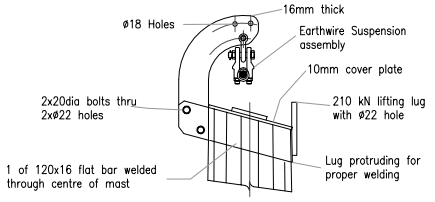
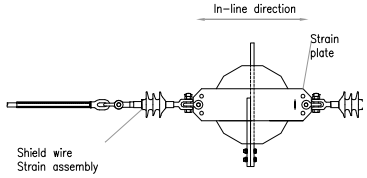
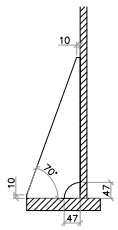
POLE TOP DETAILS



IN–LINE VIEW
Non–Insulated Configuration



TOP VIEW
Insulated Configuration



GUSSET DETAIL

Pole Design Specification:

The design of these structures is generally in accordance with ASCE/SEI 48–11, Design of Steel Transmission Pole Structures.

Poles to be fabricated and erected as per Pole fabrication specification DSP 34 1683.

Fabrication/Construction Information:

Poles will have the lowest number of slip joints in conformance with the limitation imposed by the length of the galvanising bath. Slip joint length is to be 1.5 times the largest i.d. of the female section.

Jacking Tension to be specified by contractor. Jacking lugs fitted as per drawing 0.69/00/JL

Full penetration welds are to be used on: All sections joined by the circumferential welds. All longitudinal welds within 75mm of circumferential welds or in the female section of a slip joint.

Access ladders are required on all structures from approximately 6m above ground level.

Protruding edges of the pole tip cap plate to be ground off. All sharp corners to be rounded to min 5mm radius.

OPGW Downlead lugs to be fitted where required in accordance with 0.69/00/OPGW/POLC.

Structure type and number must be clearly shown on each pole section. It is preferable wherever possible to weld this information to the side/ inside of the structure for each section as well as on the template, viz.277A/1 (first section), 277A/2 (second section) etc. and 277A on the template. The CAH should also be indicated on the bottom pole section.

Fabricator to specify vent holes for galvanizing.

Pole Information:

Structure Code:	277A
Phase Conductor:	Twin Chicadee
Shield Wire:	Chicadee (21mm)
Design Wind Span:	350 m
Design Weight Span:	490 m
Design Electrical Span:	505m
Min. horizontal distance btw phases:	4.028m
Vertical Ph–Ph Spacing:	2.35 m
Vertical Top Ph–Pole Top Spacing:	3.95 m
CAH:	22 m – 12m
Total Length:	30.4m – 20.4m
Sides:	12
Design Angle:	0 – 3 degrees
Tip Dia. :	350mm & 325mm
Base Dia. :	see BP info below
Wall Thickness:	see drawing

Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	See 0.69/277A/2

Loading Information: Unfactored Ultimate Base Momnent

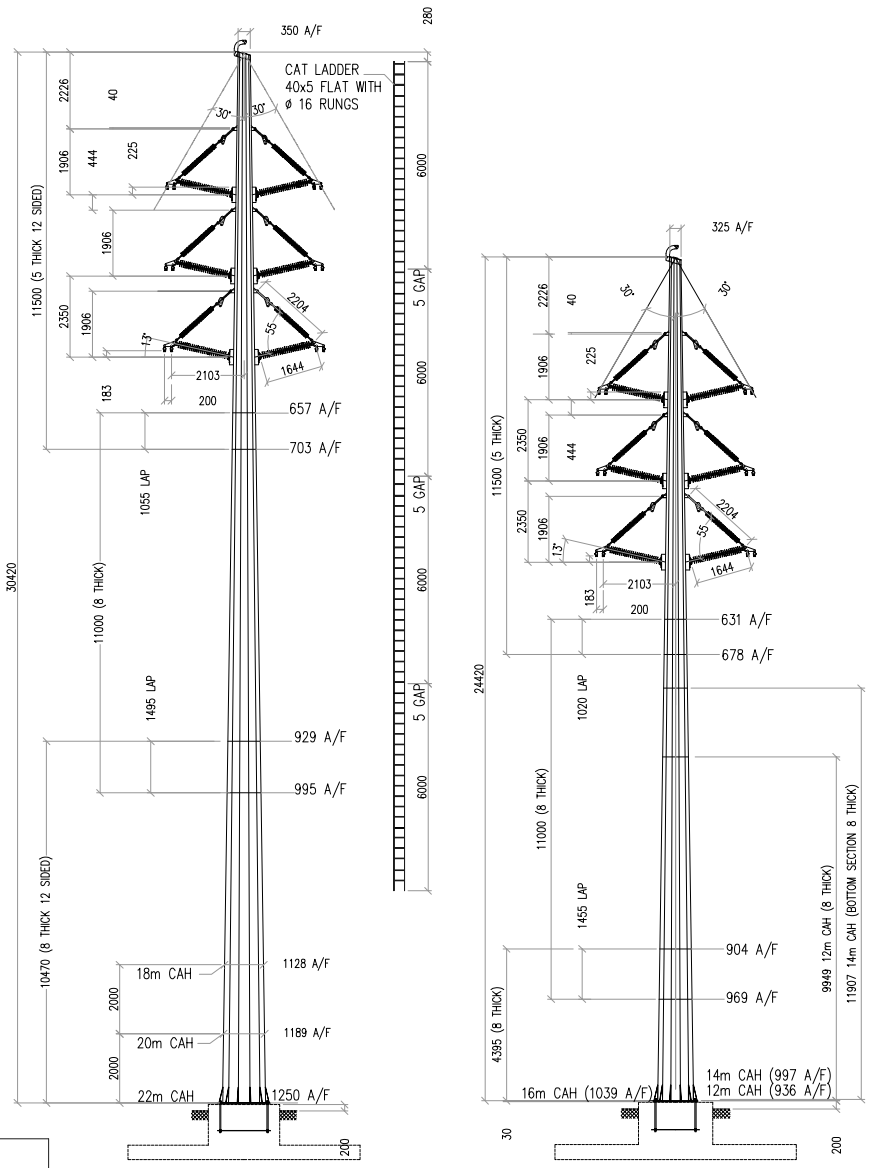
CAH (m)	Design Wind Pressure (Pa)	Working Tip Load (kN)	Ultimate Base (g.l.) Moment (kNm)	Approximate Mass (kg)	Total Vertical Load(kN)
22m	1000	104	3151	7282	79.5 kN
20m	1000	101	2870	5864	79.5 kN
18m	1000	98	2594	5285	79.5 kN
16m	1000	95	2319	4752	79.5 kN
14m	1000	92	2053	4197	79.5 kN
12m	1000	88	1793	3714	79.5 kN

Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	Gusset Thickness	Template Thickness	No. Templ.
22m	1500	1045	30	1370	24 X M36 X 1370	16	8	1
20m	1440	985	30	1310	24 X M36 X 1310	16	8	1
18m	1380	920	30	1250	24 X M36 X 1250	16	6	1
16m	1290	835	30	1160	24 X M36 X 1160	16	6	1
14m	1250	790	30	1120	24 X M36 X 1120	16	6	1
12m	1150	730	25	1040	24 X M30 X 1040	12	6	1

NOTE: COMPLETE BASE PLATE INFORMATION ON DRAWING 0.69/277A/2

POLE IN–LINE VIEW



Notes:

Material: S355JR steel
Welding to be min 6mm continuous seal to SANS 10162 Section 11.
Hot dip galvanising to SANS 121.
Stress relieving to be applied in accordance with SANS 121.
Tolerances: on dimensions: 2mm
on drilling centres: 2mm
Bolt positions on base plate can be moved in order to avoid clashing between parts.

TRANS-AFRICA PROJECTS

CLIENT Eskom

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3	RM	MAB	22/05/2012	ALTERED OUTLINE DRAWINGS AS PER CIS FABRICATION DRAWINGS
2	AH	TL	03/06/2010	RE–DESIGNED POLE & CROSS–ARM BASEPLATES
1	GSL	PM	03/12/2009	Revised crossarm lengths (increased electrical span), & Ph–Earth spacing, & 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

PROJECTION SCALE 4:1

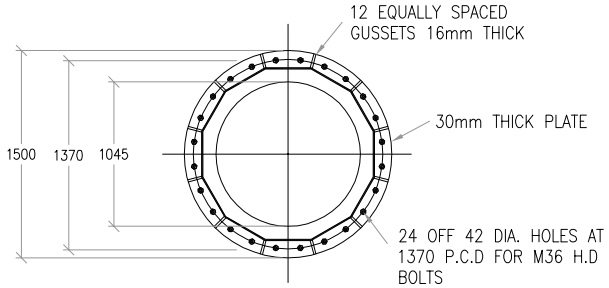
AUTH P. MARAIS DATE

CHKD G.LANDWEHR DATE 23/09/2009

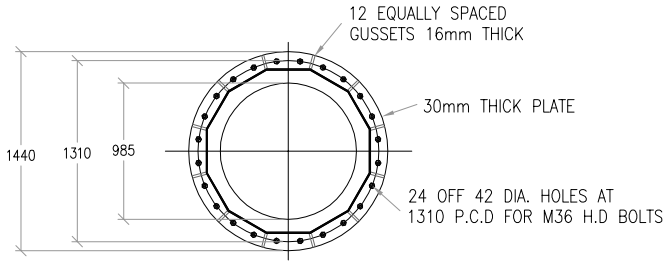
DRAWN G.LOUW DATE 23/09/2009

TITLE:
132kV DOUBLE CIRCUIT MONOPOLE INTERMEDIATE TYPE "277 A" BASE PLATE INFORMATION

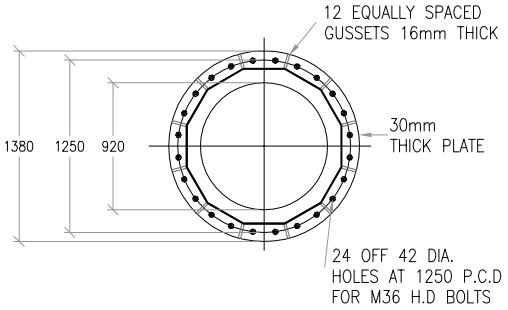
0.69/277A/02 SHEET 1 OF 1 REV 3



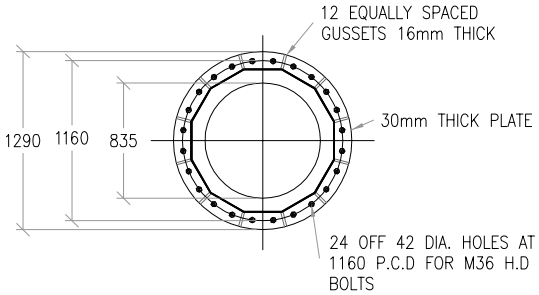
BASE PLATE FOR 22m ATT. HEIGHT



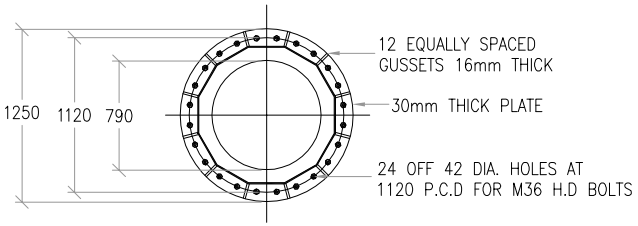
BASE PLATE FOR 20m ATT. HEIGHT



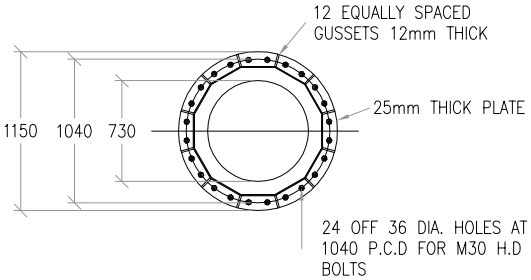
BASE PLATE FOR 18m ATT. HEIGHT



BASE PLATE FOR 16m ATT. HEIGHT



BASE PLATE FOR 14m ATT. HEIGHT



BASE PLATE FOR 12m ATT. HEIGHT

NOTE:THIS DRAWING MUST BE READ IN CONJUNCTION WITH 0.69/277A/01 (FOR FABRICATION NOTES).

Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	VARIES
Gusset thickness:	VARIES

Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	Gusset Thickness	Template Thickness	No. Templ.
22m	1500	1045	30	1370	24 X M36 X 1370	16	8	1
20m	1440	985	30	1310	24 X M36 X 1310	16	8	1
18m	1380	920	30	1250	24 X M36 X 1250	16	6	1
16m	1290	835	30	1160	24 X M36 X 1160	16	6	1
14m	1250	790	30	1120	24 X M36 X 1120	16	6	1
12m	1150	730	25	1040	24 X M30 X 1040	12	6	1

TRANS-AFRICA PROJECTS

CLIENT Eskom

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3	RM	MAB	22/05/2012	ALTERED OUTLINE DRAWINGS AS PER CIS FABRICATION DRAWINGS
2	AH	TL	03/06/2010	RE-DESIGNED POLE & CROSS-ARM BASEPLATES
1	GSL	PM	03/12/2009	Revised crossarm lengths (increased electrical span), & Ph-Earth spacing, & 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

PROJECTION

SCALE 4:1

AUTH P. MARAIS DATE

CHKD M. BADZE DATE 23/10/ 2012

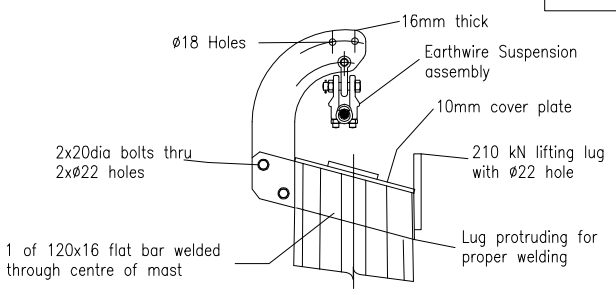
DRAWN R.MACARIO DATE 25/05/ 2012

TITLE:
132kV DOUBLE CIRCUIT MONOPOLE INTERMEDIATE TYPE "277 A" BASE PLATE INFORMATION

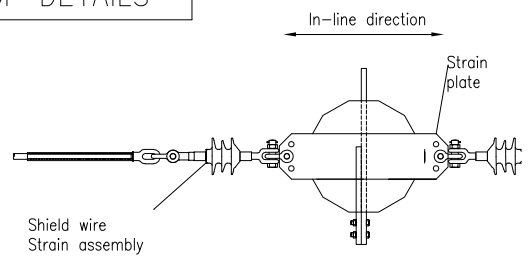
0.69/277A/02 | SHEET 1 | OF 1 | REV 3

A3L

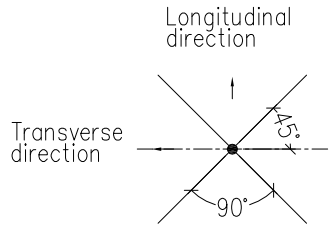
POLE TOP DETAILS



IN–LINE VIEW
Non–Insulated Configuration



TOP VIEW
Insulated Configuration



PLAN ORIENTATION OF GUYS

Pole Design Specification:

The design of these structures is generally in accordance with ASCE/SEI 48–11, Design of Steel Transmission Pole Structures.

Poles to be fabricated and erected as per Pole fabrication specification DSP 34 1683.

Fabrication/Construction Information:

Poles will have the lowest number of slip joints in conformance with the limitation imposed by the length of the galvanising bath. Slip joint length is to be 1.5 times the largest i.d. of the female section.

Jacking Tension to be specified by contractor. Jacking lugs fitted as per drawing 0.69/00/JL

Full penetration welds are to be used on: All sections joined by the circumferential welds. All longitudinal welds within 75mm of circumferential welds or in the female section of a slip joint.

Access ladders are required on all structures from approximately 6m above ground level.

Protruding edges of the pole tip cap plate to be ground off. All sharp corners to be rounded to min 5mm radius.

OPGW Downlead lugs to be fitted where required in accordance with 0.69/00/OPGW/POLC.

Structure type and number must be clearly shown on each pole section. It is preferable wherever possible to weld this information to the side/inside of the structure for each section as well as on the template, viz.277A/1 (first section), 277A/2 (second section) etc. and 277A on the template. The CAH should also be indicated on the bottom pole section.

Fabricator to specify vent holes for galvanizing.

Pole Information:

Structure Code:	277B
Phase Conductor:	Twin Chicadee
Shield Wire:	Chicadee (21mm)
Design Wind Span:	350 m
Design Weight Span:	490 m
Design Electrical Span:	500 m
Min. horizontal distance btw phases:	4.020m
Vertical Ph–Ph Spacing:	2.35 m
Vertical Top Ph–Pole Top Spacing:	3.95 m
CAH:	22 m – 12m
Total Length:	30.65m – 22.65m
Sides:	12
Design Angle:	0 – 3 degrees
Tip Dia. :	325 mm
Flange Dia. :	800 mm
Bottom Dia. :	330 mm
Wall Thickness:	6 mm

General Flange Plate Information:

Flange Bolts Class:	Class 4.8
Flange Bolts length:	100 mm
Flange Plate thickness:	20 mm
OD:	800 mm
ID:	500 mm
PCD:	700 mm

*Total guy length for all 4 guy ropes assuming flat ground.

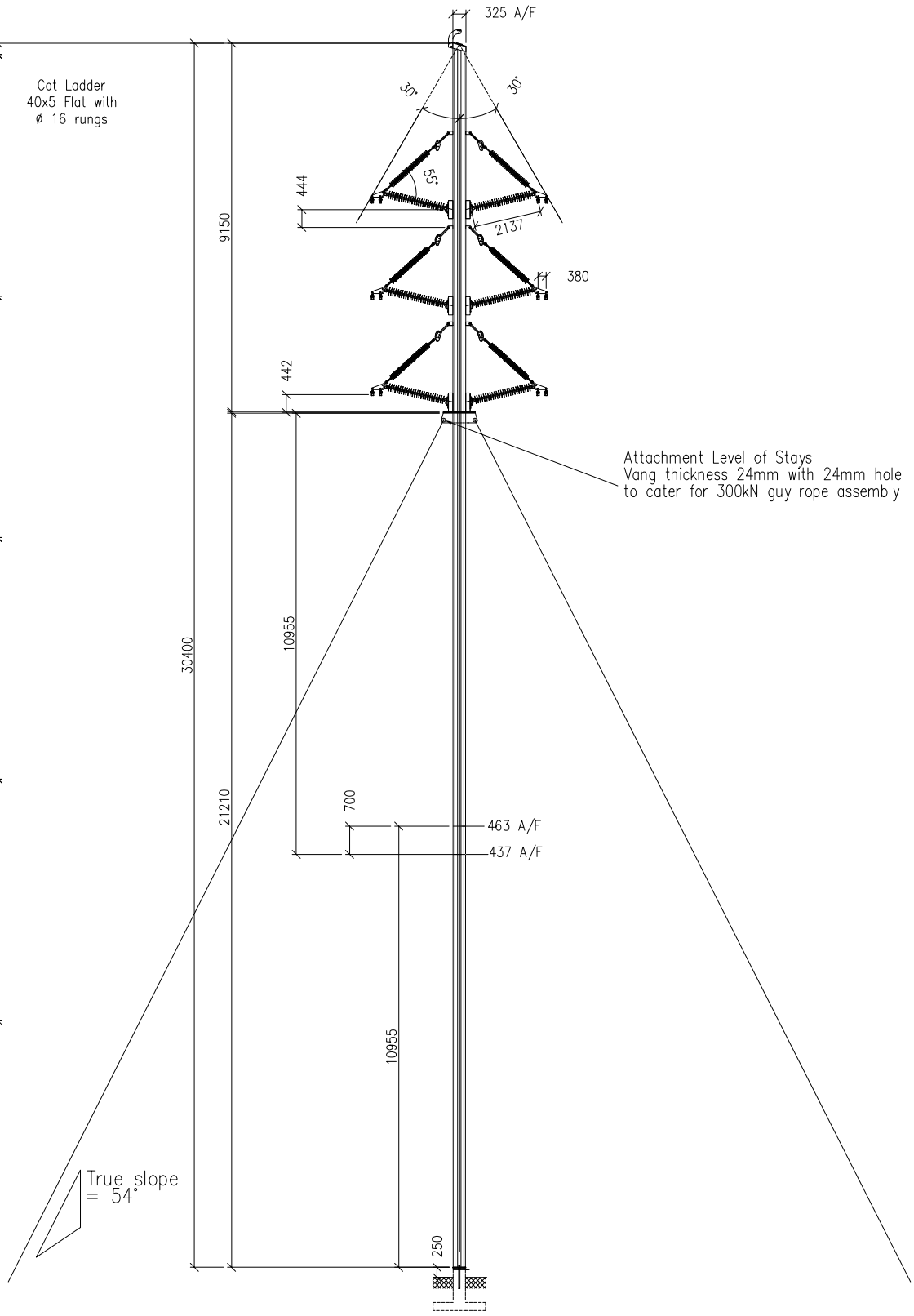
Design Wind Pressure:	1000 Pa
Factored Guy tension load:	220 kN
Ultimate Flange Moment:	425 kNm
Total Vertical Load:	355 kN
Guy Adjustability:	+–250 mm
	500mm total

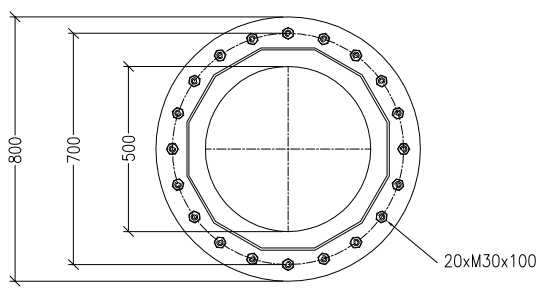
Guyed Monopole Information:

CAH (m)	Bot.Sec.(1) (mm)	Lap Length (mm)	Bot. Sec.(2) (mm)	Approximate Mass (kg)	*Total Guy Length (mm)
22m	10955	700	10955	3018	106
20m	9955	700	9955	2843	96
18m	8955	700	8955	2680	86
16m	7955	700	7955	2522	76
14m	6955	700	6955	2359	66

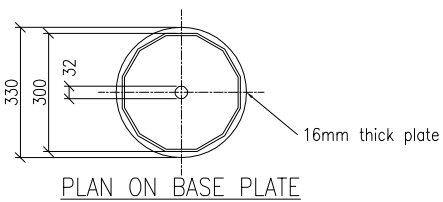
Notes:
Material: S355JR steel
Welding to be min 6mm continuous seal to SANS 10162 Section 11.
Hot dip galvanising to SANS 121.
Stress relieving to be applied in accordance with SANS 121.
Tolerances: on dimensions: 2mm & on drilling centres: 2mm
Bolt positions on base plate can be moved in order to avoid clashing between parts.

POLE IN–LINE VIEW





FLANGE PLATE FOR ALL ATT. HEIGHT



PLAN ON BASE PLATE

TRANS-AFRICA PROJECTS

CLIENT Eskom

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3	RM	MAB	22/05/2012	ALTERED OUTLINE DRAWINGS AS PER CIS FABRICATION DRAWINGS
2	AH	TL	03/06/2010	RE–DESIGNED POLE & CROSS–ARM BASEPLATES
1	GSL	PM	03/12/2009	Revised crossarm lengths (increased electrical span), & Ph–Earth spacing, & 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

PROJECTION SCALE NTS

AUTH P. MARAIS DATE 23/06/ 2010

CHKD G.LOUW DATE 23/06/ 2010

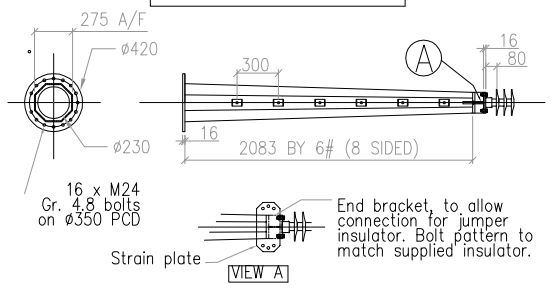
DRAWN M.BADZE DATE 23/06/ 2010

TITLE:
132kV DOUBLE CIRCUIT MONOPOLE INTERMEDIATE TYPE "277 B"

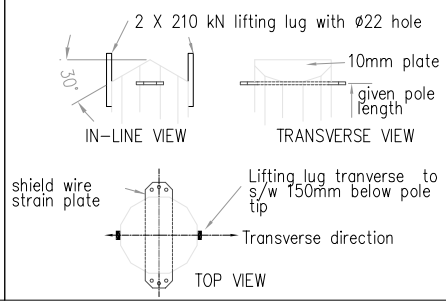
0.69/277B/01 | SHEET 1 | OF 1 | REV 3

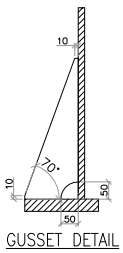
A3L

CROSSARM DETAILS



POLE TOP DETAILS





Pole Design Specification:

The design of these structures is generally in accordance with ASCE/SEI 48-11, Design of Steel Transmission Pole Structures.

Poles to be fabricated and erected as per Pole fabrication specification DSP 34 1683.

Fabrication/Construction Information:

Poles will have the lowest number of slip joints in conformance with the limitation imposed by the length of the galvanising bath. Slip joint length is to be 1.5 times the largest i.d. of the female section.

Jacking Tension to be specified by contractor. Jacking lugs fitted as per drawing 0.69/00/JL

Full penetration welds are to be used on: All sections joined by the circumferential welds. All longitudinal welds within 75mm of circumferential welds or in the female section of a slip joint.

Access ladders are required on all structures from approximately 6m above ground level.

Protruding edges of the pole tip cap plate to be ground off. All sharp corners to be rounded to min 5mm radius.

OPGW Downlead lugs to be fitted where required in accordance with 0.69/00/OPGW/POLC.

Structure type and number must be clearly shown on each pole section. It is preferable wherever possible to weld this information to the side/ inside of the structure for each section as well as on the template, viz.277A/1 (first section), 277A/2 (second section) etc. and 277A on the template. The CAH should also be indicated on the bottom pole section.

Fabricator to specify vent holes for galvanizing.

Pole Information:

Structure Code:	277C
Phase Conductor:	Twin Chicadee
Shield Wire:	Chicadee (21mm)
Design Wind Span:	350 m
Design Weight Span:	700 m
Design Electrical Span:	525m
Min. horizontal distance btw phases:	5.011m
Vertical Ph-Ph Spacing:	2.35 m
Vertical Top Ph-Pole Top Spacing:	4.3 m
CAH:	22 m - 12m
Total Length:	30.87m - 20.88m
Sides:	12
Design Angle:	0-15 degrees
Tip Dia. :	460 mm
Base Dia. :	see BP info below
Wall Thickness:	see drawing

Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	Varies
Gusset thickness:	Varies

Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	No. Templ.	Template Thickness
22m	1750	1230	30	1620	24 X M42 X 1620	1	8
20m	1685	1160	25	1552	24 X M42 X 1552	1	8
14m	1455	980	20	1345	24 X M36 X 1345	2	6
12m	1390	915	20	1280	24 X M36 X 1280	1	6

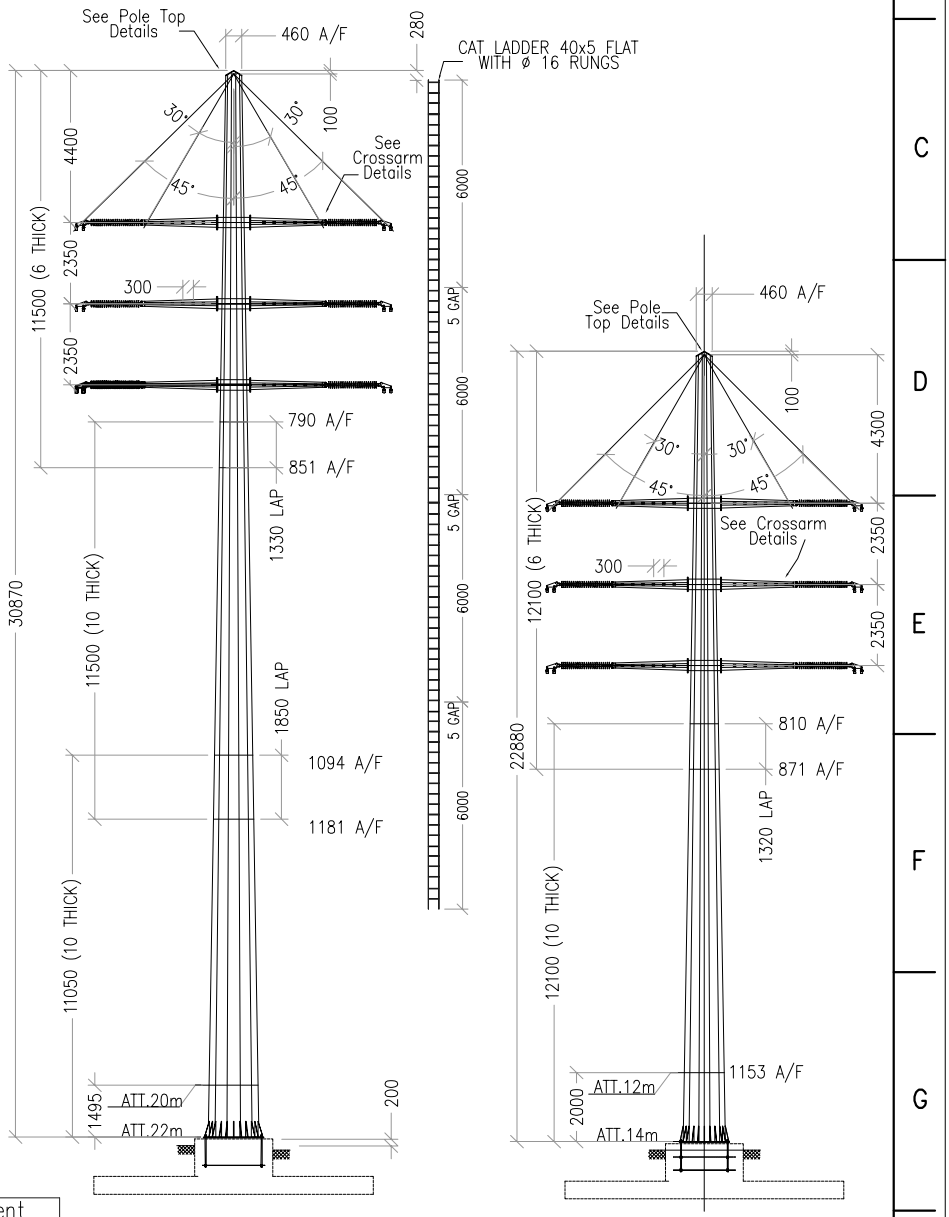
NOTE: COMPLETE BASE PLATE INFORMATION ON DRAWING 0.69/277A/2

Loading Information: Unfactored Ult. Base Moment

CAH (m)	Design Wind Pressure (Pa)	Working Tip Load (kN)	Ultimate Base (g.l.) Moment (kNm)	Approximate Mass (kg)	Total Vertical Load (kN)
22m	1000	180	5529	11096	115 kN
20m	1000	175	5052	10180	115 kN
14m	1000	160	3649	6993	115 kN
12m	1000	153	3195	6258	115 kN

Notes:
Material: S355JR steel
Welding to be min 6mm continuous seal to SANS 10162 Section 11.
Hot dip galvanising to SANS 121.
Stress relieving to be applied in accordance with SANS 121.
Tolerances: on dimensions: 2mm
on drilling centres: 2mm
Bolt positions on base plate can be moved in order to avoid clashing between parts.

POLE IN-LINE VIEW



TRANS-AFRICA PROJECTS

CLIENT Eskom

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3	RM	MAB	22/05/2012	ALTERED OUTLINE DRAWINGS AS PER CIS FABRICATION DRAWINGS
2	AH	TL	31/05/2010	RE-DESIGNED POLE & CROSS-ARM BASEPLATES
1	GSL	PM	03/12/2009	Revised crossarm lengths (increased electrical span) and added a 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

PROJECTION		SCALE	NTS
AUTH	P. MARAIS	DATE	23/09/ 2009
CHKD	G.LANDWEHR	DATE	23/09/ 2009
DRAWN	G.LOUW	DATE	23/09/ 2009

TITLE: 132kV DOUBLE CIRCUIT MONOPOLE 0°-15°ANGLE STRAIN TYPE "277 C" ATTACHMENT HEIGHT 12m TO 22m OUTLINE

0.69/277C/01 | SHEET 1 | OF 1 | REV 3

Pole Design Specification:

The design of these structures is generally in accordance with ASCE/SEI 48-05, Design of Steel Transmission Pole Structures.

Poles to be fabricated and erected as per Pole fabrication specification SCSSABG2 Rev 1.

Pole Information:

Structure Code:	277C
Phase Conductor:	Twin Chicadee
Shield Wire:	Chicadee (21mm)
Design Wind Span:	350 m
Design Weight Span:	700 m
Design Electrical Span:	525m
Min. horizontal distance btw phases:	5.011m
Vertical Ph-Ph Spacing:	2.35 m
Vertical Top Ph-Pole Top Spacing:	4.3 m
CAH:	22 m - 12m
Total Length:	30.805m - 20.805m
Sides:	12
Design Angle:	0-15 degrees
Tip Dia. :	350 mm
Base Dia. :	see BP info below
Wall Thickness:	see drawing

Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	Varies
Gusset thickness:	20 mm

Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	No. Templ.	Template Thickness
22m	1860	1340	40	1720	36 X M36 X 1080	1	8
20m	1770	1270	40	1640	36 X M36 X 1080	1	8
18m	1650	1200	35	1540	36 X M30 X 1050	2	8
16m	1550	1120	35	1440	36 X M30 X 1050	2	8
14m	1470	1050	35	1360	36 X M30 X 1050	2	6
12m	1390	990	35	1280	36 X M30 X 1050	1	6

Loading Information:

CAH (m)	Design Wind Pressure (Pa)	Working Tip Load (kN)	Ultimate Base (g.l.) Moment (kNm)	Approximate Mass (kg)	Total Vertical Load (kN)
22m	1000	165	5065	11096	115 kN
20m	1000	162	4646	10160	115 kN
18m	1000	158	4236	9125	115 kN
16m	1000	155	3827	7773	115 kN
14m	1000	150	3417	6993	115 kN
12m	1000	145	3008	6253	115 kN

Fabrication/Construction Information:

Poles will have the lowest number of slip joints in conformance with the limitation imposed by the length of the galvanising bath. Slip joint length is to be 1.5 times the largest i.d. of the female section.

Jacking Tension to be specified by contractor. Jacking lugs fitted as per drawing 0.69/00/JL

Full penetration welds are to be used on:
- All sections joined by the circumferential welds.
- All longitudinal welds within 75mm of circumferential welds or in the female section of a slip joint.

Access ladders are required on all structures from approximately 6m above ground level.

Protruding edges of the pole tip cap plate to be ground off. All sharp corners to be rounded to min 5mm radius.

OPGW Downlead lugs to be fitted where required in accordance with 0.69/00/OPGW/POLC.

Structure type and number must be clearly shown on each pole section. It is preferable wherever possible to weld this information to the side/ inside of the structure for each section as well as on the template, viz.277C/1 (first section), 277C/2 (second section) etc. and 277C on the template. The CAH should also be indicated on the bottom pole section.

Fabricator to specify vent holes for galvanizing.

Notes:
Material: 300W steel

Welding to be 6mm continuous seal to SANS 10162 Section 11.

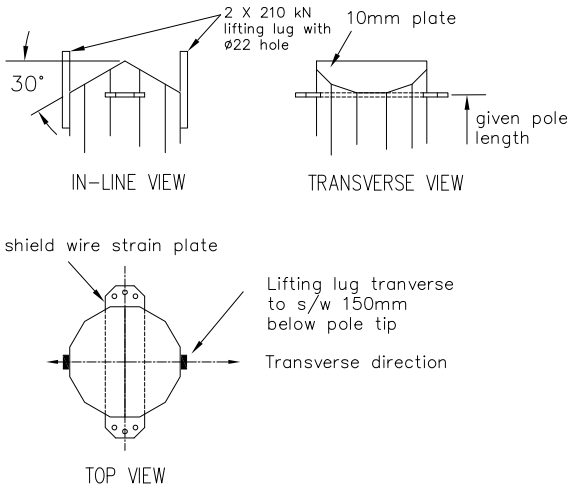
Hot dip galvanising to SANS 121.

Stress relieving to be applied in accordance with SANS 121.

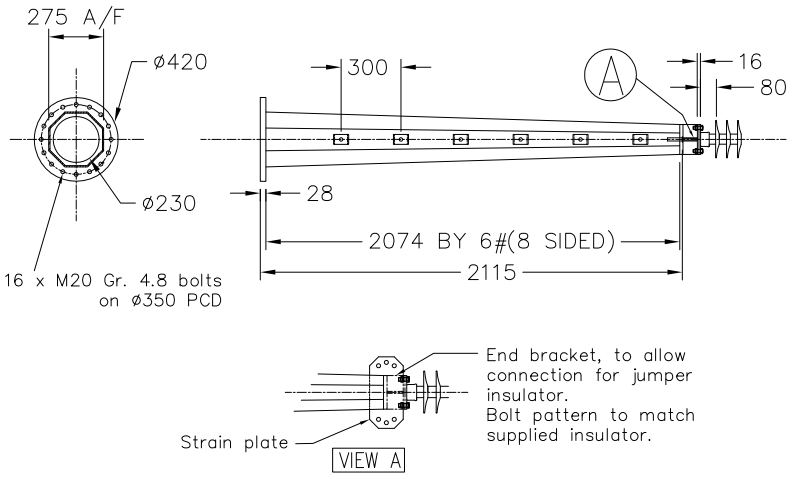
Tolerances:
- on dimensions: 2mm
- on drilling centres: 2mm

Bolt positions on base plate can be moved in order to avoid clashing between parts.

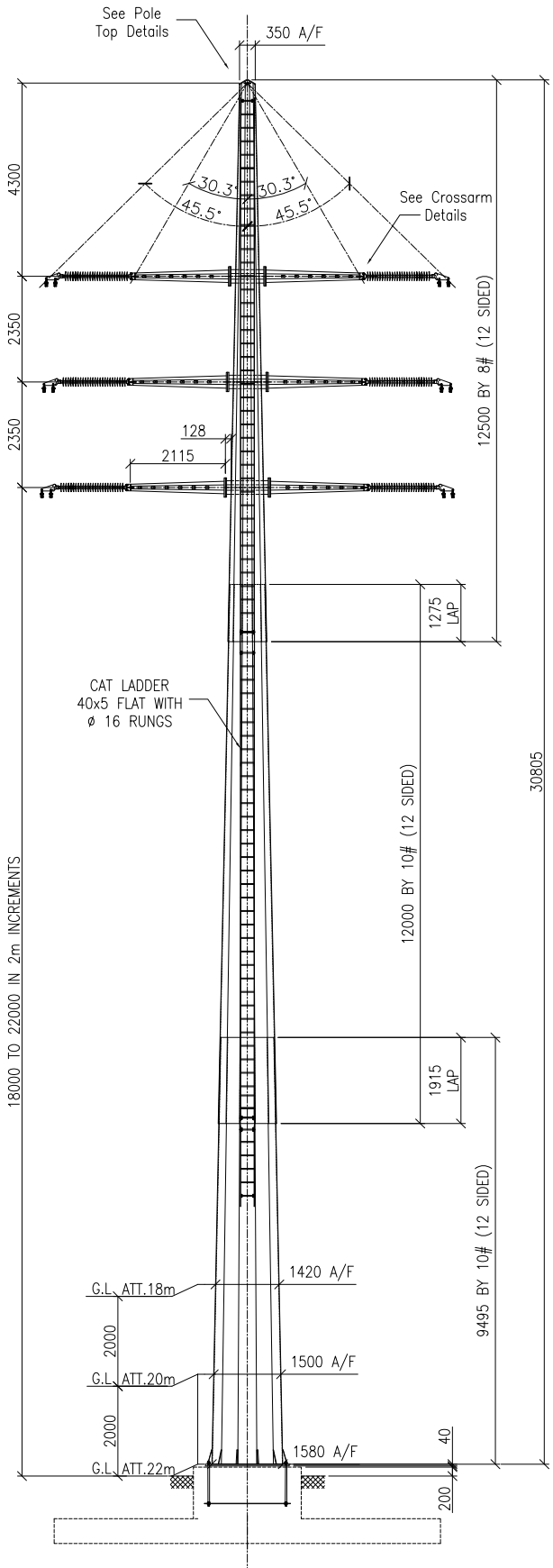
POLE TOP DETAILS

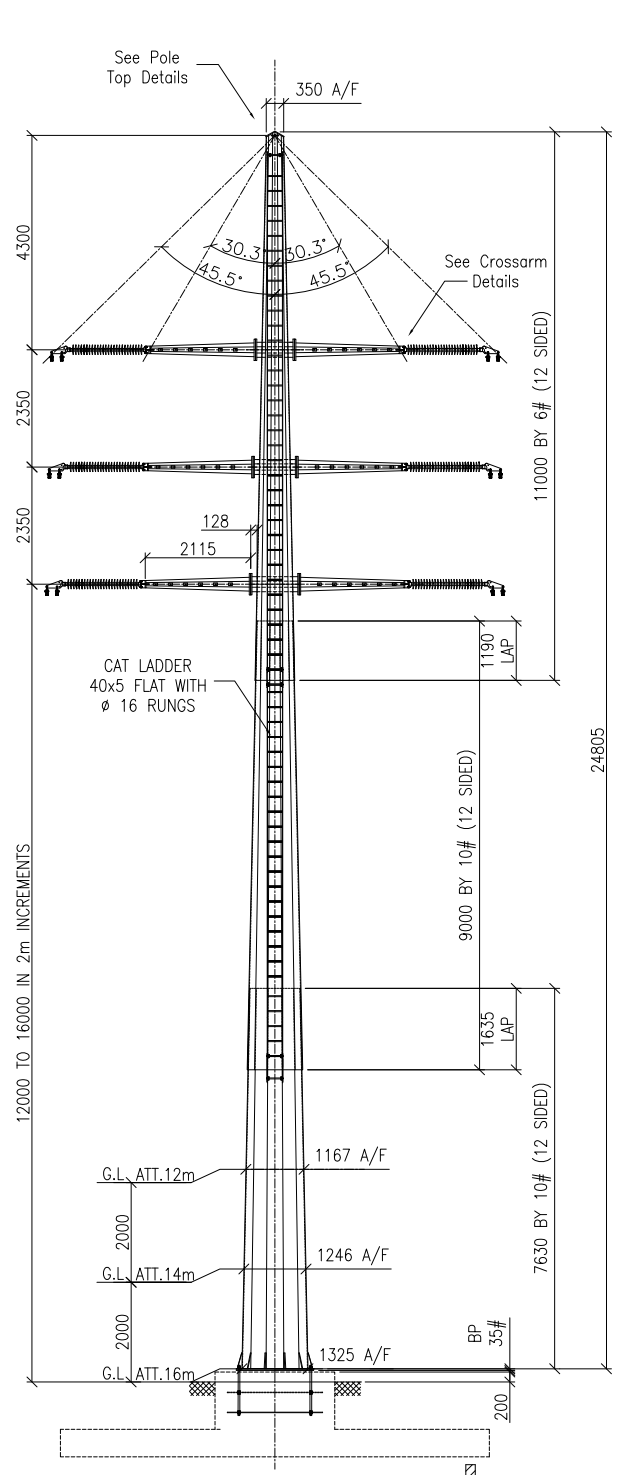


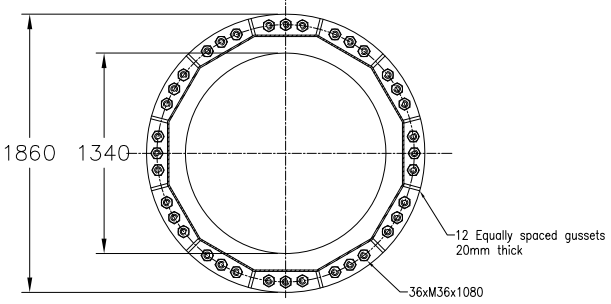
CROSSARM DETAILS



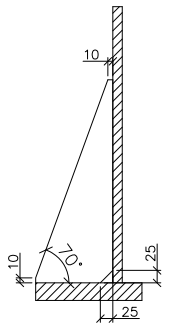
POLE IN-LINE VIEW







BASE PLATE FOR 22m ATT. HEIGHT



GUSSET DETAIL

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3				
2	AH	TL	31/05/2010	RE-DESIGNED POLE & CROSS-ARM BASEPLATES
1	GSL	PM	03/12/2009	Revised crossarm lengths (increased electrical span) and added a 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

CLIENT: Eskom Distribution

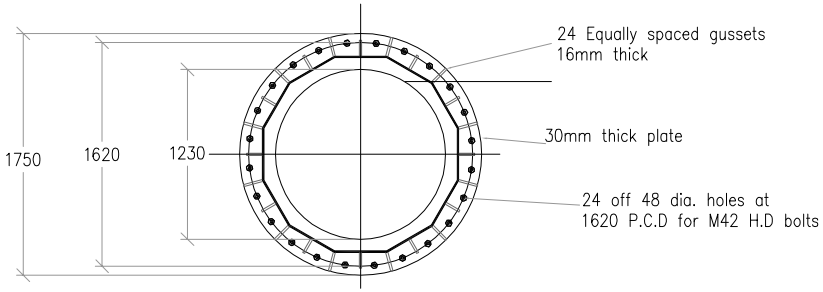
TRANS-AFRICA PROJECTS

PROJECTION		SCALE	NTS
AUTH	P. MARAIS	DATE	23/09/ 2009
CHKD	G.LANDWEHR	DATE	23/09/ 2009
DRAWN	G.LOUW	DATE	23/09/ 2009

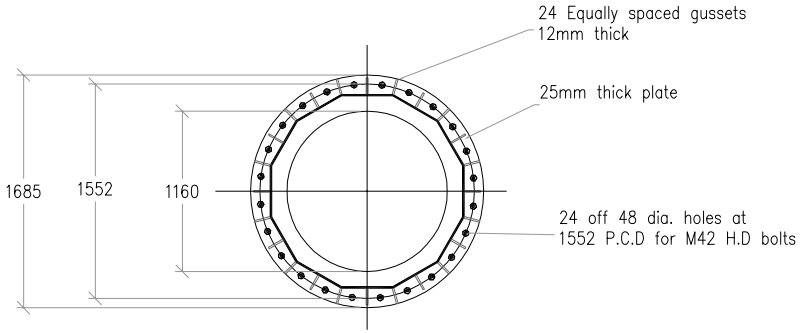
TITLE: 132kV DOUBLE CIRCUIT MONOPOLE 0°-15°ANGLE STRAIN TYPE "277 C" ATTACHMENT HEIGHT 12m TO 22m OUTLINE

0.69/277C/01 | SHEET 1 | OF 1 | REV 2

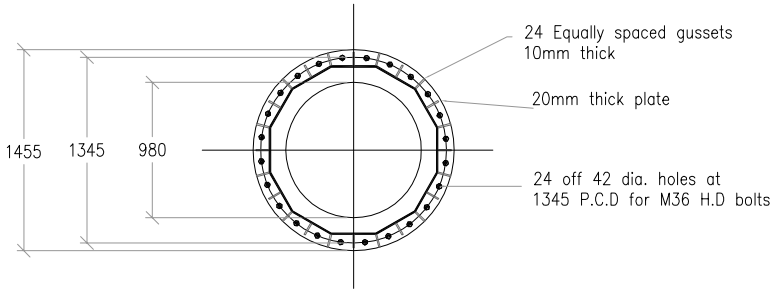
SIZE: A3



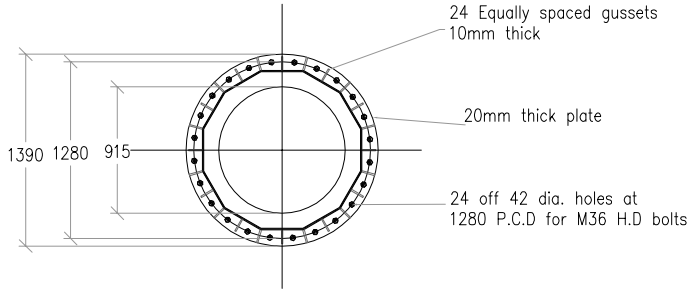
BASE PLATE FOR 22m ATT. HEIGHT



BASE PLATE FOR 20m ATT. HEIGHT



BASE PLATE FOR 14m ATT. HEIGHT



BASE PLATE FOR 12m ATT. HEIGHT

Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	VARIES
Gusset thickness:	VARIES

Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	No. Templ.	Template Thickness
22m	1750	1230	30	1620	24 X M42 X 1620	1	8
20m	1685	1160	25	1552	24 X M42 X 1552	1	8
14m	1455	980	20	1345	24 X M36 X 1345	2	6
12m	1390	915	20	1280	24 X M36 X 1280	1	6

NOTE:THIS DRAWING MUST BE READ IN CONJUNCTION WITH 0.69/277A/01 (FOR FABRICATION NOTES).

TRANS-AFRICA PROJECTS

CLIENT

Eskom

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3	RM	MAB	22/05/2012	ALTERED OUTLINE DRAWINGS AS PER CIS FABRICATION DRAWINGS
2	AH	TL	03/06/2010	RE-DESIGNED POLE & CROSS-ARM BASEPLATES
1	GSL	PM	03/12/2009	Revised crossarm lengths (increased electrical span), & Ph-Earth spacing, & 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

PROJECTION

SCALE 4:1

AUTH P. MARAIS DATE

CHKD M BADZE DATE 23/10/ 2012

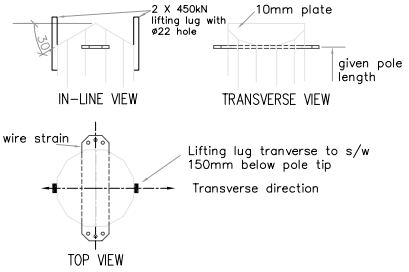
DRAWN R MACARIO DATE 25/05/ 2012

TITLE:
132kV DOUBLE CIRCUIT MONOPOLE
0°-15°ANGLE STRAIN TYPE "277 C"
BASE PLATE INFORMATION

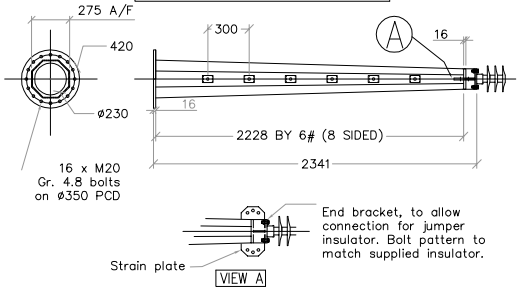
0.69/277C/02 | SHEET 1 | OF 1 | REV 3

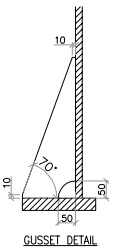
A3L

POLE TOP DETAILS



CROSSARM DETAILS





Pole Design Specification:

The design of these structures is generally in accordance with ASCE/SEI 48-11, Design of Steel Transmission Pole Structures.

Poles to be fabricated and erected as per Pole fabrication specification DSP 34 1683.

Fabrication/Construction Information:

Poles will have the lowest number of slip joints in conformance with the limitation imposed by the length of the galvanising bath. Slip joint length is to be 1.5 times the largest i.d. of the female section.

Jacking Tension to be specified by contractor. Jacking lugs fitted as per drawing 0.69/00/JL

Full penetration welds are to be used on: All sections joined by the circumferential welds. All longitudinal welds within 75mm of circumferential welds or in the female section of a slip joint.

Access ladders are required on all structures from approximately 6m above ground level.

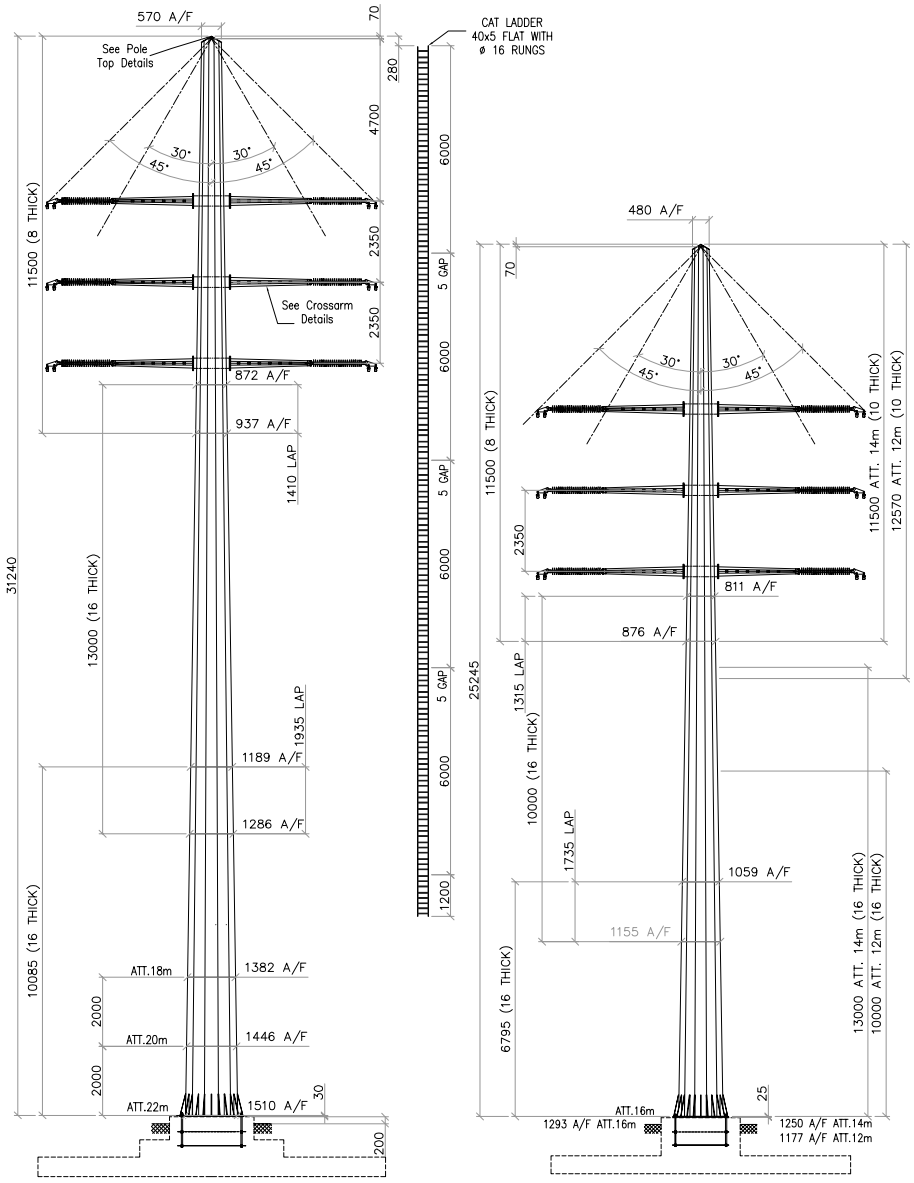
Protruding edges of the pole tip cap plate to be ground off. All sharp corners to be rounded to min 5mm radius.

OPGW Downlead lugs to be fitted where required in accordance with 0.69/00/OPGW/POLC.

Structure type and number must be clearly shown on each pole section. It is preferable wherever possible to weld this information to the side/ inside of the structure for each section as well as on the template, viz.277A/1 (first section), 277A/2 (second section) etc. and 277A on the template. The CAH should also be indicated on the bottom pole section.

Fabricator to specify vent holes for galvanizing.

POLE IN-LINE VIEW



Pole Information:

Structure Code:	277D
Phase Conductor:	Twin Chickadee
Shield Wire:	Chickadee (22mm)
Design Wind Span:	350 m
Design Weight Span:	700 m
Design Electrical Span:	525 m
Min. horizontal distance btw phases:	5.635m
Vertical Ph-Ph Spacing:	2.35 m
Vertical Top Ph-Pole Top Spacing:	4.7 m
CAH:	22 m - 12m
Total Length:	31.2m - 21.2m
Sides:	12
Design Angle:	15-45 degrees
Tip Dia. :	570mm - 480mm
Base Dia. :	see BP info below
Wall Thickness:	see drawing

Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	VARIES
Gusset thickness:	VARIES

Loading Information: Unfactored Ultimate Base Moment

CAH (m)	Design Wind Pressure (Pa)	Working Tip Load (kN)	Ultimate Base (g.l.) Moment (kNm)	Approximate Mass (kg)	Total Vertical Load (kN)
22m	1000	296	9247	18016	115 kN
20m	1000	290	8466	16198	115 kN
18m	1000	283	7694	14626	115 kN
16m	1000	274	6909	11994	115 kN
14m	1000	265	6141	10760	115 kN
12m	1000	254	5391	9513	115 kN

Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	Gusset Thickness	Template Thickness	No. Templ.
22m	1880	1270	30	1690	24 X M56 X 1690	16	8	2
20m	1810	1205	30	1620	24 X M56 X 1620	16	8	2
18m	1700	1170	25	1530	24 X M48 X 1530	16	8	2
16m	1620	1070	25	1450	24 X M48 X 1450	16	8	2
14m	1580	1025	25	1410	24 X M48 X 1410	16	6	2
12m	1510	950	25	1340	24 X M48 X 1340	16	6	2

NOTE: COMPLETE BASE PLATE INFORMATION ON DRAWING 0.69/277A/2

Notes:
Material: S355JR steel
Welding to be min 6mm continuous seal to SANS 10162 Section 11.
Hot dip galvanising to SANS 121.
Stress relieving to be applied in accordance with SANS 121.
Tolerances: on dimensions: 2mm
on drilling centres: 2mm
Bolt positions on base plate can be moved in order to avoid clashing between parts.

TRANS-AFRICA PROJECTS

CLIENT Eskom

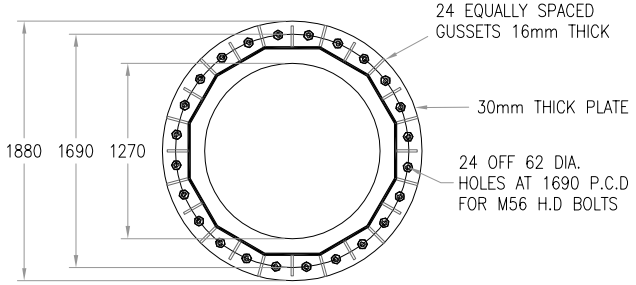
REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3	RM	MAB	22/05/2012	ALTERED OUTLINE DRAWINGS AS PER CIS FABRICATION DRAWINGS
2	AH	TL	03/06/2010	RE-DESIGNED POLE & CROSS-ARM BASEPLATES
1	GSL	PM	03/12/2009	Revised crossarm lengths (increased electrical span), & Ph-Earth spacing, & 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

PROJECTION SCALE NTS

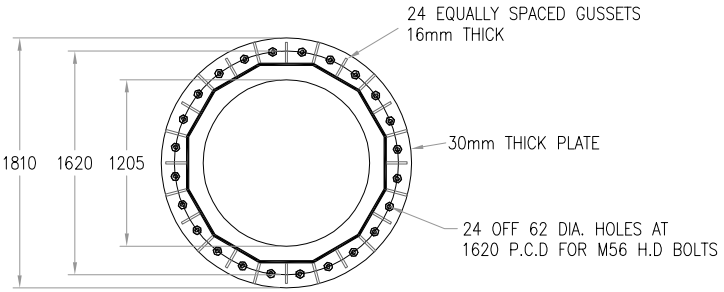
AUTH	P. MARAIS	DATE	23/09/ 2009
CHKD	G.LANDWEHR	DATE	23/09/ 2009
DRAWN	G.LOUW	DATE	23/09/ 2009

TITLE:
132kV DOUBLE CIRCUIT MONOPOLE 15°-45°ANGLE STRAIN TYPE "277 D" ATTACHMENT HEIGHT 12m TO 22m OUTLINE

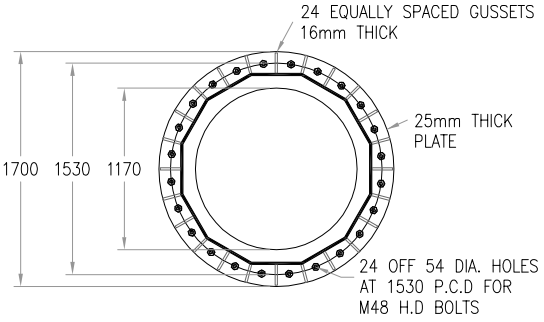
0.69/277D/01 | SHEET 1 | OF 1 | REV 3



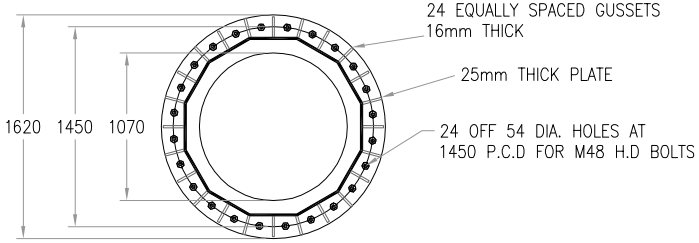
BASE PLATE FOR 22m ATT. HEIGHT



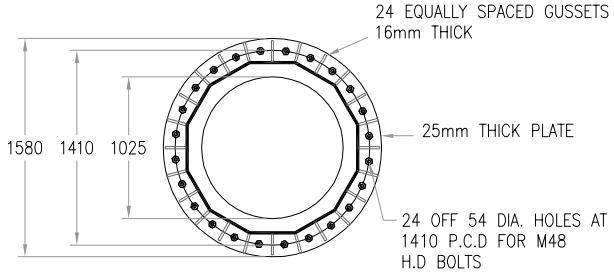
BASE PLATE FOR 20m ATT. HEIGHT



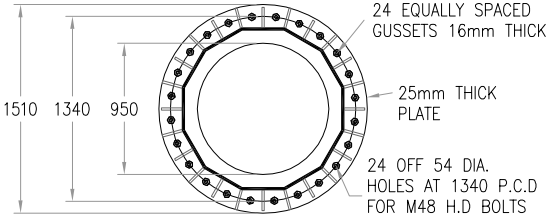
BASE PLATE FOR 18m ATT. HEIGHT



BASE PLATE FOR 16m ATT. HEIGHT



BASE PLATE FOR 14m ATT. HEIGHT



BASE PLATE FOR 12m ATT. HEIGHT

Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	VARIES
Gusset thickness:	VARIES

Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	Gusset Thickness	Template Thickness	No. Templ.
22m	1880	1270	30	1690	24 X M56 X 1690	16	8	2
20m	1810	1205	30	1620	24 X M56 X 1620	16	8	2
18m	1700	1170	25	1530	24 X M48 X 1530	16	8	2
16m	1620	1070	25	1450	24 X M48 X 1450	16	8	2
14m	1580	1025	25	1410	24 X M48 X 1410	16	6	2
12m	1510	950	25	1340	24 X M48 X 1340	16	6	2

TRANS-AFRICA PROJECTS

CLIENT

Eskom

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3	RM	MAB	22/05/2012	ALTERED OUTLINE DRAWINGS AS PER CIS FABRICATION DRAWINGS
2	AH	TL	03/06/2010	RE-DESIGNED POLE & CROSS-ARM BASEPLATES
1	GSL	PM	03/12/2009	Revised crossarm lengths (increased electrical span), & Ph-Earth spacing, & 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

PROJECTION

SCALE 4:1

AUTH P. MARAIS DATE

CHKD M. BADZE DATE 23/10/ 2012

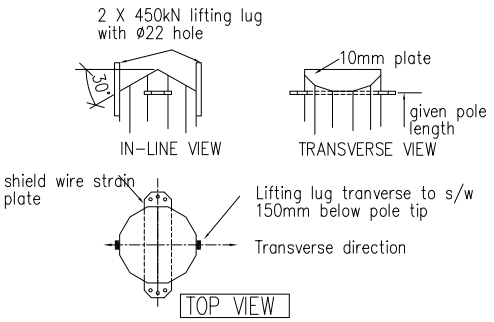
DRAWN R. MACARIO DATE 22/05/ 2012

TITLE:
132kV DOUBLE CIRCUIT MONOPOLE 15°-45°ANGLE STRAIN TYPE "277 D" BASE PLATE INFORMATION

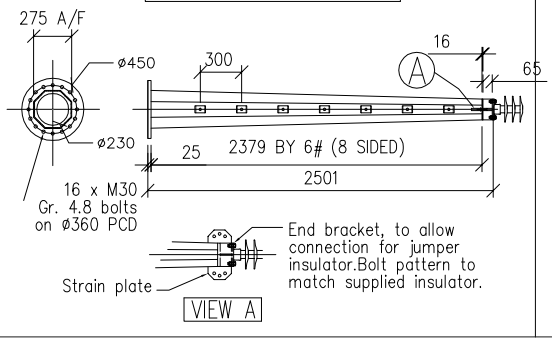
0.69/277D/02 | SHEET 1 | OF 1 | REV 3

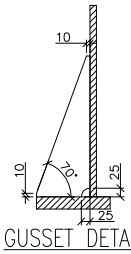
A3L

POLE TOP DETAILS



CROSSARM DETAILS





Pole Design Specification:

The design of these structures is generally in accordance with ASCE/SEI 48-05, Design of Steel Transmission Pole Structures.

Poles to be fabricated and erected as per Pole fabrication specification SCSSABG2 Rev 1.

Fabrication/Construction Information:

Poles will have the lowest number of slip joints in conformance with the limitation imposed by the length of the galvanising bath. Slip joint length is to be 1.5 times the largest i.d. of the female section.

Jacking Tension to be specified by contractor. Jacking lugs fitted as per drawing 0.69/00/JL

Full penetration welds are to be used on: All sections joined by the circumferential welds. All longitudinal welds within 75mm of circumferential welds or in the female section of a slip joint.

Access ladders are required on all structures from approximately 6m above ground level.

Protruding edges of the pole tip cap plate to be ground off. All sharp corners to be rounded to min 5mm radius.

OPGW Downlead lugs to be fitted where required in accordance with 0.69/00/OPGW/POLC.

Structure type and number must be clearly shown on each pole section. It is preferable wherever possible to weld this information to the side/ inside of the structure for each section as well as on the template, viz.277A/1 (first section), 277A/2 (second section) etc. and 277A on the template. The CAH should also be indicated on the bottom pole section.

Fabricator to specify vent holes for galvanizing.

Pole Information:

Structure Code:	277E
Phase Conductor:	Twin Chicadee
Shield Wire:	Chicadee (22mm)
Design Wind Span:	350 m
Design Weight Span:	700 m
Design Electrical Span:	525m
Min. horizontal distance btw phases:	5.703m
Vertical Ph-Ph Spacing:	2.35 m
Vertical Top Ph-Pole Top Spacing:	4.3 m
CAH:	16 m - 14m
Total Length:	25.5m - 23.5m
Sides:	12
Design Angle:	45-60 degrees
Tip Dia. :	510 mm
Base Dia. :	see BP info below
Wall Thickness:	see drawing

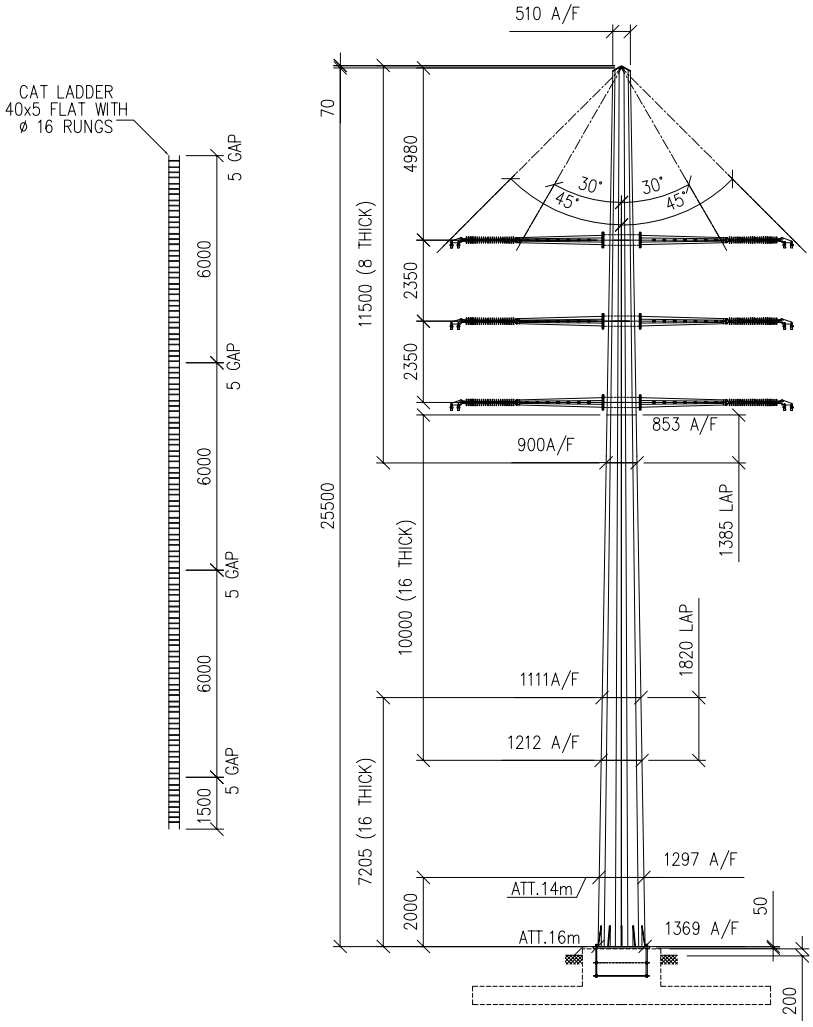
Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	VARIES
Gusset thickness:	VARIES

Loading Information: Unfactored Ultimate Base Moment

CAH (m)	Design Wind Pressure (Pa)	Working Tip Load (kN)	Ultimate Base (g.l.) Moment (kNm)	Approximate Mass (kg)	Total Vertical Load (kN)
16m	1000	304	7735	12830	115 kN
14m	1000	289	6795	11084	115 kN

POLE IN-LINE VIEW



Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	Gusset Thickness	Template Thickness	No. Templ.
16m	1720	1190	50	1560	24 X M48 X 1140	25	8	2
14m	1630	1120	50	1480	24 X M48 X 1140	25	8	2

NOTE: COMPLETE BASE PLATE INFORMATION AS MANUFACTURED IS GIVEN ON DRAWING 0.69/277A/2

Notes:
Material: S355JR steel
Welding to be min 6mm continuous seal to SANS 10162 Section 11.
Hot dip galvanising to SANS 121.
Stress relieving to be applied in accordance with SANS 121.
Tolerances: on dimensions: 2mm
on drilling centres: 2mm
Bolt positions on base plate can be moved in order to avoid clashing between parts.

TRANS-AFRICA PROJECTS

CLIENT Eskom

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3	RM	MAB	22/05/2012	ADJUSTED DRAWING AS PER CIS FABRICATION DRAWING
2	AH	TL	07/06/2010	RE-DESIGNED POLE BASEPLATE & CROSS-ARM BASEPLATE
1	GSL	PM	02/12/2009	Revised crossarm lengths (increased electrical span),& Ph-Earth spacing, & 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

PROJECTION		SCALE	NTS
AUTH P. MARAIS		DATE	23/09/ 2009
CHKD G. LANDWEHR		DATE	23/09/ 2009
DRAWN G. LOUW		DATE	23/09/ 2009

TITLE:
132kV DOUBLE CIRCUIT MONOPOLE 45°-60°ANGLE STRAIN TYPE "277 E" ATTACHMENT HEIGHT 14m TO 16m OUTLINE

0.69/277E/01 | SHEET 1 | OF 1 | REV 3

A3L

Pole Design Specification:

The design of these structures is generally in accordance with ASCE/SEI 48-05, Design of Steel Transmission Pole Structures.

Poles to be fabricated and erected as per Pole fabrication specification SCSSABG2 Rev 1.

Pole Information:

Structure Code:	277E
Phase Conductor:	Twin Chicadee
Shield Wire:	Chicadee (22mm)
Design Wind Span:	350 m
Design Weight Span:	700 m
Design Electrical Span:	525m
Min. horizontal distance btw phases:	5.703m
Vertical Ph-Ph Spacing:	2.35 m
Vertical Top Ph-Pole Top Spacing:	4.3 m
CAH:	22 m - 12m
Total Length:	21.475m - 31.475m
Sides:	12
Design Angle:	45-60 degrees
Tip Dia. :	400mm - 470mm
Base Dia. :	see BP info below
Wall Thickness:	see drawing

Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	VARIES
Gusset thickness:	VARIES

Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	No. Templ.	Template Thickness	Gusset Thickness
22m	1900	1300	60	1710	24 X M56 X 1180	2	8	25
20m	1820	1240	60	1640	24 X M56 X 1180	2	8	25
18m	1750	1180	60	1570	24 X M56 X 1180	2	8	25
16m	1720	1190	50	1560	24 X M48 X 1140	2	8	25
14m	1630	1120	50	1480	24 X M48 X 1140	2	8	25
12m	1550	1050	50	1400	24 X M48 X 1140	2	8	20

Loading Information:

CAH (m)	Design Wind Pressure (Pa)	Working Tip Load (kN)	Ultimate Base (g.l.) Moment (kNm)	Approximate Mass (kg)	Total Vertical Load (kN)
22m	1000	315	9896	21423	115 kN
20m	1000	309	9106	19617	115 kN
18m	1000	303	8315	17920	115 kN
16m	1000	296	7525	14513	115 kN
14m	1000	287	6734	12878	115 kN
12m	1000	277	5943	11332	115 kN

Fabrication/Construction Information:

Poles will have the lowest number of slip joints in conformance with the limitation imposed by the length of the galvanising bath. Slip joint length is to be 1.5 times the largest i.d. of the female section.

Jacking Tension to be specified by contractor. Jacking lugs fitted as per drawing 0.69/00/JL

Full penetration welds are to be used on:
- All sections joined by the circumferential welds.
- All longitudinal welds within 75mm of circumferential welds or in the female section of a slip joint.

Access ladders are required on all structures from approximately 6m above ground level.

Protruding edges of the pole tip cap plate to be ground off. All sharp corners to be rounded to min 5mm radius.

OPGW Downlead lugs to be fitted where required in accordance with 0.69/00/OPGW/POLC.

Structure type and number must be clearly shown on each pole section. It is preferable wherever possible to weld this information to the side/ inside of the structure for each section as well as on the template, viz.277D/1 (first section), 277D/2 (second section) etc. and 277D on the template. The CAH should also be indicated on the bottom pole section.

Fabricator to specify vent holes for galvanizing.

Notes:
Material: 300W steel

Welding to be 6mm continuous seal to SANS 10162 Section 11.

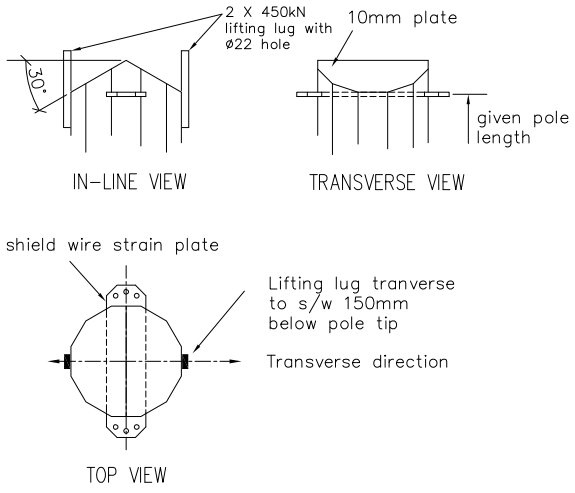
Hot dip galvanising to SANS 121.

Stress relieving to be applied in accordance with SANS 121.

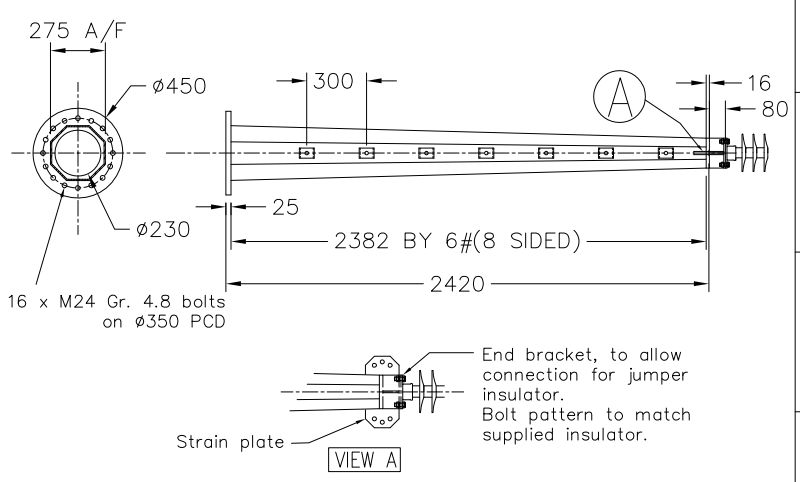
Tolerances:
- on dimensions: 2mm
- on drilling centres: 2mm

Bolt positions on base plate can be moved in order to avoid clashing between parts.

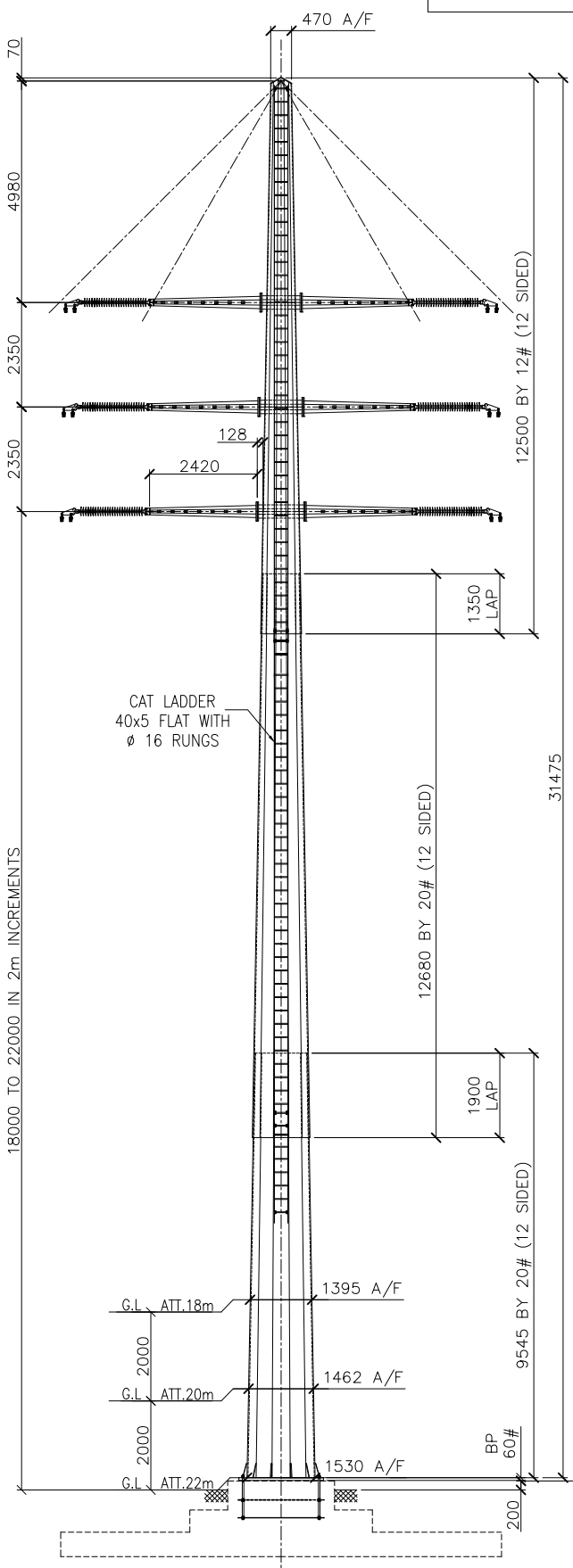
POLE TOP DETAILS

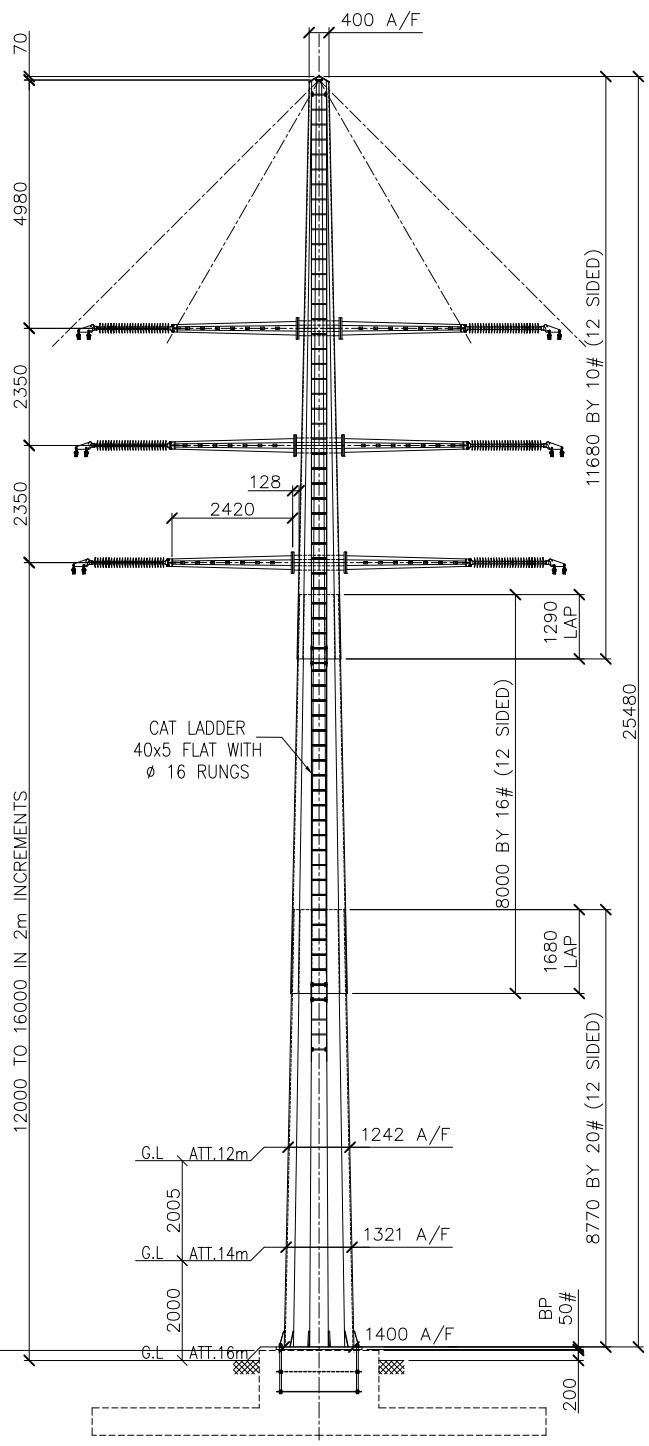


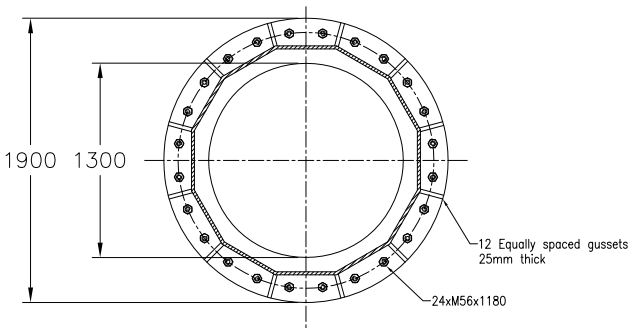
CROSSARM DETAILS



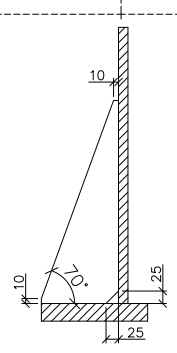
POLE IN-LINE VIEW







BASE PLATE FOR 22m ATT. HEIGHT



GUSSET DETAIL

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3				
2	AH	TL	07/06/2010	RE-DESIGNED POLE BASEPLATE & CROSS-ARM BASEPLATE
1	GSL	PM	02/12/2009	Revised crossarm lengths (increased electrical span),& Ph-Earth spacing, & 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

CLIENT: Eskom Distribution

TRANS-AFRICA PROJECTS

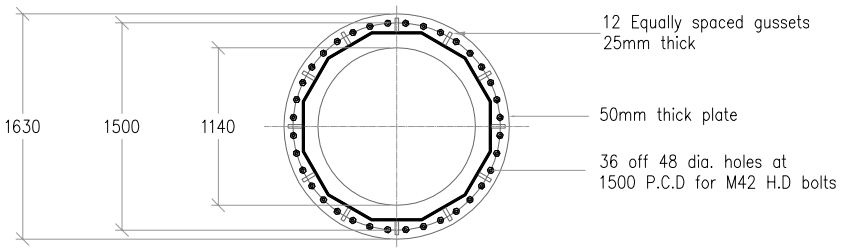
PROJECTION | SCALE NTS

AUTH P. MARAIS	DATE 23/09/ 2009	
CHKD G. LANDWEHR	DATE 23/09/ 2009	
DRAWN G. LOUW	DATE 23/09/ 2009	

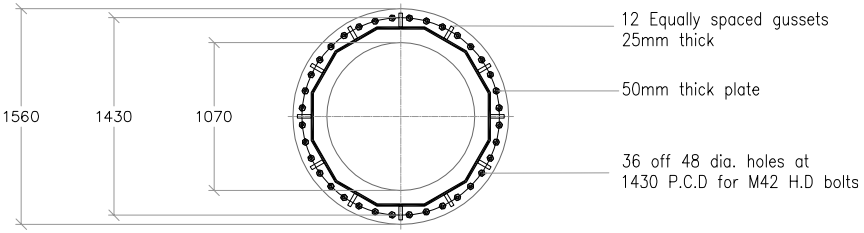
TITLE: 132kV DOUBLE CIRCUIT MONOPOLE 45°-60°ANGLE STRAIN TYPE "277 E" ATTACHMENT HEIGHT 12m TO 22m OUTLINE

0.69/277E/01 | SHEET 1 | OF 1 | REV 2

SIZE A3



BASE PLATE FOR 16m ATT. HEIGHT



BASE PLATE FOR 14m ATT. HEIGHT

Generic Base Plate Information:

H.D. Bolts Class:	Class 8.8
H.D. Bolts length:	VARIES
Gusset thickness:	VARIES

Specific Base Plate Information:

CAH (m)	O.D. (mm)	I.D. (mm)	Thickness (mm)	PCD (mm)	Bolt Information	Gusset Thickness	Template Thickness	No. Templ.
16m	1720	1190	50	1560	24 X M48 X 1140	25	8	2
14m	1630	1120	50	1480	24 X M48 X 1140	25	8	2

TRANS-AFRICA PROJECTS

CLIENT

Eskom

REV	DRAWN BY:	CHKD	DATE:	REVISION DESCRIPTION:
5				
4				
3	RM	MAB	22/05/2012	ALTERED OUTLINE DRAWINGS AS PER CIS FABRICATION DRAWINGS
2	AH	TL	03/06/2010	RE-DESIGNED POLE & CROSS-ARM BASEPLATES
1	GSL	PM	03/12/2009	Revised crossarm lengths (increased electrical span), & Ph-Earth spacing, & 12m CAH
0	GSL	GBL	23/09/2009	FIRST ISSUE

PROJECTION

SCALE 4:1

AUTH P. MARAIS DATE

CHKD M.BADZE DATE 23/10/ 2012

DRAWN R. MACARIO DATE 22/05/ 2012

TITLE:
132kV DOUBLE CIRCUIT MONOPOLE
45°-60°ANGLE STRAIN TYPE "277 E"
BASE PLATE INFORMATION

0.69/277E/02 | SHEET 1 | OF 1 | REV 3

A3L