MAINSTREAM RENEWABLE POWER

ROUTE SURVEY

for the

Sutherland Wind Farm

From the

PORT OF SALDANHA

to

SUTHERLAND WIND FARM SITE

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1. INTRODUCTION

1.1. EXECUTIVE SUMMARY

This report records observations and a detailed desktop study of a route survey mainly, transportation route and details of necessary changes or improvements required. This survey will consider the feasibility of transporting the (WTG) wind turbine generator components from the Port to the Site for the above-mentioned Wind Farms.

A feasibility route survey of the practical route(s) has been appointed to an ALE engineer. To further verify the feasibility of the transporting the (WTG) components, Google Map Software will be used to illustrate critical information. The transport route will be inspected, and all obstructions noted; while the feasibility of the port of entry will also be considered along with possible storage areas.

Note 1: There are 2 Ports that are usually used for the receiving of wind turbine generator components, namely Port of Saldanha, located in the Western Cape, and Coega, located in Port Elizabeth. For the purpose of this report the Port of Saldanha is recommended as Coega is geographically further from the wind farm site locations.

1.2. SCOPE OF ROUTE SURVEY

The survey will specifically note the following:

a) Possible berths at port of entry
b) Port of entry exit
c) Bridge overpasses, visible culverts, underground pipelines / works along transport route
d) Overhead obstructions
e) Width restrictions
f) Sharp corners
g) Steep inclines, declines and cambers
h) Poor road conditions – (ditches, large potholes, sudden changes in gradients)

1.3. REPORT DELIVERABLES

This report will contain following information:

a) Route overview and description
b) Photographs of route, port, and items outlined in section 1.2
c) Basic transport drawings for the relevant WTG components
d) Tracking drawings where relevant
e) Modifications required en-route
f) Risk analysis
g) Overall findings and Future work

2. ADMINISTRATIVE INFORMATION

Survey: 13/05/2019
Start point: Port of Saldanha
End point: Sutherland Wind farm, near Sutherland, Northern cape South Africa

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3. BILL OF QUANTITY

The table below shows the bill of quantity for the final project, simulation drawings were created for the blade and combination of the longest, highest, widest, and heaviest sections to ensure the specified routes are suitable for abnormal loads. The dimensions and presumed shapes are subject to change.

3.1. WTG COMPONENT INFORMATION

3.1.1. Wind Turbine Generator Components

Table1: Packing list

COMPONENT	LENGTH	WIDTH	HEIGHT	WEIGHT
Blade	76.645	4.395	3.030	27.50
Hub	7.000	4.700	4.100	52.00
Nacelle	14.614	4.200	3.800	103.59
Drive train	6.681	3.200	3.200	86.61

3.1.2. Wind Turbine Generator Combinations:

COMPONENT	LENGTH	WIDTH	HEIGHT	WEIGHT
Blade	81.230	4.395	4.335	27.50
Hub	21.127	4.700	4.871	52.00
Nacelle	23.500	4.200	4.875	103.59
Drive train	23.110	3.200	4.22	86.61

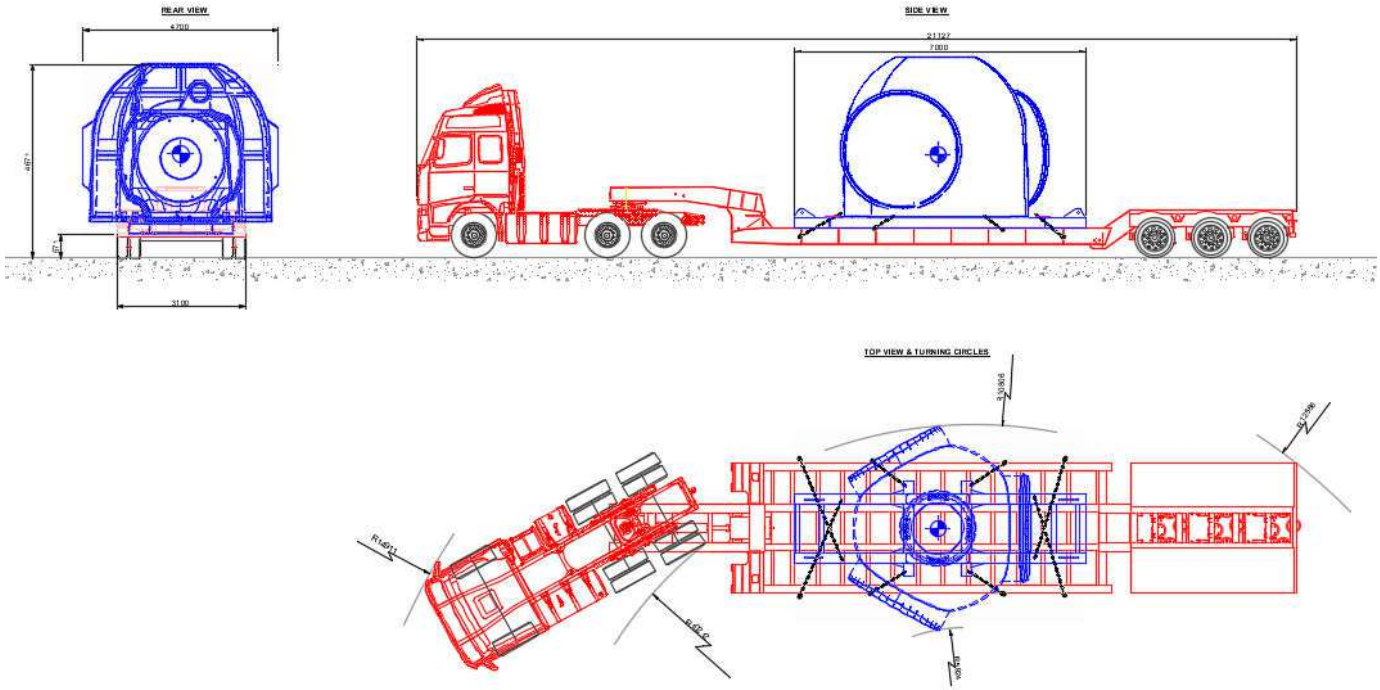
Source Information:

Received From: Mainstream Renewable Power
Date: 5/9/2019
Format: Excel sheet
Document name: Wind Turbine Generator Components

4. TRANSPORT DRAWINGS

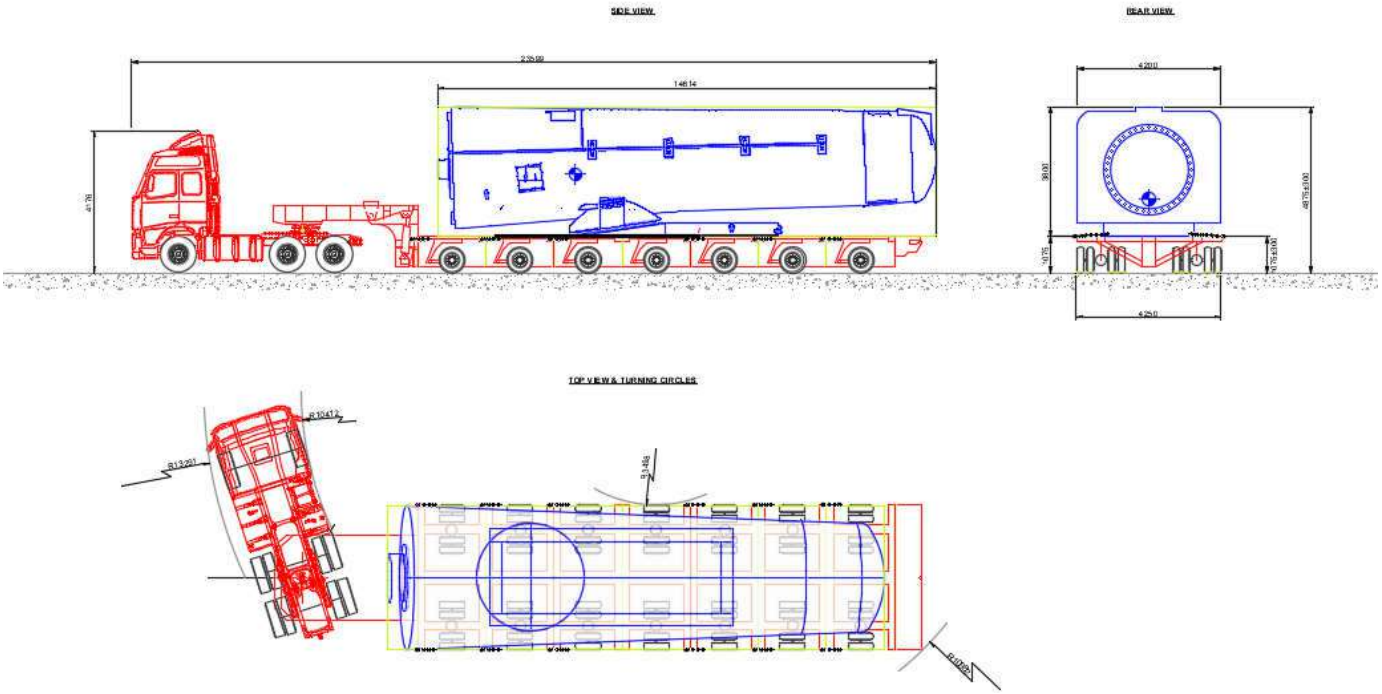
Preliminary transport drawings have been done for the purpose of this report.

4.1. Hub (Widest combination)



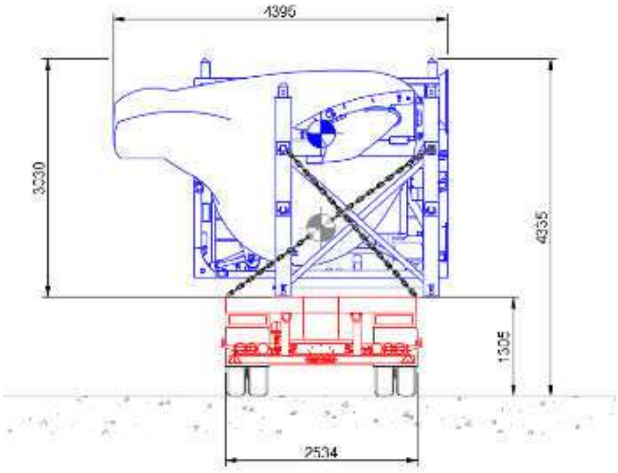
- Transport combination dimensions (LxBxH) : 21.127 × 4.70 × 4.87 m
- Component mass: 52.00 t

4.2. Nacelle (Highest and heaviest combination)



- Transport combination dimensions (LxBxH) : 23.50 × 4.20 × 4.875 m
- Component mass: 103.59 t

4.3. Blade (Longest combination)



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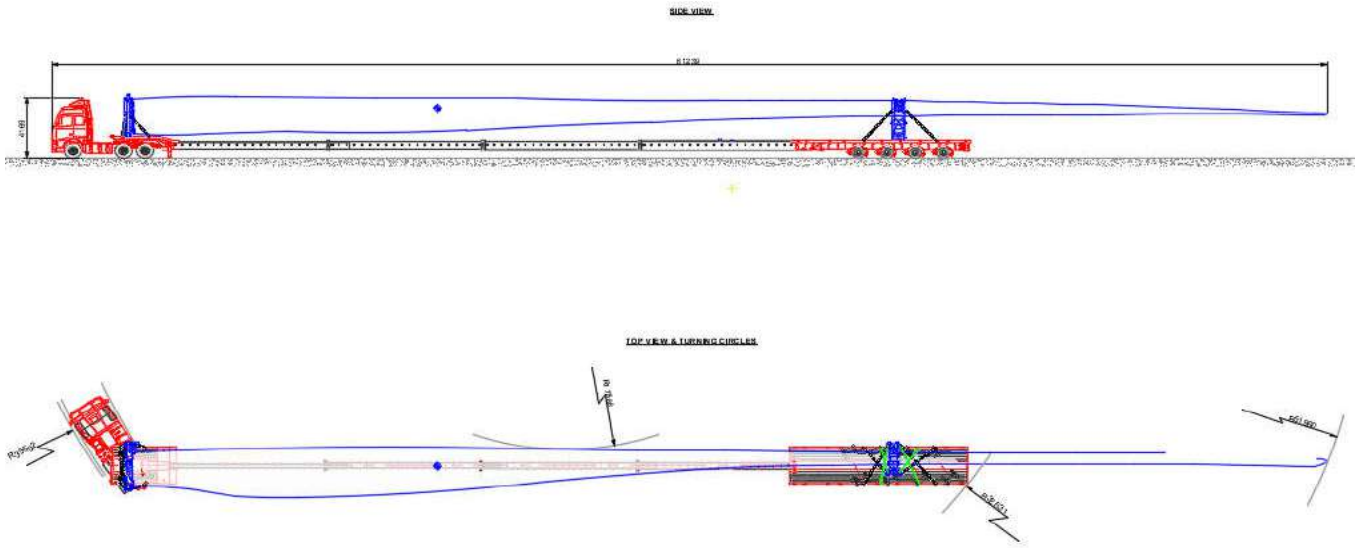
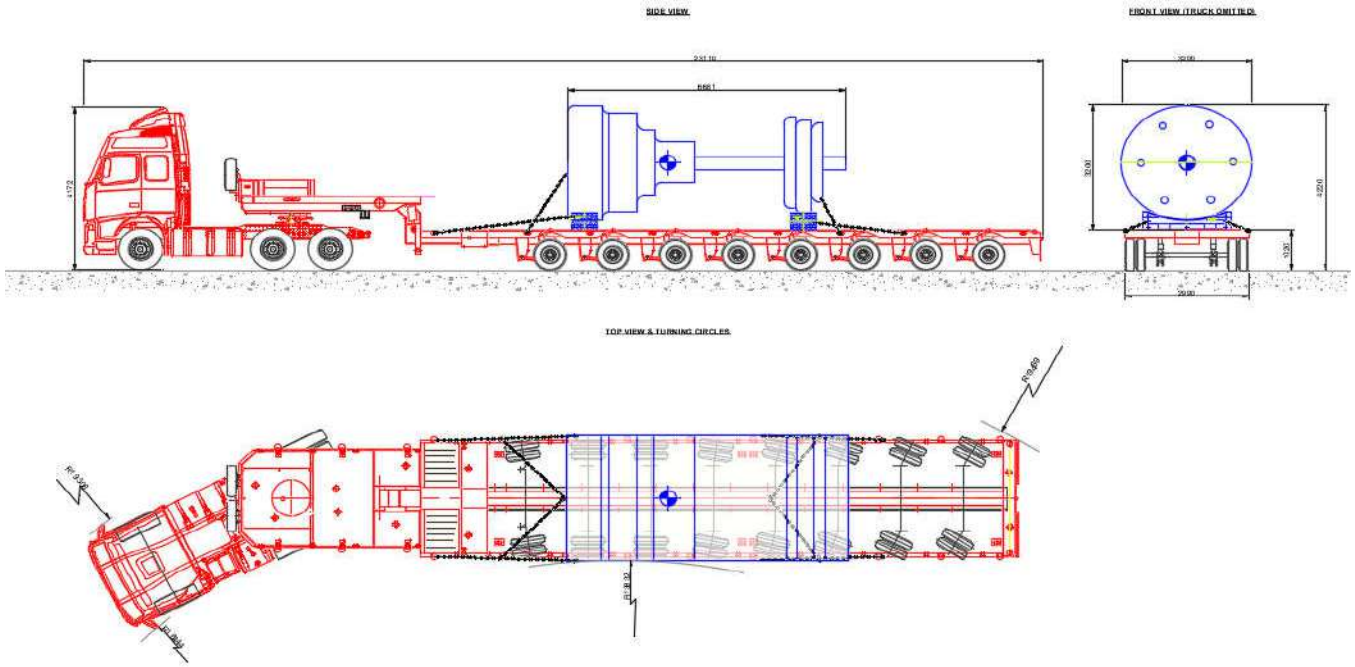


- Transport combination dimensions (LxBxH) : 81.23 × 4.40 × 4.335 m
- Component mass: 27.50 t

4.4. Drivetrain



- Transport combination dimensions (LxBxH) : 23.11 × 3.20 × 4.22 m
- Component mass: 86.61 t

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5. ROUTE OVERVIEW FOR SUTHERLAND WIND FARM

5.1. ROUTE MAP OVERVIEW

The proposed route for the transportation of the wind turbine generators is shown below. The route survey study is the feasibility of transporting wind turbine components from Saldanha Port to Sutherland wind farm. The report will further describe the critical points along the routes.

The route depicted is commonly used for abnormal loads, however with the largest blade of 76.65m tracking at all of the turns is required in order to ensure components are delivered undamaged. Laybys are in abundance, and overhead bridges that pose a potential threat to the in loads are not applicable.

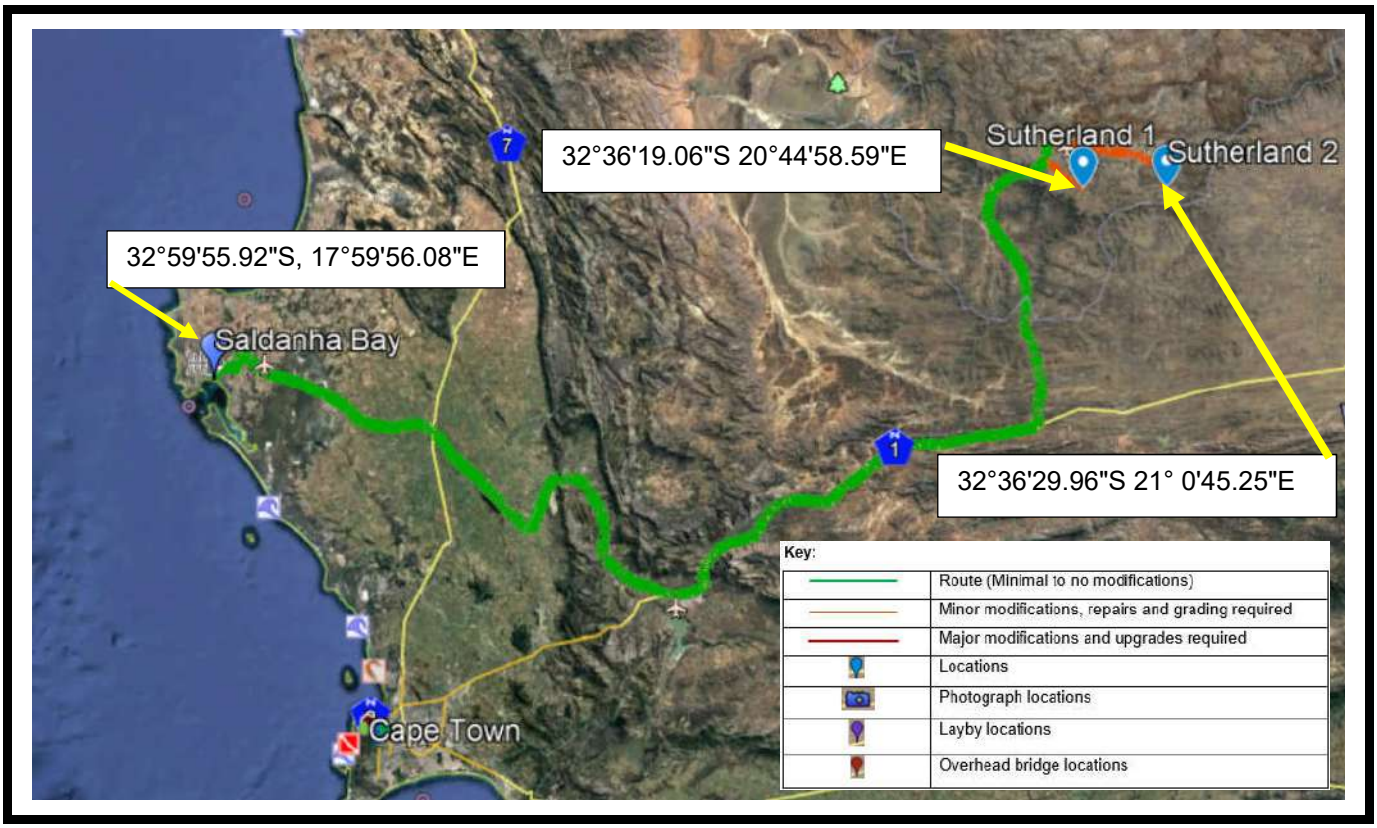

Figure 1: Route Map

6. PHOTOGRAPHIC REPORT:

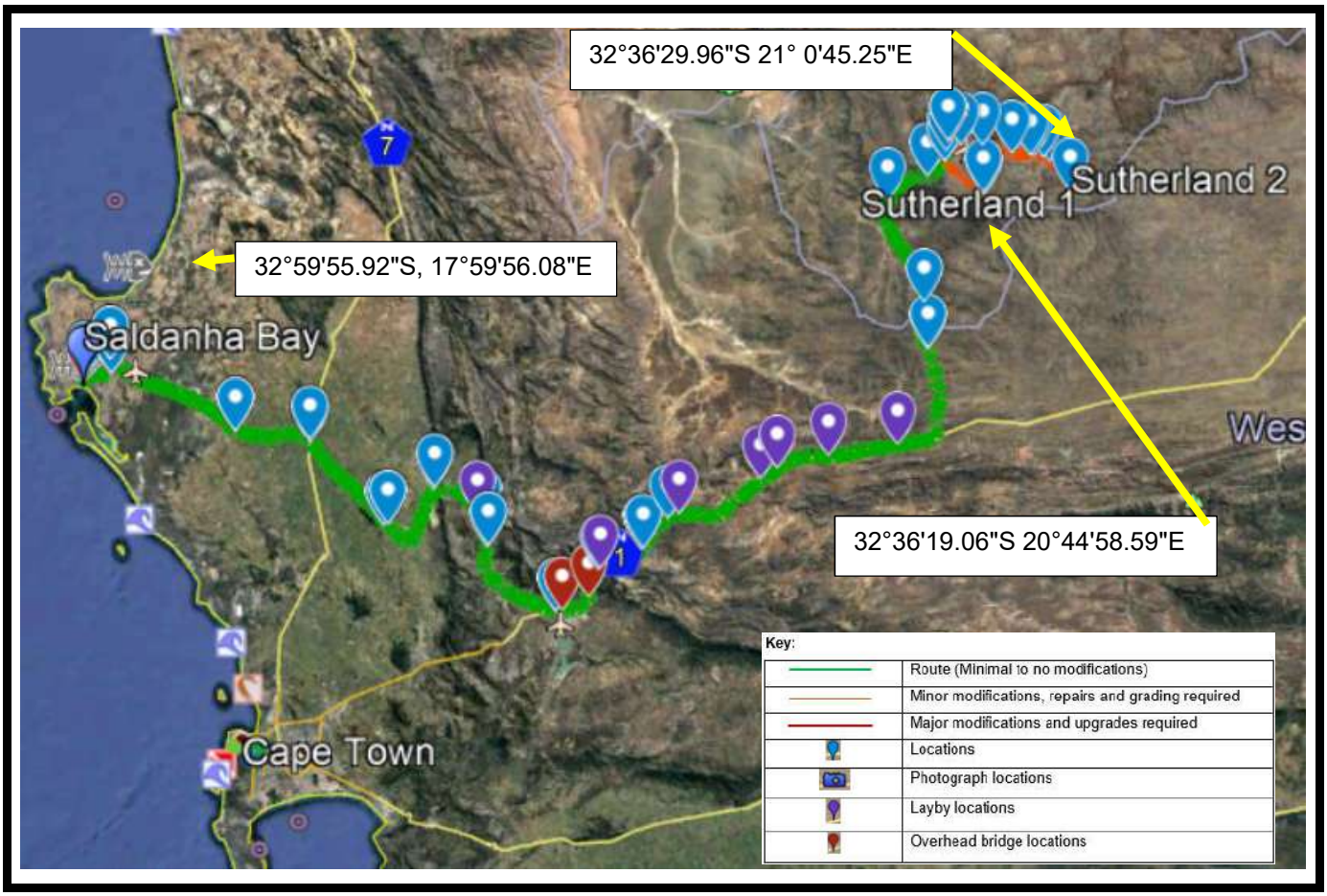

Figure 2: Route Map

6.1.1. ROUTE DESCRIPTION

The following points were analysed in terms of obstructions, constraints and measurements. At critical corners, tracking was illustrated using the transport combination of the blade. All pictures were taken with a DJI Phantom 4 Pro Drone.

1. Exit Saldanha Iron Ore terminal.
2. Cross under the bridge and continue on the access road.
3. Cross under the second bridge and continue on the access road.
4. Turn right on the road to Velddrif (R27).
5. Turn left on the R27.
6. Turn right on the R45 to Malmesbury.
7. Veer left onto the R311 to Morreesburg.
8. Through Morreesburg on the R311.
9. At the intersection turn right on the N7 to Malmesbury.
10. Turn left onto the R311 to Riebeeck West.
11. At the T-Junction turn left onto the R46 to Hermon.
12. At the T-Junction turn left onto the R46 to Gouda.
13. Past Gouda and tunr right into Voortrekker Street and continue through Wolsley.
14. At the T-Junction turn right onto the R43 and continue to Worcester.
15. At the T-Junction turn left onto the N1.
16. Overhead bridge min Height = 5.669m on and offramps available.
17. Overhead bridge at De wet Station Min height = 5.156m (Bypass available).
18. Overhead bridge at De Doorns Min Height = 5.373m
19. Overhead Pedestiran crossing at De Doorns Min height = 5.80m
20. At Matjiesfontein turn left onto the R354 to Suterland.
    a. Before Sutherland turn right onto the Gravel road to site (Option 1).
    b. Before Sutherland turn right onto the Gravel road to site (Option 2).

6.1.2. TRACKING ILLUSTARTION

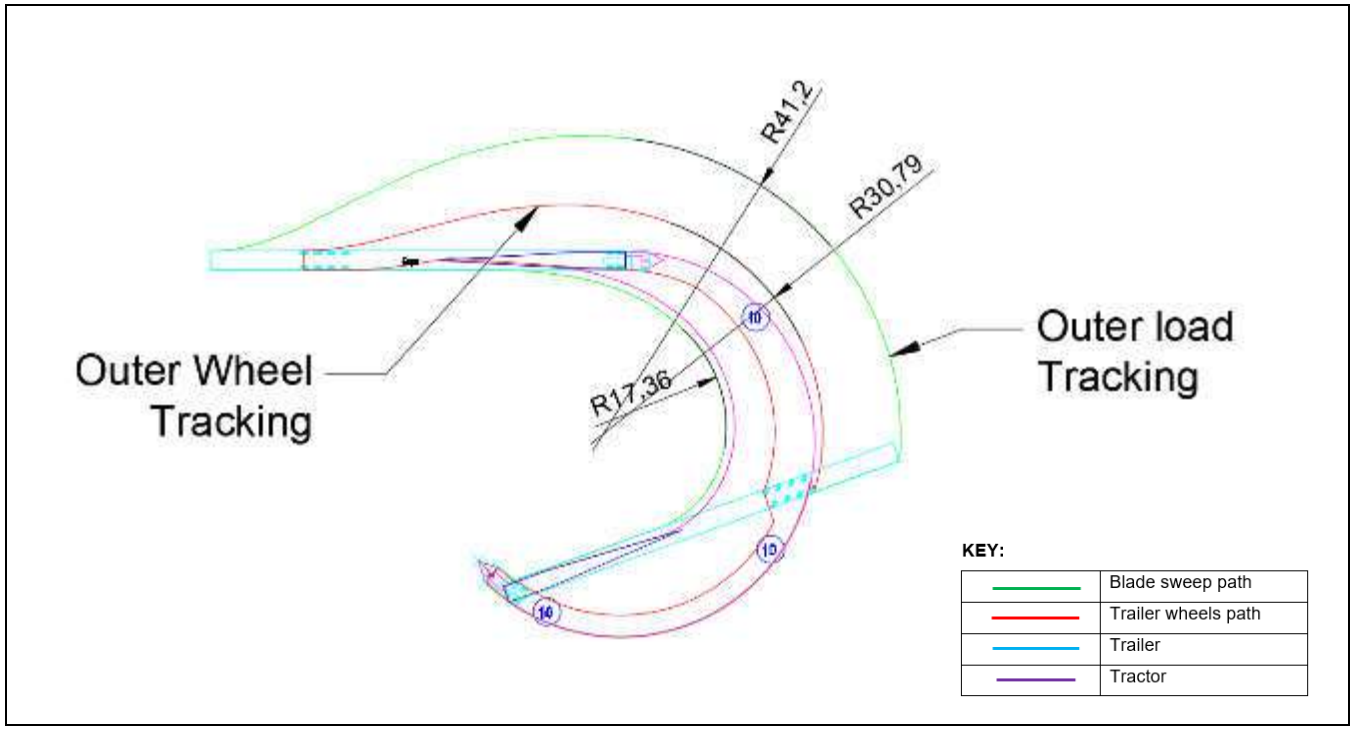

Figure 3: Blade Tracking Illustration.

Photographic Key:

	Yellow arrow	Indication
	White arrow	Direction of Travel
	Yellow Circle	Selection/Multiple objects
	Green angle	Roll angle
	Green double arrow	Height

6.2. ROUTE SURVEY: SALDANA PORT SUTHERLAND WIND FARM SITE

Bridge 1: Cross under bridge and continue on access road.

Coordinates: 32°59'26.26"S, 18° 0'6.90"E

Distance travelled: 0.85 km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Bridge on main route

Recommendation:
- ✓ None

Photo location on route:

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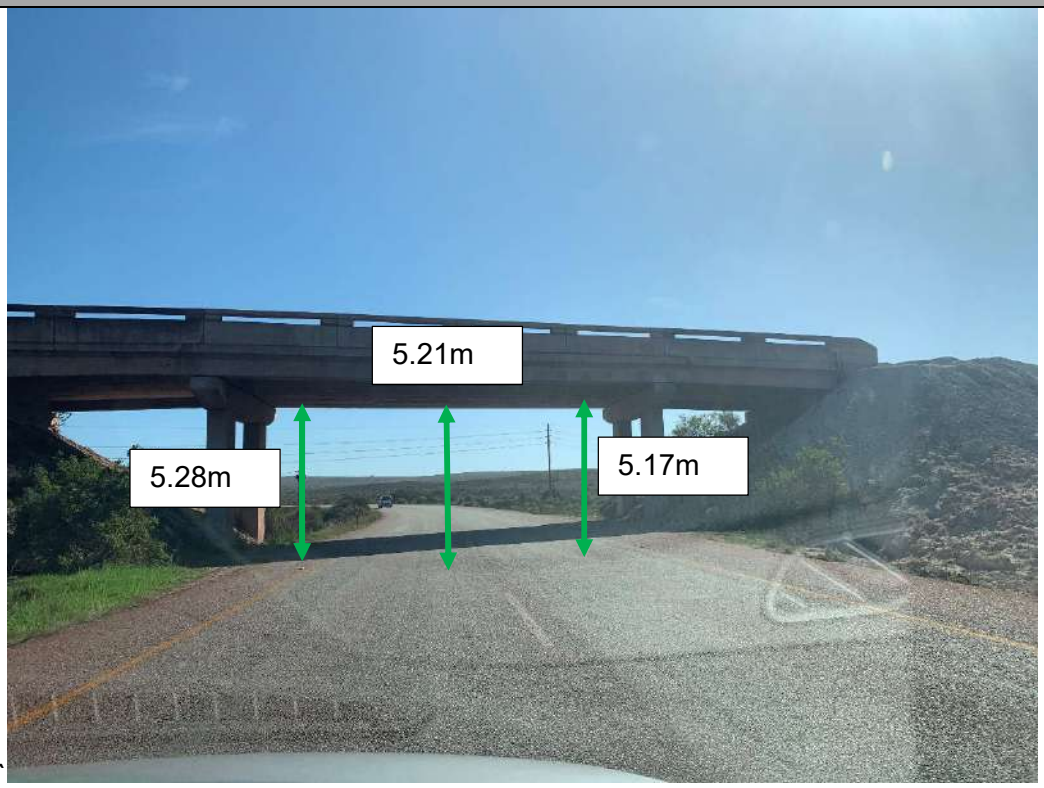
Bridge 2: Cross under 2nd bridge and continue on access road.



Coordinates: 32°58'35.09"S, 18° 0'29.83"E

Distance travelled: 2.70 km

Road Surface/Condition: Tarmac

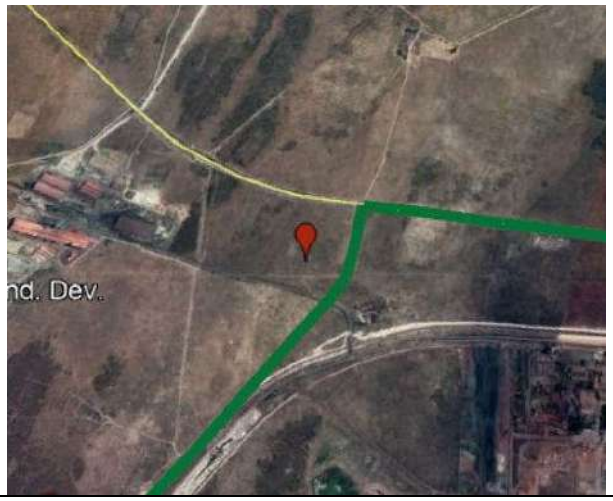
Description of Hazard:

- ◊ Bridge on main route

Recommendation:

- ✓ None

Photo location on route:



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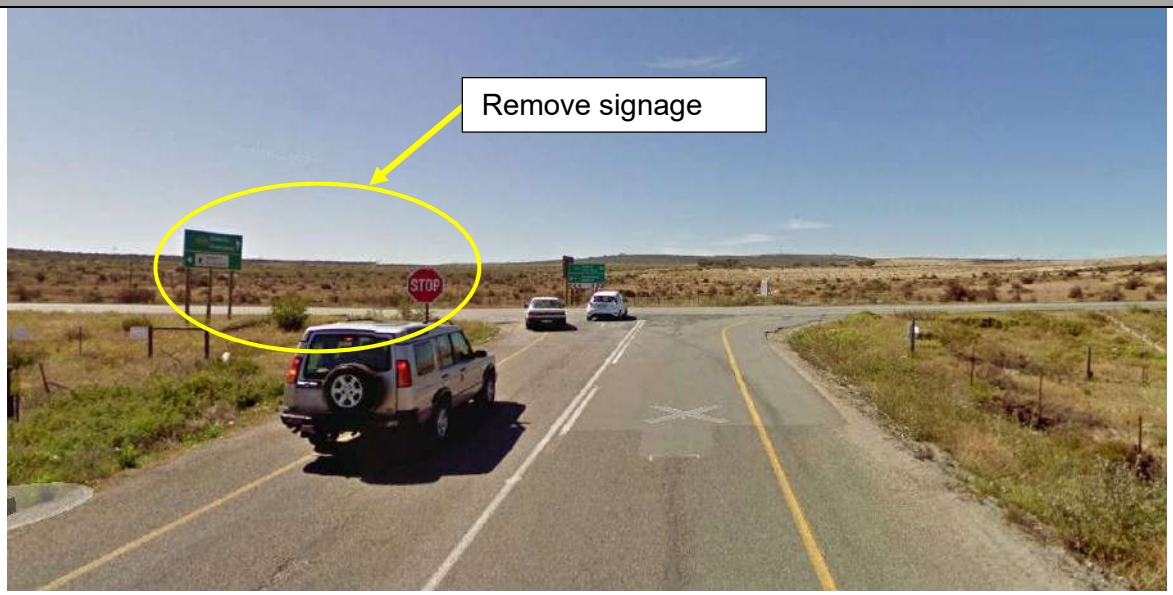
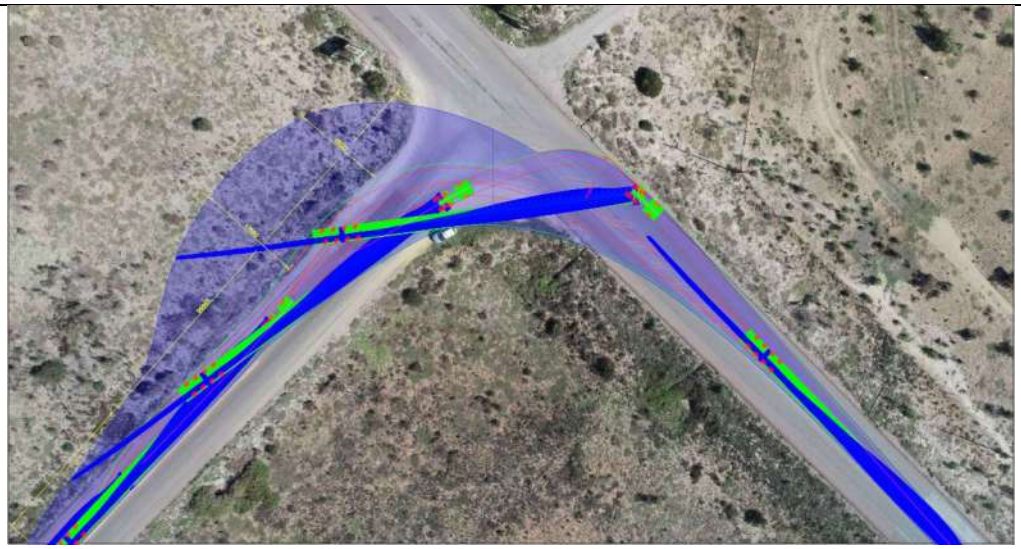
A1: Turn right on to road heading toward Velddrif (R27)





Coordinates: 32°58'17.07"S, 18° 0'30.14"E

Distance travelled: 3.20 km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Road signs
- ◊ Potential obstacles in private owned land

Recommendation:
- ✓ Removal of signs
- ✓ Permission from landowner to remove obstacles
- ✓ Conduct a dummy run

Photo location on route:

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A2: Veer left on detour, towards road heading toward R27

Coordinates: 32°58'30.64"S, 18° 4'55.00"E

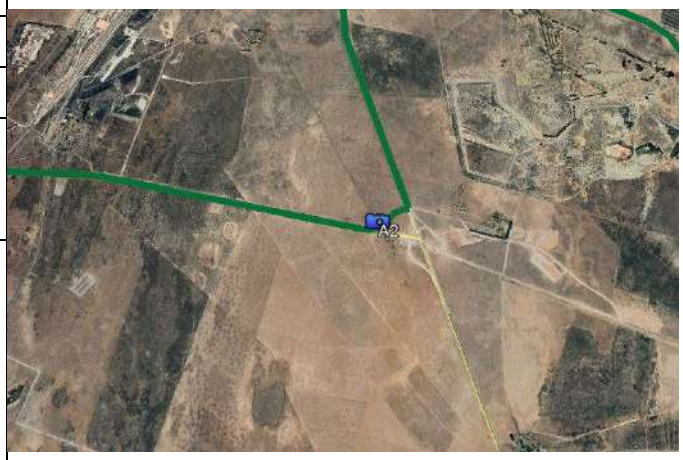
Distance travelled: 10.3 km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Road construction

Recommendation:
- ✓ Proceed along detour

Photo location on route:



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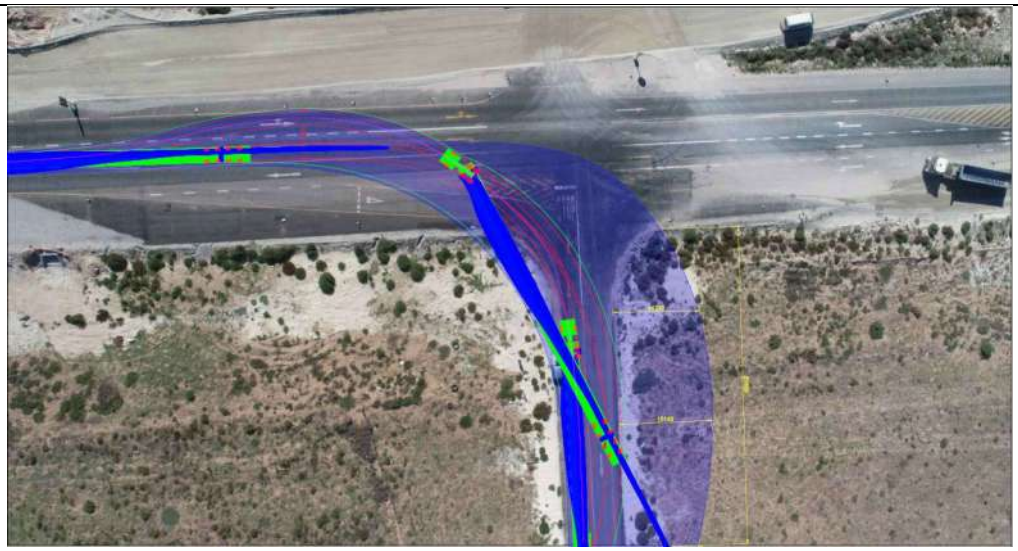
A3: Turn left on R27 heading toward Velddrif



Coordinates: 32°58'24.85"S, 18° 5'5.12"E

Distance travelled: 10.6 km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Road signs
- ◊ Potential obstacles in private owned land
- ◊ Civil works required

Recommendation:
- ✓ Removal of signs
- ✓ Seek permission from landowner to remove obstacles
- ✓ Ground to be compacted and levelled
- ✓ Conduct a dummy run

Photo location on route:

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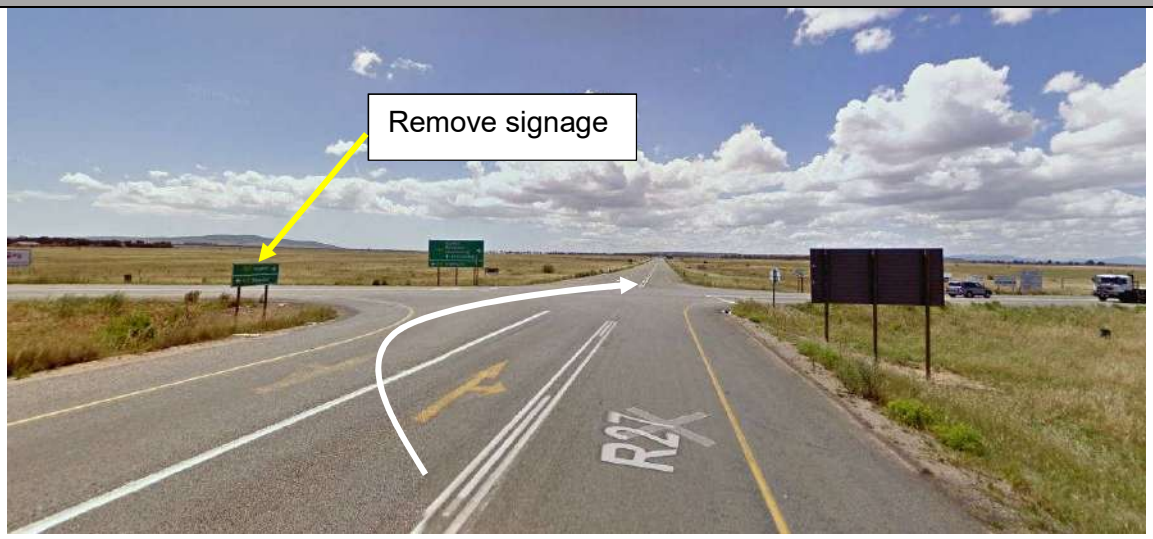
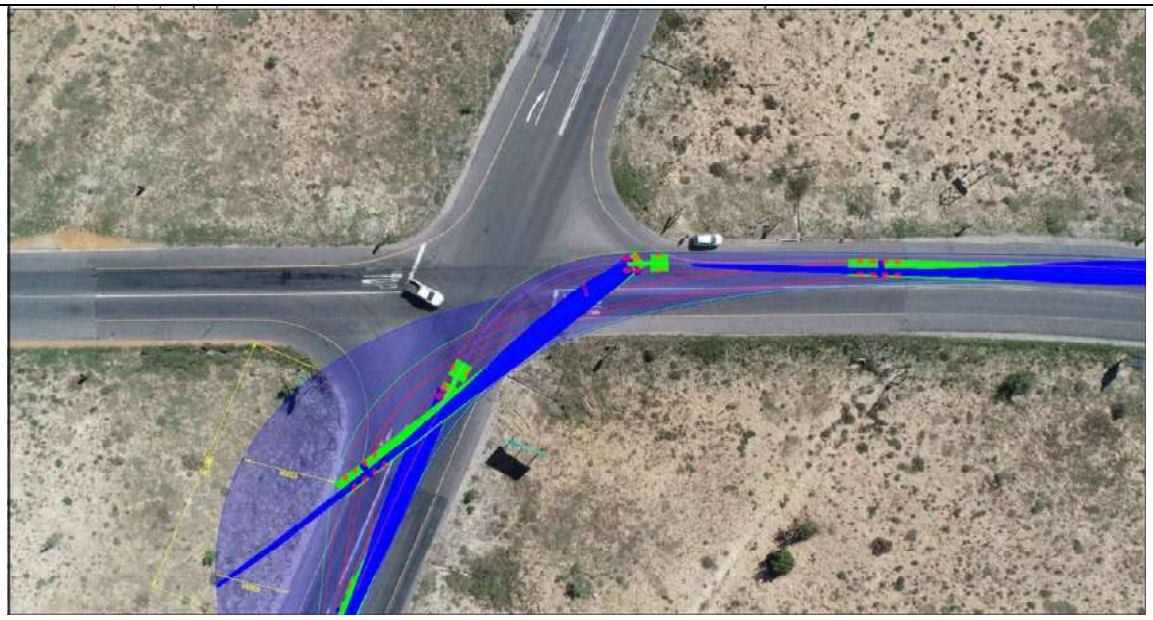
A4: Turn right on R45 towards Malmsbury





Coordinates: 32°56'9.96"S, 18° 5'1.83"E	Photo location on route:
Distance travelled: 15.0 km	
Road Surface/Condition: Tarmac	
Description of Hazard: ◊ Road signs ◊ Potential obstacles in landowner's property	
Recommendation: ✓ Make road signs collapsible ✓ Seek permission from landowner to remove obstacles	

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A5: Turn left on R311 toward Morreesburg

Coordinates: 33° 8'7.72"S, 18°27'15.82"E

Distance travelled: 57.0 km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Road Signs
- ◊ Potential obstacles in landowner's property
- ◊ Load interference with overhead line poles supports

Recommendation:
- ✓ Remove road signs
- ✓ Seek permission from landowner to remove obstacles
- ✓ Seek permission to remove support poles

Photo location on route:

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A6: Turn left on N7 toward Piketberg

Coordinates: 33°10'1.08"S, 18°40'49.41"E

Distance travelled: 79.3 km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Road signs
- ◊ Potential obstacles in landowner's property

Recommendation:
- ✓ Remove road signs as indicated
- ✓ Seek permission from landowner to remove obstacles

Photo location on route:

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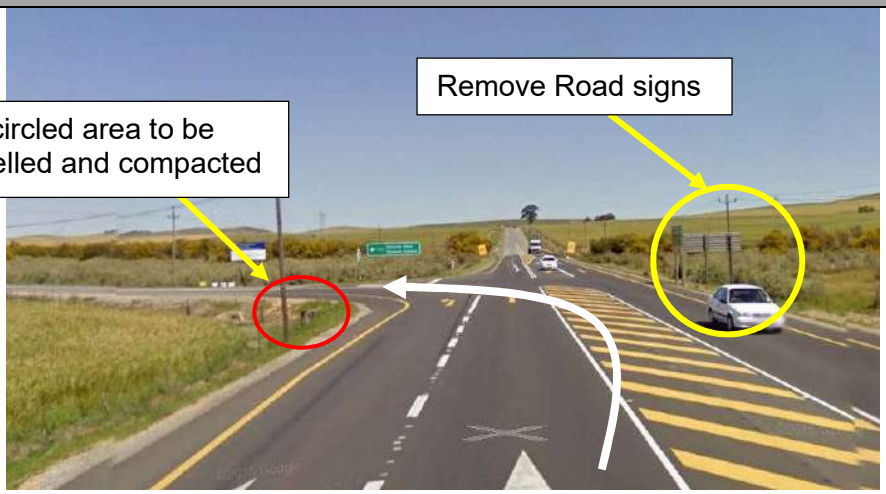
C1: Turn left on R311 to Riebeeck west



Coordinates: 33°10'24.19"S, 18°40'51.28"E

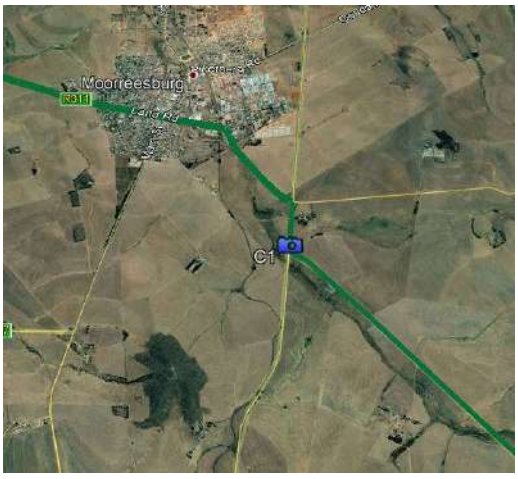
Distance travelled: 80.1km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Turn
- ◊ Road signs
- ◊ Potential fauna collision
- ◊ Possible collision with overhead line supports

Recommendation:
- ✓ Remove road signs
- ✓ Remove fauna
- ✓ Encircled area to be levelled and compacted
- ✓ Permission required to remove overhead line supports

Photo location on route:



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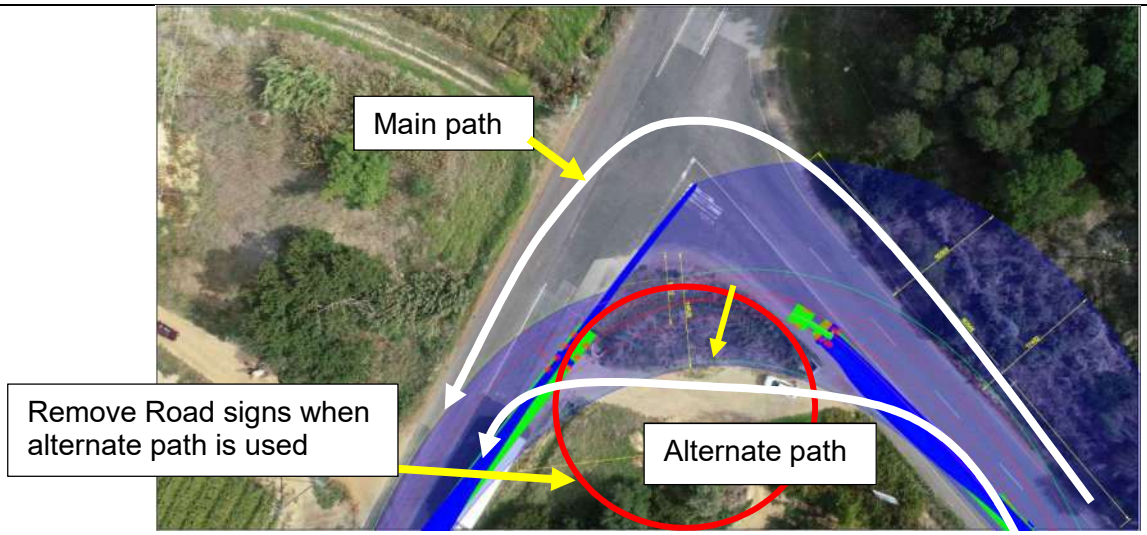
C2: Turn left on R46 to Hermon



Coordinates: 33°23'36.21"S, 18°53'35.16"E

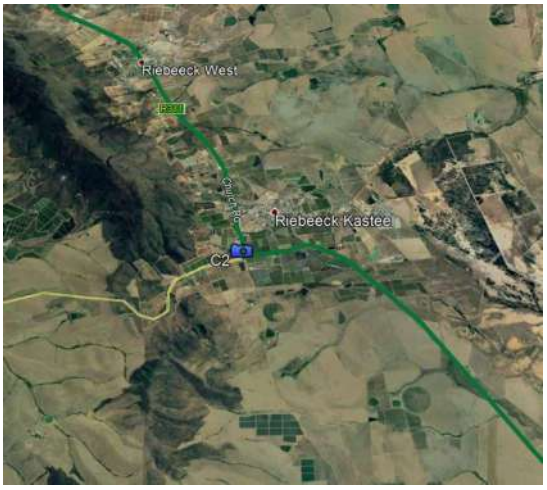
Distance travelled: 112.1km

Road Surface/Condition: Tarmac

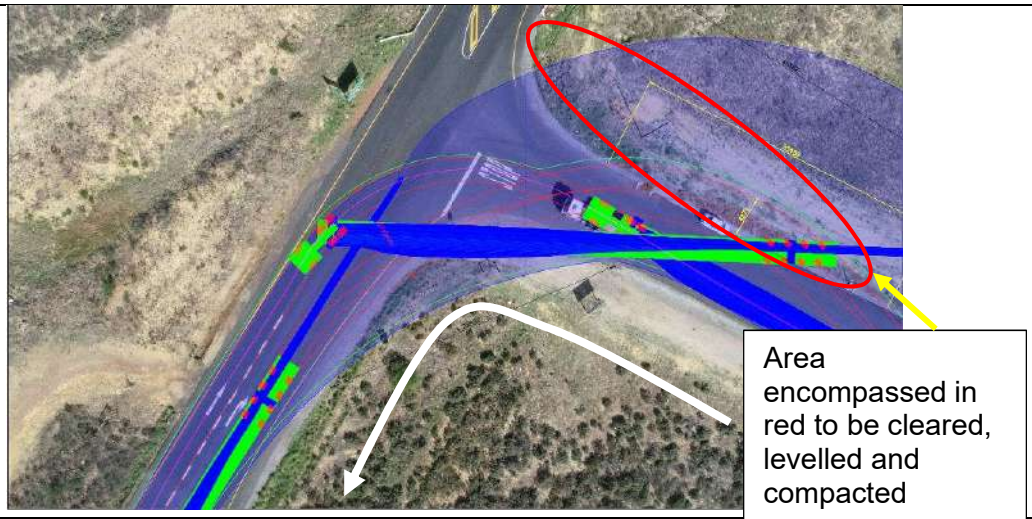
Description of Hazard:
- ◊ Turn
- ◊ Road signs (using alternate path)
- ◊ Potential fauna collision in privately owned land

Recommendation:
- ✓ Use alternate path
- ✓ Compact and level encircled area
- ✓ Remove road signs (using alternate path)
- ✓ Seek permission to remove trees

Photo location on route:



C3: Turn left on R46 to Hermon



Coordinates: 33°26'38.80"S, 18°58'12.24"E

Distance travelled: 122.0km

Road Surface/Condition: Tarmac

Description of Hazard:

- ◊ Turn
- ◊ Road signs
- ◊ Loose gravel on left at intersection
- ◊ Potential collision with obstacles in privately owned land

Recommendation:

- ✓ Remove road signs
- ✓ Area encompassed in red to be cleared, levelled and compacted
- ✓ Seek permission to remove obstacles
- ✓ Compact and level ground

Photo location on route:

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Layby

Coordinates: 33°22'36.68"S, 19°10'52.03"E

Distance travelled: 157.0km

Road Surface/Condition: Tarmac

Description of Hazard:

- ◊ None

Recommendation:

- ✓ Layby

Photo location on route:

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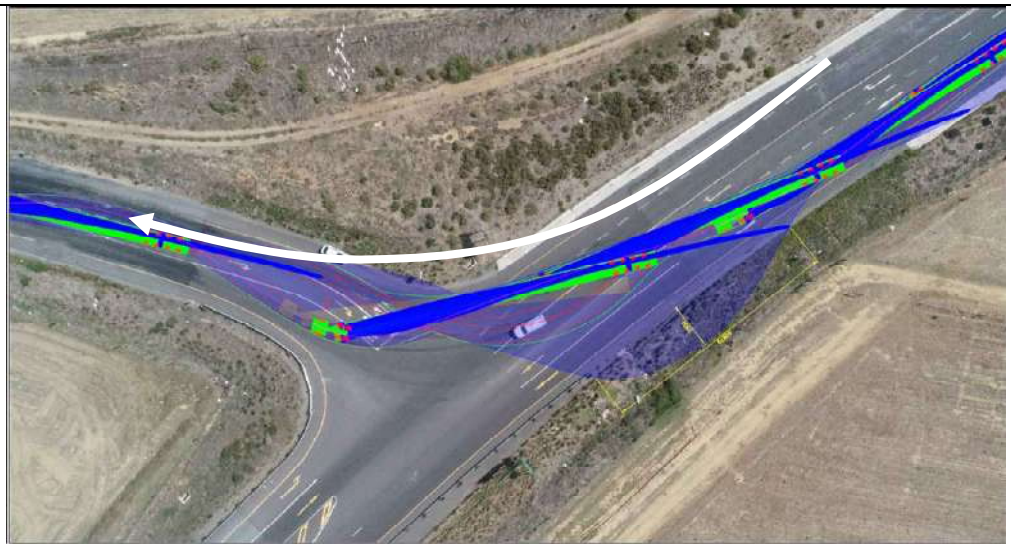
C4: Turn right on Voortrekker street to Wolseley



Coordinates: 33°23'47.81"S, 19°11'48.67"E

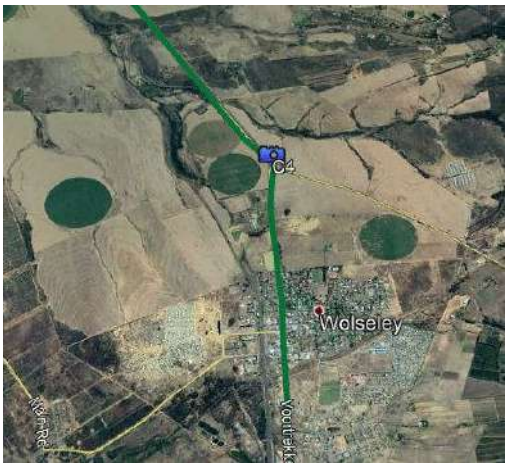
Distance travelled: 160.0km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Turn
- ◊ Road signs
- ◊ Potential collision with obstacles in privately owned land

Recommendation:
- ✓ Remove road signs
- ✓ Seek permission to remove obstacles

Photo location on route:



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C5: Turn right on R43 to Worcester

Coordinates: 33°27'22.36"S, 19°12'35.78"E

Distance travelled: 167.0km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Turn
- ◊ Road signs
- ◊ Potential collision with obstacles in privately owned land

Recommendation:
- ✓ Remove road signs
- ✓ Seek permission to remove obstacles
- ✓ Signs and telephone mast to be removed

Photo location on route:

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C6: Turn left on N1 to Worcester

Coordinates: 33°27'22.36"S, 19°12'35.78"E

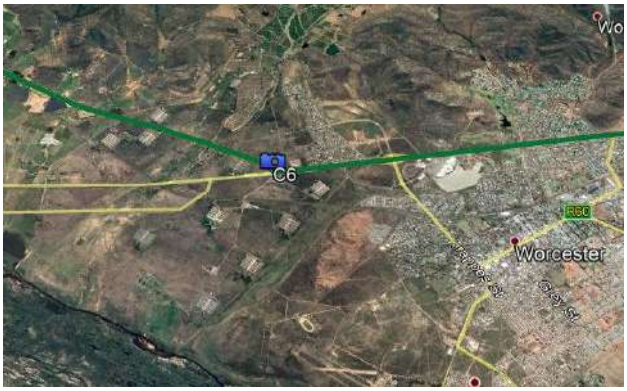
Distance travelled: 198.0km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Turn
- ◊ Road signs
- ◊ Potential collision with obstacles in privately owned land

Recommendation:
- ✓ Remove road signs
- ✓ Seek permission to remove obstacles

Photo location on route:



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C7: Bridge on N1

Coordinates: 33°37'49.56"S, 19°25'35.85"E

Distance travelled: 200.0km

Road Surface/Condition: Tarmac

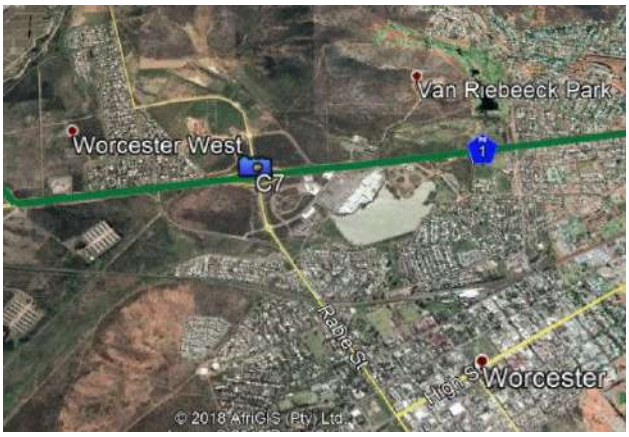
Description of Hazard:

- ◊ Bridge Height, 5.66m

Recommendation:

- ✓ None

Photo location on route:



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C8: Bridge on N1

Coordinates: 33°35'58.52"S, 19°30'34.40"E

Distance travelled: 210.0km

Road Surface/Condition: Tarmac

Description of Hazard:

- ◊ Bridge Height, 5.16m

Recommendation:

- ✓ None

Photo location on route:

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C9: Bridge on N1 at De Doorns

Coordinates: 33°28'57.24"S, 19°40'34.15"E

Distance travelled: 233.0km

Road Surface/Condition: Tarmac

Description of Hazard:

- ◊ Bridge Height, 5.37m

Recommendation:

- ✓ None

Photo location on route:

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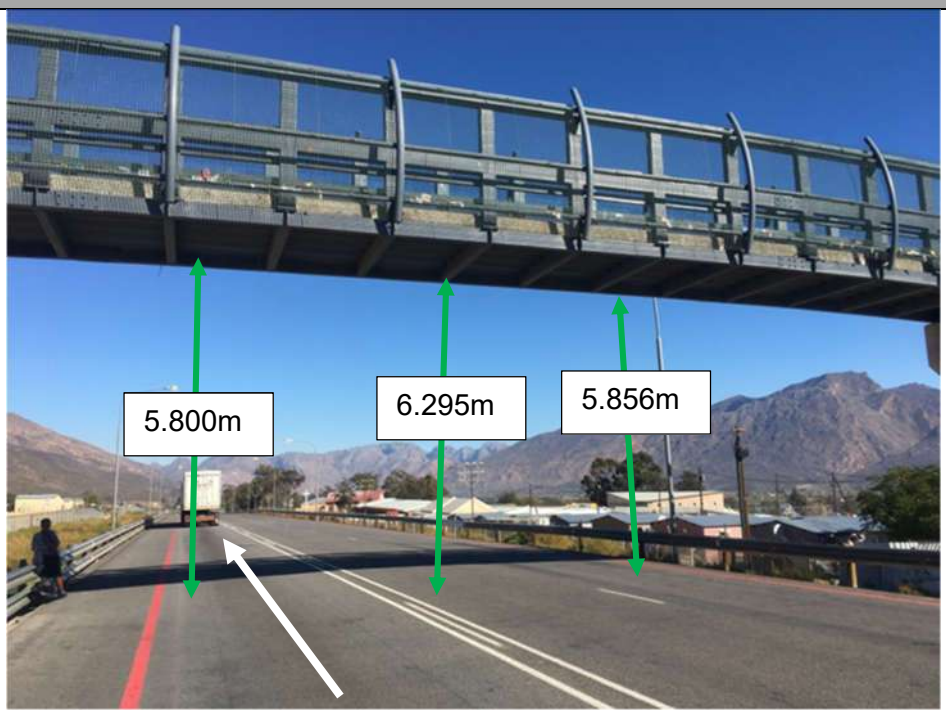
C10: 2nd Bridge on N1 at De Doorns



Coordinates: 33°28'48.99"S, 19°40'55.31"E

Distance travelled: 233.0km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Bridge Height, 5.800m

Recommendation:
- ✓ None

Photo location on route:

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C11: Turn left, at Matjiesfontein, onto the R354 to Sutherland

Coordinates: 33°13'29.51"S, 20°34'53.49"E

Distance travelled: 329.0km

Road Surface/Condition: Tarmac

Description of Hazard:
- ◊ Turn
- ◊ Road signs
- ◊ Potential collision with obstacles in privately owned land

Recommendation:
- ✓ Remove road signs
- ✓ Seek permission to remove obstacles

Photo location on route:

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Sutherland Wind Farm Route options

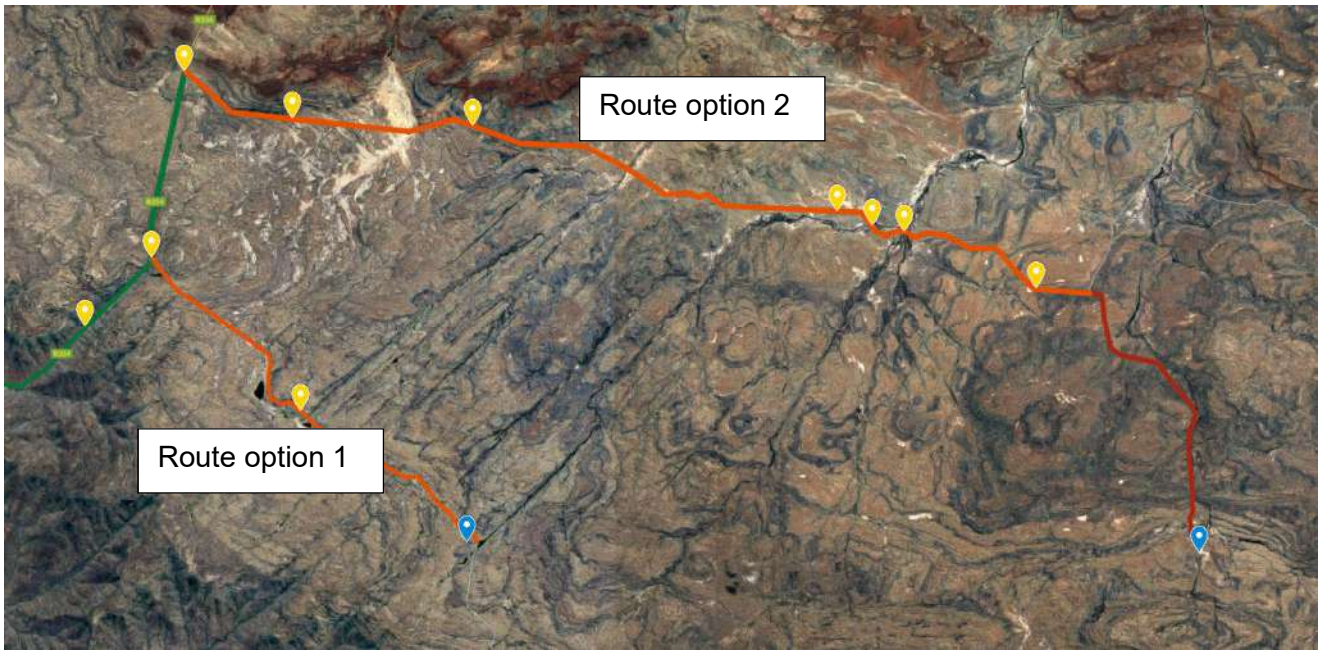
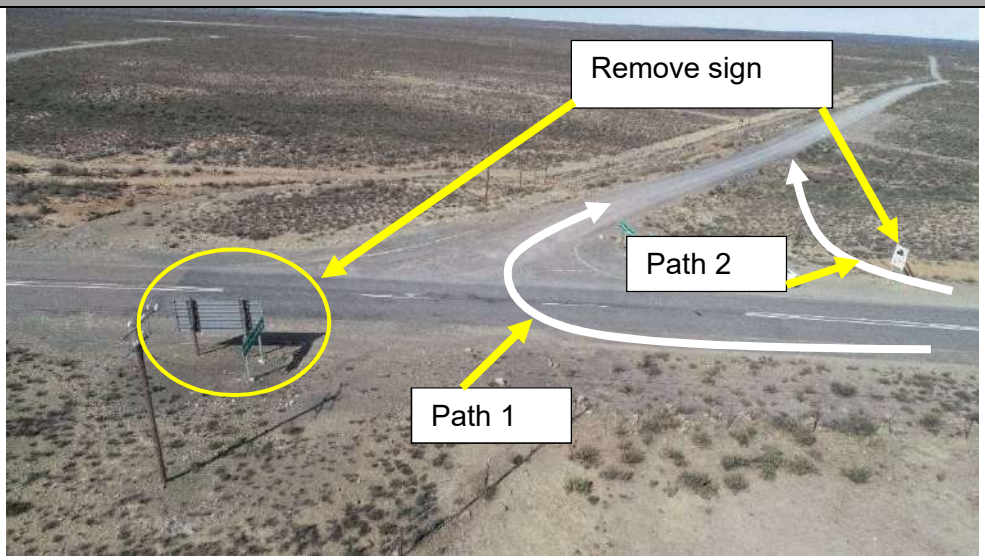
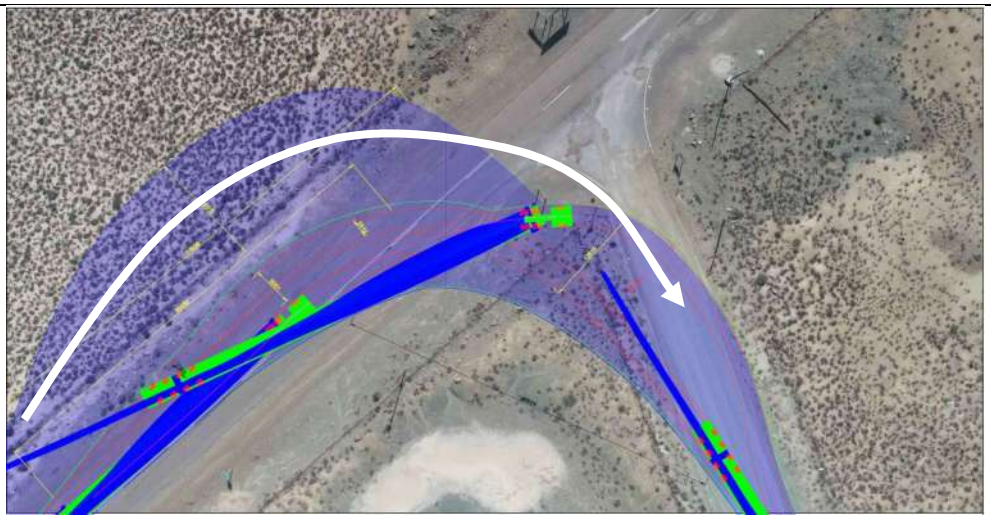


Figure 4: Sutherland wind farm route options

At Sutherland there are 2 routes to use in order to reach the site. Route 1 is shorter and requires grading, approximately 200m, of the path to be conducted. Route 2 is longer are requires more civil works to be conducted than route 1, with a larger section to be graded before reaching the site entrance.

H1: Turn right from R354 before Sutherland





Coordinates: 32°31'27.68"S, 20°38'10.90"E

Distance travelled: 424.0km

Road Surface/Condition: Gravel

Description of Hazard:
- ◊ Sharp Turn
- ◊ Road signs
- ◊ Potential collision with obstacles in privately owned land

Recommendation:
- ✓ Remove road signs
- ✓ Seek permission to remove obstacles
- ✓ Path 2 is advised to be taken

Photo location on route:

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H2: Turn right from R354 before Sutherland

Coordinates: 32°34'4.50"S, 20°41'21.76"E

Distance travelled: 431.0km

Road Surface/Condition: Gravel

Description of Hazard:

- ◊ 200m section requires grading

Recommendation:

- ✓ Gravel road generally in a good condition except for one location of 200m which will require levelling and compaction.

Photo location on route:

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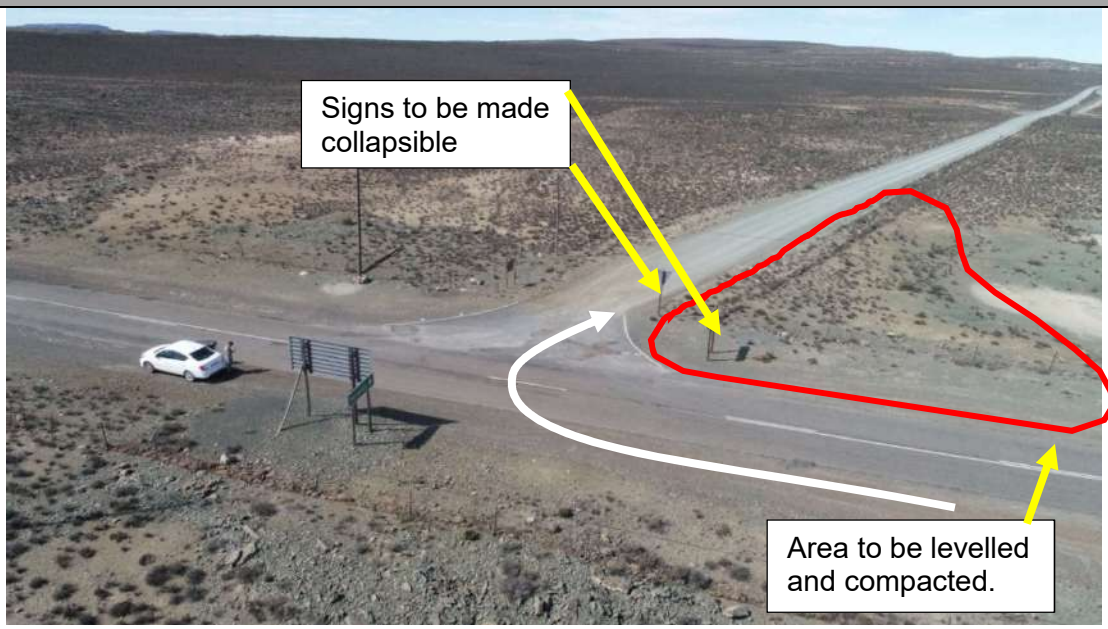
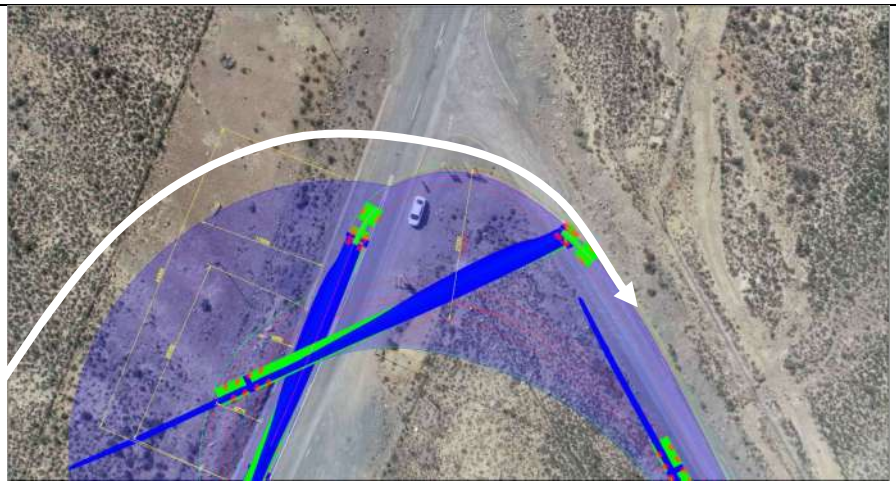
H3: Turn right from R354 before Sutherland





Coordinates: 32°28'17.39"S, 20°38'53.92"E

Distance travelled: 430.0km

Road Surface/Condition: Gravel

Description of Hazard:
- ◊ Turn on to soft ground
- ◊ Road signs
- ◊ Potential collision with obstacles in privately owned land

Recommendation:
- ✓ Remove road signs
- ✓ Seek permission to remove obstacles
- ✓ Area encircled to be levelled and compacted.

Photo location on route:

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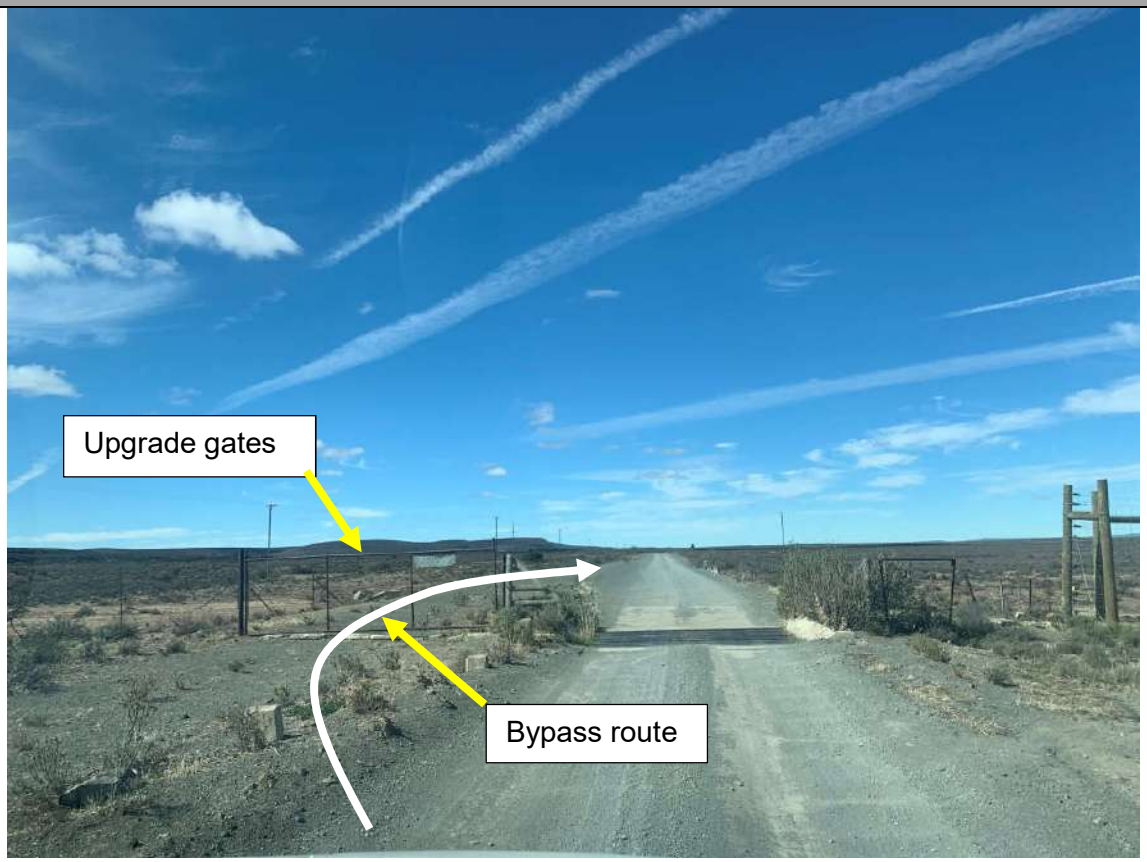
H4: Cattle grids on route



Coordinates: 32°29'4.78"S, 20°41'12.66"E

Distance travelled: 434.0km

Road Surface/Condition: Gravel

Description of Hazard:

- ◊ Cattle grids

Recommendation:

- ✓ Bypass, upgrade gates to the left

Photo location on route:

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H5: Gravel road upgrade

Coordinates: 32°29'25.38"S, 20°45'51.40"E

Distance travelled: 442.0km

Road Surface/Condition: Gravel

Description of Hazard:

- ◊ Gravel road in bad condition

Recommendation:

- ✓ Road to be graded

Photo location on route:

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H6: Steep incline

Coordinates: 32°32'05.0"S 20°58'37.2"E

Distance travelled: 442.0km

Road Surface/Condition: Gravel

Description of Hazard:

- ◊ Gravel road in bad condition

Recommendation:

- ✓ Road to be graded

Photo location on route:

This document is uncontrolled if printed

H7: Cattle grid

Coordinates: 32°33'07.9"S 20°59'10.1"E

Distance travelled: 442.0km

Road Surface/Condition: Gravel

Description of Hazard:

- ◊ Gravel road in bad condition
- ◊ Cattle Grid

Recommendation:

- ✓ Road to be graded
- ✓ To be bypassed

Photo location on route:

This document is uncontrolled if printed

H8: Hill alongside road

Coordinates: 32°34'18.8"S 21°00'38.0"E

Distance travelled: 442.0km

Road Surface/Condition: Gravel

Description of Hazard:
- ◊ Hill on right

Recommendation:
- ✓ Hill on right to be excavated
- ✓ Dummy run to be conducted

Photo location on route:

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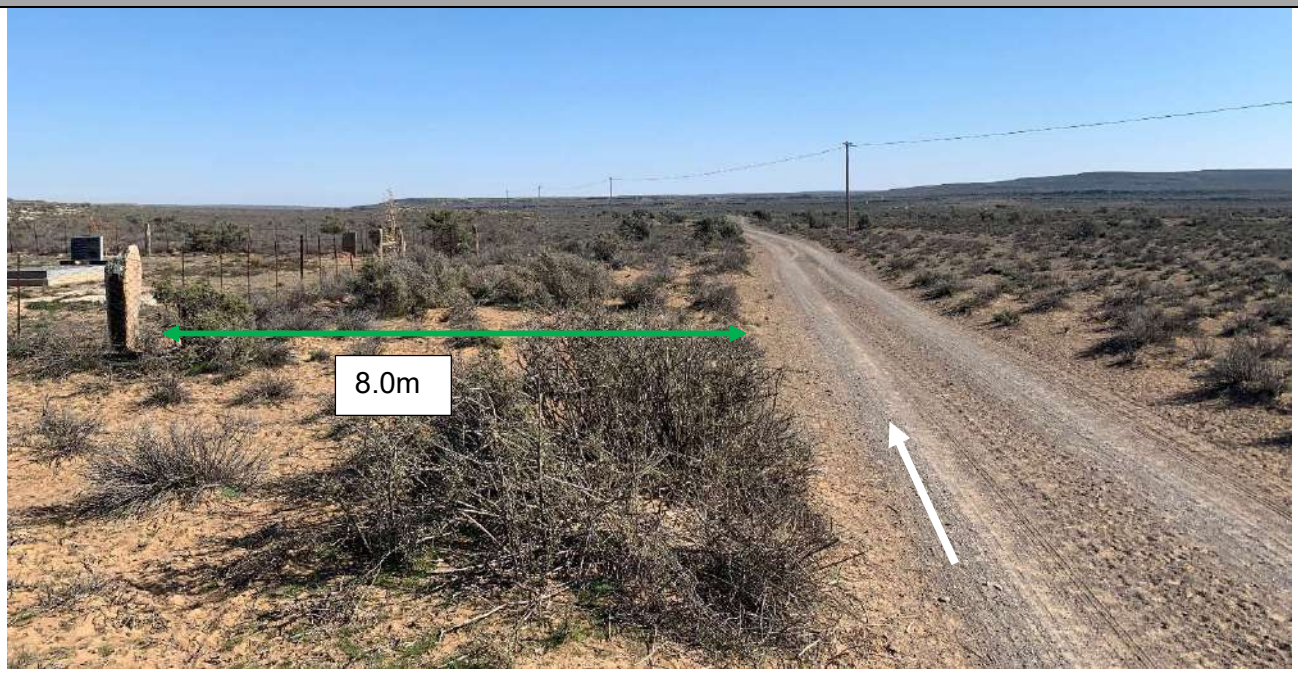
H9: Grave site



Coordinates: 32°36'16.7"S 21°00'28.2"E

Distance travelled: 442.0km

Road Surface/Condition: Gravel

Description of Hazard:

- ◊ Grave site on left

Recommendation:

- ✓ Dummy run to be conducted

Photo location on route:

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7. RISK ANALYSIS

Description		Findings	Risk	Solution/Mitigation
Is information about future road works freely available?	☐ Yes ☒ No ☐ TBC	The conditions of some gravel roads in close to sites is deteriorating.	medium 31-60%	Upgrade of the roads to ensure no good surface
Are there existing road works on route?	☒ Yes ☐ No ☐ TBC	Some main roads and T junctions are under road works	medium 31-60%	Survey a possible route diversion
Will the environment and public structure be interrupted?	☒ Yes ☐ No ☐ TBC	The tracking illustrates that the area that must be cleared.	low 0-30 %	Apply for principle approval with relevant authorities
Will bridges on route require external evaluation?	☒ Yes ☐ No ☐ TBC	Large loads to be transported, therefore bridges need to be in good condition.	medium 31-60%	Bridges to be examined for loads greater than 50t – 120 t. This will be done by a third-party civil engineer.
Will bridges require propping?	☐ Yes ☐ No ☒ TBC	The condition of some bridges requires examining	medium 31-60%	Assess the loads to be transported and decide whether propping is needed or not.
Will the normal traffic be interrupted?	☒ Yes ☐ No ☐ TBC	All corners need to be free when turning.	High 61-90%	Access temporary traffic control facilities. Apply for principle approval.
Are there overhead barriers	☐ Yes ☐ No ☒ TBC	There are indications of overhead barriers along the route	medium 31-60%	Little to no excavation and road works

8. CONCLUSION

The report considered the feasibility of transporting the wind turbine generator components form the Port of Saldanha to the Sutherland wind farm. The feasibility of transporting wind turbine generator components was based on a route survey conducted by an ALE engineer. The study was mainly to identify any changes and improvements needed to transport the wind turbine generator components.

8.1. ROUTE FINDINGS

The route findings are discussed in the following section mainly, overhead restrictions, road width, turning radius, weight restrictions, road conditions and traffic.

8.1.1. Overhead restrictions

A summary of the overhead restrictions of the route survey is shown in the table below. Also shown in the table below is the maximum transport combination height.

	Minimum [m]	Maximum [m]	Transport combination [m]
Overhead permanent structures e.g. bridge	5.170	5.7	4.875

Table 1: Overhead dimensions and transport combination comparison.

As seen from appendix 9.1.3 drawing 9, the dimensions of the highest transport combination is 4.875m. As clearly shown in the table above it will be possible to transport the Nacelle as its transport combination height does not exceeds the minimum overhead height. Further research will be required if there is a change in the transport component dimensions.

8.1.2. Road width

A summary of the road width mainly, bridge width and structure width (toll gates) is shown in the table below.

	Minimum [m]	Maximum [m]	Transport combination [m]
Bridge width	6.4	9.0	4.7
Structures width	4.5	14	4.7

Table 2:Road width and transport combination comparison.

The widest transport combination is the Hub with a width of 4.7m. From the summary in the table above, there are a few structures that have a minimum width of 4.5m. Some of these structures (cattle grid) may be avoided by using a pass next to them. The other structures like the road furniture will need o be cleared.

8.1.3. Sharp corners

Several sharp turns have been identified and a transport combination tracking was conducted to find the feasibility of transporting through the route. The tracking illustration presented in sections 3, 4 and 5 shows several obstructions which will require attention before the actual project.

8.1.4. Weight restrictions on culverts and bridges

The bridges look acceptable but the load per axle must not exceed 10t to avoid failure. Some culverts would require maintenance as they will be exposed to cyclic loading from movement of trucks and trailers.

8.1.5. Road conditions

The road conditions from both the ports to distances close to the access points for all the sites is good. However, road conditions near the sites require upgrades as they are many bumps that will have a negative effect on the transportation of loads.

8.1.6. Traffic

Possible route deviations will need to be considered to reduce delays in the timeline of the project as transportation may be delayed by traffic congestion. Traffic control systems may need to be conducted in towns to avoid delays.

8.2. ROUTE IMPROVEMENTS

As seen from the tracking illustration figures shown in section 3, 4 and 5 improvements are required to ensure successful transportation of the loads. The main improvements on the route require site clearance, earthworks and excavation. Site clearance will include removing and grubbing road furniture. Earthworks will include scarifying and compacting of existing surfaces to allowable densities. Some specific areas will require excavation and disposal of unwanted material to a designated area.

Road works on the gravel roads near the access points of most sites will require grading and compacting. Islands, separators and any sudden change in heights will need to be cleared as tower clamps have a small clearance height, hence reducing the amount of overhead restriction barriers. Servicing of the culverts will be required to avoid any failure that would cause delays in the project.

In conclusion, the information gathered proves that transportation of the wind turbine generator is feasible. However, a simulation run (test run) would need to be conducted before start of project to provide final proof of the suitability of transportation through this route.

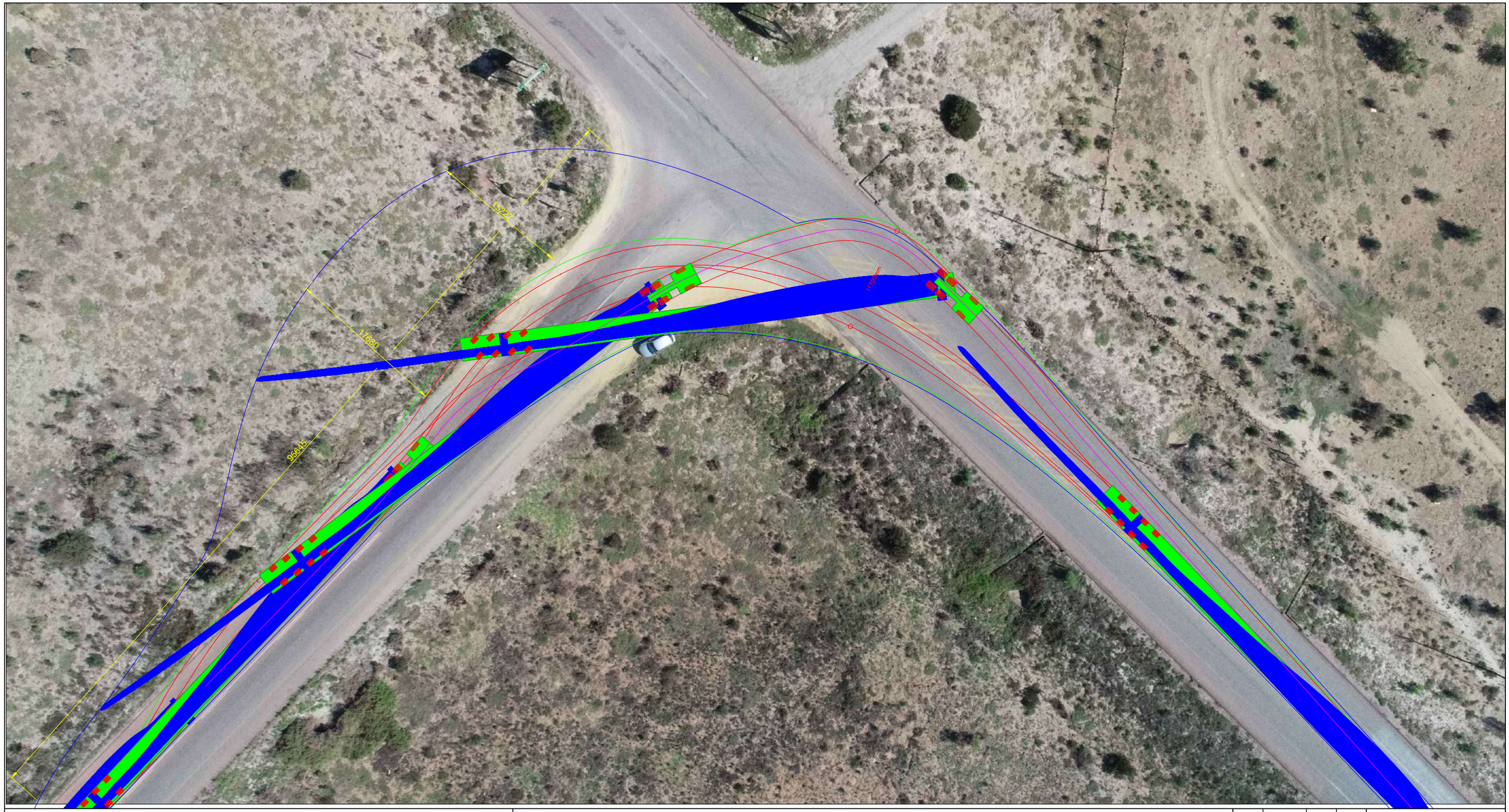
9. FUTURE WORKS REQUIRED

Future works required		Notes
Is corner tracking required?	☒ Yes ☐ No ☐ TBC	Yes, future tracking will be required with the actual transportation combinations.
Is vertical tracking required	☒ Yes ☐ No ☐ TBC	Yes, vertical tracking is required to ensure accurate overhead restriction analysis. Also, to asses ground clearance for clamp trailers.
Will a simulation run be beneficial?	☒ Yes ☐ No ☐ TBC	Yes, a simulation run will be beneficial for several reasons namely, changes may occur to the route, the google map software might be outdated by time of project execution, practicality of the study may be assessed and lastly the actual timeline of the project will be evaluated.
Storage facilities	☒ Yes ☐ No ☐ TBC	At the bay, storage or open space is required whilst paper work is being processed.
Transport accommodation plan	☒ Yes ☐ No ☐ TBC	The relevant authorities will need to be engaged and made aware of all logistics through the different towns and cities. Access may be denied in some periods during the day as traffic needs to be cleared for access.
Overhead Bridge and Powerline clearance	☒ Yes ☐ No ☐ TBC	There are overhead bridges and several powerlines that are below the minimum transport combination height.
Route Clearance	☒ Yes ☐ No ☐ TBC	Excessive work will need to be done mainly, the civil work and general clearance of route furniture.
Time and motion study	☒ Yes ☐ No ☐ TBC	The time and motion study will give a rough estimation of the feed rate of turbine components delivered in a specific period. Thereafter the achieved feed rate can be compared to the target and assess if modifications in the project are required.

10. APPENDICES

10.1. APPENDIX A – TRACKING DRAWINGS

In order of appearance



DRAWING NOTES

1. ALL DIMENSIONS ARE IN mm UNLESS OTHERWISE STATED
2. ALL WEIGHTS ARE IN t (METRIC TONNES) UNLESS OTHERWISE STATED
3. ALL DETAILS ARE PROVISIONAL AND ARE SUBJECT TO CONFIRMATION

TECHNICAL NOTES

1. TRANSPORT CONFIGURATION IS TO BE CONFIRMED
2. WHERE TRAILER PATH (RED) GOES OFF-ROAD, GROUND WORKS ARE REQUIRED
3. WHERE LOAD SWEEP PATH (BLUE) GOES OFF-ROAD, CARE MUST BE TAKEN TO ENSURE NO OBSTACLES ARE IN THE WAY
4. WHERE TRAILER PATH (GREEN) GOES OFF-ROAD, CARE MUST BE TAKEN TO ENSURE NO OBSTACLES ARE IN THE WAY
5. DRAWING OF ROAD SCALED FROM EXTERNAL IMAGES
6. MINIMAL AMOUNT OF CIVIL WORKS REQUIRED
7. RISK: TO REMOVE ANY OBSTACLES IN PRIVATE OWNED LAND MAY REQUIRE PERMISSION

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Project Title: Round 5 Route Surveys

Drawing Title: Tracking for transport of 76m Blade

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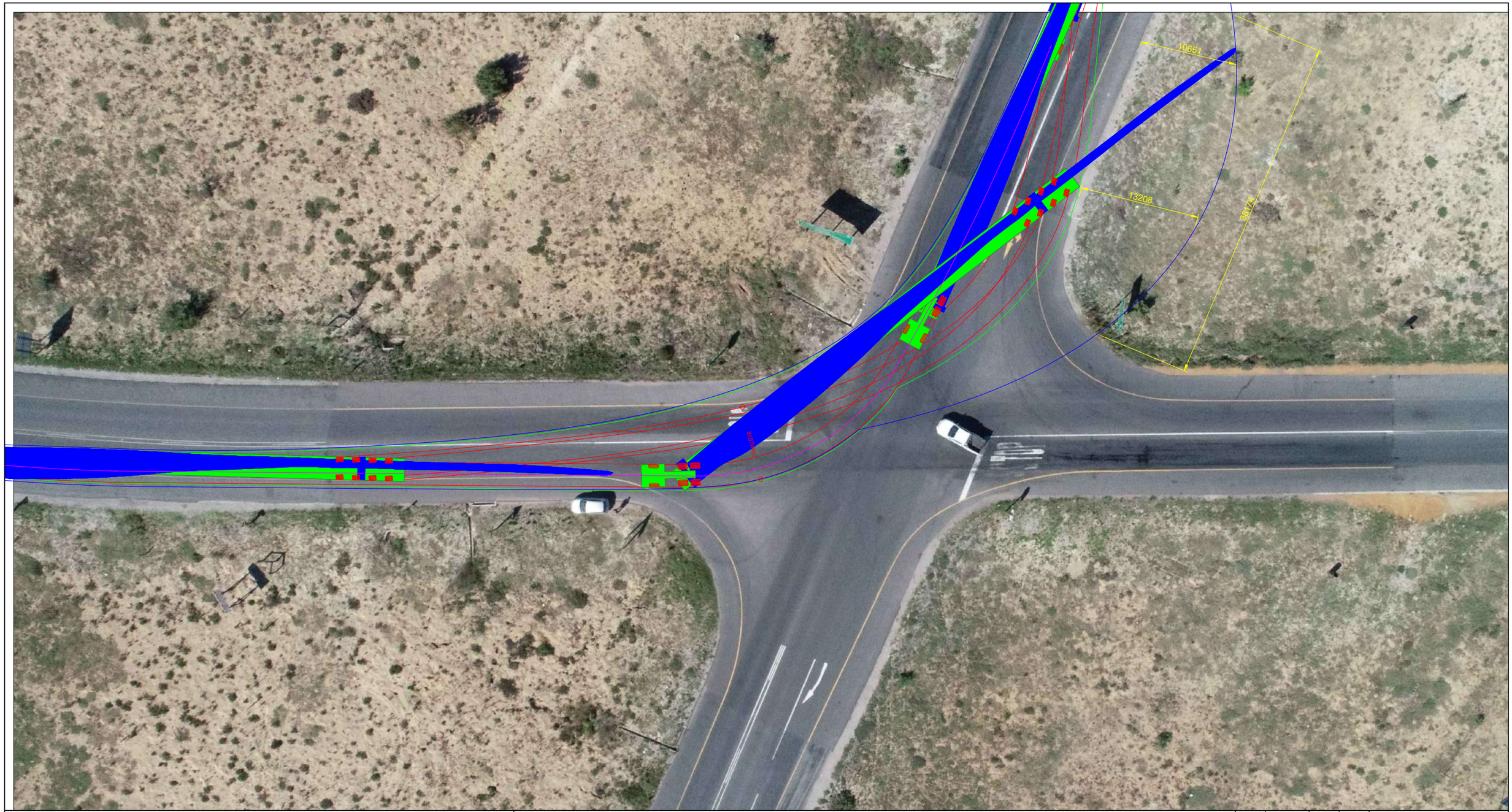

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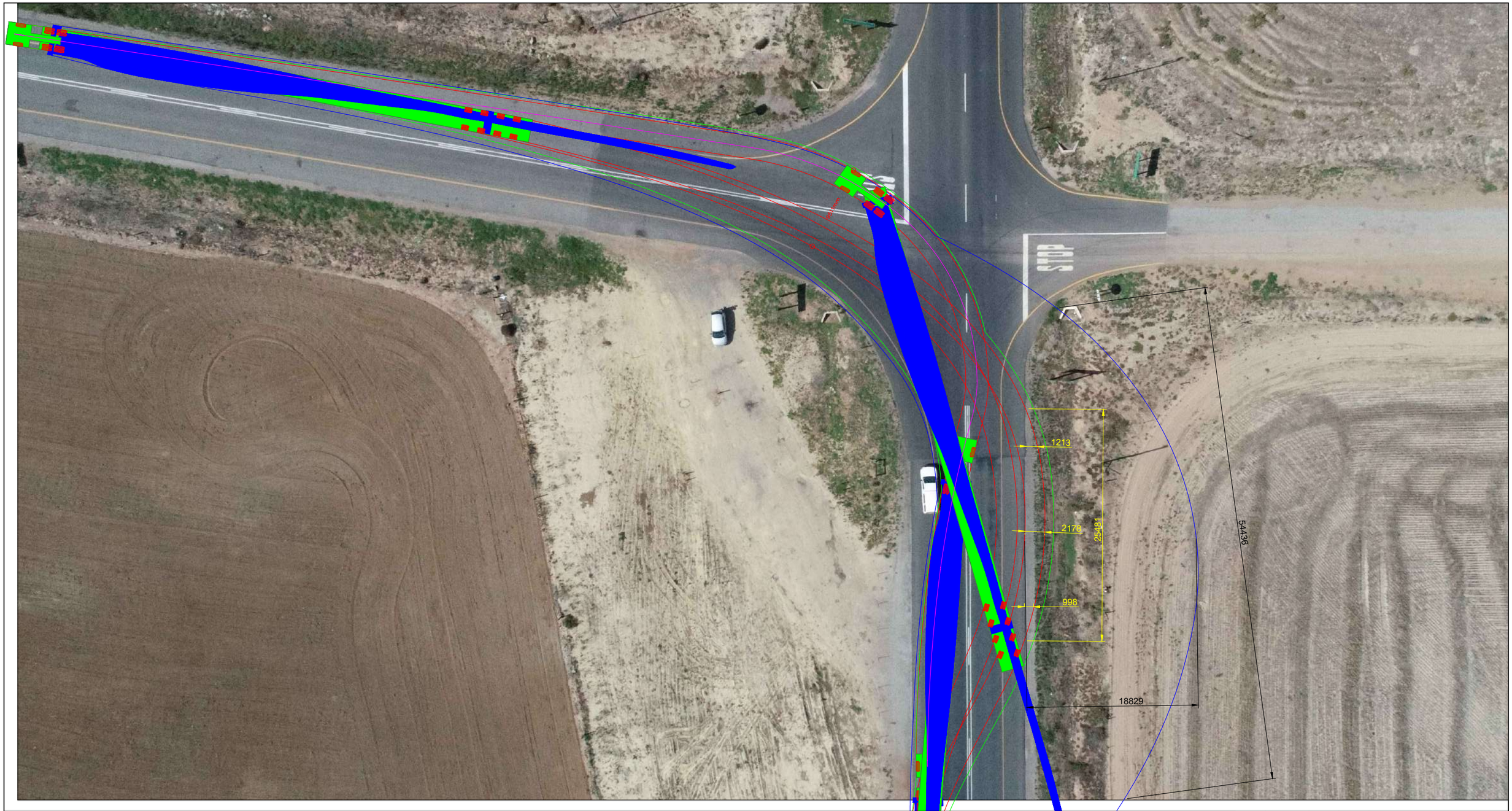

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7. RISK: LOAD INTERFERENCE WITH OVERHEAD LINE SUPPORT POLES, MAY REQUIRE PERMISSION TO REMOVE THEM

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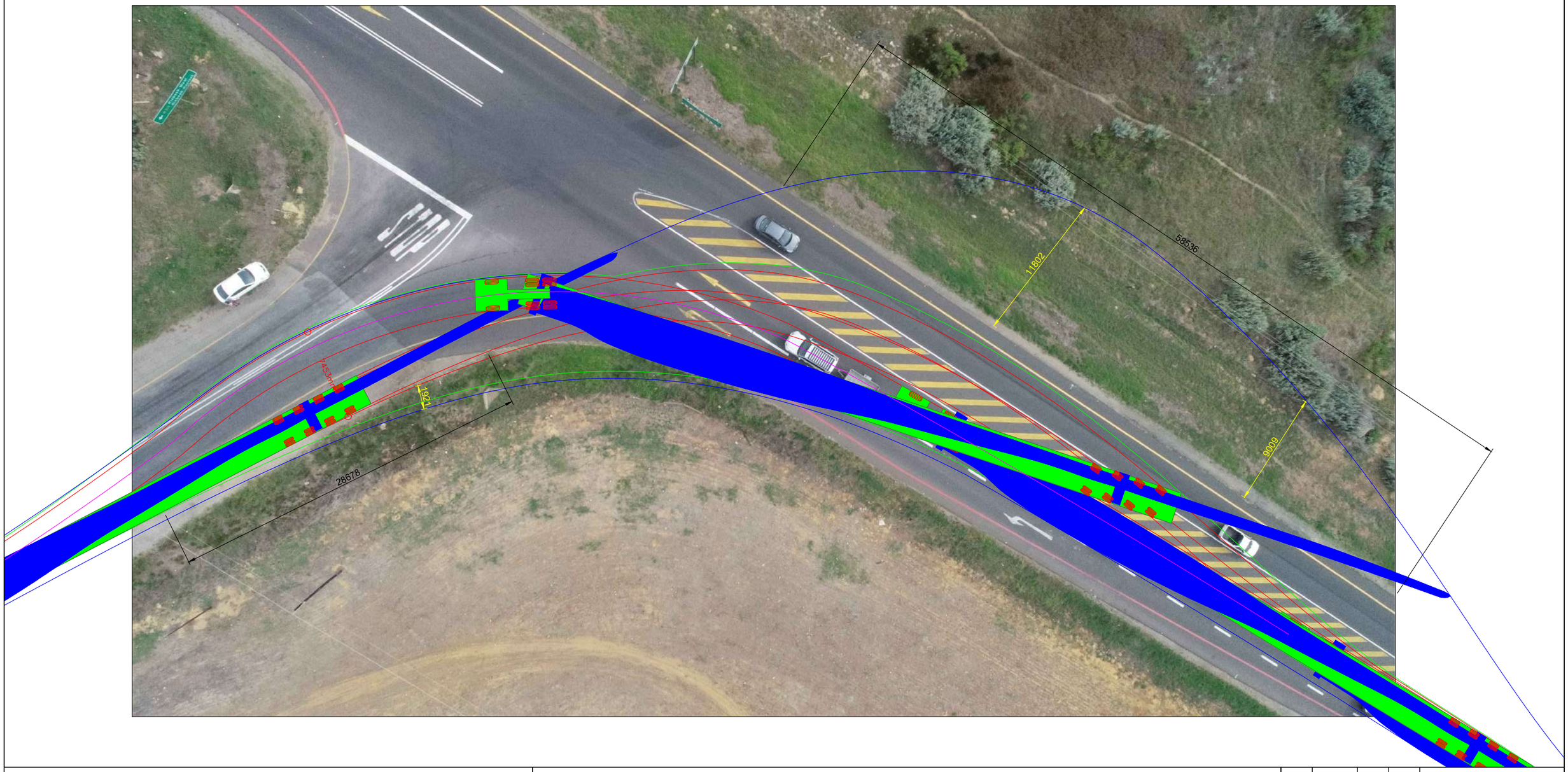

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7. RISK: POSSIBLE INTERFERENCE WITH OVERHEAD LINE SUPPORT POLES

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Client: MAINSTREAM RENEWABLE POWER

Project Title: Round 5 Route Surveys

Drawing Title: Tracking for transport of 76m Blade

Project No.	Drawn	Checked	Scale	Sheet	Date
AB0184-01	RG	GV	NTS	1 of 1	28/05/2019

Drawing No. AB0184-01-ENG-EF-01-DRWP-01-TRH-01-DRW-01 Rev. A1

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DRAWING NOTES

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TECHNICAL NOTES

1. TRANSPORT CONFIGURATION IS TO BE CONFIRMED
2. WHERE TRAILER PATH (RED) GOES OFF-ROAD, GROUND WORKS ARE REQUIRED
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5. DRAWING OF ROAD SCALED FROM EXTERNAL IMAGES
6. MODERATE CIVIL WORKS REQUIRED
7. RISK: TO REMOVE TREES AND OBSTRUCTIONS FROM PRIVATE OWNED LAND

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Drawing No.: AB0184-01-ENG-EF-01-DRWP-01-TRH-01-DRW-02

Rev.: A1

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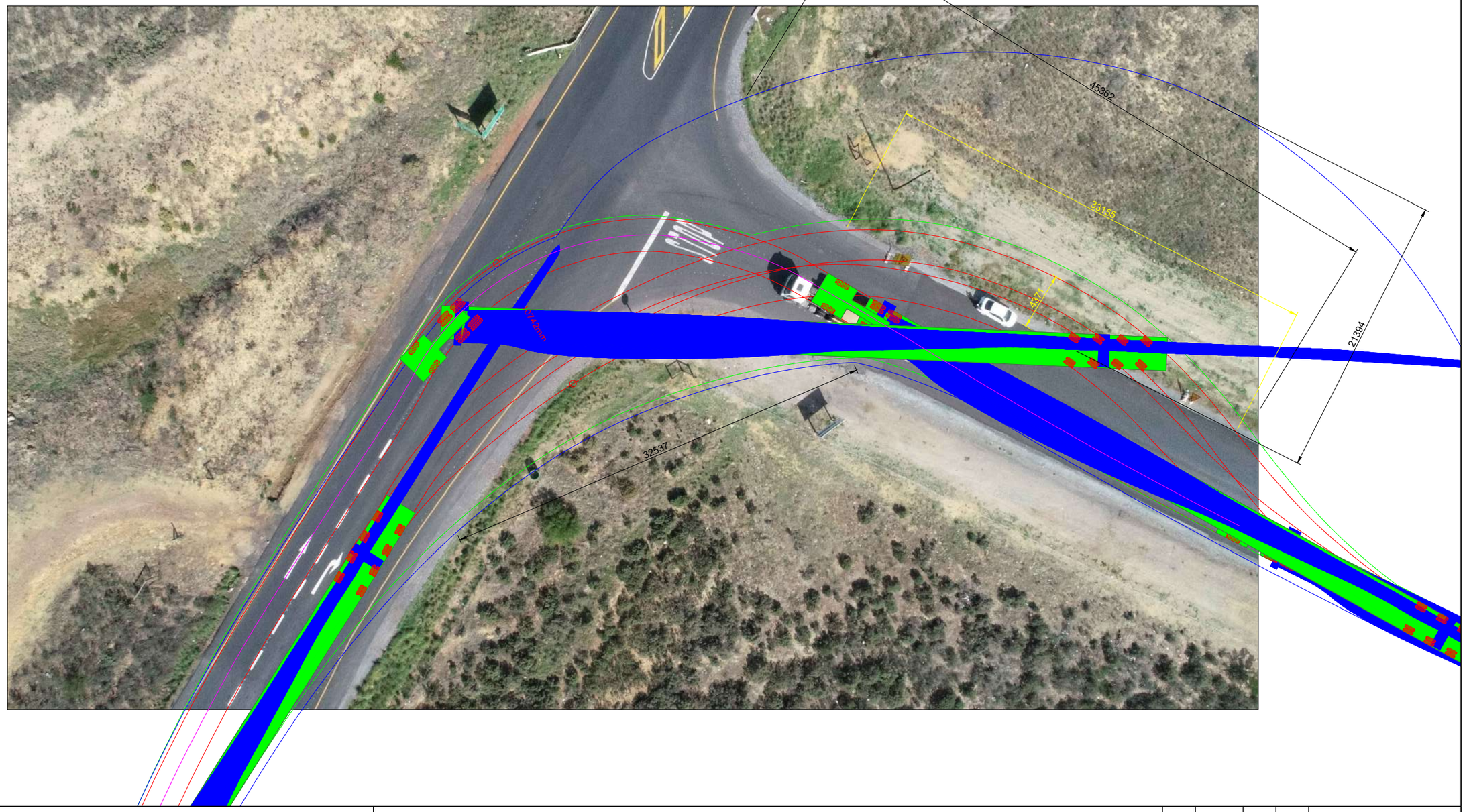

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6. MODERATE AMOUNT OF CIVIL WORKS REQUIRED
7. RISK: TO CARRY OUT CIVIL WORKS AND REMOVE OBSTACLES IN PRIVATE OWNED LAND

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Drawing No. AB0184-01-ENG-EF-01-DRWP-01-TRH-01-DRW-03 Rev. A1

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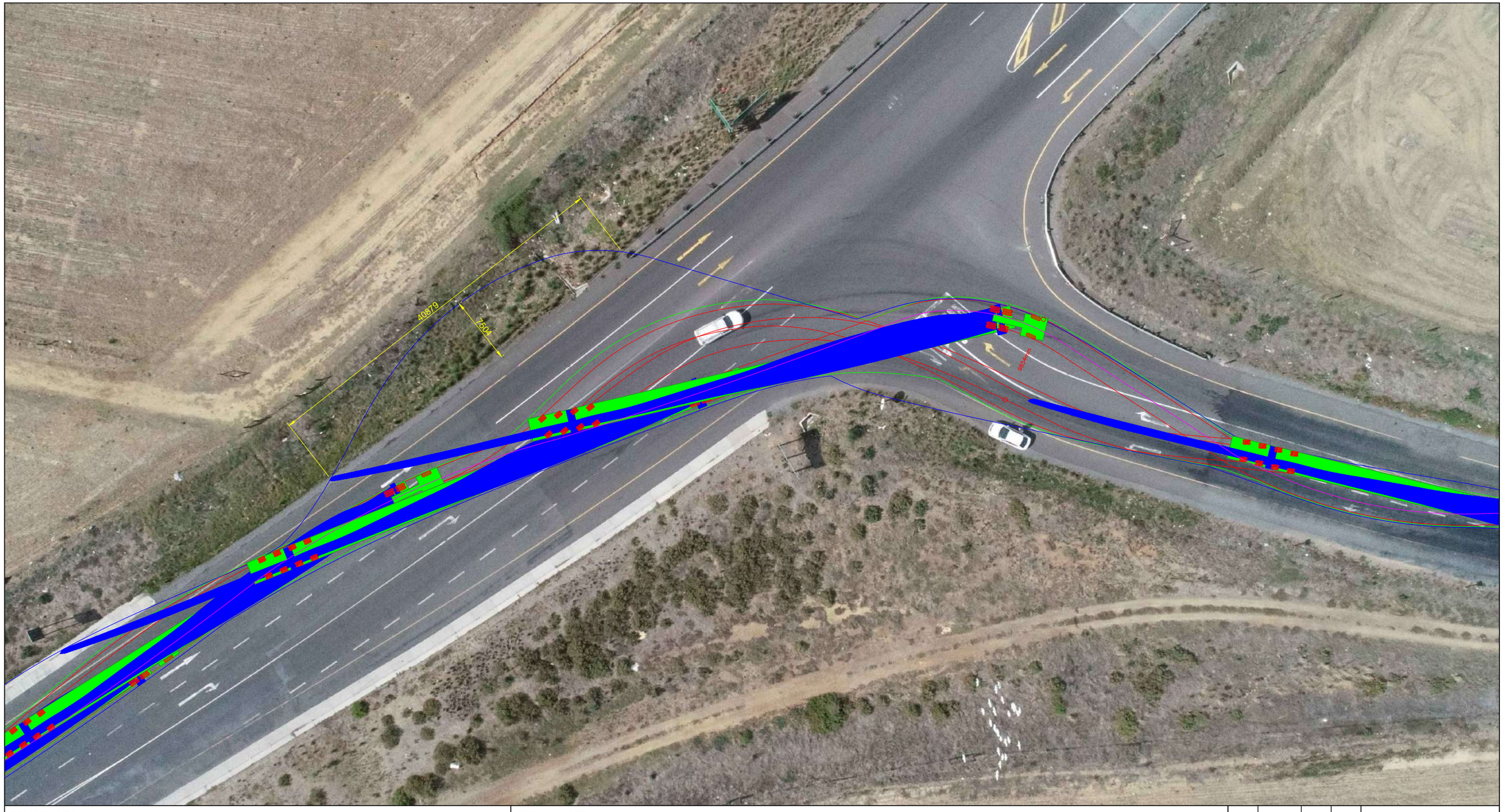

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Drawing No. AB0184-01-ENG-EF-01-DRWP-01-TRH-01-DRW-04 | Rev. A1

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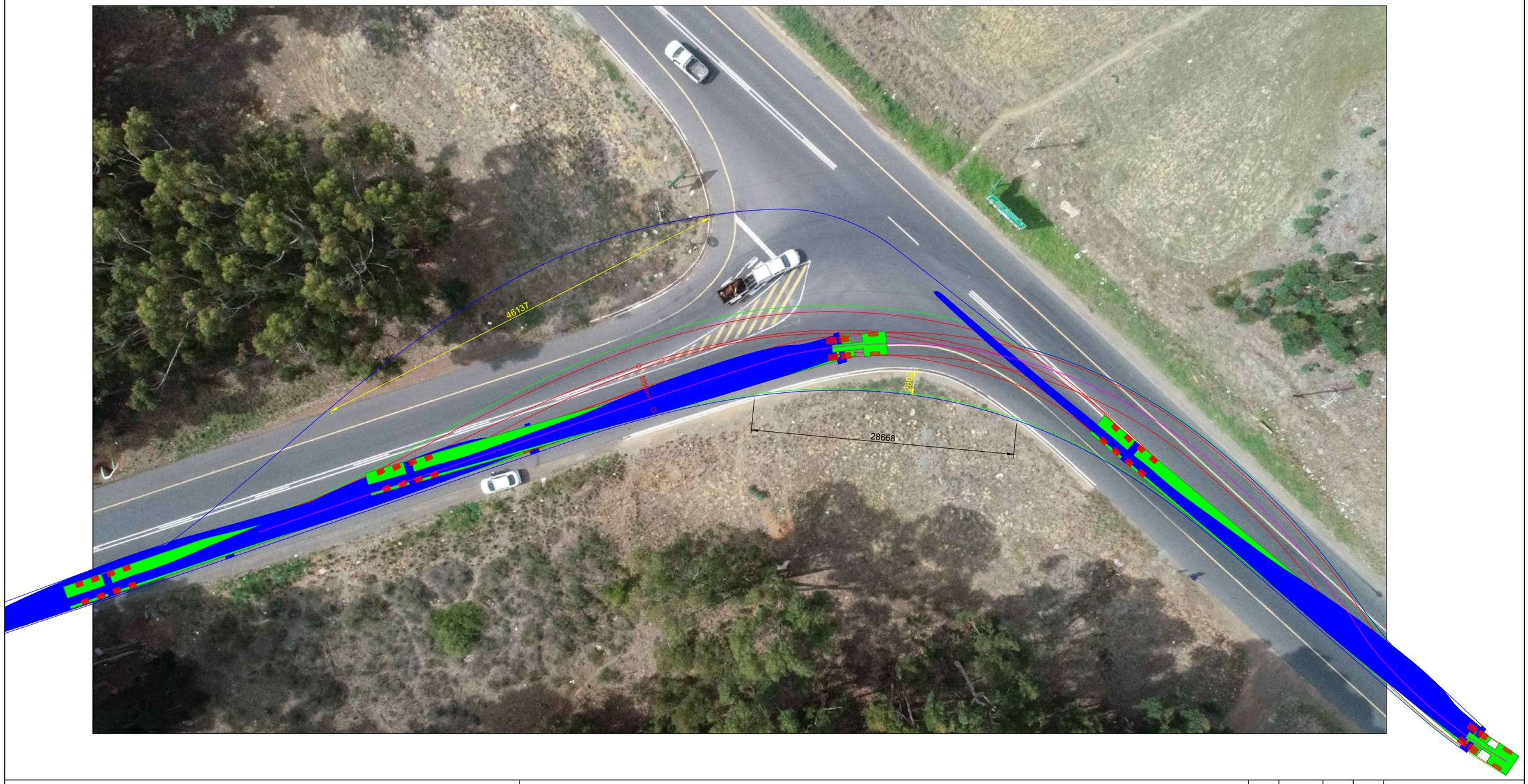

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5. DRAWING OF ROAD SCALED FROM EXTERNAL IMAGES
6. MINIMAL CIVIL WORKS REQUIRED
7. RISK: POSSIBLE INTERFERENCE WITH OVERHEAD LINE SUPPORT POLES MAY REQUIRE PERMISSION TO REMOVE

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Drawing Title: Tracking for transport of 76m Blade

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Drawing No. AB0184-01-ENG-EF-01-DRWP-01-TRH-01-DRW-05 Rev. A1

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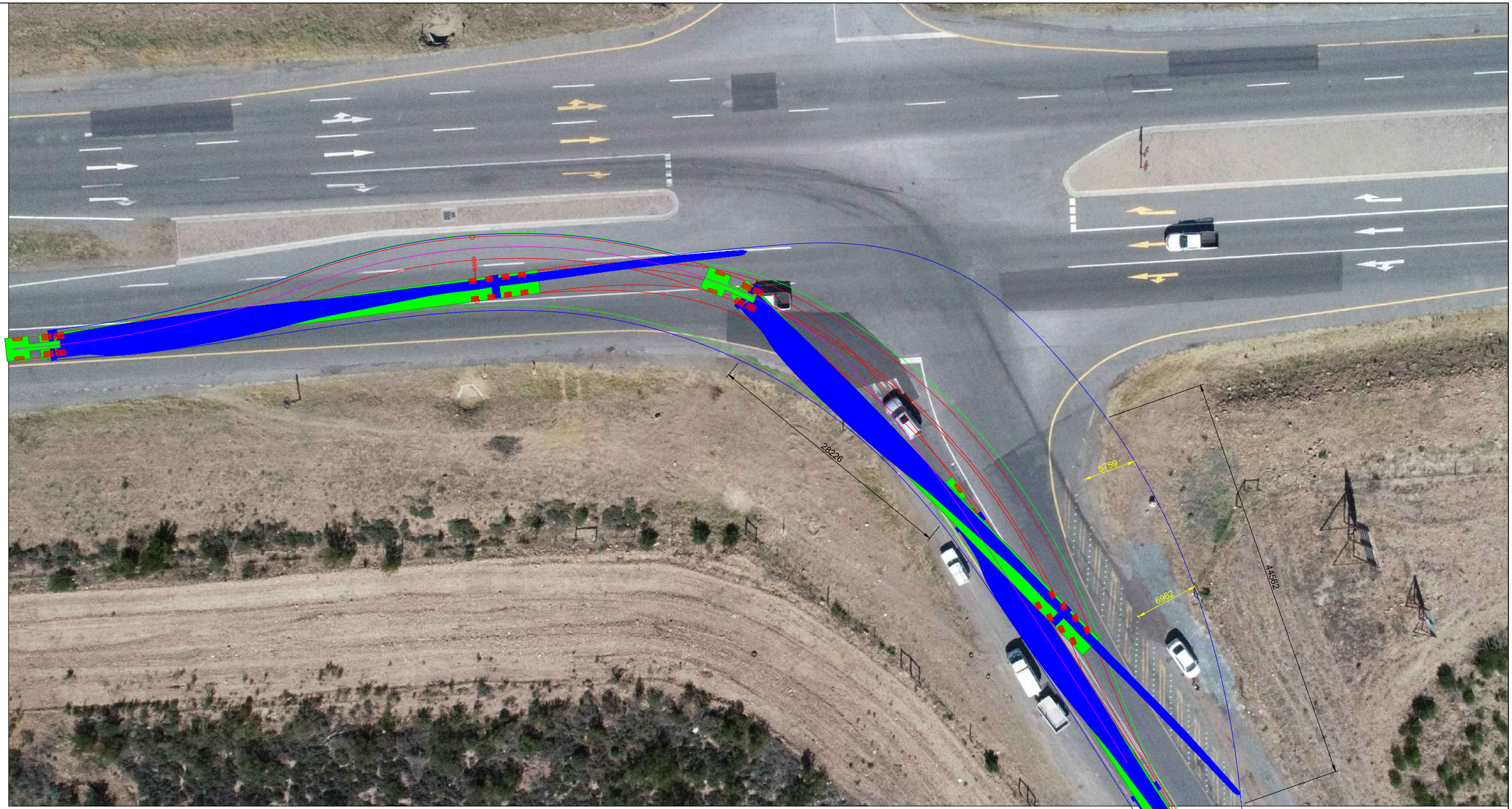

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Drawing No. AB0184-01-ENG-EF-01-DRWP-01-TRH-01-DRW-06 Rev. A1

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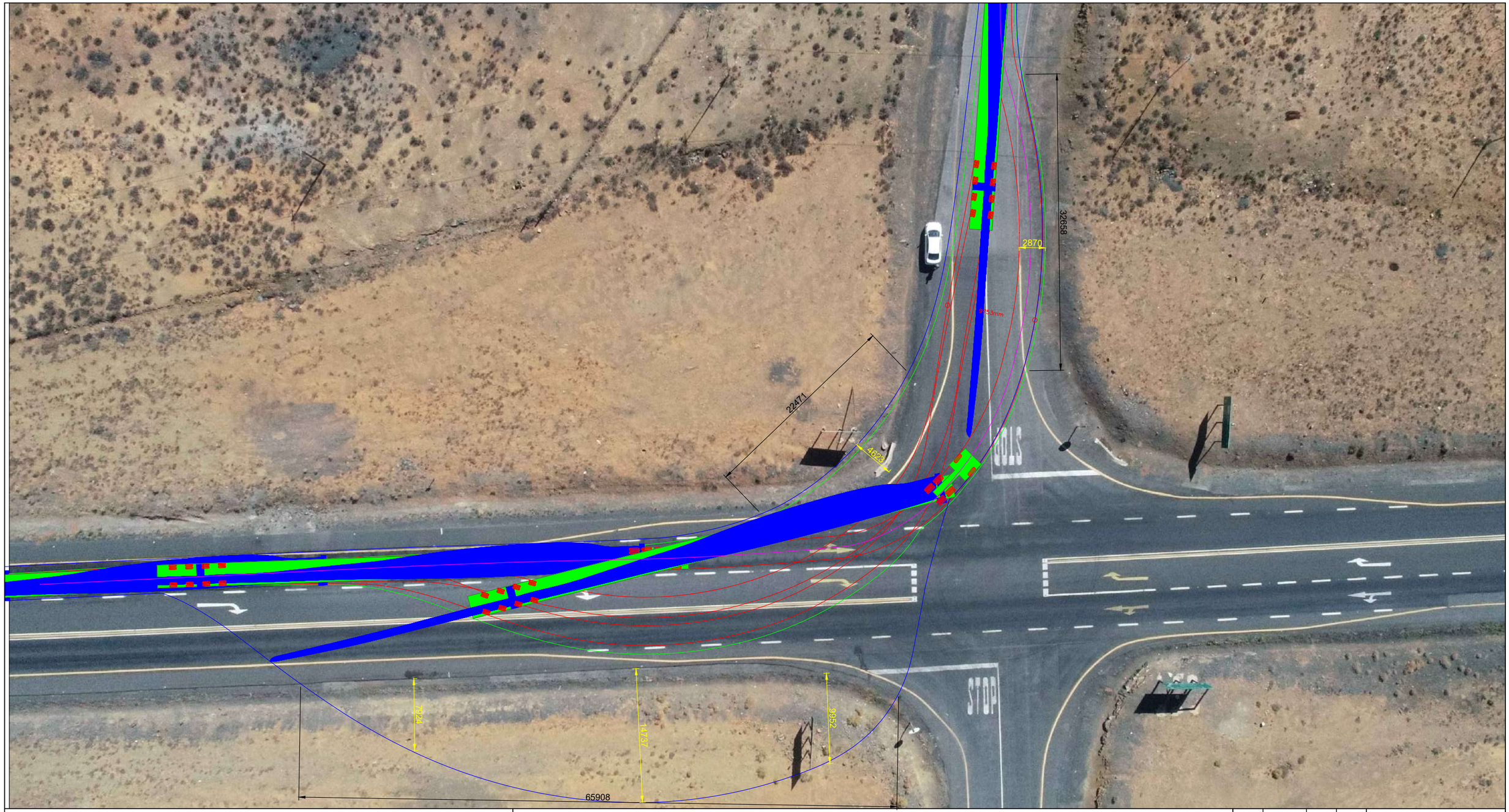

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6. MODERATE AMOUNT OF CIVIL WORKS REQUIRED
7. RISK: LOAD INTERFERENCE WITH ROAD SIGNS, MAY REQUIRE PERMISSION TO REMOVE THEM

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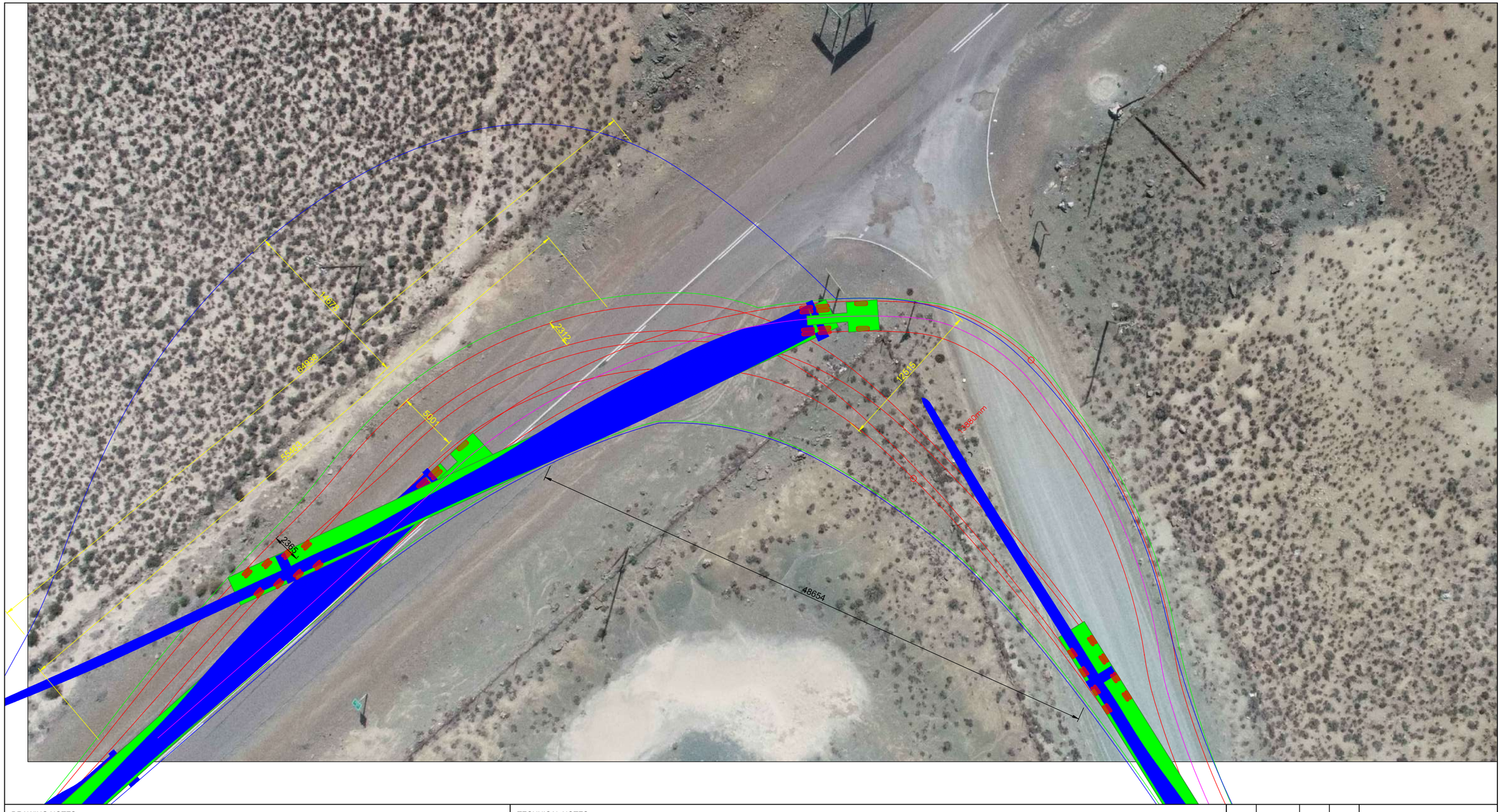

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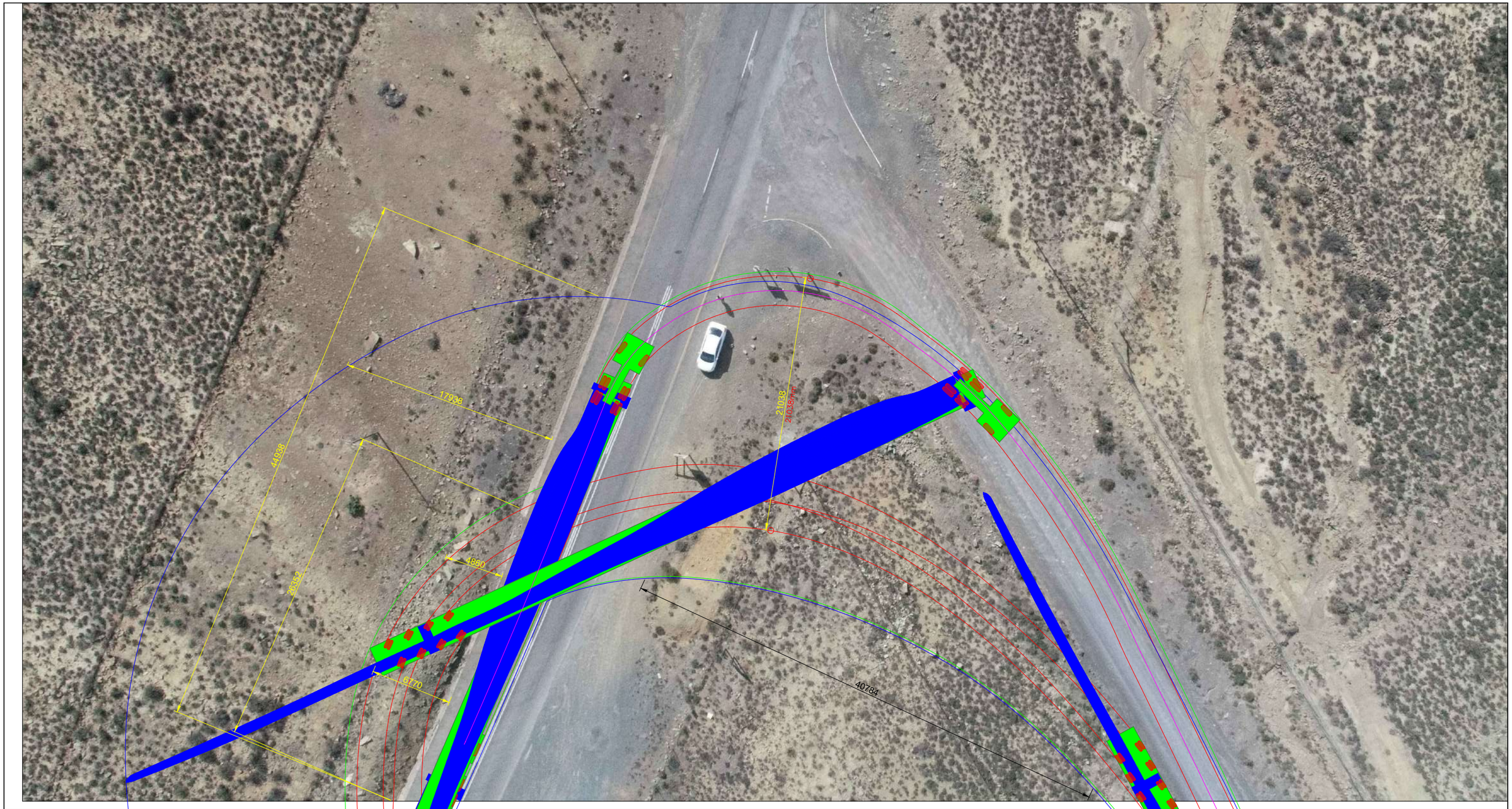

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