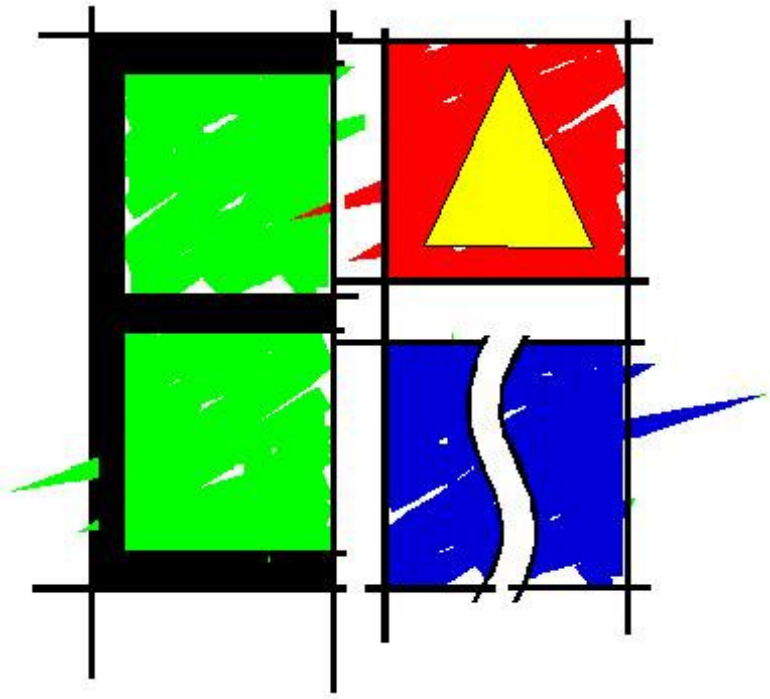
TRAFFIC IMPACT STATEMENT

FOR THE

PROPOSED BELMONT VALLEY GOLF COURSE IN GRAHAMSTOWN



March 2012

Prepared for: **Belmont Devco (Pty) Ltd**
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Prepared by: **Engineering Advice and Services (Pty) Ltd**
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1. INTRODUCTION

1.1 BACKGROUND

Engineering Advice & Services (Pty) Ltd was appointed by Belmont Devco (Pty) Ltd during January 2012 to conduct a traffic impact statement for the proposed development of a golf course in the Belmont Valley, outside Grahamstown on Portion 6 of the Farm Belmont Valley and Portions 1 and 2 of the Farm Willow Glen No. 445, Grahamstown.

1.2 METHODOLOGY

The approach followed in conducting the traffic impact statement was in accordance with accepted general practice.

Given that the proposed development is accessed from a provincial Minor Road (MN50685) and that existing traffic volumes are minimal and related to existing farms along the route, the methodology used was as follows:

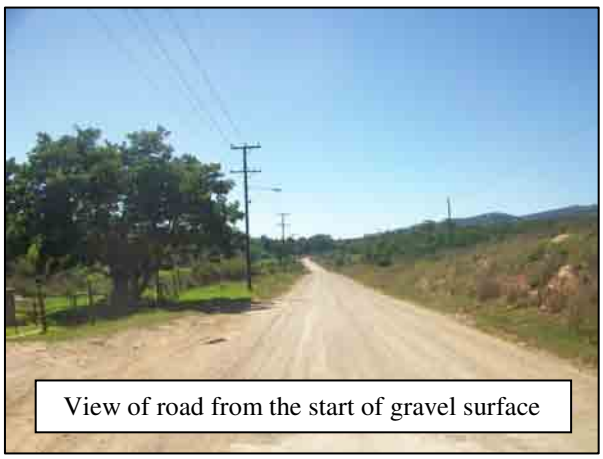
- The road was assessed in order to determine current road and traffic safety conditions between Grahamstown and the proposed Golf Course access;
- Traffic volumes generated by the proposed golf course development were determined;
- Taking cognizance of the proposed development generated traffic volumes, recommendations were tabled to ensure that the road remains in an acceptable operational condition in terms of both road surface condition and traffic safety;
- The potential impacts were assessed in terms of environmental significance.

1.3 PROPOSED DEVELOPMENT

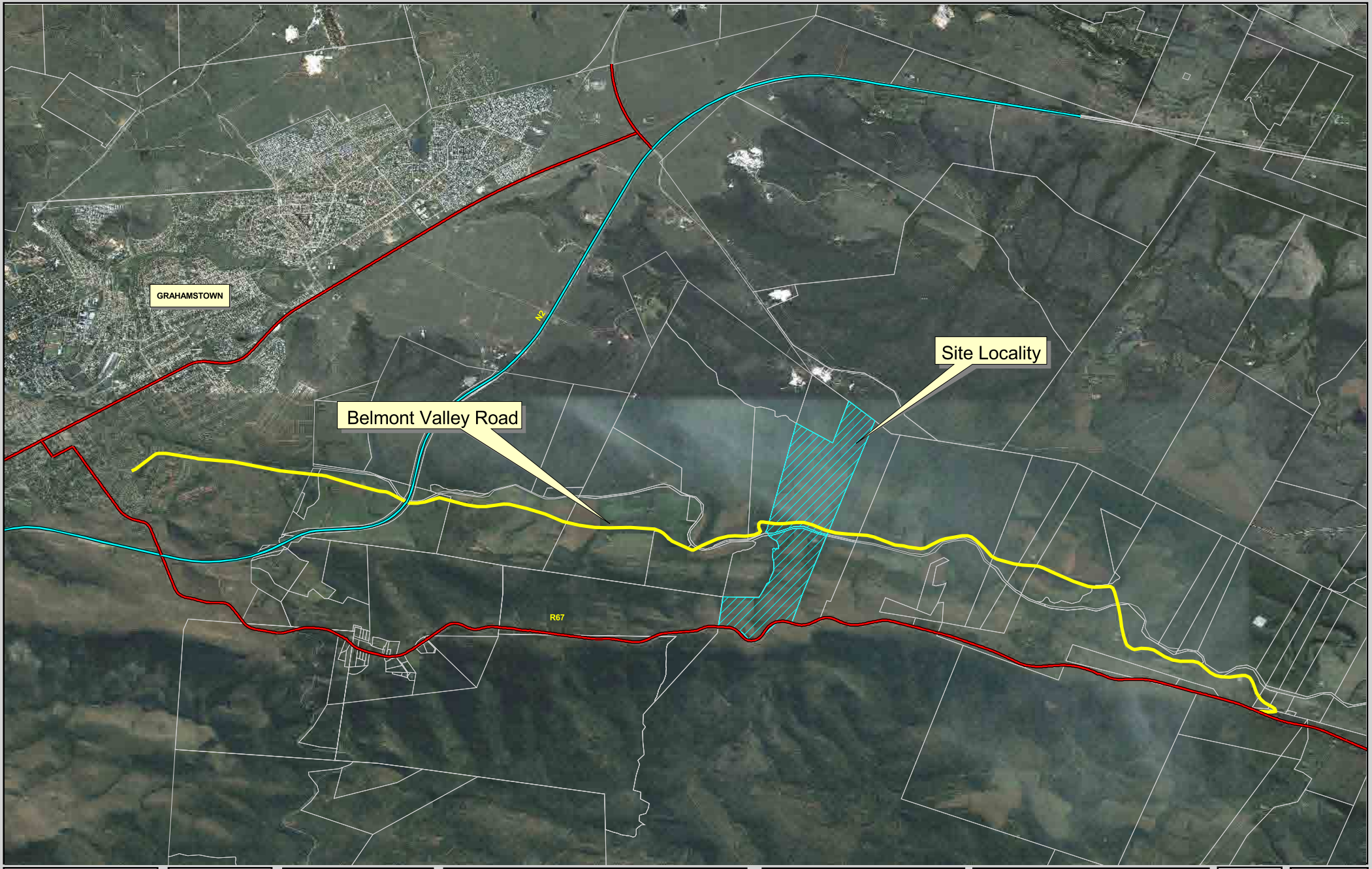
The proposed development comprises of an 18-hole golf course located both north and south of the Belmont Valley Road as indicated on the layout plan attached as **Annexure A**. The clubhouse, driving range and 6 holes will be located south of the road and 12 holes north of the road. Two pedestrian crossing points are proposed to facilitate movement between the holes on the course. Vehicular access is proposed via an existing access road onto portion 2 of farm 445.

1.4 STUDY AREA

Given that the brief was to investigate the impact of traffic generated by the proposed golf course development on MN 50685, and that the road carries low volumes of traffic daily, the study area was restricted to the road itself between Grahamstown past the proposed golf course development to the R67.



View of road from the start of gravel surface



Projection:
Gauss-Conform

Project Title:
PROPOSED BELMONT VALLEY GOLF COURSE DEVELOPMENT - TRAFFIC IMPACT ASSESSMENT

Drawing Title:
FIGURE 01 - LOCALITY PLAN

Approved:

Engineer: Date:

Client: Date:

50 0 50 Meters

SCALE 1 : 50,000

Project No:
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Date: FEBRUARY 2012

Prepared: AM

Checked: CH

Dwg No:
FIGURE 1

Engineering Advice and Services

Tel: (041) 581 2421

2. DATA COLLECTION

2.1. EXISTING ROAD NETWORK

Belmont Valley Road is a minor provincial road **(MN50685)** which is surfaced for the initial 750m from York Street. This portion of the road is kerbed, comprises a 3.7m lane per direction and can be considered to be in a fair condition. The remaining 12.5 km of the road to the R67 in the east can be categorised as a low-volume gravel road which serves farms in the Belmont Valley east of Grahamstown. The road is 6m wide and appears to be in a fair to good condition.

Regional Route 67 is a route of national and provincial significance between Grahamstown and Port Alfred and comprises of a 3,5m wide traffic lane and 1.m wide gravelled shoulders in each direction. The posted speed limit is 80km/h in the vicinity of the site. The road can be considered to be in a fair to poor condition.

2.2. EXISTING TRAFFIC VOLUMES

The road presently carries low traffic volumes related to the farms situated along the route. Very few vehicles were observed during the course of the road assessment.

3. ROAD CONDITION AND SAFETY ASSESSMENT

A basic road condition and road safety assessment of the road section was conducted in accordance with the requirements of the **South African Road Traffic Safety Manual** [(1)]. The assessment was undertaken independently with no undue influence by any organization or person.

Note that no guarantee is made that every deficiency has been identified. Further, should all the deficiencies identified during this assessment not be addressed nor any of the recommendations adopted for implementation, this would NOT imply nor confirm that the road is "safe". However, addressing the deficiencies and adopting the recommendations should improve the level of safety of the road.

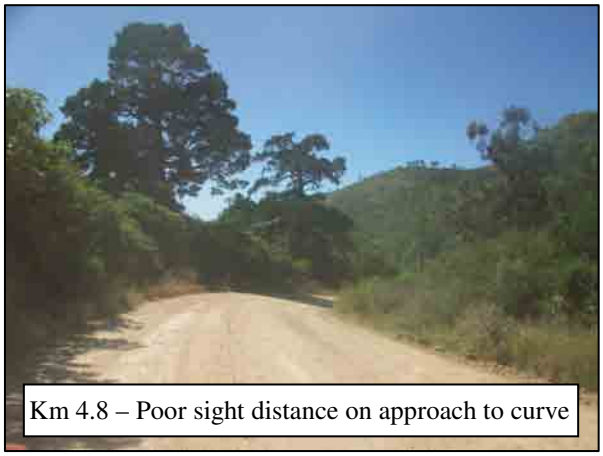
Inspection of the road revealed a number of existing and potential safety problems. These problems are indicated on **Figure 2** overleaf and described in further detail below. Note that km distances referred to have been measured from the start of the gravel section.

3.1 ROAD ALIGNMENT AND SIGHT DISTANCE

The road generally has a straight alignment with gentle curves between km 2 and 2.5, at km 4.8. Sharp curves occur at km 5.1, between km 5.8 and km 6.1, at km 8.2, km 9.87, km 10.5 and between km 11.2 and 12.0.

Sight distance is restricted on the approaches to the curves, in particular at the combined sharp curves between km 5.8 and km 6.1, the sharp curves at km 9.7 and 10.5 and at the hairpin bend at km 12.3.

Sight distance is impaired by bridge abutments as the road passes under the N2 at km 2.1.



Km 4.8 – Poor sight distance on approach to curve

Sight distance on the approaches to concealed entrance is also impaired by overgrown vegetation along the road at km 9.

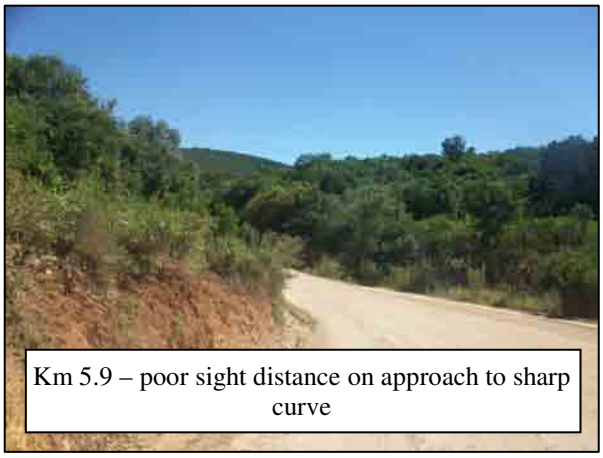
3.2 ROAD SIGNS AND FIXED OBJECTS

In general, advance warning signage along the section of road assessed is inadequate and can be improved.

In particular, signage warning motorists of changes in the road surface from asphalt to gravel, changes in the road alignment, fixed objects such as bridge abutments and culverts and a general warning of the slippery road surface, should be installed. Delineation of the sharp curves should also be introduced. Some signs are obscured by vegetation.

Recommended speed limit signs should also be provided at km 0.

At km 12, a speed limit of 100km/k has been posted, and should be changed to 60km/h.



Km 5.9 – poor sight distance on approach to sharp curve

3.3 ROAD SURFACE

The road surface appears to be in a fair condition. However, substantial fine material is evident along the whole length of the road, creating dust during dry conditions and a slippery surface during wet conditions.

During dry conditions, dust will impair drivers' vision, while during wet conditions; drivers' face the possibility of losing control of their vehicles.

Km 2.35 – Dusty road surface impairing visibility

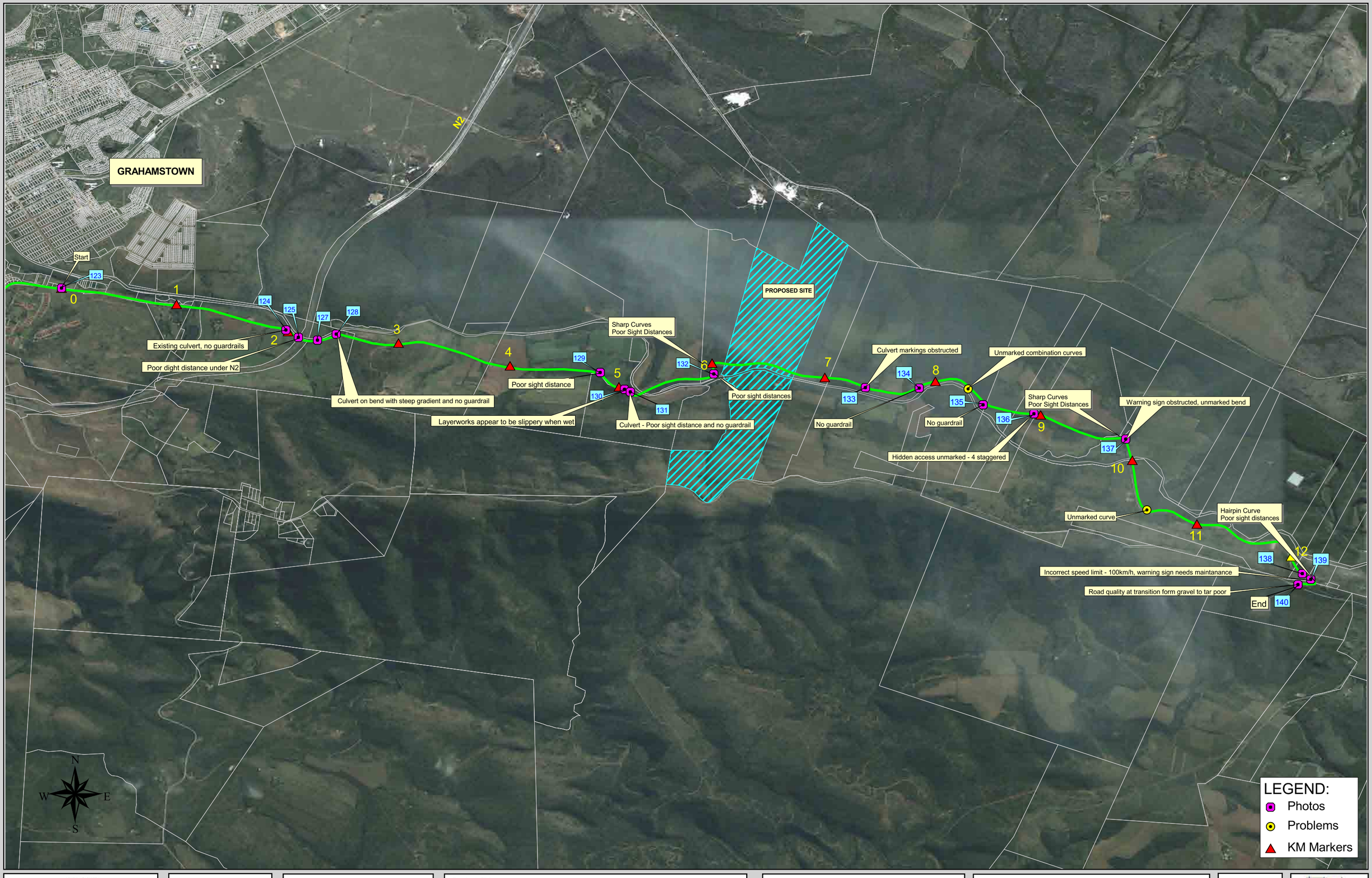
3.4 ROAD DRAINAGE

Culverts are in place at km 2.0, 2.5 and 5.1, are not visible and have no protection for road users.

3.5 OVERGROWN VERGES

Vegetation encroaching on the road at km must be cleared in order to improve sight distance at km 2.5 and km 9.0.

Km 5.1 – Poor sight distance, unmarked and unprotected culvert



Projection:
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Project Title:
PROPOSED BELMONT VALLEY GOLF COURSE DEVELOPMENT - TRAFFIC IMPACT ASSESMENT

Drawing Title:
FIGURE 02 - TRAFFIC SAFETY & ROAD CONDITION ASSESSMENT OF MN50685 - LOCATION OF PROBLEMS

Approved:

Engineer: *Date:*

Client: *Date:*

200 0 200 400 600 800 1000 Meters

SCALE 1 : 35,000

Project No:
867\GIS\Problems.apr
Date: MARCH 2012

Prepared: JC

Checked: CH

Dwg No:

FIGURE 2

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4. TRIP GENERATION

Currently, an average of between 500 and 680 rounds of golf are played at the Grahamstown Golf Club per week. The busiest days are Wednesdays, Thursdays and Saturdays when an average of approximately 50 to 70 rounds are played on each of these days.

It is assumed that each round of golf would generate approximately one inbound and one outbound trip, and further assumed that there would be some sharing of trips (conservatively estimated at 10%). Although the number of rounds played is relatively low considering that a maximum of 60 four-balls (240 rounds) could be accommodated in one day, it is considered that these numbers are representative of the current situation as the number of rounds played at courses throughout the country has been decreasing over the past few years due to a variety of factors.

Notwithstanding this situation, it is considered that the development of a new golf course would stimulate activity and result in an increase in rounds played.

As such it is considered that the current average daily high of 60 rounds could increase by up to 20% on weekdays and as much as 50% on Saturdays.

Given a maximum of 90 rounds played on a Saturday, the expected trip generation for the new golf course is estimated as follows:

Trip Generation	=	90 rounds x 2 trips per round x 90%
	=	168 trips
Split (in: out)	=	50: 50

The inbound trips would arrive between 06:30 and 14:00 (latest that round would tee off) and the outbound trips would depart between 12:00 and 19:00.

5. ROAD CATEGORY AND CONDITION

The existing and projected traffic volumes (golf course related) result in the road falling into the upper range of the medium category or the lower range of the high category as indicated in **Table 1** below.

Table 1: Rural Road Categories by Traffic Volume

Daily traffic (v/d)	Category	Proposed road surface
0 – 50	Low	Gravel (75 mm)
50 – 180	Medium	Gravel (150 mm)
180 – 350	High	Gravel (150 mm)
Over 350		Surfaced

Given the condition of the road, which is in a fair to good condition, and the projected daily traffic volumes, the road would remain as a gravel surfaced road.

6. PROPOSED MITIGATORY MEASURES

Measures to improve the safety of the existing road and to mitigate against the impact of the additional traffic volumes generated by the proposed golf course development are indicated on **Figure 3** overleaf.

6.1 ROAD SURFACE MEASURES

6.1.1 Road Surface

The road is currently in a fair to good condition. Based on the amount of dust observed during the assessment, it is clear that the road was bladed in the days preceding the assessment.

During dry periods the dust will hang in the air when disturbed and can interfere with visibility, particularly if the weather conditions are wind still.

One or two sections of the road appeared to have clayey material which leads to a slippery road surface during wet conditions.

During the construction phase of the development, construction vehicles are likely to cause damage to the road surface. As such it is recommended that after construction is complete, the road surface be regravelled and compacted to ensure that the riding quality of the road remains at least at a similar standard after development than it currently is.

Given that the traffic volumes are likely to increase substantially as a result of the proposed golf course, the developer should perhaps contribute towards annual maintenance of the road in order to ensure that it remains in a good condition.

6.1.2 Dust

Dust will be prevalent for a few days after the road is bladed as during the blading process, fine material from the road edge is worked into the road surface. However, the dust will generally dissipate after a few days.

It is also noted that the higher the speed of vehicles, the more dust will be created. Speed limits of 60km/h would therefore result in less dust.

6.2 TRAFFIC SAFETY MEASURES

6.2.1 Traffic Signs

The main concern from a traffic safety perspective is the lack of road signage along the entire length of the road.

Of particular concern is the lack of advance warning of sharp curves and the poor sight distance on the approaches to these curves.

It is considered that traffic using the road is currently at risk and additional road users would also be at risk should suitable advance warning of hazards not be provided.

While vehicle operating speeds can be relatively high along the majority of the length of the road given long straight sections, problems can occur at curves due to lack of advance warning and as a result of visibility being impaired by dust. As such, a general speed limit should be posted together with recommended speeds at sharp curves.

The existing 100km/h signage at km 12.0 at the end of the road should be replaced with a 60km/h sign.

Delineation of the curves as well as culverts is also recommended to ensure safe operation.

6.2.2 Guardrails

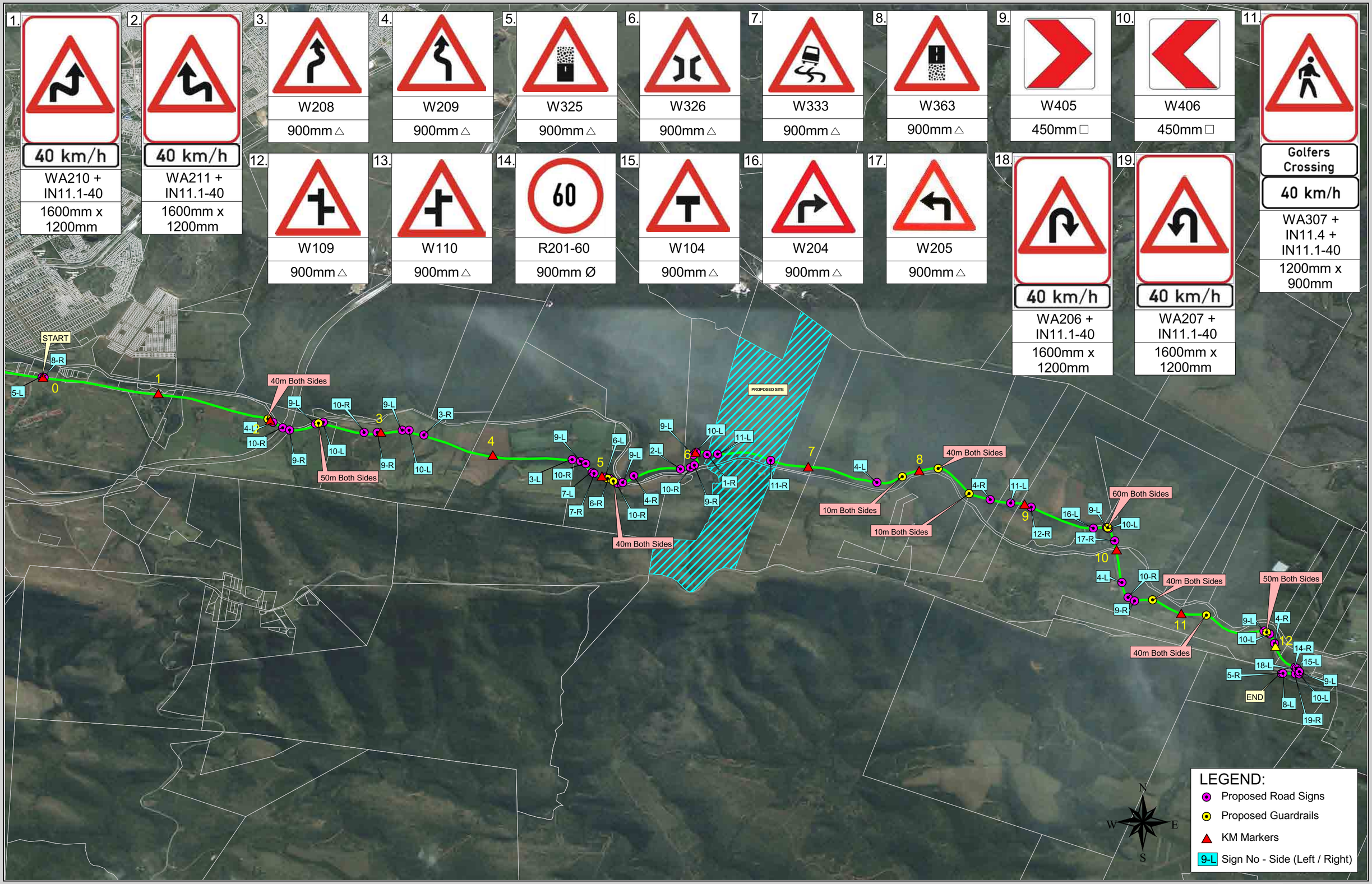
No protection is afforded those road users who may lose control of vehicles at culverts and at embankments. Guardrails should be provided at these locations in order to improve safety of the road.

6.2.3 Pedestrian Crossings

The crossings between the two sections of the golf course must be clearly demarcated by means of advance warning signage on Belmont Valley Road.

6.2.4 Verge Clearing

Bush clearing should be conducted where vegetation encroaches onto the road surface in order to improve sight distances and ensure that motorists in opposing directions are able to pass each other.



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Project Title:
PROPOSED BELMONT VALLEY GOLF COURSE DEVELOPMENT - TRAFFIC IMPACT ASSESSMENT

Drawing Title:
PROPOSED REMEDIAL MEASURES ON MN50685

Approved:

Engineer: *Cient:*

Date: *Date:*

250 0 250 500 750 1000 Meters

SCALE 1 : 35,000

Project No: 867/GIS/Problems.apr
Date: FEBRUARY 2012

Prepared: JC
Checked: CH
Dwg No:
FIGURE 3

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7. SIGNIFICANCE OF IMPACTS

The identified impacts are listed in **Tables 2** to **4** below, and have been evaluated in terms of the criteria contained in the **EIA Final Scoping Report** [(2)], in order to determine the environmental significance of each impact.

The evaluation criteria are attached as Annexure B.

Table 2: Ranking of Impacts - Descriptions

Impact	Effect			Likelihood
	Temporal	Spatial	Severity/Benefit	
Increased traffic	Permanent	Study area	Severe impact	Definite
Increased accidents	Permanent	Study area	Slight impact	May occur
Increased dust	Long term	Study area	Slight impact	May occur
Increased noise	Long term	Study area	Moderate impact	Probable
Construction traffic	Short term	Study area	Slight impact	Definite

Table 3: Ranking of Impacts - Scores

Impact	Effect			Effect Score	Likelihood
	Temporal	Spatial	Severity / Benefit		
Increased traffic	4	2	4	10	4
Increased accidents	4	2	1	7	2
Increased dust	3	2	2	7	2
Increased noise	3	2	2	7	3
Construction traffic	1	2	4	7	4

Table 4: Ranking of Impacts – Environmental Significance

Impact	Score	Significance
Increased traffic	14	High
Increased accidents	9	Moderate
Increased dust	8	Moderate
Increased noise	10	Moderate
Construction traffic	11	Moderate

8. CONCLUSIONS

The following conclusions can be drawn from the study:

- Belmont Valley Road can be considered to be in a fair to good condition at present although it is noted that this condition could be attributed to low traffic volumes;
- Excessive fine material was observed along the road creating visibility concerns in dry weather and slippery conditions in wet weather;
- Road traffic signage is lacking along the entire length of the road, particularly on the approaches to and through sharp curves;
- Upgrading of the road traffic signs will contribute significantly to safer operating conditions;
- The new golf course can be expected to generate an average of 180 vehicle trips (1 trip = 1 direction)on a the three busiest days each week (Wednesday, Thursdays and Saturdays) with fewer trips on the remaining days;
- Based on the anticipated daily traffic volumes, the road can be categorized as a medium to high-volume gravel road;
- Construction traffic is anticipated to damage the road during the construction phase, particularly the section between Grahamstown and the proposed course;
- The provision of additional road traffic signage as indicated on **Figure 3**, will result in safer operation;
- Given that the golf course development will result in an increase of traffic making use of the road, the development should contribute towards maintenance required to ensure that the road remains in a suitable condition after construction has been completed.

9. RECOMMENDATIONS

In view of the findings of this study, it is recommended that:

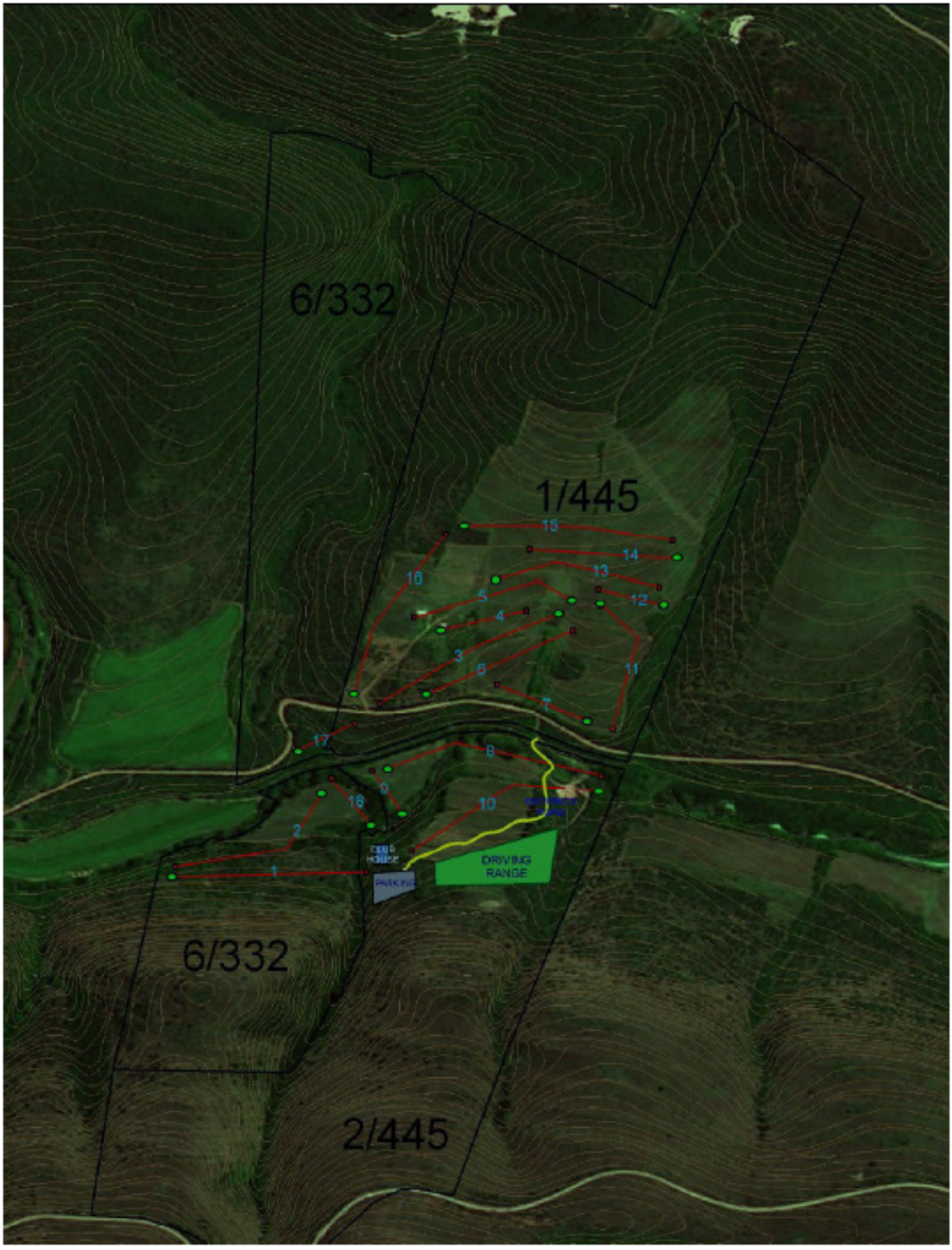
- The developer install additional road traffic signs as indicated on **Figure 3**, and that such signage be installed as soon as development commences;
- The developer ensure that the standard of the road remains at an acceptable level during construction;
- The developer upgrade the road to a suitable gravel standard once construction of the golf course has been completed.

8. REFERENCES

1. CES, **proposed Golf Course Development at Belmont Valley, Grahamstown – Final Environmental Scoping Report**, Belmont Devco, December 2011.
2. Transportation Research Board, **Highway Capacity Manual**, 2000.
3. De Leuw Cather & SENA, **SADC Road Traffic Signs Manual**, Department of Transport, June 1999.

ANNEXURE A

Proposed Golf Course Layout


6/332
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15
14
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16
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2
1
CLUB HOUSE
PARKING
DRIVING RANGE
6/332
2/445

ANNEXURE B

Environmental Significance Ranking and Evaluation Criteria

EFFECT	**Temporal scale**			**Score**
	Short term	Less than 5 years		1
	Medium term	Between 5 and 20 years		2
	Long term	Between 20 and 40 years (a generation) and from a human perspective almost permanent.		3
	Permanent	Over 40 years and resulting in a permanent and lasting change that will always be there		4
	Spatial Scale			
	Localised	At localised scale and a few hectares in extent		1
	Study area	The proposed site and its immediate environs		2
	Regional	District and Provincial level		3
	National	Country		3
	International	Internationally		4
	*	**Severity**	**Benefit**	
	Slight / Slight Beneficial	Slight impacts on the affected system(s) or party(ies).	Slightly beneficial to the affected system(s) or party(ies).	1
	Moderate / Moderate Beneficial	Moderate impacts on the affected system(s) or party (ies).	An impact of real benefit to the affected system(s) or party(ies).	2
	Severe / Beneficial	Severe impacts on the affected system(s) or party(ies).	A substantial benefit to the affected system(s) or party(ies).	4
	Very Severe / Very Beneficial	Very severe change to the affected system(s) or party (ies).	A very substantial benefit to the affected system(s) or party(ies).	8
LIKELIHOOD	**Likelihood**			
	Unlikely	The likelihood of these impacts occurring is slight		1
	May Occur	The likelihood of these impacts occurring is possible		2
	Probable	The likelihood of these impacts occurring is probable		3
	Definite	The likelihood is that this impact will definitely occur		4

LIKELIHOOD	EFFECT													
	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	4	5	6	7	8	9	10	11	12	13	14	15	16	17
2	5	6	7	8	9	10	11	12	13	14	15	16	17	18
3	6	7	8	9	10	11	12	13	14	15	16	17	18	19
4	7	8	9	10	11	12	13	14	15	16	17	18	19	20

Table 8-2: Ranking matrix to provide an Environmental Significance

Environmental Significance		
LOW	An acceptable impact which for which mitigation is desirable but not essential; The impact by itself is insufficient even in combination with other low impacts to prevent the development. These impacts will result in either positive or negative medium to short term effects on the social and/or natural environment.	4-7
MODERATE	An important impact which requires mitigation. The impact is insufficient by itself to prevent the implementation of the project but which in conjunction with other impacts may prevent its implementation. These impacts will usually result in either positive or negative medium to long term effects on the social and/or natural environment.	8-11
HIGH	A serious impact which, if not mitigated, may prevent the implementation of the project. These impacts would be considered by society as constituting a major and usually long term change to the (natural and/or social) environment and result in severe effects or beneficial effects.	12-15
VERY HIGH	A very serious impact which may be sufficient by itself to prevent the implementation of the project. The impact may result in permanent change. Very often these impacts are unmitigable and usually result in very severe effects, or very beneficial effects.	16 - 20

ANNEXURE C

Photo Report

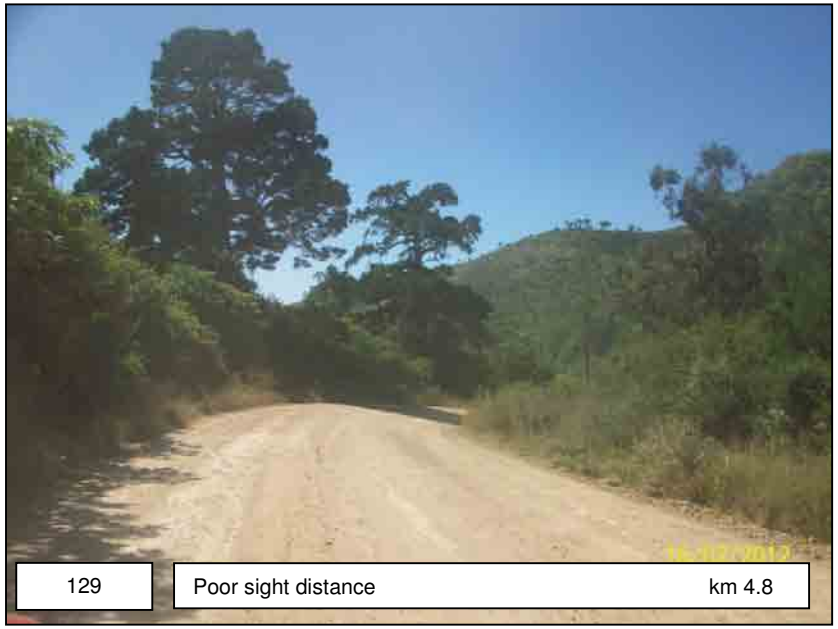
123	Start	km 0

124	Existing culvert, no guardrails	km 2.0

125	Poor sight distance under N2	km 2.1

127	Road Very Dusty

128	Culvert on bend with steep gradient & no guardrail	km 2.5

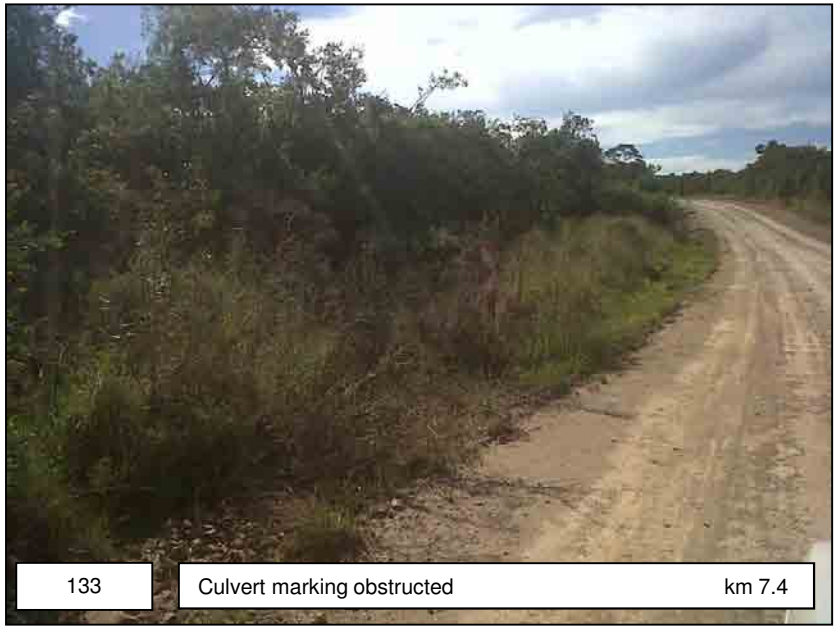


129	Poor sight distance	km 4.8

130	Layerworks appear to be slippery when wet	km 5.1

131	Culvert – poor sight distance and no guardrails	km5.2

132 Poor sight distance km 6.0



133 Culvert marking obstructed km 7.4

134 No guardrail at culvert km 7.9

135 No guardrail at culvert km 8.5

136	Concealed staggered access	km 8.9

137	Warning sign obstructed	km 9.8

138	Obscure signage	km 12.2

139	100km/h speed limit – incorrect signage	km 12.3

140	Road quality poor with edge breakoff and potholes km 12.45