17			
PROJECT :	Kindaruma-Mwingi-Garissa 132 KV S/C Transmission Lines (LOT A17)			
DESIGN	Manali	09.02.2013	SCALE:-1:20	TITLE
DRN.	MJ	27.05.2013		STRUCTURAL DRAWING FOR TENSION TOWER TYPE "SB3" (0°-90°/0°) X-ARMS
CHD.	WS	27.05.2013		
APPR.	MKM	27.05.2013		
DRG. NO.	KETRACO/A17/SB3/SD/03			
REV	1	SHEET 3 OF 3		

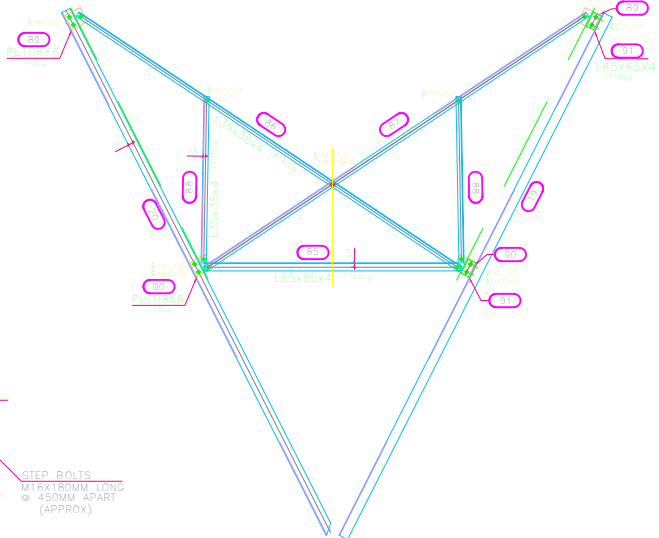
TOWER SLOPE	
TAN B	0.15331119
2TAN B	0.30662238
FACE	1.01169815
DEVELOP	1.023243393



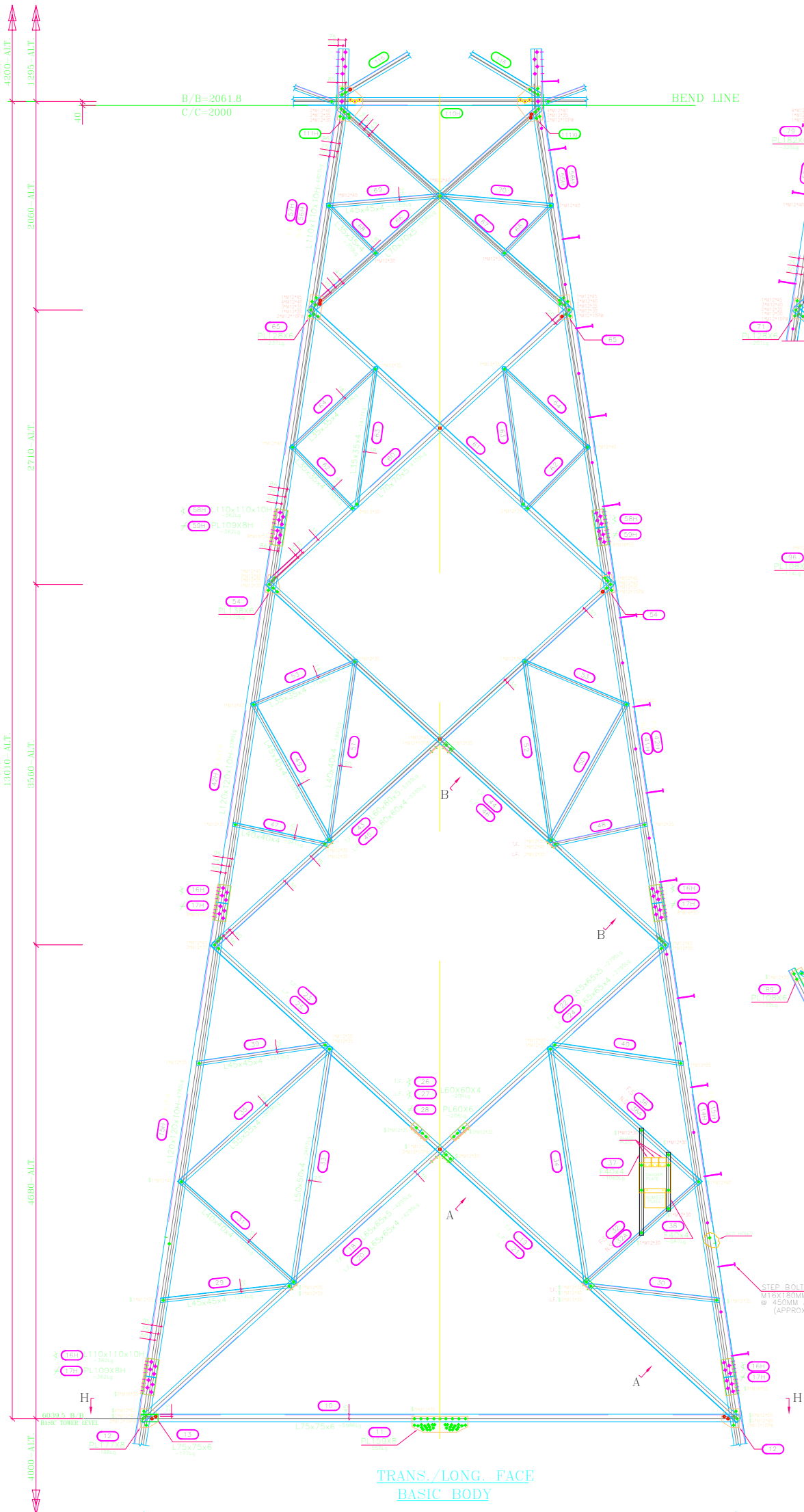
LONG FACE



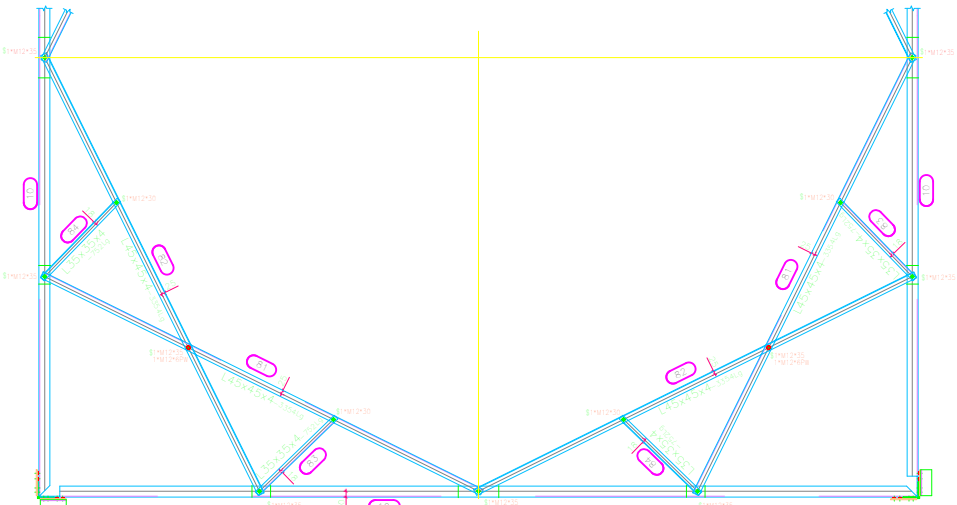
VIEW B-B



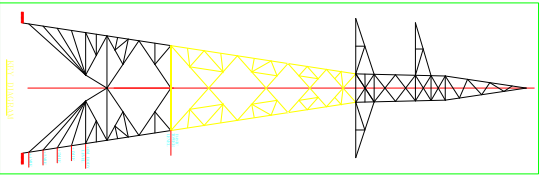
VIEW A-A



TRANS./LONG. FACE
BASIC BODY



VIEW H-H



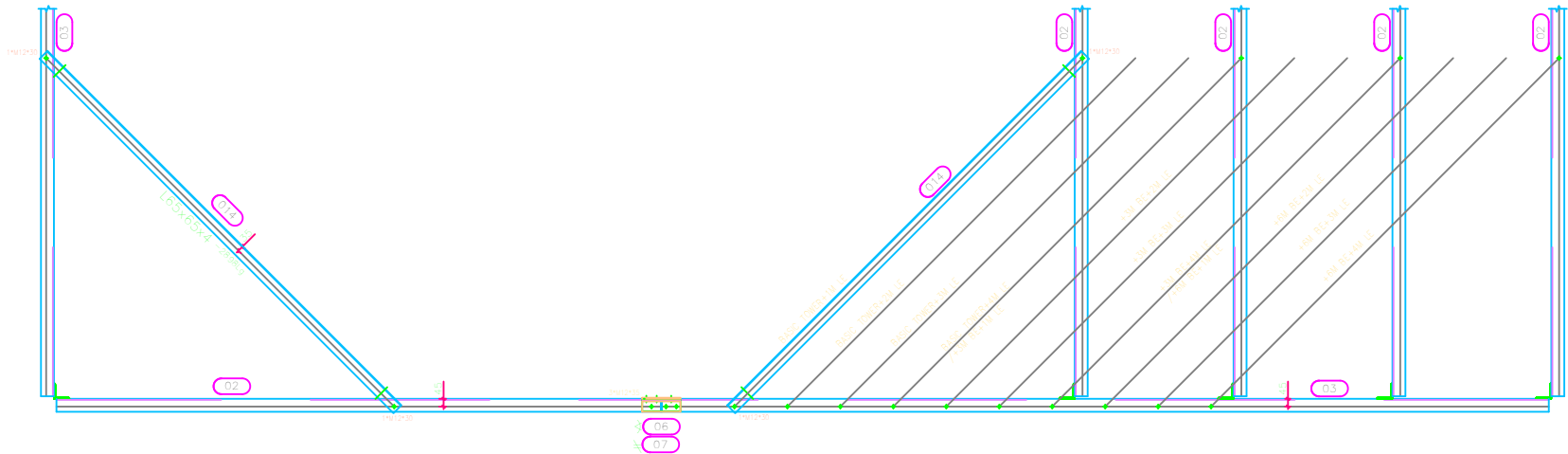
TOWERS / TOWER STRUCTURE		
TOWER / TOWER STRUCTURE		
TYPE	SIZE (length in mm)	TOTAL QTY
		DEVELOP (mm) QTY
	512 X 30 000	120 60
	512 X 35 000	120 120
	512 X 40 000	120 20
	512 X 45 000	120 20
	512 X 50 000	120 20
	512 X 55 000	120 20
	512 X 60 000	120 20
	512 X 65 000	120 20
	512 X 70 000	120 20
	512 X 75 000	120 20
	512 X 80 000	120 20
	512 X 85 000	120 20
	512 X 90 000	120 20
	512 X 95 000	120 20
	512 X 100 000	120 20
	512 X 105 000	120 20
	512 X 110 000	120 20
	512 X 115 000	120 20
	512 X 120 000	120 20
	512 X 125 000	120 20
	512 X 130 000	120 20
	512 X 135 000	120 20
	512 X 140 000	120 20
	512 X 145 000	120 20
	512 X 150 000	120 20
	512 X 155 000	120 20
	512 X 160 000	120 20
	512 X 165 000	120 20
	512 X 170 000	120 20
	512 X 175 000	120 20
	512 X 180 000	120 20
	512 X 185 000	120 20
	512 X 190 000	120 20
	512 X 195 000	120 20
	512 X 200 000	120 20
	512 X 205 000	120 20
	512 X 210 000	120 20
	512 X 215 000	120 20
	512 X 220 000	120 20
	512 X 225 000	120 20
	512 X 230 000	120 20
	512 X 235 000	120 20
	512 X 240 000	120 20
	512 X 245 000	120 20
	512 X 250 000	120 20
	512 X 255 000	120 20
	512 X 260 000	120 20
	512 X 265 000	120 20
	512 X 270 000	120 20
	512 X 275 000	120 20
	512 X 280 000	120 20
	512 X 285 000	120 20
	512 X 290 000	120 20
	512 X 295 000	120 20
	512 X 300 000	120 20
	512 X 305 000	120 20
	512 X 310 000	120 20
	512 X 315 000	120 20
	512 X 320 000	120 20
	512 X 325 000	120 20
	512 X 330 000	120 20
	512 X 335 000	120 20
	512 X 340 000	120 20
	512 X 345 000	120 20
	512 X 350 000	120 20
	512 X 355 000	120 20
	512 X 360 000	120 20
	512 X 365 000	120 20
	512 X 370 000	120 20
	512 X 375 000	120 20
	512 X 380 000	120 20
	512 X 385 000	120 20
	512 X 390 000	120 20
	512 X 395 000	120 20
	512 X 400 000	120 20
	512 X 405 000	120 20
	512 X 410 000	120 20
	512 X 415 000	120 20
	512 X 420 000	120 20
	512 X 425 000	120 20
	512 X 430 000	120 20
	512 X 435 000	120 20
	512 X 440 000	120 20
	512 X 445 000	120 20
	512 X 450 000	120 20
	512 X 455 000	120 20
	512 X 460 000	120 20
	512 X 465 000	120 20
	512 X 470 000	120 20
	512 X 475 000	120 20
	512 X 480 000	120 20
	512 X 485 000	120 20
	512 X 490 000	120 20
	512 X 495 000	120 20
	512 X 500 000	120 20
	512 X 505 000	120 20
	512 X 510 000	120 20
	512 X 515 000	120 20
	512 X 520 000	120 20
	512 X 525 000	120 20
	512 X 530 000	120 20
	512 X 535 000	120 20
	512 X 540 000	120 20
	512 X 545 000	120 20
	512 X 550 000	120 20
	512 X 555 000	120 20
	512 X 560 000	120 20
	512 X 565 000	120 20
	512 X 570 000	120 20
	512 X 575 000	120 20
	512 X 580 000	120 20
	512 X 585 000	120 20
	512 X 590 000	120 20
	512 X 595 000	120 20
	512 X 600 000	120 20
	512 X 605 000	120 20
	512 X 610 000	120 20
	512 X 615 000	120 20
	512 X 620 000	120 20
	512 X 625 000	120 20
	512 X 630 000	120 20
	512 X 635 000	120 20
	512 X 640 000	120 20
	512 X 645 000	120 20
	512 X 650 000	120 20
	512 X 655 000	120 20
	512 X 660 000	120 20
	512 X 665 000	120 20
	512 X 670 000	120 20
	512 X 675 000	120 20
	512 X 680 000	120 20
	512 X 685 000	120 20
	512 X 690 000	120 20
	512 X 695 000	120 20
	512 X 700 000	120 20
	512 X 705 000	120 20
	512 X 710 000	120 20
	512 X 715 000	120 20
	512 X 720 000	120 20
	512 X 725 000	120 20
	512 X 730 000	120 20
	512 X 735 000	120 20
	512 X 740 000	120 20
	512 X 745 000	120 20
	512 X 750 000	120 20
	512 X 755 000	120 20
	512 X 760 000	120 20
	512 X 765 000	120 20
	512 X 770 000	120 20
	512 X 775 000	120 20
	512 X 780 000	120 20
	512 X 785 000	120 20
	512 X 790 000	120 20
	512 X 795 000	120 20
	512 X 800 000	120 20
	512 X 805 000	120 20
	512 X 810 000	120 20
	512 X 815 000	120 20
	512 X 820 000	120 20
	512 X 825 000	120 20
	512 X 830 000	120 20
	512 X 835 000	120 20
	512 X 840 000	120 20
	512 X 845 000	120 20
	512 X 850 000	120 20
	512 X 855 000	120 20
	512 X 860 000	120 20
	512 X 865 000	120 20
	512 X 870 000	120 20
	512 X 875 000	120 20
	512 X 880 000	120 20
	512 X 885 000	120 20
	512 X 890 000	120 20
	512 X 895 000	120 20
	512 X 900 000	120 20
	512 X 905 000	120 20
	512 X 910 000	120 20
	512 X 915 000	120 20
	512 X 920 000	120 20
	512 X 925 000	120 20
	512 X 930 000	120 20
	512 X 935 000	120 20
	512 X 940 000	120 20
	512 X 945 000	120 20
	512 X 950 000	120 20
	512 X 955 000	120 20
	512 X 960 000	120 20
	512 X 965 000	120 20
	512 X 970 000	120 20
	512 X 975 000	120 20
	512 X 980 000	120 20
	512 X 985 000	120 20
	512 X 990 000	120 20
	512 X 995 000	120 20
	512 X 1000 000	120 20
	512 X 1005 000	120 20
	512 X 1010 000	120 20
	512 X 1015 000	120 20
	512 X 1020 000	120 20
	512 X 1025 000	120 20
	512 X 1030 000	120 20
	512 X 1035 000	120 20
	512 X 1040 000	120 20
	512 X 1045 000	120 20
	512 X 1050 000	120 20
	512 X 1055 000	120 20
	512 X 1060 000	120 20
	512 X 1065 000	120 20
	512 X 1070 000	120 20
	512 X 1075 000	120 20
	512 X 1080 000	120 20
	512 X 1085 000	120 20
	512 X 1090 000	120 20
	512 X 1095 000	120 20
	512 X 1100 000	120 20
	512 X 1105 000	120 20
	512 X 1110 000	120 20
	512 X 1115 000	120 20
	512 X 1120 000	120 20
	512 X 1125 000	120 20
	512 X 1130 000	120 20
	512 X 1135 000	120 20
	512 X 1140 000	120 20
	512 X 1145 000	120 20
	512 X 1150 000	120 20
	512 X 1155 000	120 20
	512 X 1160 000	120 20
	512 X 1165 000	120 20
	512 X 1170 000	120 20
	512 X 1175 000	120 20
	512 X 1180 000	120 20
	512 X 1185 000	120 20
	512 X 1190 000	120 20
	512 X 1195 000	120 20
	512 X 1200 000	120 20
	512 X 1205 000	120 20
	512 X 1210 000	120 20
	512 X 1215 000	120 20
	512 X 1220 000	120 20
	512 X 1225 000	120 20
	512 X 1230 000	120 20
	512 X 1235 000	120 20
	512 X 1240 000	120 20
	512 X 1245 000	120 20
	512 X 1250 000	120 20
	512 X 1255 000	120 20
	512 X 1260 000	120 20
	512 X 1265 000	120 20
	512 X 1270 000	120 20
	512 X 1275 000	120 20
	512 X 1280 000	120 20
	512 X 1285 000	120 20
	512 X 1290 000	120 20
	512 X 1295 000	120 20
	512 X 1300 000	120 20
	512 X 1305 000	120 20
	512 X 1310 000	120 20
	512 X 1315 000	120 20
	512 X 1320 000	120 20
	512 X 1325 000	120 20
	512 X 1330 000	120 20
	512 X 1335 000	120 20
	512 X 1340 000	120 20
	512 X 1345 000	120 20
	512 X 1350 000	120 20
	512 X 1355 000	120 20
	512 X 1360 000	120 20
	512 X 1365 000	120 20
	512 X 1370 000	120 20
	512 X 1375 000	120 20
	512 X 1380 000	120 20
	512 X 1385 000	120 20
	512 X 1390 000	120 20
	512 X 1395 000	120 20
	512 X 1400 000	120 20
	512 X 1405 000	120 20
	512 X 1410 000	120 20
	512 X 1415 000	120 20
	512 X 1420 000	120 20
	512 X 1425 000	120 20
	512 X 1430 000	120 20
	512 X 1435 000	120 20
	512 X 1440 000	120 20
	512 X 1445 000	120 20
	512 X 1450 000	120 20
	512 X 1455 000	120 20
	512 X 1460 000	120 20
	512 X 1465 000	120 20
	512 X 1470 000	120 20
	512 X 1475 000	120 20
	512 X 1480 000	120 20
	512 X 1485 000	120 20
	512 X 1490 000	120 20
	512 X 1495 000	120 20
	512 X 1500 000	120 20
	512 X 1505 000	120 20
	512 X 1510 000	120 20
	512 X 1515 000	120 20
	512 X 1520 000	120 20
	512 X 1525 000	120 20
	512 X 1530 000	120 20
	512 X 1535 000	120 20
	512 X 1540 000	120 20
	512 X 1545 000	120 20
	512 X 1550 000	120 20
	512 X 1555 000	120 20
	512 X 1560 000	120 20
	512 X 1565 000	120 20
	512 X 1570 000	120 20
	512 X 1575 000	120 20
	512 X 1580 000	120 20
	512 X 1585 000	120 20
	512 X 1590 000	120 20
	512 X 1595 000	120 20
	512 X 1600 000	120 20
	512 X 1605 000	120 20
	512 X 1610 000	120 20
	512 X 1615 000	120 20
	512 X 1620 000	120 20
	512 X 1625 000	120 20
	512 X 1630 000	120 20
	512 X 1635 000	120 20
	512 X 1640 000	120 20
	512 X 1645 000	120 20
	512 X 1650 000	120 20
	512 X 1655 000	120 20
	512 X 1660 000	120 20
	512 X 1665 000	120 20
	512 X 1670 000	120 20
	512 X 1675 000	120 20
	512 X 1680 000	120 20
	512 X 1685 000	120 20
	512 X 1690 000	120 20
	512 X 1695 000	120 20
	512 X 1700 000	120 20
	512 X 1705 000	120 20
	512 X 1710 000	120 20
	512 X 1715 000	12

TOWER SLOPE	
TAN B	0.15334119
2TAN B	0.30668238
FACE	1.01168845
DEVELOP	1.023243393

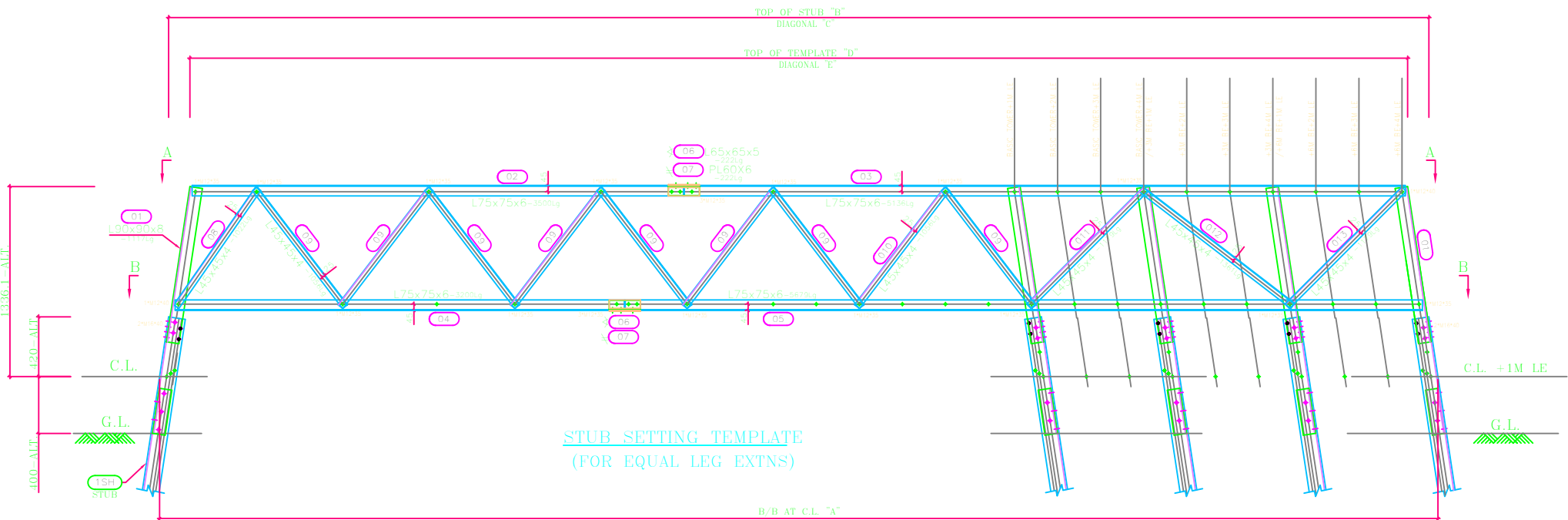
STUB SETTING DIMENSIONS					
	A	B	C	D	E
BASIC TOWER +1M LE	8346.2	8217.4	8792.7	8916.1	8363.8
BASIC TOWER +2M LE	8652.0	8524.1	9226.4	9220.8	8797.5
BASIC TOWER +3M LE	8959.6	8830.8	9660.2	9527.5	9231.2
BASIC TOWER +4MLE/ +3M BE +1M LE	7266.2	7137.4	10093.9	6834.1	9664.0
+3M BE +2M LE	7572.9	7444.1	10527.6	7140.8	10098.7
+3M BE +3M LE	7879.6	7750.8	10961.3	7447.5	10532.4
+3M BE +4M LE/ +6M BE +1M LE	8186.3	8057.5	11395.0	7754.2	10966.1
+6M BE +2M LE	8493.0	8364.2	11828.7	8060.9	11399.8
+6M BE +3M LE	8799.7	8670.9	12262.4	8367.6	11833.5
+6M BE +4M LE	9106.3	8977.5	12696.2	8674.2	12267.2

BOLTS / NUTS STATEMENT SST		
TYPE	SIZE (Length in mm)	TOTAL QTY.
	M12 X 30 MM	16
	M12 X 35 MM	104
	M12 X 40 MM	8
	M16 X 40 MM	16

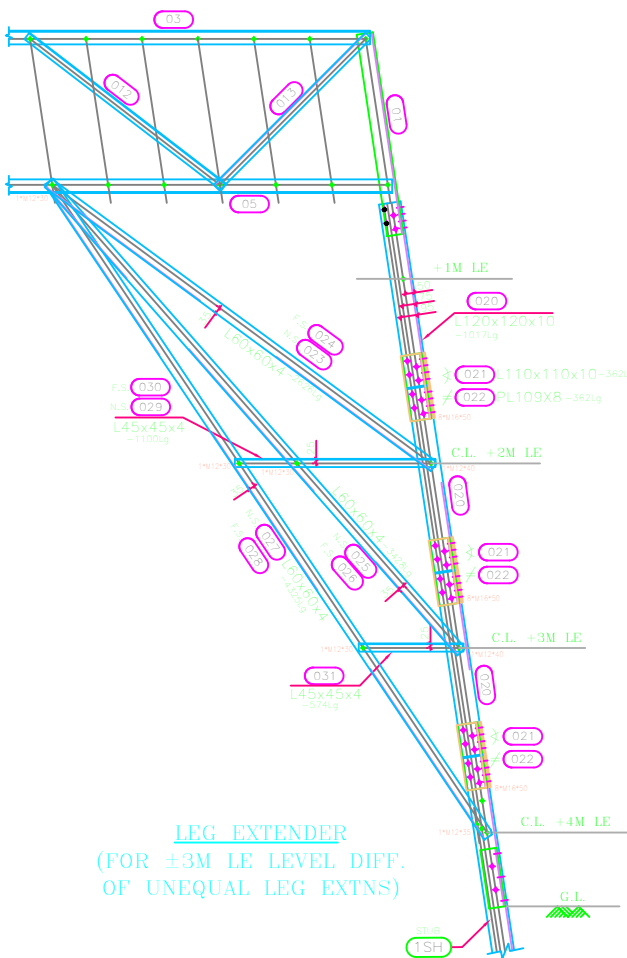
BOLTS / NUTS STATEMENT LEG EXTENDER		
TYPE	SIZE (Length in mm)	TOTAL QTY.
	M12 X 30 MM	8
	M12 X 35 MM	2
	M12 X 40 MM	4
	M16 X 50 MM	48



VIEW 'A-A'



STUB SETTING TEMPLATE
(FOR EQUAL LEG EXTNS)











LEG EXTENDER
(FOR ±3M LE LEVEL DIFF.
OF UNEQUAL LEG EXTNS)

NOTES:-

- ALL DIMENSIONS ARE IN MM.
- MATERIALS :
 - 'H' INDICATES HIGH TENSILE STEEL - IS2062:2006 E350 ($f_y=350N/sqmm$)
 - MILD STEEL - IS2062:2006 E250 ($f_y=250N/sqmm$)
 - BOLTS & NUTS - 120 & 160 - GRADE 5.6/5 (ISO:898) OR EQUIVALENT.
 - BOLT SET: ONE BOLT+ONE NUT+ONE SPRING WASHER.
 - STEP BOLT SET: ONE BOLT+TWO NUT+TWO SPRING WASHER.
- ALL STEEL MEMBERS SHALL BE RED OXIDE PAINTED.
- THE PROCEEDING LETTER WILL BE "T43 SR3".
- ♦ INDICATES HOLES OF 17.5mm DIA FOR 16mm DIA BOLTS.
- ◆ INDICATES HOLES OF 13.5mm DIA FOR 12mm DIA BOLTS.
- INDICATES HOLES OF 17.5mm DIA FOR 16mm DIA STEP BOLTS.
- § INDICATES ANTITHEFT BOLTS.

MARK NOS.
SST :- 01 TO 015
LEG EXTENDER :- 020 TO 031

REV.	DATE	DESCRIPTION	DRAWN	CHECKED	APPROVED
2	13.07.13	REVISED AS PER CLIENTS COMMENTS	WS	WS	MKM
1	10.06.13	EQUAL LEG EXTN COMBINATION ADDED IN SST	WS	WS	MKM

CLIENT :		KETRACO KENYA ELECTRICITY TRANSMISSION CO. LTD., KENYA		
CONSULTANT		ELECTRO CONSULTANT.		
CONTRACTOR :		TATA PROJECTS LIMITED, NEW DELHI, INDIA		
Contract :	XVIII: KPLC1/6E/2/A17			
PROJECT :	Kindaruma-Mwingi-Garissa 132 KV S/C Transmission Lines (Lot A17)			
DESIGN	Monali	09.02.2013		TITLE STRUCTURAL DRAWING FOR TENSION TOWER TYPE "SB3" (0°-90°/0°) STUB SETTING TEMPLATE
DRN.	MJ	27.05.13		
APP.	WS	27.05.13		
APPD.	MKM	27.05.13		
				DRG. NO. KETRACO/A17/SB3/SD/02
				REV (NO.)   2   SHEET 1 OF 1

