

**PROPOSED STRENGTHENING (PARTIAL RECONSTRUCTION) OF
NATIONAL ROUTE 27 SECTION 7 & 8 BETWEEN WESTERN/ NORTHERN
CAPE BORDER (KM 40.0) AND CALVINIA (KM 70.0)**

CONTRACT R.027-080-2011/1D

SPECIALIST TERMS OF REFERENCE

1. INTRODUCTION

The South African National Roads Agency Limited (SANRAL) is proposing to strengthen and partially reconstruct certain structures on the R27, Sections 7 and 8, between the Western / Northern Cape border (km 40.0) and Calvinia (km 70.0). The proposed project is comprised of the following main components:

- Road works: The upgrading of the approximately 73-km road section by strengthening the existing layers and limited widening of the road.
- Bridges and culverts: The widening of three (of the four) bridges and the possible widening or reconstruction of some of the major culverts.
- Borrow pits: The development of a number of borrow areas for the sourcing of road-building material and crushed aggregates.

Aurecon (Pty) Ltd has been appointed by SANRAL to investigate, plan and execute the project. CCA Environmental (Pty) Ltd (CCA) has been appointed as the independent environmental consultant to compile the necessary Environmental Management Programmes (EMPs) to obtain approval for borrowpit development from the Department of Mineral Resources (DMR) and to undertake a Basic Assessment process in order to ensure compliance with the NEMA Environmental Impact Assessment (EIA) Regulations 2010 and obtained environmental authorisation from the Department of Environmental Affairs (DEA).

As part of this process, CCA proposes to commission a number of specialists to undertake relevant studies in order to determine and assess the potential impacts of the proposed project alternatives on the project environment.

2. GENERAL TERMS OF REFERENCE FOR THE SPECIALIST STUDY

- 2.1 Include the completed form entitled "Details of specialist and declaration of interest" as required by the Department of Environmental Affairs (DEA) (see Attachment A), together with a short CV indicating qualifications and experience, in the specialist report.
- 2.2 Review previous work done in the area and describe the baseline conditions that exist in the study area¹.
- 2.3. Provide a full assessment report on any sensitive areas identified in the road reserve as well as the seven borrow pit sites and four bridge sites.

¹ "Study area" refers to the length of the road sections included in the proposed project and includes the seven potential borrow pit sites as well as the four bridge sites.

- 2.4 Provide a brief outline of the approach used in the study. Assumptions, sources of information and the difficulties with predictive models must also be clearly stated.
- 2.5 If applicable, provide a brief description of any consultation process that was undertaken, as well as a brief description and copies of any comments that were received during any consultation process.
- 2.6 Identify and assess potential impacts of the construction, operational and closure/decommissioning phases, as relevant in the case of each site. To ensure that specialists use a common standard, the determination of the significance of the assessed impacts will be undertaken in accordance with CCA's Convention for Assigning Significance Ratings to Impacts (see Attachment B). A table template for reporting on impact assessment is provided in Attachment C for use in assessment reports.
- 2.7 Identify feasible ways in which impacts could be mitigated and benefits enhanced giving an indication of the likely effectiveness of such mitigation and how these could be implemented in the construction and management of the proposed development.
- 2.8 Identify and assess any cumulative impacts arising from the proposed project.
- 2.9 Identify and list all legislation and permit requirements that are relevant to the development proposal in the specific field of expertise, and provide guidance for compliance with any relevant legislation.
- 2.10 Indicate the reliability of information utilised in the assessment of impacts, as well as any constraints to which the assessment was subjected (e.g. any areas of insufficient information or uncertainty).
- 2.11 Indicate whether any of these areas of insufficient information or uncertainty associated with the specialist study would impact on the decision whether or not to authorise the proposed project.
- 2.12 Comply with guidelines on specialist study requirements for EIA provided by the Department of Environmental Affairs (DEA) and the Department of Environmental Affairs and Development Planning (DEA&DP) of the Western Cape Province², as well as the requirements listed in Sections 17 and 32(2) of the EIA Regulations 2010 dated 18 June 2010 promulgated in terms of Chapter 5 of NEMA.

3. SPECIFIC TERMS OF REFERENCE

Three specialist studies are anticipated at this stage, namely:

1. Vegetation;
2. Freshwater Ecology; and
3. Heritage – archaeology and cultural history.

The specific terms of reference for each of these studies are set out below.

3.1 VEGETATION STUDY

- 3.1.1 Provide a broad, baseline description of the vegetation of the study area, placing it in a regional context. Reference should also be made of any bioregional maps of the area.

² Please note that DEA&DP recently updated these guidelines. The August 2010 versions of the guidelines are available on the DEA&DP Webpage <http://www.capecapegateway.gov.za/eng/yourgovernment/gsc/406/services/11537/10199>.

- 3.1.2 Map the vegetation communities and associated conservation value/sensitivity of the study area and identify any areas of specific concern (e.g. high sensitivity and/or conservation status).
- 3.1.3 Provide guidance on any permits that would be required from any organ of state in respect of the conservation or removal of vegetation in the study area.
- 3.1.4 Provide specific information relating to the vegetation of each borrow pit and bridge site, with reference to any species of special concern and their conservation status, which can be used as baseline information for the assessment of potential impacts of the proposed project.
- 3.1.5 Investigate ecological/biodiversity processes that could be affected by the proposed project.
- 3.1.6 Identify, describe and assess the impacts of the proposed activities and any activity alternatives on the vegetation.
- 3.1.7 Recommend appropriate, practicable mitigation measures that will reduce all major (significant) impacts or enhance potential benefits, if any.

3.2 FRESHWATER ECOLOGY

- 3.2.1 Provide a broad, baseline description of the freshwater systems (including rivers, watercourses and wetlands) of the study area, placing it in a regional context.
- 3.2.2 Provide specific information relating to the freshwater systems on each borrow pit and bridge site, with reference to locations of special concern and their conservation status and/or ecological importance, which can be used as baseline information for the assessment of potential impacts of the proposed project.
- 3.2.3 Provide guidance on any special standards prescribed by the Department of Water Affairs (DWA) or any other authority in relation to the freshwater systems included in this study.
- 3.2.4 Identify, describe and assess the impacts of the proposed activities and any activity alternatives on freshwater ecosystems.
- 3.2.5 Recommend appropriate, practicable mitigation measures that will reduce all major (significant) impacts or enhance potential benefits, if any.
- 3.2.6 Advise on the appropriate procedure(s) and format(s) to be followed in relation to a Water Use Licence (WUL) Application for Section 21 (a), (c) and (i) water uses (taking water from a water resource; impeding or diverting the flow of water in a watercourse; and altering the bed, banks, course or characteristics of a watercourse) as required for the proposed project.
- 3.2.7 Compile the documentation required for a Water Use Licence (WUL) Application for submission to the relevant authority.

3.3 HERITAGE (ARCHAEOLOGY AND CULTURAL HISTORY)

- 3.3.1 Provide a broad, baseline description of the archaeological and cultural history resource potential of the study area, placing the sites in a local and regional context.
- 3.3.2 Provide specific information relating to the archaeology and cultural history resources of each borrow pit and bridge site, with reference to locations and/or structures of special concern and their conservation significance, which can be used as baseline information for the assessment of potential impacts of the proposed activities and any activity alternatives.

- 3.3.4 Identify, describe and assess the impacts of the proposed activities and any activity alternatives on archaeology and cultural history resources.
- 3.3.5 Recommend appropriate, practicable mitigation measures that will reduce all major (significant) impacts or enhance potential benefits, if any.
- 3.3.6 Provide guidance on the requirement of any permits from the South African Heritage Resources Agency (SAHRA) and/or the relevant provincial heritage authority.
- 3.3.7 If necessary, compile an application for permission for the proposed project in compliance with the National Heritage Resources Act (No. 25 of 1999) for submission to SAHRA and/or the relevant provincial heritage authority, if necessary.

AUR02R27/Specialists/Specialist Terms of Reference – 5 April 2011

ATTACHMENT A

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST



environmental affairs

Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

DETAILS OF SPECIALIST AND DECLARATION OF INTEREST

	(For official use only)
File Reference Number:	12/12/20/
NEAS Reference Number:	DEAT/EIA/
Date Received:	

Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010

PROJECT TITLE

PROPOSED STRENGTHENING (PARTIAL RECONSTRUCTION) OF NATIONAL ROUTE 27 SECTION 7 & 8 BETWEEN WESTERN/ NORTHERN CAPE BORDER (KM 40.0) AND CALVINIA (KM 70.0) - CONTRACT R.027-080-2011/1D

Specialist:			
Contact person:			
Postal address:			
Postal code:		Cell:	
Telephone:		Fax:	
E-mail:			
Professional affiliation(s) (if any)			

Project Consultant:	CCA Environmental (Pty) Ltd		
Contact person:	Jonathan Crowther / Ena de Villiers		
Postal address:	PO Box 10145, Caledon Square, CAPE TOWN		
Postal code:	7905	Cell:	082 777 1477
Telephone:	(021) 461 1118	Fax:	(021) 461 1120
E-mail:	jonathan@ccaenvironmental.co.za / ena@ccaenvironmental.co.za		

4.2 The specialist appointed in terms of the Regulations

I, _____, declare that --

General declaration:

- I act as the independent specialist in this application
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

Signature of the specialist:

Name of company (if applicable):

Date:

ATTACHMENT B

CONVENTION FOR ASSIGNING SIGNIFICANCE RATINGS TO IMPACTS

CONVENTION FOR ASSIGNING SIGNIFICANCE RATINGS TO IMPACTS

Specialists will consider seven rating scales when assessing potential impacts. These include:

- extent;
- duration;
- intensity;
- status of impact;
- probability;
- degree of confidence; and
- significance.

In assigning significance ratings to potential impacts before and after mitigation specialists are instructed to follow the approach presented below:

1. The core criteria for determining significance ratings are “extent” (Section 6.3.1), “duration” (Section 6.3.2) and “intensity” (Section 6.3.3). The preliminary significance ratings for combinations of these three criteria are given in Section 6.3.7.
2. The status of an impact is used to describe whether the impact will have a negative, positive or neutral effect on the surrounding environment. An impact may therefore be negative, positive (or referred to as a benefit) or neutral.
3. Describe the impact in terms of the probability of the impact occurring (Section 6.3.5) and the degree of confidence in the impact predictions, based on the availability of information and specialist knowledge (Section 6.3.6).
4. Additional criteria to be considered, which could “increase” the significance rating if deemed justified by the specialist, with motivation, are the following:
 - Permanent / irreversible impacts (as distinct from long-term, reversible impacts);
 - Potentially substantial cumulative effects (see Item 7 below); and
 - High level of risk or uncertainty, with potentially substantial negative consequences.
5. Additional criteria to be considered, which could “decrease” the significance rating if deemed justified by the specialist, with motivation, is the following:
 - Improbable impact, where confidence level in prediction is high.
6. When assigning significance ratings to impacts *after mitigation*, the specialist needs to:
 - First, consider probable changes in intensity, extent and duration of the impact after mitigation, assuming effective implementation of mitigation measures, leading to a revised significance rating; and
 - Then moderate the significance rating after taking into account the likelihood of proposed mitigation measures being effectively implemented. Consider:
 - Any potentially significant risks or uncertainties associated with the effectiveness of mitigation measures;
 - The technical and financial ability of the proponent to implement the measure; and
 - The commitment of the proponent to implementing the measure, or guarantee over time that the measures would be implemented.
7. The cumulative impacts of a project should also be considered. “Cumulative impacts” refer to the impact of an activity that may become significant when added to the existing activities currently taking place within the surrounding environment.
8. Where applicable, assess the degree to which an impact may cause irreplaceable loss of a resource. A resource assists in the functioning of human or natural systems, i.e. specific vegetation, minerals, water, agricultural land, etc.

The significance ratings are based on largely objective criteria and inform decision-making at a project level as opposed to a local community level. In some instances, therefore, whilst the significance rating of potential impacts might be “low” or “very low”, the importance of these impacts to local communities or individuals might be extremely high. The importance which I&APs attach to impacts must be taken into consideration, and recommendations should be made as to ways of avoiding or minimising these negative impacts through project design, selection of appropriate alternatives and / or management.

The relationship between the significance ratings after mitigation and decision-making can be broadly defined as follows (see overleaf): substance

Significance rating	Effect on decision-making
VERY LOW; LOW	Will not have an influence on the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
MEDIUM	Should influence the decision to proceed with the proposed project, provided that recommended measures to mitigate negative impacts are implemented.
HIGH; VERY HIGH	Would strongly influence the decision to proceed with the proposed project.

1. Extent

“Extent” defines the physical extent or spatial scale of the impact.

Rating	Description
LOCAL	Extending only as far as the activity, limited to the site and its immediate surroundings. Specialist studies to specify extent.
REGIONAL	Western Cape. Specialist studies to specify extent.
NATIONAL	South Africa
INTERNATIONAL	

2. Duration

“Duration” gives an indication of how long the impact would occur.

Rating	Description
SHORT TERM	0 - 5 years
MEDIUM TERM	5 - 15 years
LONG TERM	Where the impact will cease after the operational life of the activity, either because of natural processes or by human intervention.
PERMANENT	Where mitigation either by natural processes or by human intervention will not occur in such a way or in such time span that the impact can be considered transient.

3. Intensity

“Intensity” establishes whether the impact would be destructive or benign.

Rating	Description
ZERO TO VERY LOW	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected.
LOW	Where the impact affects the environment in such a way that natural, cultural and social functions and processes continue, albeit in a slightly modified way.
MEDIUM	Where the affected environment is altered, but natural, cultural and social functions and processes continue, albeit in a modified way.
HIGH	Where natural, cultural and social functions or processes are altered to the extent that it will temporarily or permanently cease.

4. Loss of resources

“Loss of resource” refers to the degree to which a resource is permanently affected by the activity, i.e. the degree to which a resource is irreplaceable.

Rating	Description
LOW	Where the activity results in a loss of a particular resource but where the natural, cultural and social functions and processes are not affected.
MEDIUM	Where the loss of a resource occurs, but natural, cultural and social functions and processes continue, albeit in a modified way.
HIGH	Where the activity results in an irreplaceable loss of a resource.

5. Status of impact

The status of an impact is used to describe whether the impact would have a negative, positive or zero effect on the affected environment. An impact may therefore be negative, positive (or referred to as a benefit) or neutral.

6. Probability

“Probability” describes the likelihood of the impact occurring.

Rating	Description
IMPROBABLE	Where the possibility of the impact to materialise is very low either because of design or historic experience.
PROBABLE	Where there is a distinct possibility that the impact will occur.
HIGHLY PROBABLE	Where it is most likely that the impact will occur.
DEFINITE	Where the impact will occur regardless of any prevention measures.

7. Degree of confidence

This indicates the degree of confidence in the impact predictions, based on the availability of information and specialist knowledge.

Rating	Description
HIGH	Greater than 70% sure of impact prediction.
MEDIUM	Between 35% and 70% sure of impact prediction.
LOW	Less than 35% sure of impact prediction.

8. Significance

“Significance” attempts to evaluate the importance of a particular impact, and in doing so incorporates the above three scales (i.e. extent, duration and intensity).

Rating	Description
VERY HIGH	Impacts could be EITHER: of high intensity at a regional level and endure in the long term ; OR of high intensity at a national level in the medium term ; OR of medium intensity at a national level in the long term .
HIGH	Impacts could be EITHER: of high intensity at a regional level and endure in the medium term ; OR of high intensity at a national level in the short term ; OR of medium intensity at a national level in the medium term ; OR of low intensity at a national level in the long term ; OR of high intensity at a local level in the long term ;

Rating	Description
	OR of <i>medium intensity</i> at a <i>regional level</i> in the <i>long term</i> .
MEDIUM	Impacts could be EITHER: of <i>high intensity</i> at a <i>local level</i> and endure in the <i>medium term</i> ; OR of <i>medium intensity</i> at a <i>regional level</i> in the <i>medium term</i> ; OR of <i>high intensity</i> at a <i>regional level</i> in the <i>short term</i> ; OR of <i>medium intensity</i> at a <i>national level</i> in the <i>short term</i> ; OR of <i>medium intensity</i> at a <i>local level</i> in the <i>long term</i> ; OR of <i>low intensity</i> at a <i>national level</i> in the <i>medium term</i> ; OR of <i>low intensity</i> at a <i>regional level</i> in the <i>long term</i> .
LOW	Impacts could be EITHER of <i>low intensity</i> at a <i>regional level</i> and endure in the <i>medium term</i> ; OR of <i>low intensity</i> at a <i>national level</i> in the <i>short term</i> ; OR of <i>high intensity</i> at a <i>local level</i> and endure in the <i>short term</i> ; OR of <i>medium intensity</i> at a <i>regional level</i> in the <i>short term</i> ; OR of <i>low intensity</i> at a <i>local level</i> in the <i>long term</i> ; OR of <i>medium intensity</i> at a <i>local level</i> and endure in the <i>medium term</i> .
VERY LOW	Impacts could be EITHER of <i>low intensity</i> at a <i>local level</i> and endure in the <i>medium term</i> ; OR of <i>low intensity</i> at a <i>regional level</i> and endure in the <i>short term</i> ; OR of <i>low to medium intensity</i> at a <i>local level</i> and endure in the <i>short term</i> .
INSIGNIFICANT	Impacts with: Zero to very low intensity with any combination of extent and duration.
UNKNOWN	In certain cases it may not be possible to determine the significance of an impact.

9. Degree to which impact can be mitigated

This indicates the degree to which an impact can be reduced / enhanced.

Rating	Description
NONE	No change in impact after mitigation.
VERY LOW	Where the significance rating stays the same, but where mitigation will reduce the intensity of the impact.
LOW	Where the significance rating drops by one level, after mitigation.
MEDIUM	Where the significance rating drops by two to three levels, after mitigation.
HIGH	Where the significance rating drops by more than three levels, after mitigation.

10 Reversibility of an impact

This refers to the degree to which an impact can be reversed.

Rating	Description
IRREVERSIBLE	Where the impact is permanent.
PARTIALLY REVERSIBLE	Where the impact can be partially reversed.
FULLY REVERSIBLE	Where the impact can be completely reversed.

ATTACHMENT C

TABLE TEMPLATE FOR REPORTING ASSESSMENT SIGNIFICANCE RATINGS OF IMPACTS

Table for specialists to use in their assessment reports:

CRITERIA	WITHOUT MITIGATION	WITH MITIGATION
Extent		
Duration		
Intensity		
Probability		
Confidence		
Significance		
Cumulative impact		
Nature of Cumulative impact		
Degree to which impact can be reversed		
Degree to which impact may cause irreplaceable loss of resources		
Degree to which impact can be mitigated		