

From here the route turns in a slight north eastern direction and traverse Portion 59 of the Farm Rietfontein 485 JQ. On Portion 59 the route turns in a northern direction and traverse Portions 236, 237 and 67 of the Farm Rietfontein 485 JQ. On the northern boundary of Portion 67, the route turns in a north western direction and traverse Portions 218 and 108 of the Farm Rietfontein 485 JQ. On Portion 108 the route turns in a northern direction and traverse Portions 111 and 70 of the Farm Rietfontein 485 JQ. On Portion 70 the route turns in a western direction and traverses Portions 71, 57, 28, 47, and 27 of the Farm Rietfontein 485 JQ, Portions 3 and the Remaining Extent of the Farm Uitval 484 JQ, and Portions 38, 37, 35, 34, 51 and 30 of the Farm Zilkaatsnek 439 JQ. On Portion 30 the route turns in a north western direction and traverses Portions 127, 29, 52, 53, 159, 160, 134 and 108 of the Farm Zilkaatsnek 439 JQ. On Portion 108 the route turns on a northern direction and runs in close proximity to the western boundary of Portion 108 from where it traverses Portion 14 of the Farm Zilkaatsnek 439 JQ.

From here the route traverses Portion 0 (or the Remaining Extent) of the Farm Elandsfontein 440 JQ. From here the route turns in a north eastern direction and traverses Portion 52 of the Farm Elandsfontein 440 JQ. From here the route continues in a north eastern direction and traverse Portions 707, 0, 626, 163, 164, 165, 166, 167, 168, 169, 568, 860, and 814 of the Farm Roodekopjes of Zwartkopjes 427 JQ. On Portion 814 the route turns into an eastern direction where it traverse Portion 843 of the Farm Roodekopjes of Zwartkopjes 427 JQ. The route terminates on Portion 843 of the Farm Roodekopjes of Zwartkopjes 427 JQ where the Dinaledi Substation is located.

The Western Route Alternative is located within the North West Province and the Madibeng Local Municipal area (figures 17 – 21). A total of 49 properties are currently directly affected by this proposed route alternative.

As mentioned previously, the property of the Xsrata Eland Platinum Mine is located between the Eastern and Western route alternatives. During the Eskom route selection process, one deviation was made to the Eastern Route to accommodate the Eland Platinum Mine, and two of the three deviations to the Western Route alternative were made to accommodate the Eland Platinum Mine. These deviations were created in order to avoid mining areas and to provide the mine with various options on how the route could traverse their property should the routes not interfere with already approved future mine expansions and to avoid traversing of surfaces earmarked for future open cast mining. The third deviation made to the Western Alternative was created as this deviation follows existing roads and powerline infrastructure. The deviations to the Western Route Alternative are discussed in the sub-sections to follow.

The coordinates for the bend points along the Western Route Alternative are provided in **Table 11**.

Table 11: Western Route Alternative bend points (start and end points from south to north)

No.	Latitude	Longitude	
1.	25°46'29.53"S	27°58'26.19"E	Start Point
2.	25°44'5.656"S	27°56'32.563"E	
3.	25°43'53.83"S	27°56'28.183"E	
4.	25°43'38.766"S	27°56'25.03"E	
5.	25°43'33.601"S	27°56'14.194"E	
6.	25°42'13.24"S	27°55'53.5"E	
7.	25°42'9.468"S	27°55'39.772"E	
8.	25°42'1.193"S	27°54'3.613"E	
9.	25°41'8.728"S	27°52'26.659"E	
10.	25°39'42.021"S	27°51'45.439"E	
11.	25°38'2.406"S	27°51'12.423"E	
12.	25°37'50.194"S	27°50'57.797"E	
13.	25°37'21.048"S	27°50'36.298"E	
14.	25°37'9.193"S	27°50'35"E	
15.	25°36'52.802"S	27°50'30.376"E	
16.	25°36'15.122"S	27°50'34.117"E	
17.	25°35'10.743"S	27°50'33.522"E	
18.	25°34'52.785"S	27°51'7.163"E	End Point

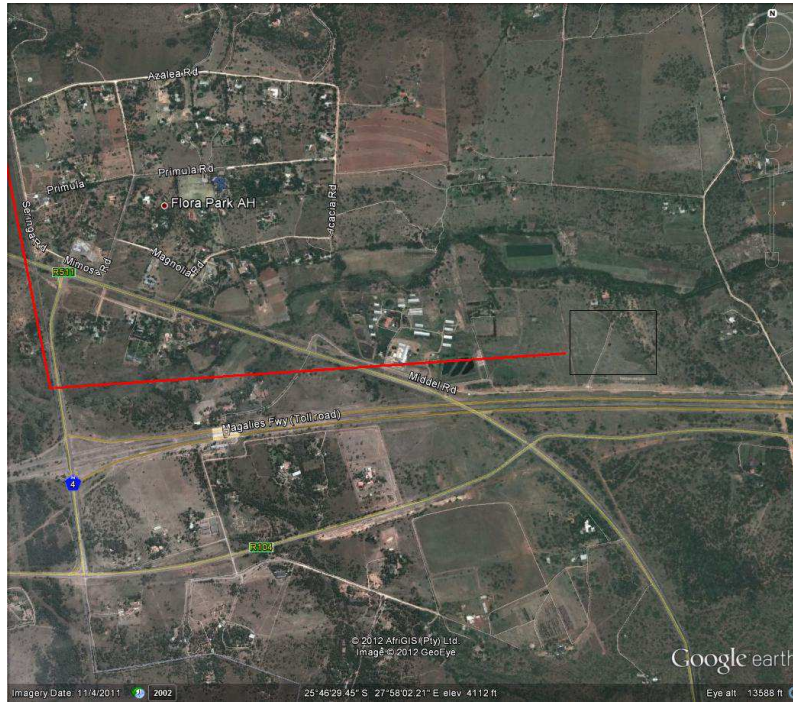


Figure 17: Aerial map showing the start point of the centre line of the western route corridor at proposed Anderson substation site



Figure 18: Aerial map showing the end point of the centre line of the western route corridor at the Dinaledi substation



Figure 19: South-eastern view along the Western Route Alternative (Magaliesberg in background)



Figure 20: North-western view along the Western Route Alternative (western boundary of Damonsville on the right)



Figure 21: South-eastern view along the Western Route Alternative (crossing of the N4)

8.1.3.1 Western Route Alternative – Deviation 1 (Western Deviation)

This deviation originates on Portion 104 of the Farm Zilkaatsnek 439 JQ from where it links from the Western Route Alternative Deviation 3 (Southern Deviation). From the point of origin, the route runs in a north western direction and traverses Portions 93, 92, 91, 90, 105, 106, 107 and 85 of the Farm Hartebeesfontein 445 JQ.

From here the route traverses the suburb of Madibeng where it traverses Erf 2. From here the route traverses Portions 207, 60, 97, and 96 of the Farm Hartebeesfontein 445 JQ. On Portion 96 the route turns in an eastern direction and traverses Portion 137 of the Farm Hartebeesfontein 445 JQ. On Portion 137 the route turns in a north eastern direction and traverses Portions 101, 184, 176, 175, 174, 191, 100, and 46 of the Farm De Kroon 444 JQ. On Portion 46 the route turns in a north western direction and traverses Portions 231, 173, 52, 51, 122, and 121 of the Farm De Kroon 444 JQ, and Portion 81 of the Farm Elandsfontein 440 JQ. On the northern boundary of Portion 81 the route turns further in a north eastern direction and traverses Portions 2, 24, 10, 64 and 0 of the Farm Elandsfontein 440 JQ. This deviation terminates on Portion 0 of the Farm Elandsfontein 440 JQ where it joins the original Western Route Alternative.

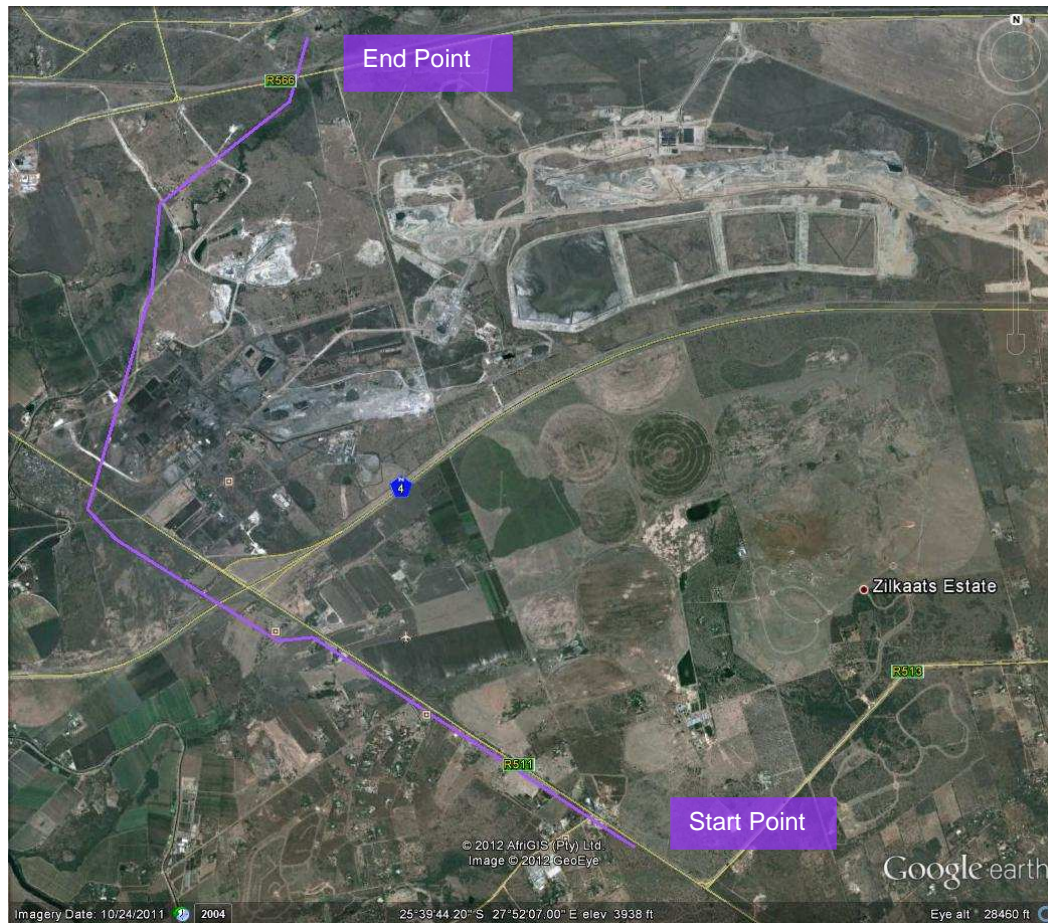


Figure 22: Aerial map showing the start and end point of the centre line of the western route-western deviation corridor

The Western Route Alternative – Deviation 1 (Western Deviation) (figure 22) is located within the North West Province and the Madibeng Local Municipal area. A total of 35 properties are currently directly affected by this proposed route alternative.

The coordinates for the bend points along the Western Route Alternative Deviation 1 are provided in **Table 12**.

Table 12: Western Route Alternative Deviation 1 bend points (start and end points from south to north)

No.	Latitude	Longitude	
1.	25°41'24.152"S	27°52'38.216"E	Start point

No.	Latitude	Longitude	
2.	25°40'30.61"S	27°51'2.314"E	
3.	25°40'31.8"S	27°50'52.092"E	
4.	25°40'5.477"S	27°50'3.662"E	
5.	25°39'57.527"S	27°49'54.941"E	
6.	25°38'58.052"S	27°50'12.731"E	
7.	25°38'35.46"S	27°50'14.72"E	
8.	25°38'7.482"S	27°50'52.71"E	
9.	25°37'50.194"S	27°50'57.797"E	End point



Figure 23: Southern view along the Western Route Alternative – Deviation 1 (crossing of the R511)

8.1.3.2 Western Route Alternative – Deviation 2 (Eastern Deviation)

This deviation originates on Portion 14 of the Farm Zilkaatsnek 439 JQ where it links from the original Western Route Alternative (figure 24). From here the route runs in an eastern direction and traverses a very small section of Portion 0 (or Remaining Extent) of the Farm Elandsfontein 440 JQ. On Portion 0 the route turns back to traverse Portion 14 of the Farm Zilkaatsnek 439 JQ and continues in an eastern direction to traverse Portions 113, 86, 88, 89, 87, 80 and 98 of the Farm Zilkaatsnek 439 JQ. On Portion 98 the route turns in a north eastern direction where it intersects with the original Eastern Route alignment on Portion 13 of the Farm Schietfontein 437 JQ and where it joins the Eastern Route Deviation on Portion 13 of the Farm Schietfontein 347 JQ.



Figure 24: Aerial map showing the start and end point of the centre line of the western route-eastern deviation corridor

The Western Route Alternative – Deviation 2 (Eastern Deviation) is located within the North West Province and the Madibeng Local Municipal area. A total of 11 properties are currently directly affected by this proposed route alternative.

The coordinates for the bend points along the Western Route Alternative Deviation 2 are provided in **Table 13**.

Table 13: Western Route Alternative Deviation 2 bend points (start and end points from south to north)

No.	Latitude	Longitude	
1.	25°39'32.958"S	27°51'42.643"E	Start point
2.	25°39'22.797"S	27°51'50.998"E	
3.	25°39'1.586"S	27°52'52.356"E	
4.	25°38'54.795"S	27°53'38.084"E	
5.	25°38'54.625"S	27°55'1.606"E	
6.	25°38'34.538"S	27°55'14.331"E	End point



Figure 25: North-eastern view along the Western Route Alternative – Deviation 2 - route situated between the slimes dam (left) and the N4 (right)

8.1.3.3 Western Route Alternative – Deviation 3 (Southern Deviation)

This deviation originates on Portion 70 of the Farm Rietfontein 485 JQ where it links from the original Western Route Alternative (figure 26). From here the route turns in a western direction and traverse Portions 71, 186, 185, 28, 47, and 27 of the Farm Rietfontein 485 JQ and Portions 3 and Portion 0 (Remaining Extent) of the Farm Uitval 484 JQ. From here the route traverses Portions 2, 127 and 105 of the Farm Zilkaatsnek 439 JQ. On Portion 105 the route turns in a north western direction and runs in close proximity to the boundary of Portion 104 of the Farm Zilkaatsnek 439 JQ.

On Portion 104 the route turns in a northern direction where it intersects with the original Western Route Alternative on Portion 108 of the Farm Zilkaatsnek 439 JQ. The route then turns in a north eastern direction where it joins the original Western Route Alternative on Portion 108 of the Farm Zilkaatsnekl 439 JQ.

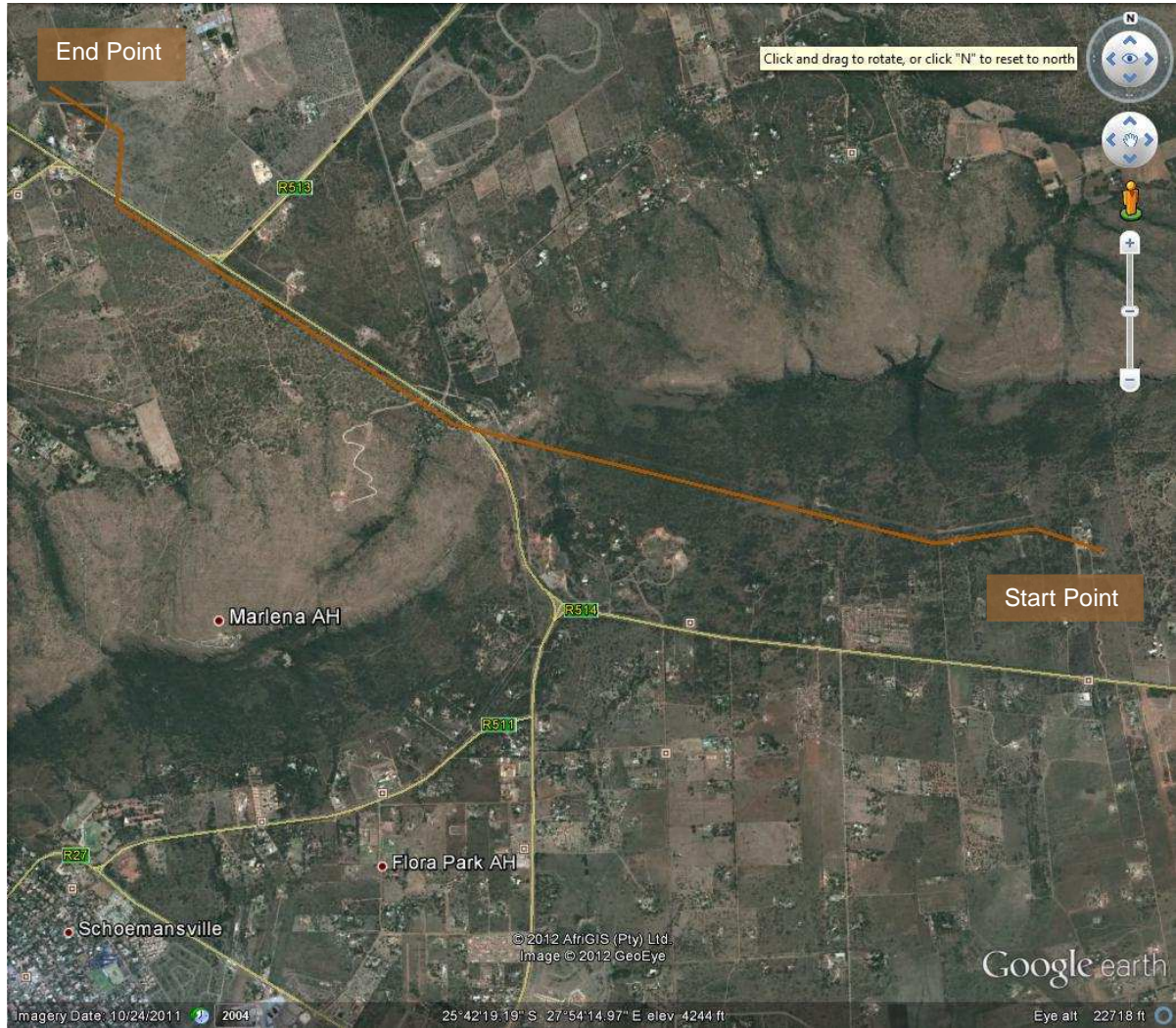


Figure 26: Aerial map showing the start and end point of the centre line of the western route-southern deviation corridor

The Western Route Alternative – Deviation 3 (Southern Deviation) is located within the North West Province and the Madibeng Local Municipal area. A total of 14 properties are currently directly affected by this proposed route alternative.

The coordinates for the bend points along the Western Route Alternative Deviation 3 are provided in **Table 14**.

Table 14: Western Route Alternative Deviation 3 bend points (start and end points from south to north)

No.	Latitude	Longitude	
1.	25°42'23.783"S	27°55'56.254"E	Start point
2.	25°42'20.134"S	27°55'42.971"E	
3.	25°42'23.039"S	27°55'22.944"E	
4.	25°42'3.254"S	27°53'47.26"E	
5.	25°41'24.152"S	27°52'38.216"E	
6.	25°41'10.754"S	27°52'38.622"E	
7.	25°41'2.423"S	27°52'23.661"E	End point

**Figure 27: South-eastern view along the Western Route Alternative – Deviation 3 - route situated to the right of the R511**

8.2 Upgrade of the Existing 88kV Line

The proposed Madibeng substation project, which is undertaken by Eskom Distribution, forms part of the Tshwane Strengthening Scheme. This project entails the construction of a proposed Madibeng Substation which will be located at about 8km south-west of the Dinaledi Substation. The Madibeng Substation will be fed from Dinaledi MTS through two 132kV lines and thereby split the existing 88kV network in the Tshwane and Brits area. The existing 88kV network in and around the Brits and Tshwane area will be split in such a way that an existing 88kV Lomond-De Wildt line becomes

redundant. The Lomond-De Wildt line route is located within the Anderson-Dinaledi 400kV line study area and thus it can be decommissioned after the construction of the Madibeng Substation in order to accommodate the proposed Anderson-Dinaledi 400kV line (Figure 28).

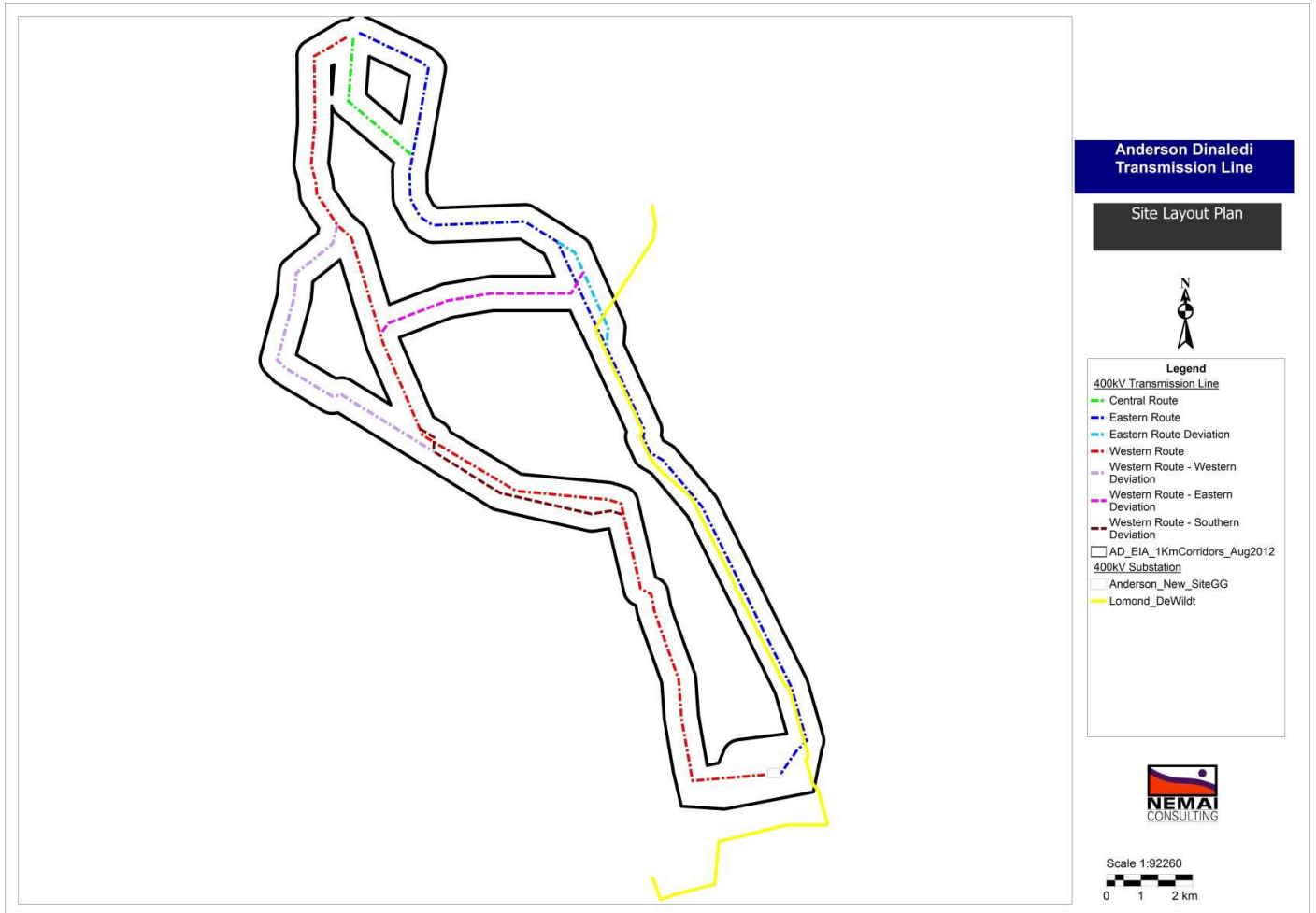


Figure 28: Map illustrating the Le-Mondt line that will be decommissioned in yellow

The Madibeng substation project is scheduled to be commissioned by 2014 depending on the prompt acquisition of servitudes. The current 88kV Lomond-De Wildt line route servitude is designed for 88kV lines and therefore becomes inadequate for a 400kV line route. The majority of the existing line towers are wood poles which were designed for 88kV lines in terms of clearances and insulations. It is thus necessary that the servitude be extended from 22m to 55m and the towers be re-designed or changed for the 400kV line. The foundation of the towers will most probably change as the centre line servitude may change due to the servitude extension and different towers.

The centre line will change because the existing line runs closer to another existing 88kV line, however it is very close to the proposed Eastern route centre line. It is therefore worth noting that the decommissioning and dismantling of the existing 88kV Lomond-De Wildt line for the proposed 400kV Anderson-Dinaledi line can only begin when Madibeng substation is successfully commissioned.

8.3 Power Line Servitude

Following a contractual agreement with a landowner, an application for registration of the servitude (55m for a 400 kV transmission line) is lodged with the Provincial Deeds Office against the property deed. A registered servitude grants Eskom certain defined rights for the use of the specific area of land, which include:

- Access to erect a transmission line along a specific agreed route;
- Reasonable access to operate and maintain the line inside the servitude area; and
- The removal of trees and vegetation that will interfere with the operation of the line.

The landowner is prevented from erecting any structures or carrying out activities under the line that would interfere with the safe operation of the line. However, certain standard farming practices such as some crop cultivation, grazing and the use of farm roads may continue as normal.

Refer to **Appendix F** for an overview of the servitude negotiation process.

8.4 Design Considerations

Certain standard design considerations for a 400 kV transmission line include:

- Standard servitude width is 55 m (i.e. 27.5 m on either side of centre line);
- Minimum spacing between pylons is ± 300 m and the maximum spacing is ± 500 m (depending on the topography of the area);
- Line may be no closer than 95 m from the centre line of a national road, unless a relaxation on this is granted by the roads department;
- Minimum clearance between the midspan point of the line and the ground is 8.1 m,
- Minimum distance between any part of a tree or shrub and any bare phase conductor must be 5.6 m; and
- Minimum safe distance required from the centre of the power line to the beginning of a domestic house is 27.5 m.

8.5 Tower Structures

The selection of a tower types depends on several factors, including terrain, expense and recommendations that emanate from the visual impact study.

The towers type has not been finalised as yet, as the type of structure is dependent on the abovementioned factors as well as the final route of the power line. Below are several examples of towers that could be considered for a 400 kV transmission line.

Cross-rop suspension tower (Figure 29);

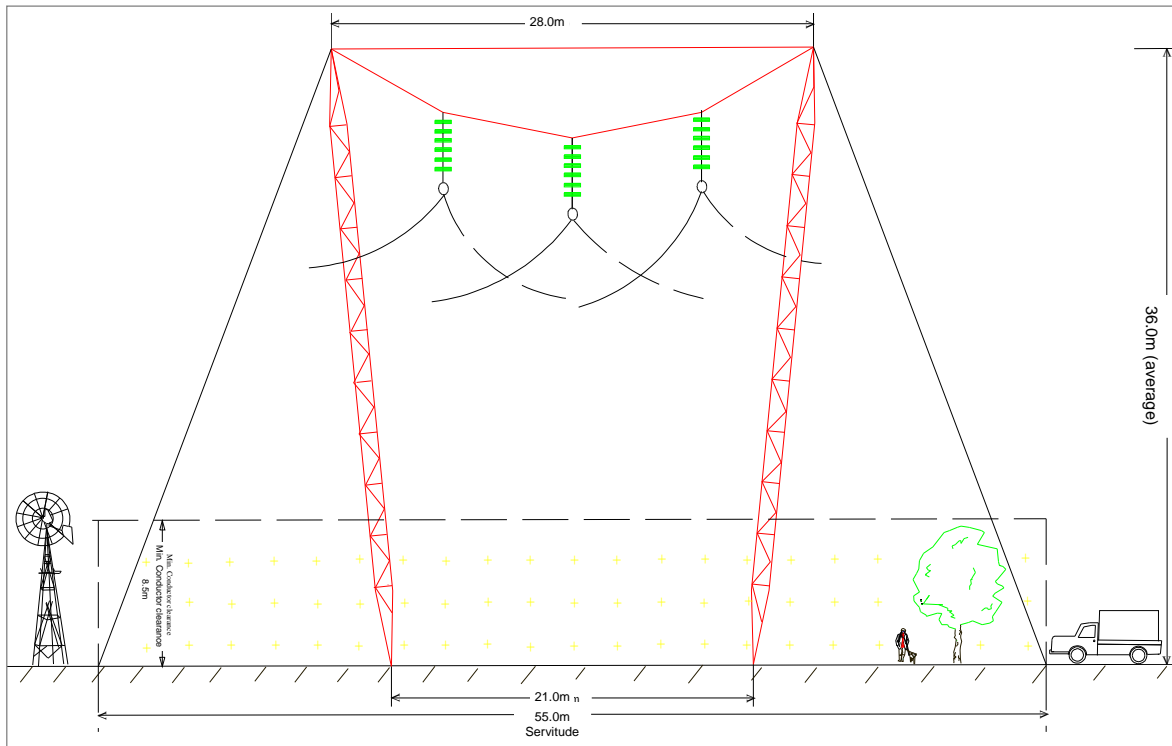


Figure 29: Cross-rop suspension tower