PROPOSED DEVELOPMENT OF PORTION 24 AND 28 OF 567 MOHLABA, TZANEEN, LIMPOPO

ELECTRICAL SERVICES REPORT

OCTOBER 2022, Rev02

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1. Executive Summary

The proposed portion 24 and 28 of 567 Mohlaba, Tzaneen, Limpopo, is located 30km east of Tzaneen town CBD along the R36 road. The area is administrated by Tzaneen Local Municipality, under the Mopani District Municipality in Limpopo Province. The stand is not yet electrified. There is an existing medium voltage feeder lines that are supplying the area. The medium voltage line is Fox Conductor. The township establishment consists of 2008 stands. All the stands are not yet electrified. There is an existing medium voltage feeder lines that are supplying the area. The proposed portion 24 and 28 of 567 Mohlaba will be connecting electricity from existing pole No: NY 73/1 on 11KV.

The medium voltage line is Fox Conductor. The proposed portion 24 and 28 of 567 Mohlaba will be connecting electricity from the existing Nkowankowa Yingisani feeder medium voltage line on 11KV. The feeder line will fed from Nkowankowa Substation and the capacity is 2x10MVA on 11KV. There existing medium voltage aluminum conductor steel reinforced passing through the development will be utilized to supply the development. According to Eskom the development can be connected. It is recommended that the development will be connected according to Eskom Distribution Standard.

2. Introduction

This report outlines the design philosophy of the electrical medium voltage and low voltage installation for the proposed area. The proposed portion 24 and 28 of 567 Mohlaba, Tzaneen, Limpopo, is located 30km east of Tzaneen town CBD along the R36 road. The area is administrated by Tzaneen Local Municipality, under the Mopani District Municipality in Limpopo Province. The installation will be designed to ensure that the installation will comply with the South African national safety standard while meeting the objective of the development.

Table 1 Demographic Information

ITEM	DESCRIPTION	COMMENTS
1.	**DEMOGRAPHIC INFORMATION**	
Town Layout	Number of stands	2008
	Stand Density	Medium -9.56 hectare
	Town layout	Relatively Structured
	Classification of layout	Medium Density
Existing Infrastructure	Type of Road	Tar road
	Existence of Telephone Services	Yes
	Existence of Water Services	None
	Water reticulation	None
	Sewage infrastructure	None
	Others: Clinic	None
	Churches	None
Site Conditions	Soil type	Red turf
	Climate	Temp: -5 to 33^{o}C
	Population	Estimated 12500 people

ITEM	DESCRIPTION	COMMENTS
2	NETWORK INFORMATION	
2.1	Substation Source	Nkowankowa
2.2	Substation MV transformer capacity	1x20MVA
2.3	Feeder Name	Nkowankowa Yingisani
2.4	MV CONDUCTOR TYRE AND SIZE	FOX

3. Development Proposal (Locality)

The proposed portion 24 and 28 of 567 Mohlaba, Tzaneen, Limpopo, is located 30km east of Tzaneen town CBD along the R36 road. The area is administered by Tzaneen Local Municipality, under the Mopani District Municipality. GPS coordinates of site are 23°52'42.38"S 30°15'34.16"E

The locality map is shown on the figures below.

Figure 1 Locality

4. Distribution Network Model

4.1 MV Reticulation

A site survey was conducted to determine the best and most economical means to provide power supply to site. The proposed portion 24 and 28 of 567 Mohlaba will be connecting electricity from existing medium voltage on 11KV. The proposed portion 24 and 28 of 567 Mohlaba will be connecting electricity from the existing Nkowankowa Yingisani feeder medium voltage line on 11KV. The feeder line will fed from Nkowankowa Substation The capacity of the substation is 2x10MVA on 11kV. There is existing medium voltage aluminum conductor steel reinforced passing through the development and is utilized to supply the development. The power supply authority is Eskom. There are existing electrical infrastructures that are supplying the area.

5. Distribution Model

The objective of this task is to develop an adequate network model representing the entire area up to the main feeder level. The main feeder is defined as the main feeder supply from substation.

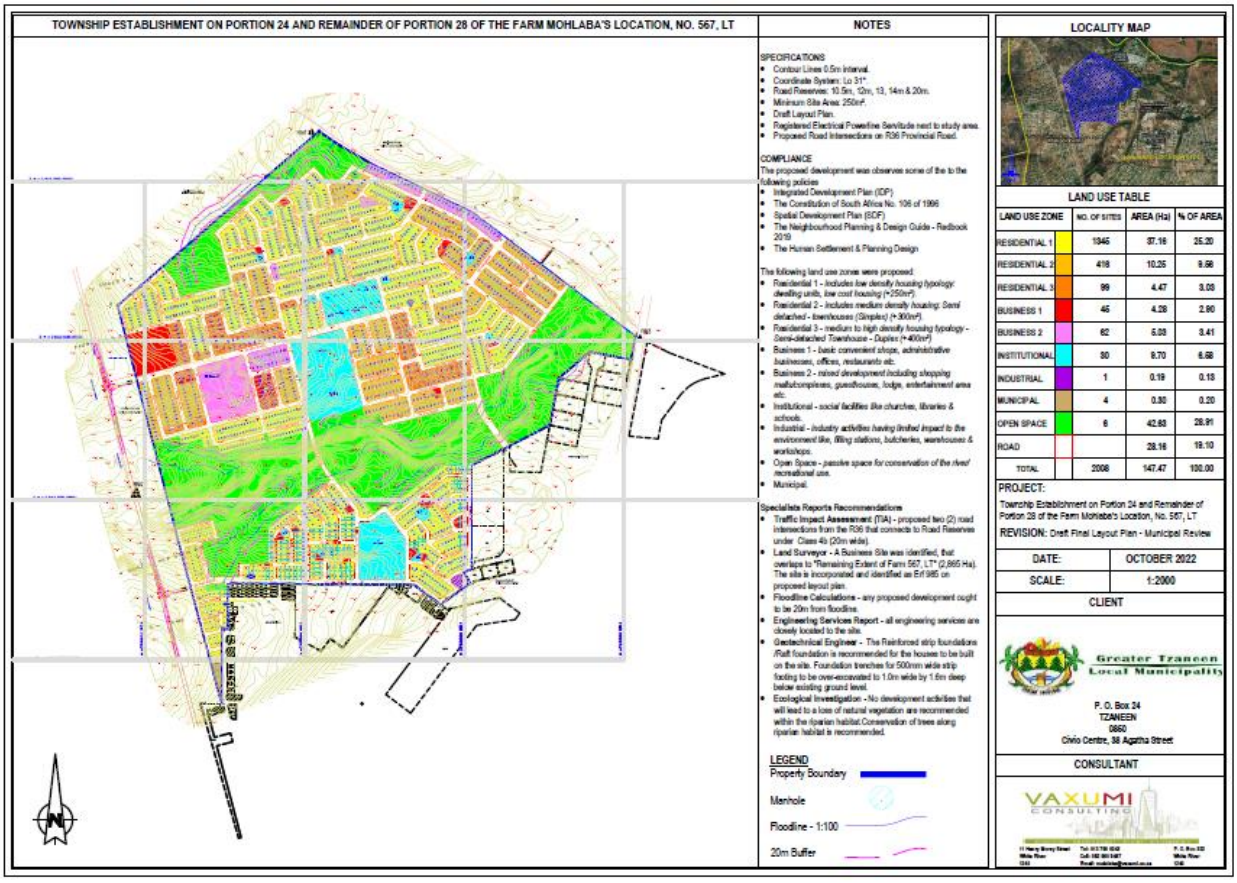


Figure 2 Proposed township development

6. Supply Authority (Licensed)

The area is situated within the electricity licensed area and supply by Eskom.

7. Existing Infrastructure

There is existing medium voltage aluminum conductor steel reinforced passing through the development and is utilized to supply the development. The power supply authority is Eskom. There are existing electrical infrastructures that are supplying the area.

Existing feeder: Existing Pole No:

Figure 3 Medium Voltage feeder and Existing pole No:

8. **Reticulation Design**

8.1 Method of Supply

Medium voltage feeder is passing through the proposed development area along the main road. The medium voltage feeder will supply the area.
This is to determine the most cost-effective supply arrangement that is used and provide details of required in feed points. The following is included regarding to bulk supply:

- The planning capacity and bulk infrastructure.
- The quality of supply.
- Metering arrangement.
- Protection arrangement.
- The loss profile due to load.

8.2 Design Parameter

The Developer shall erect the MV and LV overhead line reticulation systems in accordance with Eskom's Electrification Standards (Wood Structures).
The internal MV distribution systems shall comprise of "Fox "aluminum conductor steel reinforced configuration on 11m or 9m wooden poles and shall be built to 11kV specifications.

The LV distribution systems shall comprise an aerial bundled conductor (ABC) system, of the supporting core type mounted overhead on either 7 or 9 meter wooden poles. LV distributor spurs shall extend within a radius of approximately 500m from transformer positions depending on individual voltage drop requirements. LV distributor spurs shall share pole structures with the MV system where these follow parallel routes providing clearance of LV can be achieved.

Transformers shall be of the pole mounted type suitably rated to serve anticipated individual LV distributor loads and shall be of the SABS 780 type. All materials supplied by the Developer shall conform to Eskom's Buyer's Guide (Part 9 of DT Standard).

8.3 Electrical Load Demand.

Table 2 Electrical load demand

Land Use	**No. of Erven**	Area(Ha)	**VA / stand**	**Total**
Residential 1	1345	37.16	1.2	1614
Residential 2	416	10.25	1.2	499.2
Residential 3	99	4.47	1.2	118.8
Business 1	45	4.28	1.2	54
Business 2	62	5.03	1.2	74.4
Institutional	30	9.70	1.2	36
Industrial	1	0.19	1.2	1.2
Municipal	4	0.30	1.2	4.8
Open space	6	42.63	1.2	7.2
		Total Load		**2409.60**

Total Existing Load Demand is **2409.60**KVA.

The following design parameter is set:

- Medium voltage (Final Design)
  - ADMD 1.2kVA/stand
  - Spare capacity on feeder 0.5kVA/stand
  - Supply voltage 11kV-3 phase
  - Supply regulation(bulk) 100%(assumed)

The projected load for the final phase (at 1.2kVA per stand) is **2409.60**kVA. The transformer installed capacity is suitable for and can deliver an ADMD of 1.2kVA per stand.

- Low voltage (Final Design)
  - ADMD 1.2kVA/stand
  - Supply voltage 415/240 volt
  - Regulation +- 10%ase
  - Service connection(max) 20Amp

CART Parameters:

Table 3 Design parameter

ADMD	Alpha	Beta
Initial	0.47	8.91
Final	0.73	7.48

8.4 Summary of Predictions for each year.

Table 4 Prediction for each year

Year	Energy [kWh]	IADMD [kVA]	Alpha	Beta	Circuit
1	150.70	0.69	0.47	8.91	20.00
2	160.63	0.73	0.49	8.75	20.00
3	170.57	0.76	0.50	8.61	20.00
4	180.50	0.80	0.52	8.49	20.00
5	190.44	0.84	0.54	8.36	20.00
6	200.38	0.88	0.56	8.24	20.00
7	210.31	0.92	0.58	8.14	20.00
8	220.25	0.96	0.60	8.05	20.00
9	230.18	0.99	0.62	7.95	20.00
10	241.78	1.04	0.64	7.85	20.00
11	251.71	1.08	0.66	7.77	20.00
12	261.65	1.12	0.68	7.69	20.00
13	271.58	1.16	0.70	7 62	20.00
14	281.52	1.20	0 72	7,55	20.00
15	291.46	1.23	0.73	7.48	20.00

8.5 MV Design

The existing and proposed medium-voltage network is best described in terms of both geographic layout and electrical connection layout. The performance of the network is quantified by MV load flow studies, based on the loads described in the load forecast.
Medium Voltage supply consists of three phase mink conductor. The conductor shall be mounted on 9m wood poles and shall run street-front. A 780 pole mounted transformer shall be used to supply the stands. The transformer must not be loaded more than 108%.

All MV structures shall be constructed in accordance with Eskom Medium Voltage Distribution Standard and specifications.

The MV overhead feeder system shall comply with the requirements of ESKOM's Distribution Technology, Electrification Standards and Guidelines as and where applicable for an urban concrete pole reticulation system.

a) Conductor

Type	:	Aluminium conductor steel reinforced.
Code Name	:	Hare/Fox-see Bill of Quantities/drawings
Mass	:	85kg/km / 149kg/km
Ultimate tensile strength	:	7 900 / 13 200 Newton
Max working tension	:	@ -5oC + wind 5 240 / 8760 Newton.
Mounting	:	See structure codes on drawings.

The maximum working tension may be exceeded only during the construction stages when the conductors are to be "over-tensioned" to 1.05 x MWT for a period of not less than 8 hours nor longer than 24 hours after which the tension is to be reduced to a figure not to exceed the stated maximum working tension of the conductor concerned.

b) Poles

Pole type	-	Wood
Pole lengths	-	7m for LV distributor 9m for LV road crossing, 11m for MV Line
Planting depth	-	1.5, 1.8 and 2m respectively
Pole marker	-	painted - black on yellow background.

c) Stays

Type	-	Fiber glass for MV and Porcelain of LV
Rods	-	M20 - 2000 long
Base plate	-	380 x 380 x 6 galvanized
Stay wire	-	7/4mm, 1100 MPA - galvanized
Planting depth	-	2m

d) Flying Stays

Flying stays shall be installed in the positions indicated on the drawings by the structure codes. Anchor poles shall be as specified for the line structures and of sufficient length to ensure the required ground clearance. Overhead stay wire shall be 7/4.00mm as specified for stays.

Struts

Struts shall be installed in the positions indicated on the drawings by the structure codes. Strut poles shall be as specified for the line structures. Line structure poles shall be fitted with suitable ground anchors at all strut positions. Struts shall be fitted with barbed wire anti climbing devices.

e) Insulators, Line Clamps and Other Line Components, Pole Dressing Hardware etc.

All in accordance with Eskom's Distribution Reticulation Technology, Electrification Standards and Guidelines with particular reference to the detailed material take off sheets provided for the various line structures.

f) Sags and Tensions

The Developer shall provide suitable dynamometer sighting rods or other approved apparatus necessary for proper checking of the work. Dynamometers shall be calibrated in kg or kN.

g) Surge Arrestors

Surge arrestors shall be of the metal oxide outdoor hermetically sealed, vertical base mounted type, rated at 11kV, 10kA impulse current.

h) Sectionalizers

Dropout fuses shall be provided for each transformer zone.

8.5.1 Pole Mounted Transformers

Transformers shall generally comply with the following details:

Situation	:	Outdoors
Mounting	:	Suitable for single pole structure (Transformer outline)
Type	:	SABS 780
kVA rating	:	100/50 (as indicated on drawings)
No load voltage ratio	:	22000/415/231 volt
Vector group	:	Dyn 11
Parallel operation	:	Not required
MV & LV connections	:	External bushings with suitable insulated connections.

The transformers shall have connected on the MV side through the use of links or fuses.

8.6 LV Design

The low voltage feeders shall be three phase 4 core aerial bundle conductor with bare neutral and shall be 70 and 35mm². The LV network is to be constructed in mid-block layout on 7m wood poles. The feeders shall be fused at the transformer pole**.** All LV structures shall be constructed in accordance with Eskom Low Voltage Distribution Standard and specifications.

8.7 Service connection

The majority of customers are expected to purchase a 20 Amp supply. Service connections are to be made with a 10mm² concentric cables from a 4-way and 8-way distribution pole top boxes. The service connection shall be a concentric cable in accordance with SCSSCAAC7. For a 60A supply a 10mm² concentric cables shall be used. The concentric cable used on all new services shall be installed without joints from the pole-top distribution box into the standard passive unit base, which is mounted in the customer's premises.

Where the concentric cable enters the dwelling, suitable protection shall be applied around the cable to prevent damage to the insulation. The concentric cable shall form a "drip loop" before the attachment or entry point on the customer's wall as illustrated in drawings D-DT-0360 and D-DT-0361. The concentric cable entry point into the SPU shall be watertight.

The SPU consists of a standard dispenser socket (ED base) attached to a standard 110 mm x 110 mm socket outlet box as illustrated in D-DT-0347. The SPU shall be installed in every customer’s home regardless of the type of supply required. For customers with a 60A supply the standard 110mm X 110mm socket outlet box shall be removed from the SPU. The SPU shall comply with SCSSCAAJ1.

The SPU integrates the incoming service cable with the metering, protection and household distribution. It provides the separation of the earth and neutral for the customer's installation. The wiring between the standard dispenser terminals and the socket outlet box is part of the customer’s installation. The wiring shall be done with a separate earth and neutral wire.
The SPU shall be mounted at a position that is suitable for the customer and away from sources of heat and moisture. Refer to 7.9 in SABS 0142 for the positioning of distribution boards. On brick walls, a 6mm diameter "easy-drive" with screw (D-DT-3149) will be used to mount the SPU. In all other cases, a threaded rod with washers shall be used. A non-metallic cable gland (D-DT-3070) will be provided at the service cable entry point to the standard passive unit.
All services shall be in accordance with Eskom Distribution Services Standard and specifications.

9. **Material and Equipment Specification.**

The Developer will erect the MV and LV overhead line reticulation systems in accordance with Eskom's Electrification Standards (Wood Structures). The internal MV distribution systems shall comprise of "Fox "aluminum conductor steel reinforced configuration on 12m,11m or 9m wooden poles and shall be built to 11kV specifications.

The LV distribution systems shall comprise an aerial bundled conductor (ABC) system, of the supporting core type mounted overhead on either 7 or 9 meter wooden poles. LV distributor spurs shall extend within a radius of approximately 500m from transformer positions depending on individual voltage drop requirements. LV distributor spurs shall share pole structures with the MV system where these follow parallel routes providing clearance of LV can be achieved.

Transformers shall be of the pole mounted type suitably rated to serve anticipated individual low voltage distributor loads and shall be of the SABS 780 type. All materials supplied by the Developer shall conform to Eskom's Buyer's Guide (Part 9 of DT Standard).

10. Earthing and Lightning Protection System

In accordance with Eskom Distribution Standard Part 2, with particular reference to:

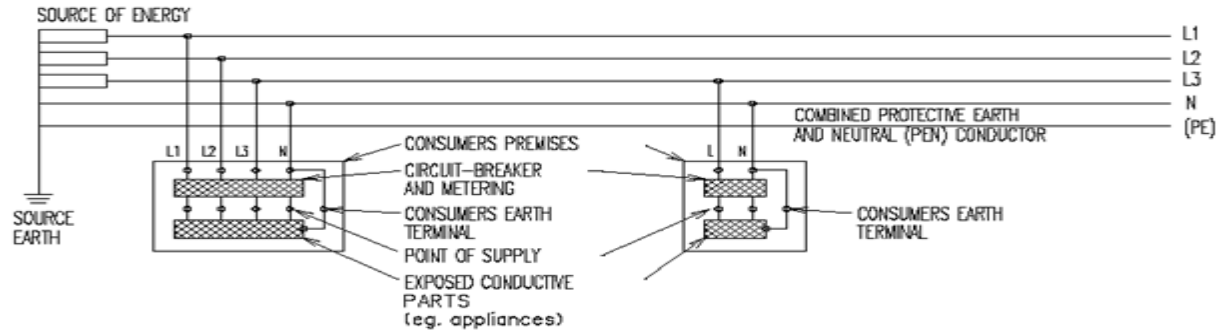


Figure 4 Consumer schematic

Results of soil resistivity survey at 2 points.
Min Cu area : 16mm² stranded
12mm² solid

- Low Voltage
  11 kV systems : 70 Ohms
- Medium Voltage
  22kV system : 30 Ohms

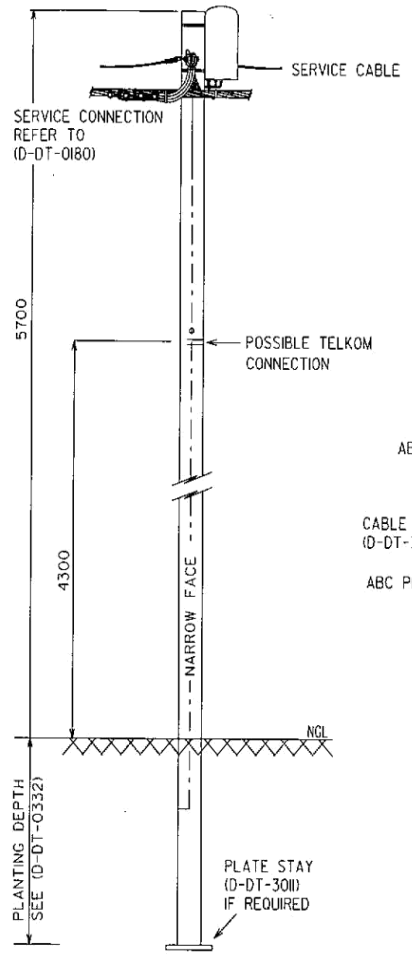
11. Recommendation

There is an existing medium voltage feeder lines that are supplying the area. The medium voltage line is Fox Conductor. The township establishment consists of 2008 stands. All the stands are not yet electrified. There is an existing medium voltage feeder lines that are supplying the area. The proposed portion 24 and 28 of 567 Mohlaba will be connecting electricity from existing pole No: NY 73/1 on 11KV.

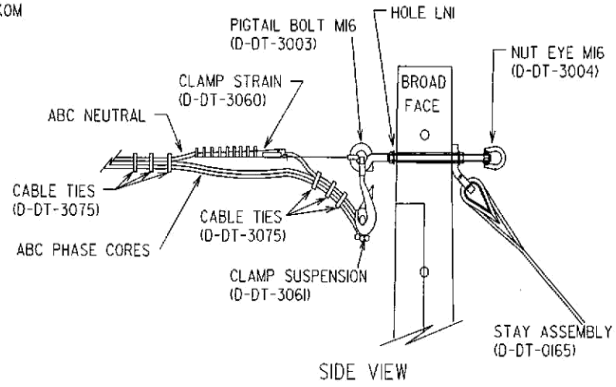
The medium voltage line is Fox Conductor. The proposed portion 24 and 28 of 567 Mohlaba will be connecting electricity from the existing Nkowankowa Yingisani feeder medium voltage line on 11KV. The feeder line will fed from Nkowankowa Substation and the capacity is 2x10MVA on 11KV. There existing medium voltage aluminum conductor steel reinforced passing through the development will be utilized to supply the development. According to Eskom the development can be connected. It is recommended that the development will be connected according to Eskom Distribution Standard.

Annexure A

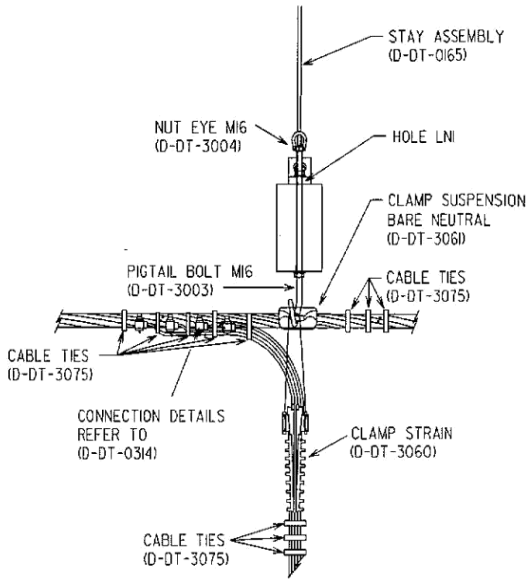
Eskom Drawing Standards



7m POLE T-OFF



SIDE VIEW



PLAN VIEW

NOTE :

1. EARTHING REQUIREMENTS SEE PART 2.
2. IF DOUBLE BUNDLES ARE USED - INSTALL MV STAYS (D-DT-0265)
3. FOR POLE HOLE POSITIONS REFER TO D-DT-0002

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
6	LOGO CHANGED AS PER NEW CORPORATE I.D.	D.D.N.	P.A.V.	J.SCHOLTZ	29.07.04	
5	TITLE CHANGED	CADNET	I.A.F.	I.FERGUSON	07.07.97	
4	VARIOUS AMMENDMENTS MADE	P.A.V.	J.SWAN	P.CROWDY	20.11.95	

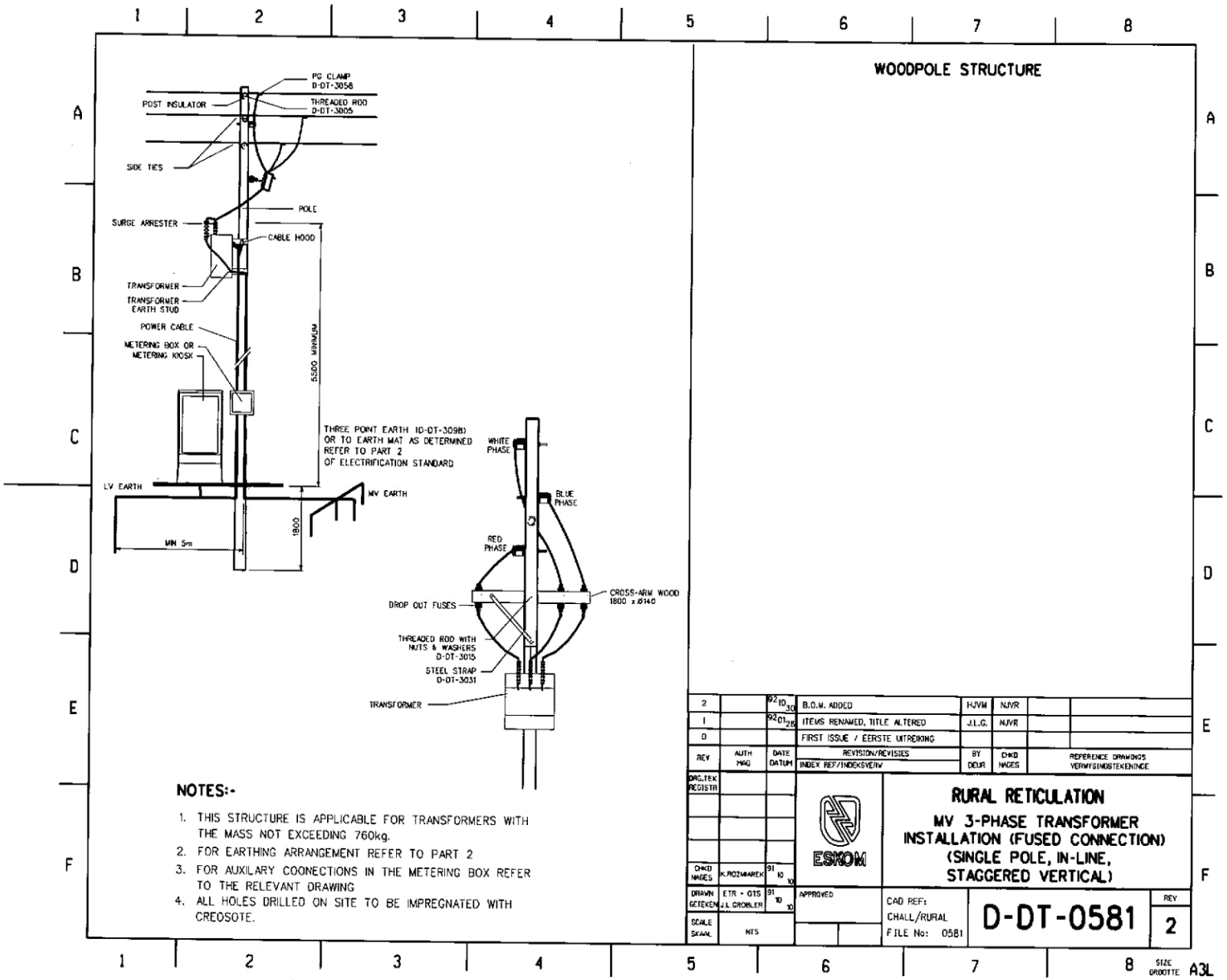
Eskom Distribution

AUTH: S.A.CILLIERS
DATE: 10.01.94
CHKD: N.J.V.R.
DATE: 01.03.93
DRAWN: E.C.R. S.T.POOK
DATE: 21.09.91

ESKOM
LV RETICULATION
THREE PHASE BARE NEUTRAL ABC
T-OFF ASSEMBLY FROM INTERMEDIATE
CONCRETE POLE

D-DT-0140

SET	SHEET	REVISION
1	1	6



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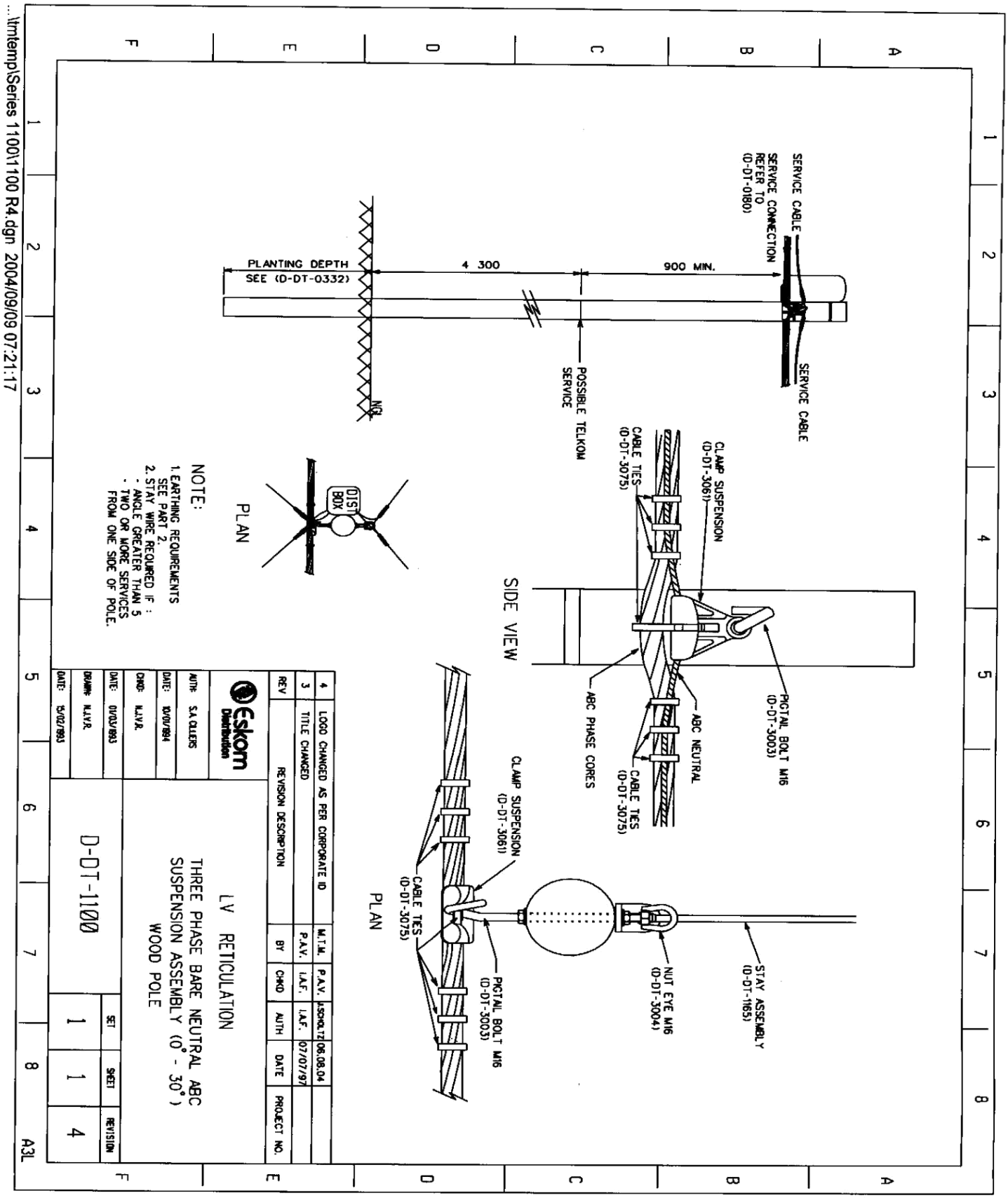
SERVICE CABLE
SERVICE CONNECTION REFER TO (D-DT-0180)
PLANTING DEPTH SEE (D-DT-0332)
4 300
900 MIN.
POSSIBLE TELKOM SERVICE
SERVICE CABLE
NGL
CABLE TIES (D-DT-3075)
CLAMP SUSPENSION (D-DT-3061)
PIGTAIL BOLT M16 (D-DT-3003)
ABC NEUTRAL
ABC PHASE CORES
CABLE TIES (D-DT-3075)
SIDE VIEW
DIST BOX
PLAN
NOTE:
1. EARTHING REQUIREMENTS SEE PART 2
2. STAY WIRE REQUIRED IF :
- ANGLE GREATER THAN 5
- TWO OR MORE SERVICES FROM ONE SIDE OF POLE.
CLAMP SUSPENSION (D-DT-3061)
CABLE TIES (D-DT-3075)
PIGTAIL BOLT M16 (D-DT-3003)
NUT EYE M16 (D-DT-3004)
STAY ASSEMBLY (D-DT-1165)
PLAN
Eskom Distribution
LV RETICULATION
THREE PHASE BARE NEUTRAL ABC SUSPENSION ASSEMBLY (0° - 30°)
WOOD POLE
D-DT-1100
AUTH: S.A. CILLIERS
DATE: 10/07/1994
CHKD: M.J.V.R.
DATE: 01/JUL/1993
DRAWN: M.J.V.R.
DATE: 15/07/1993
REV
REVISION DESCRIPTION
BY
CHKD
AUTH
DATE
PROJECT NO.
4 LOGO CHANGED AS PER CORPORATE ID M.T.M. P.A.V. JSCHULTZ 06.08.04
3 TITLE CHANGED P.A.V. I.A.F. I.A.F. 07/07/97
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REVISION 4
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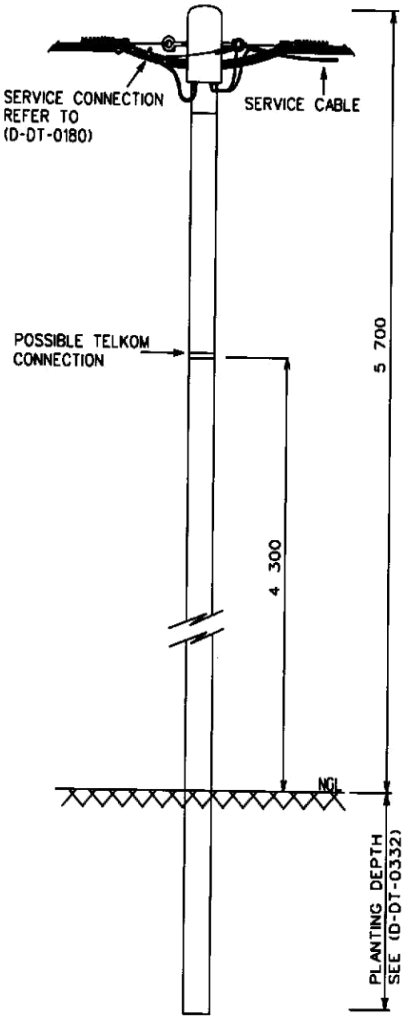
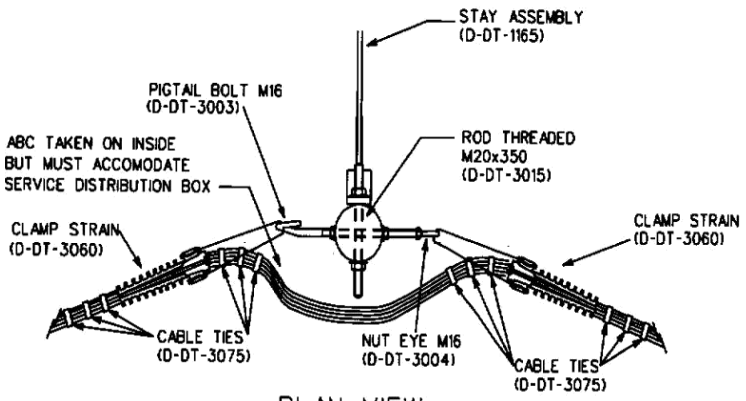
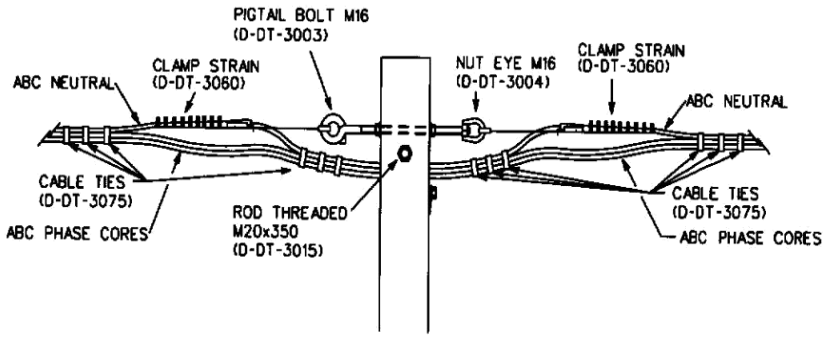


7m ANGLE STRAIN



PLAN VIEW



FRONT VIEW

NOTE :

1. EARTHING REQUIREMENTS SEE PART 2.
2. IF TWO ABC BUNDLES ARE USED - INSTALL MV STAY (D-DT-0265)

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
5	LOGO CHANGED AS PER CORPORATE ID	M.T.M.	P.A.V.	J.SCHOLTZ	06.08.04	
4	TITLE CHANGED	CADNET	I.A.F.	I.A.F.	07/07/97	

Eskom Distribution

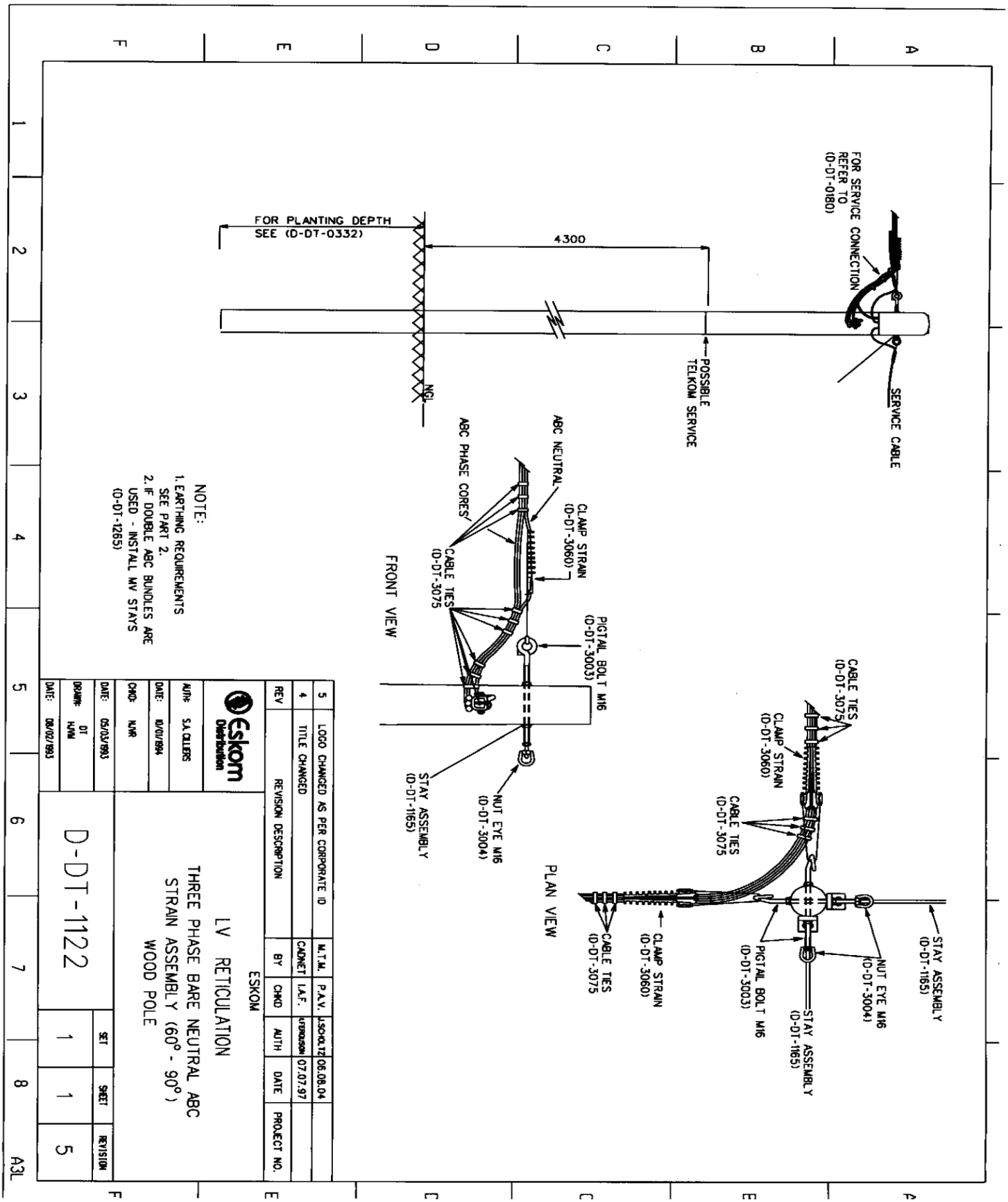
AUTH: S.A. CILLIERS
DATE: 10/01/1994
CHKD: N.J.V.R.
DATE: 01/03/1993
DRAWN: ECR S.T. POOK
DATE: 29/09/1991

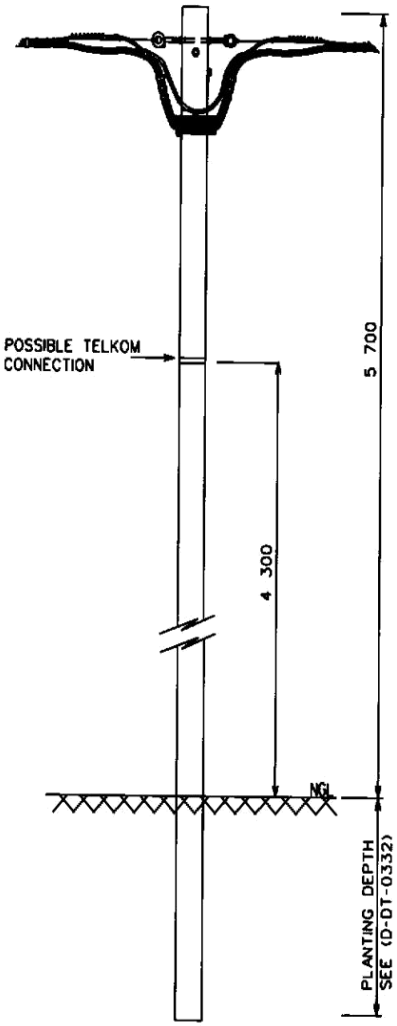
LV RETICULATION
THREE PHASE BARE NEUTRAL ABC
STRAIN ASSEMBLY (0° - 60°)
WOOD POLE

D-DT-1121

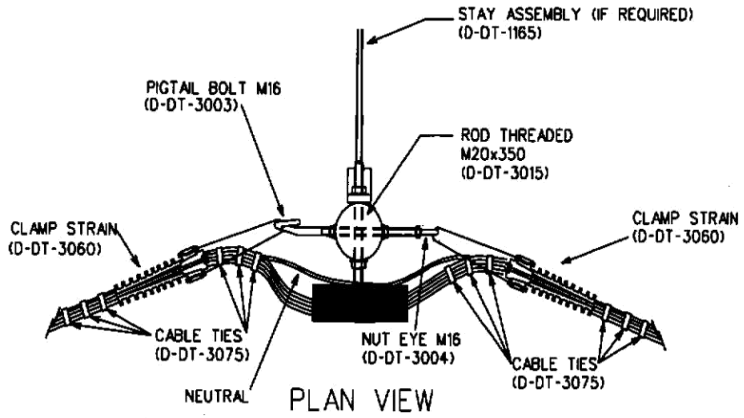
SET	SHEET	REVISION
1	1	5

A3L

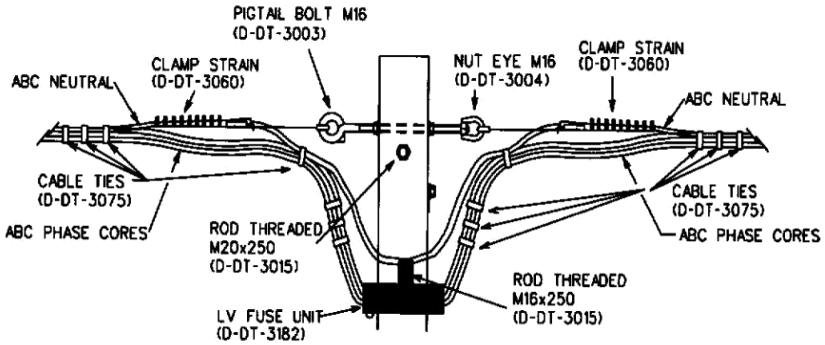

FOR SERVICE CONNECTION REFER TO (D-DT-0180)
FOR PLANTING DEPTH SEE (D-DT-0332)
4300
NGL
POSSIBLE TELKOM SERVICE
SERVICE CABLE
ABC NEUTRAL
ABC PHASE CORES
CLAMP STRAIN (D-DT-3060)
CABLE TIES (D-DT-3075)
PIGTAIL BOLT M16 (D-DT-3003)
NUT EYE M16 (D-DT-3004)
STAY ASSEMBLY (D-DT-1165)
FRONT VIEW
PLAN VIEW
NOTE:
1. EARTHING REQUIREMENTS SEE PART 2.
2. IF DOUBLE ABC BUNDLES ARE USED - INSTALL MV STAYS (D-DT-1265)
Eskom Distribution
AUTH: S.A. CILLIERS
DATE: 10/01/1994
CHKD: N.V.R.
DATE: 05/03/1993
DRAWN: DT N.V.R.
DATE: 08/02/1993
REV
REVISION DESCRIPTION
BY
5 LOGO CHANGED AS PER CORPORATE ID M.T.M. P.A.V. J.SCHOLTZ 06.08.04
4 TITLE CHANGED CADNET I.A.F. K.FERGUSON 07.07.97
ESKOM
LV RETICULATION
THREE PHASE BARE NEUTRAL ABC STRAIN ASSEMBLY (60° - 90°) WOOD POLE
D-DT-1122
SET 1
SHEET 1
REVISION 5
A3L



7m ANGLE STRAIN



PLAN VIEW



FRONT VIEW

NOTE :

1. EARTHING REQUIREMENTS SEE PART 2.
2. IF TWO ABC BUNDLES ARE USED - INSTALL MV STAY (D-DT-0265)
3. NEUTRAL NOT TO GO THROUGH FUSE UNIT

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
1	LOGO CHANGED AS PER CORPORATE ID	M.T.M.	P.A.V.	J.SCHOLTZ	06.08.04	
0	FIRST ISSUE	CADNET	E.N.	I.A.F.	27/11/97	

Eskom Distribution

AUTH: L.FERGUSON
DATE: 27/11/1997
CHKD: E.N.
DATE: 27/11/1997
DRAWN: CADNET H.J.V.R.
DATE: 27/11/1997

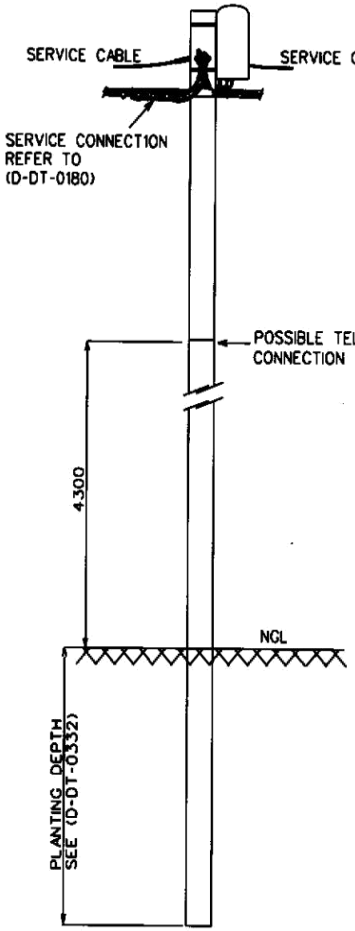
LV RETICULATION

INLINE FUSE UNIT ASSEMBLY WOOD POLE

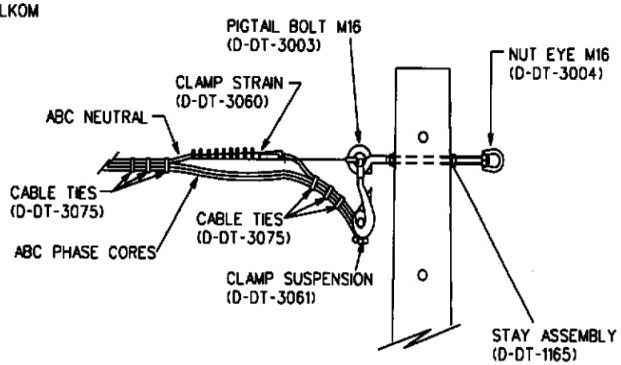
D-DT-1139

SET	SHEET	REVISION
1	1	1

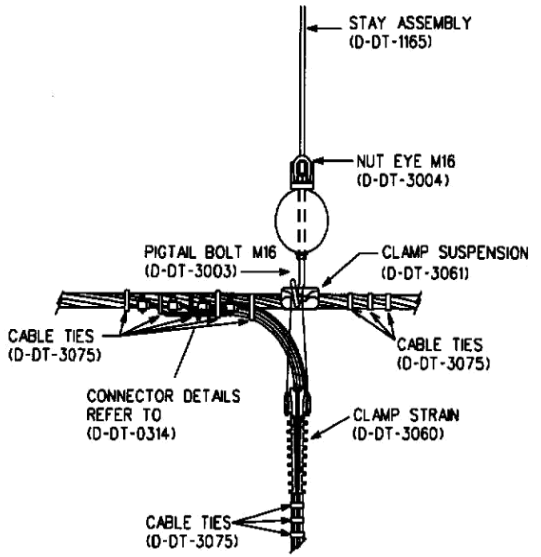
A3L



T-OFF



SIDE VIEW



PLAN VIEW

NOTE :

1. EARTHING REQUIREMENTS SEE PART 2.
2. IF DOUBLE BUNDLES ARE USED - INSTALL MV STAYS (D-DT-1265)

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
5	LOGO CHANGED AS PER CORPORATE ID	M.T.M.	P.A.V.	J.SCHOLTZ	06.08.04	
4	TITLE CHANGED	CADNET	I.A.F.	I.A.F.	07/07/97	

Eskom Distribution

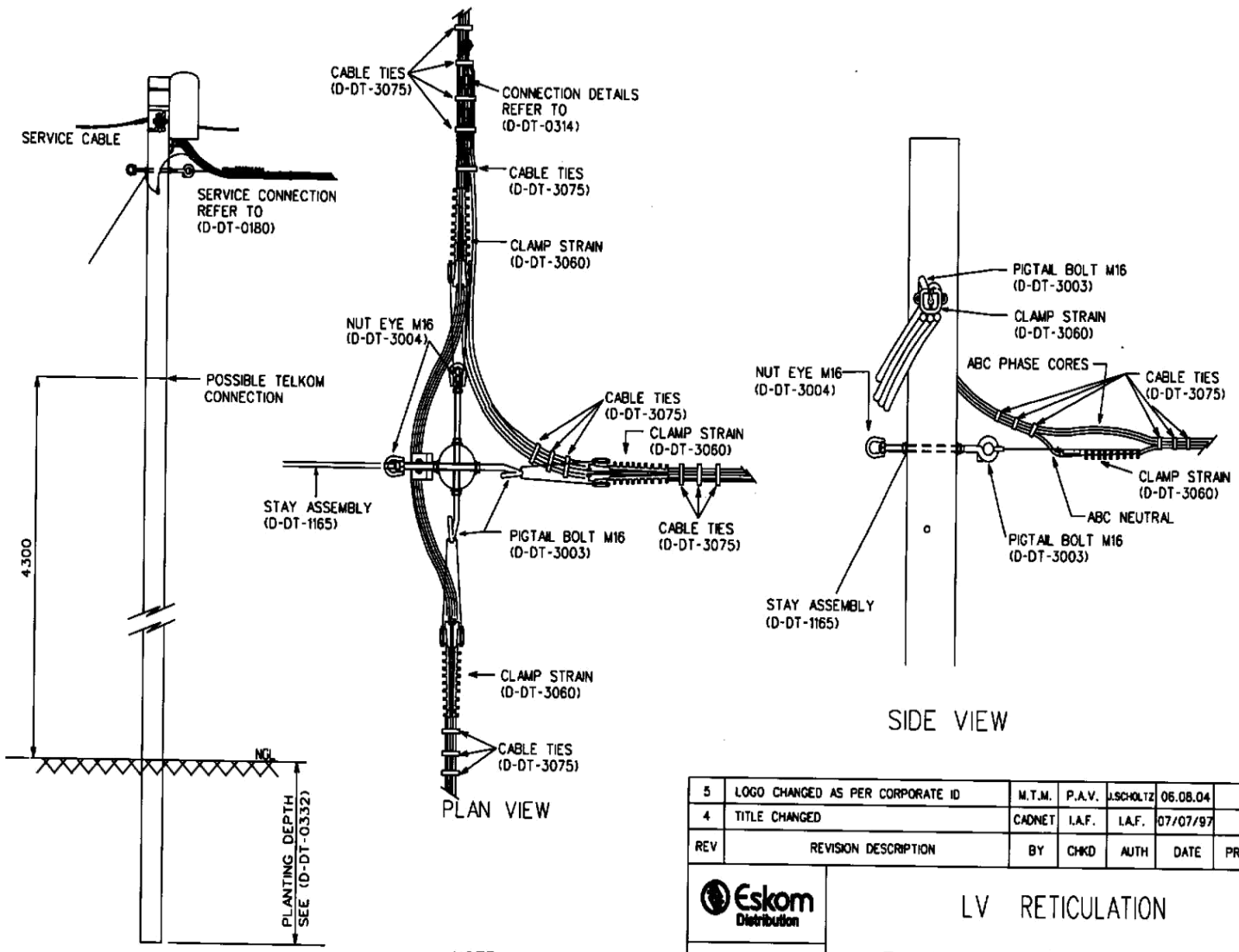
AUTH: S.A. CILLIERS
DATE: 10/01/1994
CHKD: N.J.V.R.
DATE: 05/03/1995
DRAWN: DT N.J.V.R.
DATE: 06/02/1993

LV RETICULATION
THREE PHASE BARE NEUTRAL ABC T-OFF ASSEMBLY FROM INTERMEDIATE WOOD POLE

D-DT-1140

SET	SHEET	REVISION
1	1	5

A3L



NOTE :

1. EARTHING REQUIREMENTS SEE PART 2.
2. IF DOUBLE ABC BUNDLES ARE USED - INSTALL MV STAYS (D-DT-1265)

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
5	LOGO CHANGED AS PER CORPORATE ID	M.T.M.	P.A.V.	J.SCHOLTZ	06.08.04	
4	TITLE CHANGED	CADNET	I.A.F.	I.A.F.	07/07/97	

Eskom Distribution

LV RETICULATION

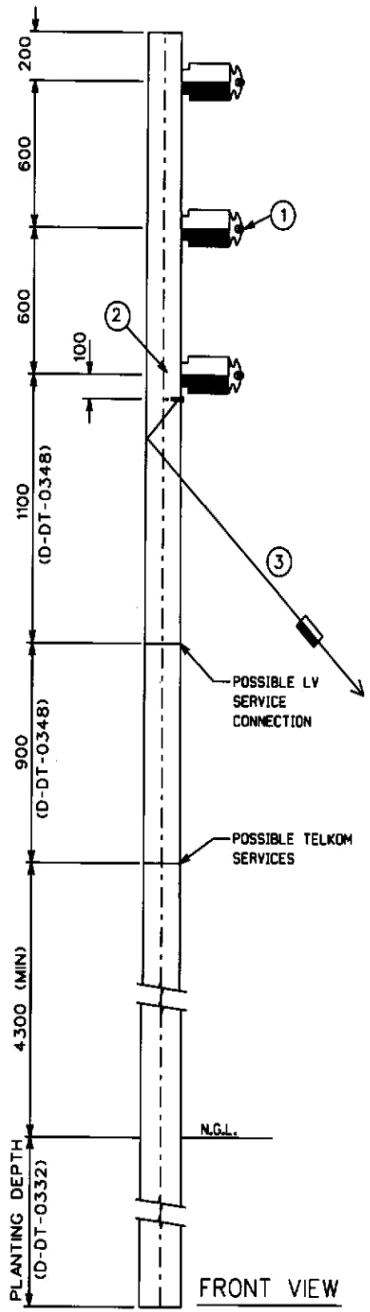
THREE PHASE ABC BARE NEUTRAL T-OFF ASSEMBLY FROM STRAIN WOOD POLE

AUTH:	S.A. CILLIERS
DATE:	10/01/1994
CHKD:	N.J.V.R.
DATE:	05/03/1993
DRAWN:	DT H.J.V.M.
DATE:	08/02/1993

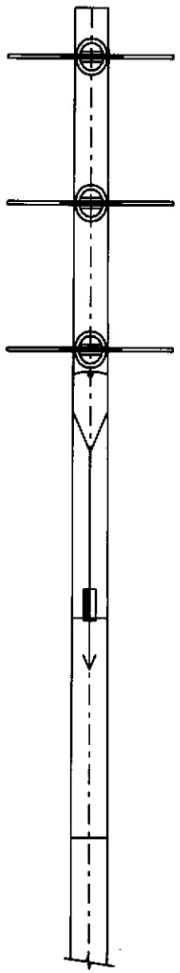
D-DT-1142

SET	SHEET	REVISION
1	1	5

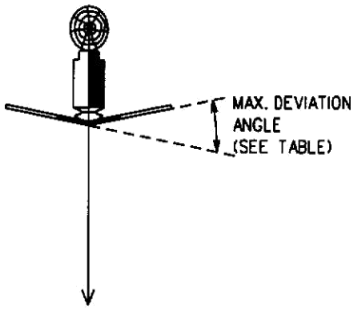
A3L



FRONT VIEW



SIDE VIEW



PLAN VIEW

REFERENCE DRAWINGS		
ITEM	DESCRIPTION	DWG NO
	CONDUCTOR / INSULATOR ATTACHMENTS	
1	POSTS -TOP GROOVE TIES	D-DT-0256
	INSULATOR / STRUCTURE ATTACHMENTS	
2	POSTS -LONG SPINDLE	D-DT-0391
	BONDING AND EARTHING	
	INSULATION CO-ORDINATION	D-DT-0310
	STAYS	
3	STAY ASSEMBLY STAY ATTACHMENTS	D-DT-0341 D-DT-0312
	PHASING	
	PHASE CONFIGURATION	D-DT-0311

DEVIATION TABLE		
CONDUCTOR	MIN.	MAX.
SQUIRREL	1	12°
FOX	1	10°
MINK	1	8°
HARE	1	5°

NOTE :
NOT SUITABLE FOR ROAD CROSSINGS.

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
2	STAY ASSEMBLY ADDED & REF. No'S CHANGED	PBM	P.A.V.	B. HILL	18.10.05	
1	LOGO CHANGED AS PER NEW CORPORATE ID	M.T.M.	P.A. VERMAAK		10.11.04	
0	FIRST ISSUE	P.A.V.	B. BRANFIELD		11.01.99	

Eskom Distribution

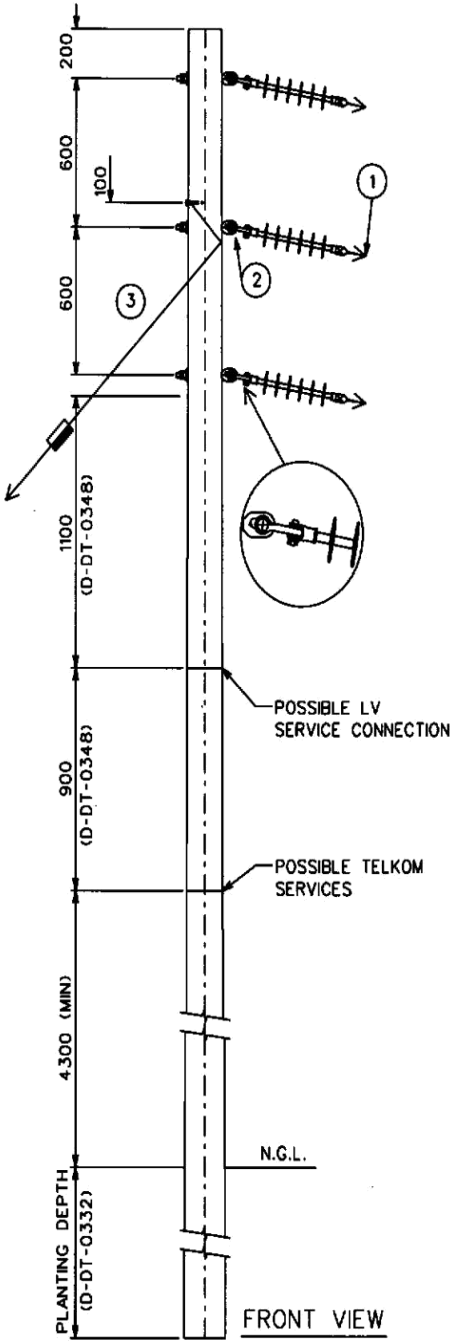
AUTH: B. BRANFIELD
DATE: 11/01/1999
CHKD: B. BRANFIELD
DATE: 11/01/1999
DRAWN: IAN B. P.A. VERMAAK
DATE: 01/08/1998

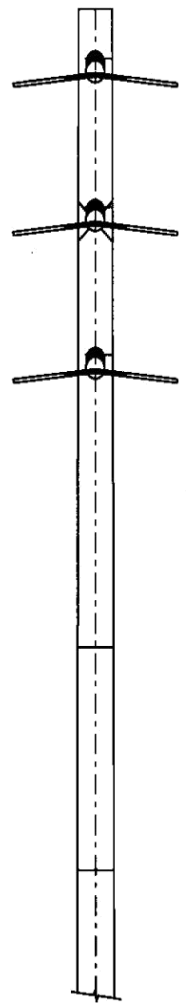
ESKOM
MV RETICULATION
THREE PHASE
VERTICAL 600 SPACING - INTERMEDIATE
SMALL (1 -10) DEG. DEVIATION

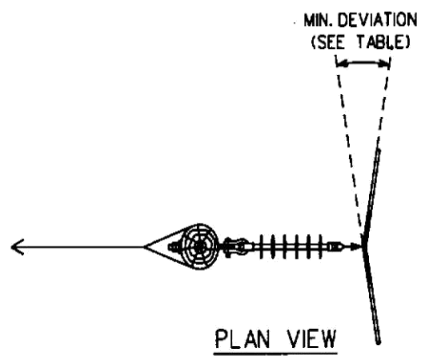
D-DT-1711

SET	SHEET	REVISION
1	1	2

A3L







REFERENCE DRAWINGS		
ITEM	DESCRIPTION	DWG NO
	CONDUCTOR / INSULATOR ATTACHMENTS	
1	SUSPENSIONS -SUSP. CLAMP/ARMOUR ROD	D-DT-0253
	INSULATOR / STRUCTURE ATTACHMENTS	
2	SUSPENSION -EYEBOLT	D-DT-0378
	BONDING AND EARTHING	
	INSULATION CO-ORDINATION	D-DT-0310
	STAYS	
3	STAY ATTACHMENTS STAY ASSEMBLY	D-DT-0312 D-DT-0341
	PHASING	
	PHASE CONFIGURATION	D-DT-0311

NOTE:
MIN DEVIATION ANGLE 15°
MAX DEVIATION ANGLE 20°

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
3	STAY ASS. ADDED, REF. No'S CHANGED, NOTE ADDED & TITLE BLOCK DES. CHANGED	PBM	B. HILL	B. HILL	08.12.05	
2	LOGO CHANGED AS PER NEW CORPORATE ID	M.T.M.	P.A. VERMAAK		10.11.04	
1	ORIENTATION OF INSULATORS CORRECTED	P.A.V.	B.B.	P.CROWDY	14.04.99	

Eskom Distribution

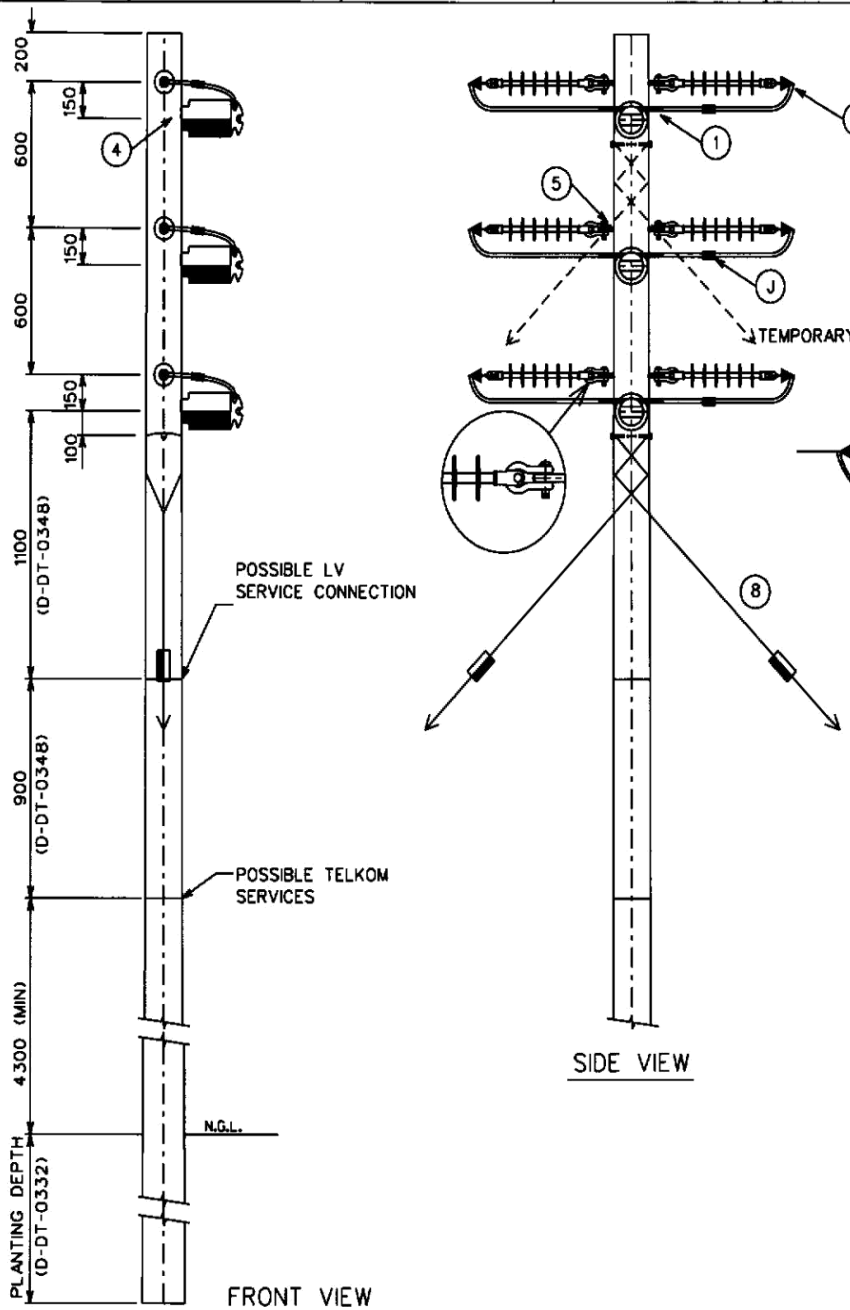
AUTH: B. BRANFIELD
DATE: 11/01/1999
CHKD: B. BRANFIELD
DATE: 11/01/1999
DRAWN: IAN B. P.A. VERMAAK
DATE: 01/08/1998

ESKOM
MV RETICULATION
THREE PHASE
VERTICAL 600 SPACING - INTERMEDIATE
MEDIUM (±15-20) DEG. DEVIATION

D-DT-1712

SET	SHEET	REVISION
1	1	3

A3L



REFERENCE DRAWINGS		
ITEM	DESCRIPTION	DWG NO
	CONDUCTOR / INSULATOR ATTACHMENTS	
1	POSTS -SIDE GROOVE TIES	D-DT-0259
3	STRAINS -HELICAL DEAD-END -PISTOL GRIPS	D-DT-0250 D-DT-0251
	INSULATOR / STRUCTURE ATTACHMENTS	
5	STRAINS -EYEBOLT	D-DT-0373
4	POSTS -LONG SPINDLE	D-DT-0391
	BONDING AND EARTHING	
	INSULATION CO-ORDINATION	D-DT-0310
	STAYS	
8	STAY ATTACHMENTS	D-DT-0312
	PHASING	
	PHASE CONFIGURATION	D-DT-0311
	JOINTS	
J	NON-TENSION JOINTS	CHOICE

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
1	LOGO CHANGED AS PER NEW CORPORATE ID	M.T.M.	P.A. VERMAAK		10.11.04	
0	FIRST ISSUE	P.A.V.	B. BRANFIELD		11.01.99	

Eskom Distribution

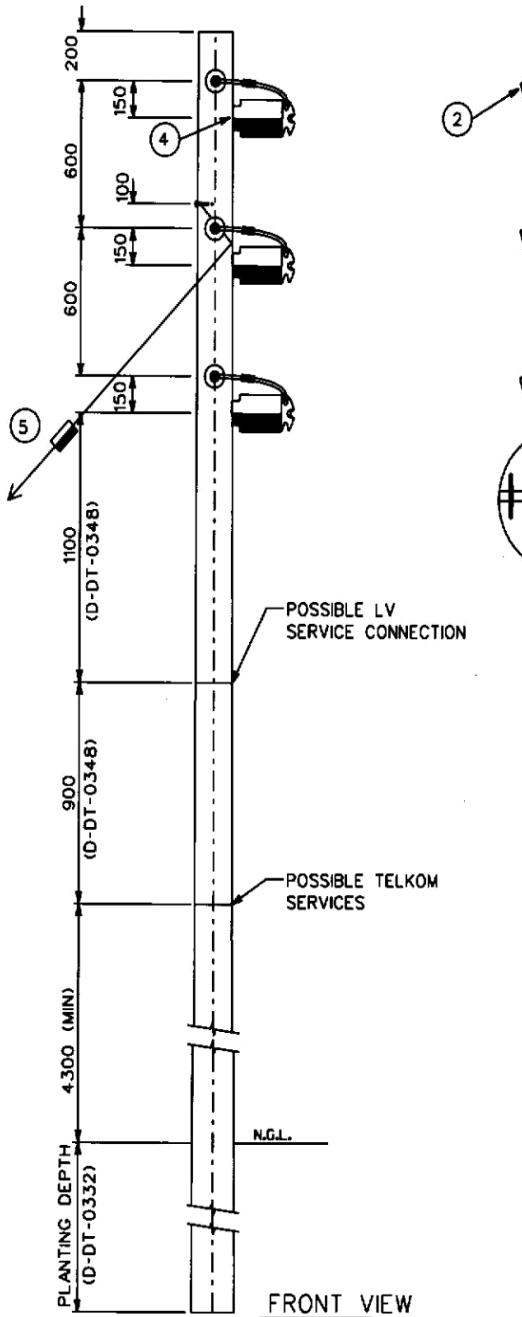
AUTH: B. BRANFIELD
DATE: 11/01/1999
CHKD: B. BRANFIELD
DATE: 11/01/1999
DRAWN: IAN B. P.A. VERMAAK
DATE: 01/08/1998

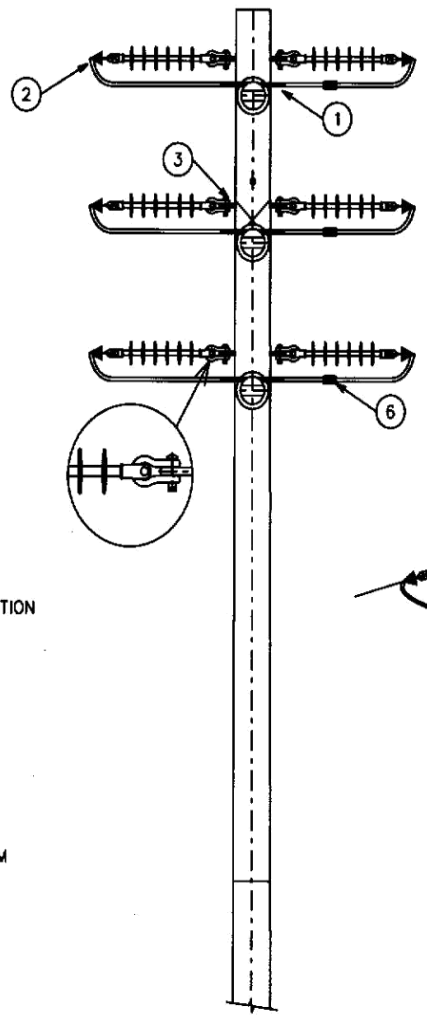
ESKOM
MV RETICULATION
THREE PHASE
VERTICAL 600 SPACING
STRAIN - 0 DEG. DEVIATION

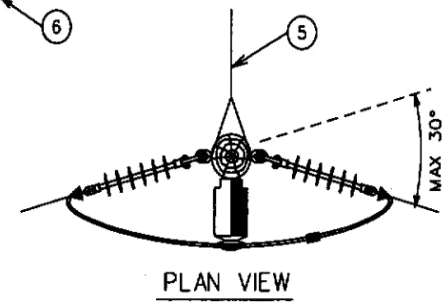
D-DT-1713

SET	SHEET	REVISION
1	1	1

A3L







REFERENCE DRAWINGS		
ITEM	DESCRIPTION	DWG NO
	CONDUCTOR / INSULATOR ATTACHMENTS	
1	POSTS -SIDE GROOVE TIES	D-DT-0259
2	STRAINS -HELICAL DEAD-END -PISTOL GRIPS	D-DT-0250 D-DT-0251
	INSULATOR / STRUCTURE ATTACHMENTS	
3	STRAINS -EYEBOLT	D-DT-0373
4	POSTS -LONG SPINDLE	D-DT-0391
	BONDING AND EARTHING	
	INSULATION CO-ORDINATION	D-DT-0310
	STAYS	
5	STAY ATTACHMENTS STAY ASSEMBLY	D-DT-0312 D-DT-0341
	PHASING	
	PHASE CONFIGURATION	D-DT-0311
	JOINTS	
6	NON-TENSION JOINTS	CHOICE

CONDUCTOR	MIN. POLE DIAMETER			
MAX.30 DEG. DEV.	9m	10m	11m	12m
SQUIRREL	140	140	160	160
FOX	140	140	160	160
MINK	140	140	160	160
HARE	160	160	180	180

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
2	REF. TO STAY ASSY. ADDED & REF. No'S AND MIN. POLE DIA'S CHANGED	PBM	B. HILL		08.12.05	
1	LOGO CHANGED AS PER NEW CORPORATE ID	M.T.M.	P.A. VERMAAK		10.11.04	

Eskom Distribution

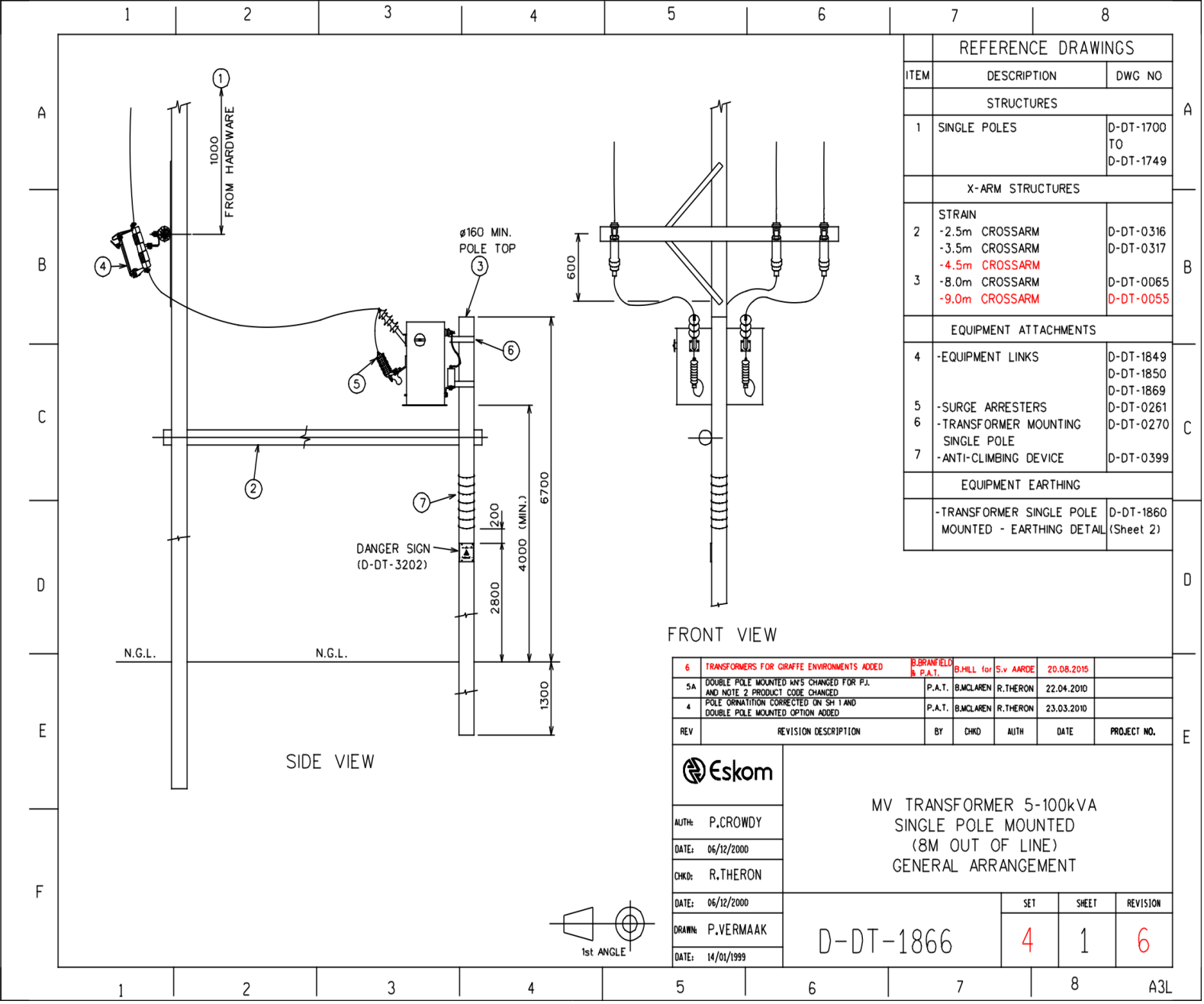
AUTH: B. BRANFIELD
DATE: 11/01/1999
CHKD: B. BRANFIELD
DATE: 11/01/1999
DRAWN: IAN B. P.A. VERMAAK
DATE: 01/08/1998

ESKOM
MV RETICULATION
THREE PHASE
VERTICAL 600 SPACING - STRAIN
SMALL (1 -30) DEG. DEVIATION

D-DT-1714

SET	SHEET	REVISION
1	1	2

A3L



REFERENCE DRAWINGS		
ITEM	DESCRIPTION	DWG NO
	STRUCTURES	
1	SINGLE POLES	D-DT-1700 TO D-DT-1749
	X-ARM STRUCTURES	
2	STRAIN -2.5m CROSSARM -3.5m CROSSARM -4.5m CROSSARM	 D-DT-0316 D-DT-0317
3	-8.0m CROSSARM -9.0m CROSSARM	D-DT-0065 D-DT-0055
	EQUIPMENT ATTACHMENTS	
4	-EQUIPMENT LINKS	D-DT-1849 D-DT-1850 D-DT-1869
5	-SURGE ARRESTERS	D-DT-0261
6	-TRANSFORMER MOUNTING SINGLE POLE	D-DT-0270
7	-ANTI-CLIMBING DEVICE	D-DT-0399
	EQUIPMENT EARTHING	
	-TRANSFORMER SINGLE POLE MOUNTED - EARTHING DETAIL	D-DT-1860 (Sheet 2)

REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.
6	TRANSFORMERS FOR GIRAFFE ENVIRONMENTS ADDED	B.BRANFIELD & P.A.T.	B.HILL for	S.v AARDE	20.08.2015	
5A	DOUBLE POLE MOUNTED kW'S CHANGED FOR P.J. AND NOTE 2 PRODUCT CODE CHANGED	P.A.T.	B.MCLAREN	R.THERON	22.04.2010	
4	POLE ORNATITION CORRECTED ON SH 1 AND DOUBLE POLE MOUNTED OPTION ADDED	P.A.T.	B.MCLAREN	R.THERON	23.03.2010	

Eskom

AUTH: P.CROWDY
DATE: 06/12/2000
CHKD: R.THERON
DATE: 06/12/2000
DRAWN: P.VERMAAK
DATE: 14/01/1999

MV TRANSFORMER 5-100kVA
SINGLE POLE MOUNTED
(8M OUT OF LINE)
GENERAL ARRANGEMENT

D-DT-1866

SET	SHEET	REVISION
4	1	6

A3L