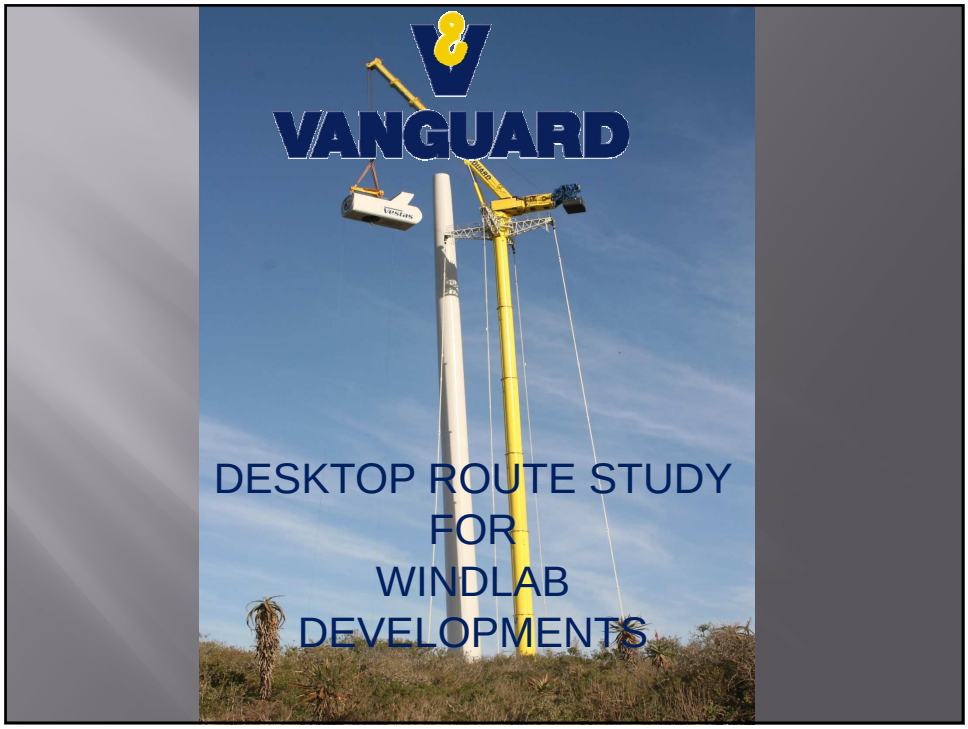

VANGUARD
DESKTOP ROUTE STUDY
FOR
WINDLAB
DEVELOPMENTS


OVERALL ROUTE DESCRIPTION
BEDFORD
COOKHOUSE
POSEIDON WIND FARM
GRAHAMSTOWN
PORT OF COEGA
Bethelsdorp
Ibhayi
Port Elizabeth
Image © 2010 DigitalGlobe
Data SIO, NOAA, U.S. Navy, NGA, GEBCO
© 2010 Tele Atlas
© 2010 Cnes/Spot Image
33°17'03.83" S 26°08'28.17" E elev 0 m
©2009 Google
Eye alt 206.59 km
2

Introduction

Vanguard has been commissioned to compile a desktop transport study, for the transportation of wind turbine equipment from the Port of Coega to the Poseidon Wind Farm site, near Bedford in the Eastern Cape. Two routes have been identified, 1. via Cookhouse and 2. via Grahamstown. This report will provide a general outline of each route and highlight some of the potential problem areas along the routes.

It must be emphasized that until such time as the exact dimensions and weights of each of the different parts of the wind turbine are known, it is not possible to accurately determine how the existing road conditions and obstacles will impact on the transport of the Wind Turbine equipment.

It should be further understood that this report is subject to any changes that may result from the outcome of the detailed route survey which still needs to be undertaken, as well as any regulations and restrictions that pertain to the transport of abnormal loads.

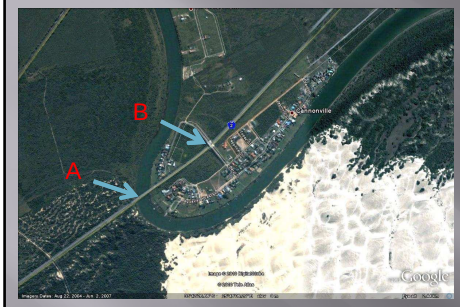
3

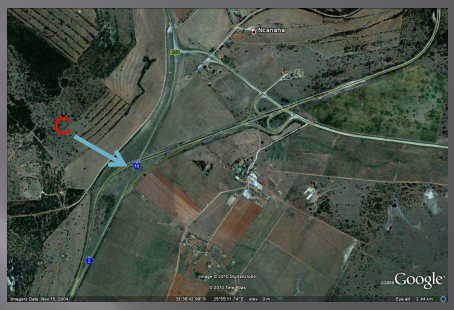
Exit out of the port

From the storage area/quayside the vehicle will proceed out of the main port gates, onto Neptune road, and proceed towards the N2 freeway. Entrance onto the N2, for long loads will be via the off-ramp from the south bound side of the freeway (truck will need to travel against the flow of the traffic – contra flow). For other loads the normal on-ramp to the freeway could be used. Once the truck is on the freeway, a temporary exit across the middle of the road will be required, in order to put the vehicle back onto the right side of the road.

4

Route from entry onto N2 TO N2/N10 split - +/- 31 kms



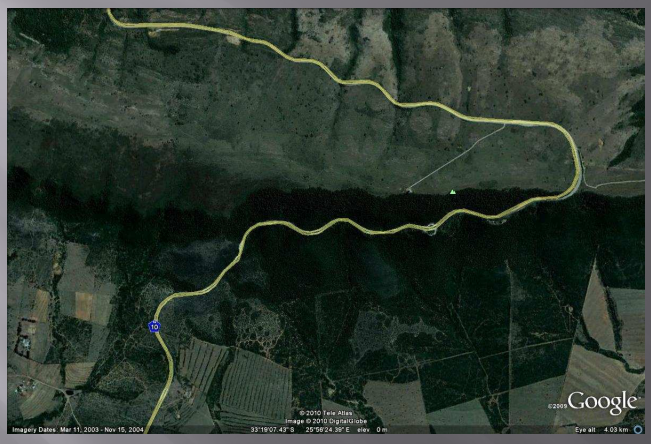


The road from Coega to N2/N10 split is clear until Colchester. Items of concern will be the bridge over the Sundays River (marked A), and the bridge, over the road, approximately 500 meters later (marked B). The road for Colchester to the interchange appears to be clearclear.

At the interchange the road to Cookhouse (N10), crosses under the road to Grahamstown (N2) – marked C.

5

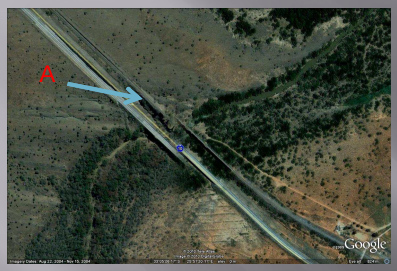
Route from Interchange to Olifantskop Pass +/- 30 kms

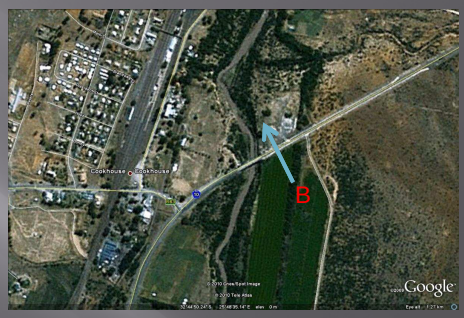


The next major obstacle along this road is the Olifanfskop Pass. The steep gradients, in places, and the twisting road make the transport of the long items (blades and towers) difficult. If this route is used it may be a requirement that the traffic department closes the pass to normal traffic, whilst the convoy traverses the pass. This is because the vehicle will be required to use both sides of the road to navigate the twisty sections of the pass. The steeper gradients will slow the heavy loads (nacelle, bottom tower section) considerably.

6

Olifantskop Pass to Cookhouse +/- 71 kms

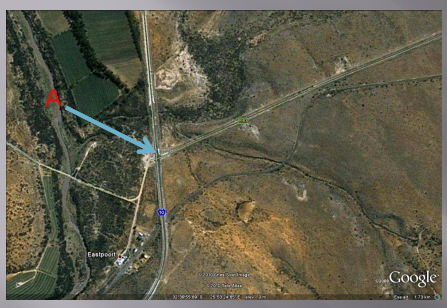


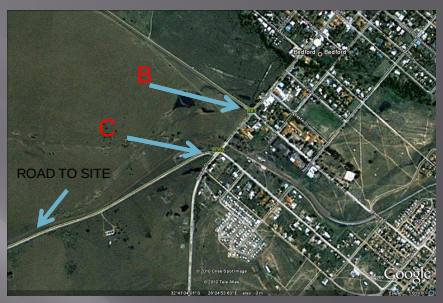


The road from Olifantskop Pass to Cookhouse is generally clear. There are bridges along the road, but the biggest of these is the bridge over the Little Fish River (marked A) and the bridge at Cookhouse (marked B). There will be instances along this section, where the vehicles need to cross over the center of the road, this will be controlled by the escort drivers.

7

Cookhouse to Bedford +/- 34 kms





Approximately 13 kilometers after leaving Cookhouse, turn right off the N10 onto the R63(marked A). At this intersection it may be necessary to do earthworks to ensure that the loads can safely negotiate the corner. There is also a possibility that “Road Furniture” i.e. sign-boards will need to be removed.

After 21 kilometers the trucks will arrive in Bedford. The entrance into Bedford (marked B) and the intersection for the road to site (marked C), are of concern and it is likely that modifications will need to be made to both intersections, in order for the trucks to pass. Intersection C will also be a problem for the trucks coming from Grahamstown. As with other intersections any “Road Furniture” will need to be removed.

8

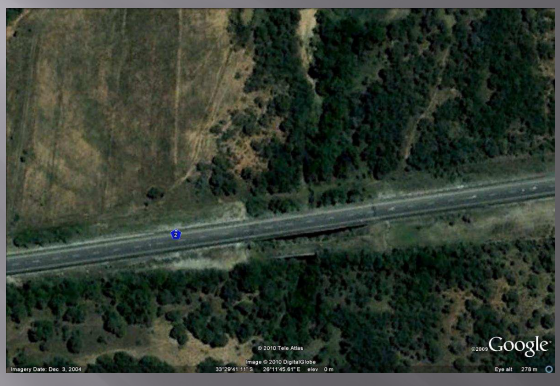
Bedford to site

The road from Bedford to site appears to be a gravel road. This needs careful examination as multiple heavy/abnormal loads could lead to the break-down of the road, and the road may need to be widened in places. For 30 turbines one can expect at least 200 very abnormal loads of which 60 loads will be very heavy (loads of +/- 70 tons), which means that the road will probably need occasional grading and compacting. A heavily rutted road can also cause damage to the equipment. Transport may have to take place during the dry season, to avoid further damage to the road.

9

Alternate Route via Grahamstown

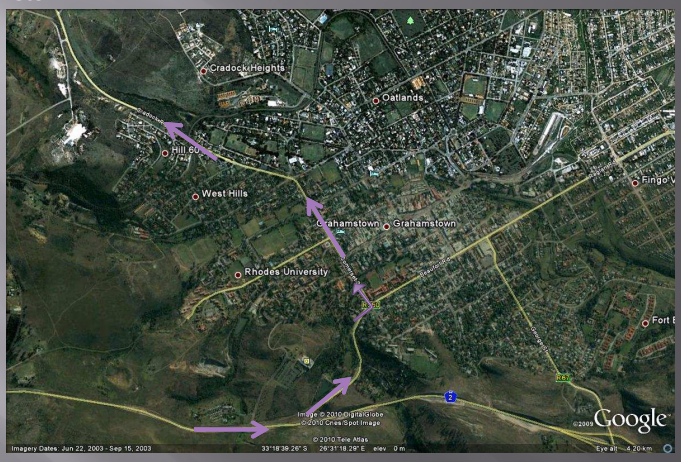
N2/N10 Intersection to Grahamstown - +/- 90 kms



The road from the N2/N10 Intersection to Grahamstown is generally clear. The biggest bridge along the route is indicated above. There are a few twisty sections just before Grahamstown which may need closer inspection.

10

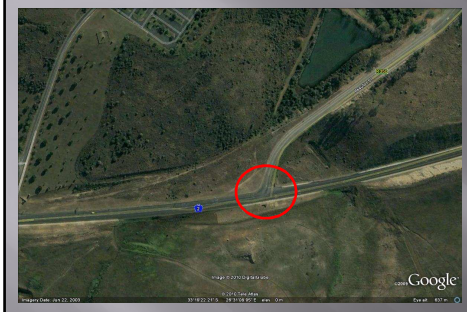
Grahamstown



Route from the N2 through Grahamstown

11

Grahamstown

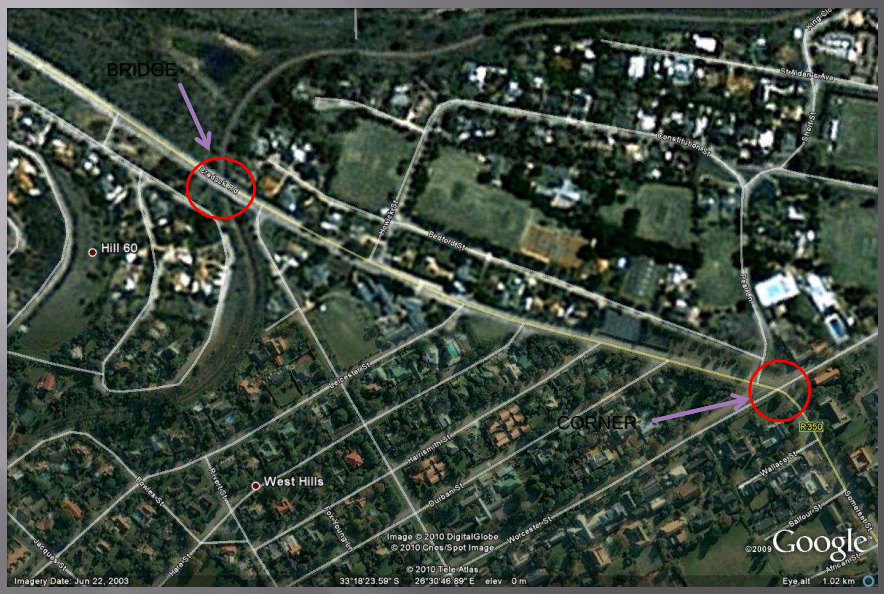


The two intersections indicated above could present a problem, especially for the blade and tower loads. The second intersection is the biggest concern due to the fact that the area is built up, leaving very little opportunity to carry out any modifications to the intersection. A detailed inspection needs to be carried out before any final conclusions can be made.

Other potential problems in Grahamstown (indicated on the following page) are the corner along Craddock Road, and a bridge over a river, further along the same road.

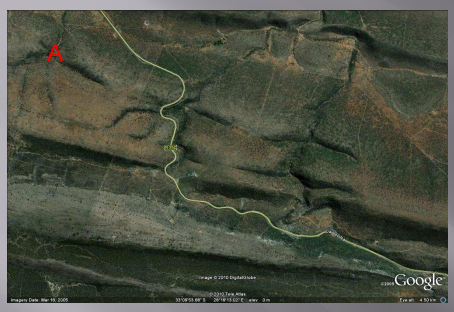
12

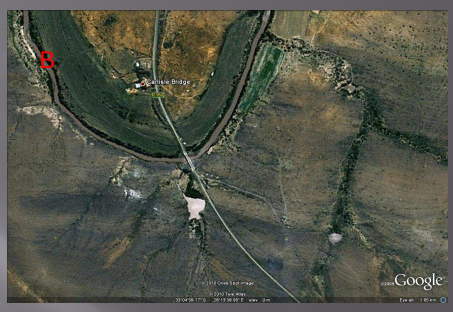
Grahamstown



13

Grahamstown to Bedford – R350 - 94 kms





The two concerns along this road are

1. The twisty section, shown in Photo A, which indicates a small pass and needs further inspection
2. The Bridge over the Little Fish River at Carlisle Bridge.

Generally there does not appear to be any other possible obstacles along this portion of the route.

On entering Bedford, the intersection marked C on page 8 will again pose a problem, and one can expect that modification would need to be done to the road to allow the bigger trucks to pass through.

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General Notes

The desktop route study only offers a very broad overview of the proposed route and does not include the following potential obstructions:
Electrical and Telephone cables
Road Furniture
Natural obstructions such as trees
Bridges
Restrictions imposed by transporting abnormal equipment

Only once all of the obstructions have been identified is it possible to work out if these obstructions can be overcome, or does another route need to be looked at.

An integral and extremely important factor in transporting large loads are the rules and regulations controlling the transport of abnormal loads as this also plays a part in the final selection of a suitable route.
It is therefore worthwhile looking at a few of the major points concerning abnormal transport.

Definition of an Abnormal Load
An indivisible object that, due to its dimensions and/or mass, cannot be transported on a vehicle or vehicles without exceeding the limitations of the dimensions or mass as described in the National Road Traffic Regulations, 2000.
It is therefore understood that the conditions under which a permit is granted for an abnormal load becomes more stringent as the degree of abnormality increases .

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Before permits are granted for abnormal transport, a route survey/clearance needs to be submitted to the authorities. In addition accurate drawings of the load and the vehicle/trailer combination also need to be submitted.

Generally abnormal loads may not be driven after dark, nor may they be driven over weekends.

Close co-operation and co-ordination needs to take place with local authorities especially when it comes to transporting loads either through towns or along busy routes – they may impose certain restrictions regarding these loads.

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Conclusion

Of the two routes investigated in this route study, we would recommend that the route via Cookhouse is used. Our major concern about using Grahamstown, besides the problems highlighted in this study, is that the local authorities may not grant permission, or severely limit the times when the abnormal loads can pass through town, especially on an on-going basis, which is what would happen on a project of this nature.

Although the pass at Olifantskop is a concern, at this point we believe that the route via Cookhouse will be the more suitable option as there will be less inconvenience to the general public when the loads are transported.

Should you require any further assistance, please do not hesitate to contact us.

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