



# **N3 TOLL CONCESSION (RF) PROPRIETARY LIMITED**

(Hereinafter referred to as N3TC)

## **PROJECT DOCUMENT**

**STATUS: TENDER DOCUMENT**

**VOLUME 3  
BOOK 2 OF 2**

**CONTRACT NO.: N3TC/RM - 2021 – 601 to 610**

**N3 TOLL ROAD: CEDARA TO HEIDELBERG**

**ROUTINE ROAD MAINTENANCE: PACKAGE 1 to 10**

Package 1: N3-4 km 1.6 to N3-4 km 37.6	Cedara to Nottingham Rd IC
Package 2: N3-4 km 37.6 to N3-5 km 5.06	Nottingham Rd IC to Tambookies Kraal Overpass
Package 3: N3-5 km 5.06 to N3-5 km 38.0	Tambookies Kraal Overpass to Frere IC
Package 4: N3-5 km 38.0 to N3-6 km 20.2	Frere IC to Bergville IC
Package 5: N3-6 km 20.2 to N3-6X km 60.4	Bergville IC to KZN/FS border
Package 6: N3-7X km 0.0 to N3-7X km 63	KZN/FS border to Meul River
Package 7: N3-8X km 0 to N3-8 km 48.8	Meul River to Holspruit
Package 8: N3-9 km 0.0 to N3-9 km 39.5	Holspruit to Schaaprand (R34 IC)
Package 9: N3-9 km 39.5 to N3-10 km 5	Schaaprand (R34 IC) to Vaaldraai IC
Package 10: N3-10 km 5 to N3-11 km 15.1	Vaaldraai IC to Heidelberg (S) IC

**Part of the operation and maintenance of the  
N3 Toll Road under the N3 Toll Road Concession  
Contract No: SAPR N0304102/1**

**TENDERER'S NAME:.....**

**JULY 2021**

## LIST OF CONTRACT DOCUMENTS

The following documents form part of this contract:

- Volume 1: The FIDIC Conditions of Contract for Construction for building and engineering works designed by the employer (1999), issued by the International Federation of Consulting Engineers, which the tenderer shall purchase himself. (See note 1).
- Volume 2: Standard Specification for Routine Road Maintenance (RRM) as issued by SANRAL. (See Note 2)
- Volume 3: The Project Document containing
- Book 1 (issued per Works Package). the tender notice, Conditions of Tender, Tender Data, Returnable Schedules, general and particular conditions of contract, Form of Offer (per Works Package) and Pricing Schedule
- Book 2. (General and applicable to all Works Packages), the Project Specifications, Environmental Management Plan, OHS Specifications and Site Information.
- Books 1 & 2 are issued by the Employer.
- The employer's Form of Acceptance and any correspondence from the selected tenderer, and all addenda issued during the period of tender will also form part of this volume once a successful tenderer has been appointed.
- Volume 4: The road works drawings. Available separately on the N3TC Website.

### Notes to Tenderer:

1. **Volume 1 is obtainable from CESA, P O Box 68482, Bryanston, 2021. Tel: (011) 463 2022 Fax: (011) 463 7383, email:general@cesa.co.za.**
2. **Volume 2 is available on the N3TC website.**
3. **Volume 3 is issued to the contractor in hard copy and contains the following files:**
  - **The full Project Document in PDF format**
  - **The information schedules in word format**
  - **The pricing data in excel format**

**At contract stage, Volume 3 will be a bound signed paper copy containing the following documents:**

- **Information schedules relevant to the project**
- **Agreements and Contract Data**
- **Pricing Data**
- **Scope of Work**
- **Site Information**

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VOLUME 3 BOOK 1 OF 2. PACKAGE 1 TO 10. (BOUND SEPARATELY)

### ***THIS DOCUMENT***

#### **BOOK 2 OF 2 APPLICABLE TO ALL PACKAGES 1 TO 10 INCLUSIVE**

PART C3:	SCOPE OF WORK	C3-1
PART C4:	SITE INFORMATION	C4-1
PART C5:	LAYOUT PLAN, N3TC CDATE PLANNER	C5-1

The Scope of Work and Site Information are common to all RRM Packages and this document titled Contract N3TC/RM-2021-600 Volume 3 Book 2 of 2 applies to all ten Packages.

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## PART C3: SCOPE OF WORK

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TYPICAL STANDARD DETAIL DRAWINGS (BOUND SEPARATELY)**

## PART C3: SCOPE OF WORK

### SECTION A STANDARD AMENDMENTS TO THE STANDARD SPECIFICATIONS

The following standard amendments shall apply.

<u>Section No</u> <u>Clause No</u> <u>or Item No</u>	<u>Amendment</u>
M0200	Substitute "Bill of Quantities" for "Schedule of Quantities" throughout the Standard Specifications.
M0204	Insert the following as the first paragraph "In terms of sub-clause 4.9 of the FIDIC Conditions of Contract for Construction, 1999 the Contractor shall institute a quality assurance system to demonstrate compliance with the requirements of the contract.
M0206	Delete paragraphs 2 to 7,
M0208 (f)	At the end of the third paragraph add "If the work is executed using rates from the daywork schedule, then the sum for overhead charges and profit in terms of sub-clause 13.5 (b)(ii) is not applicable."
M0208 (h)	in the 4 <sup>th</sup> line delete the word 'available' delete the rest of the paragraph from the word "Any" in the 5 <sup>th</sup> line
M0221	In the heading of the clause amend "ABE" to "PDE".
M0222	amend this section to read "the contractor will have to get an electronic Tag for each of his vehicles at their own cost. The Employer will at its sole discretion consider a concession on the toll fees for the applicable toll plazas".
M0303	M030.01 delete the last sentence of paragraph 5 from "The tendered sum",
M0400	"Route Patrol Services" does not form part of this contract.
M0502 (b) (iii)	add after the word "Services" in the second line "and N3TC's Route Control Centre"
M0502 (n) (i)	amend 2km to "3km"
M0502 (o)	amend the last sentence to read "recorded in the payment certificates"
M1203 (b)	Potholes replace "12 hours with 2 hours" in the first sentence.
M2402	replace "two months with four months" in the second sentence.
M3104 (a)	delete the words "of tar or" in the fifth paragraph.
M3202 (d)	replace once a week with "daily" in the 11 <sup>th</sup> line.
M3202 (e)	delete this section
M3203	Add the following paragraph to section M3203:  "Inspection of Collection and Removal of Debris and Litter for Payment:  Inspection for the collection and removal of debris and litter will be undertaken after a clearing operation. If the clearing operation does not comply with the acceptance criteria, then for each incident of non-compliance the penalty as specified in the Scope of Work is applicable."

M4302	Replace “Contractor” in the first line of paragraph 2 with “Employer”
M4402	add the following after the word “soil” in the 2 <sup>nd</sup> line of paragraph 5 “a 1:12 cement/soil mixture”.
M4402 ( c)	replace the 2 <sup>nd</sup> paragraph with “dismantle the guard-rails and remove the posts from the ground. Raise the guard-rails to the correct height, by supporting them with appropriate supports to hold the rails in place. Backfill around the posts using the excavated soil mixed with a 1:12 cement/soil mixture and compact the material in layers not exceeding 100mm and ensure that soil cement mixture is placed while at or near optimum moisture content.
M4304	Move the fifth paragraph in Section M4611 and insert it as the fourth paragraph in Section M4304.
M5102 (a)	replace the word “pesticides” in the 2 <sup>nd</sup> line of the 2 <sup>nd</sup> paragraph with the word “herbicide” replace the word “pesticides” in the 1 <sup>st</sup> line of the 4 <sup>th</sup> paragraph with the word “herbicide”
M6102	Add to sub-item (a) the sub-item: “(vi) Designated areas The shoulder now includes the designated areas as defined in sub-clause (c) below.”  Add to sub-item (c) “The designated areas form part of the shoulder and general mowing operations, when these are executed.”  (d) (vi) replace “4m” with 6m” in the last sentence
M6103 (a)	replace “450mm with 150mm” in the first sentence.
M6402 (c) (ix)	Replace "yellow line on the outside shoulder" with "edge of surfacing".
M6402 (c)	Add the sub-item "(x) Shrubs shall not be planted closer than 7m from the edge of surfacing, unless otherwise instructed by the Engineer."

## **SECTION B: PARTICULAR AMENDMENTS TO THE STANDARD SPECIFICATIONS**

In certain clauses the Standard Specifications allow a choice to be specified in the Scope of Work between alternative materials or methods of construction and for additional requirements to be specified to suit a particular contract. Details of such alternatives or additional requirements applicable to this contract are contained in this section of the Scope of Work. It also contains some additional specifications required for this particular contract.

The number of each clause and each payment item in this section of the Scope of Work consists of the prefix P followed by a number corresponding to the number of the relevant clause or payment item in the Standard Specifications. The number of a new clause or a new payment item which does not form part of a clause or a payment item in the Standard Specifications and which is included here, is also prefixed by P followed by a new number. The new numbers follow on the last clause or item number used in the relevant section of the Standard Specifications.

## SECTION M0200: GENERAL REQUIREMENTS AND PROVISIONS

### PM0208 PAYMENT

Add the following new sub-clause:

“(i) Rates to remain unchanged

Dependent on the rates and prices offered in the Schedule of Quantities, the employer intends to increase or reduce the scope of work to match the budget allowed for this project. The value of such increase or reduction in the scope of works shall not give cause for the contractor to vary the offered rates and prices, which shall remain final and binding for the duration of the contract.”

## SECTION M0300: CONTRACTOR'S ESTABLISHMENT ON SITE AND GENERAL OBLIGATIONS

### PM0303 MEASUREMENT AND PAYMENT

Add item PM030.04:

"PM030.04 General Obligations

- |     |   |              |
|-----|---|--------------|
| (a) | Occupational health and safety obligations  | Prov Sum     |
| (b) | The Contractors overhead charges and profit in respect of sub-item PM030.04 (a) above | percentage % |

Measurement and payment for sub-item PM030.04 (a) shall be in with the provisions of subclause 13.5 of the FIDIC Conditions of Contract, 1999. The tendered percentage is a percentage of the amount actually spent under sub-item PM030.04 (a), which shall include full compensation for the overhead charges and profit of the contractor for that part of the Contractor's health and safety obligations.”



## SECTION M0500: ACCOMMODATION OF TRAFFIC

Replace the whole of M0500 with PM0500 as follows.

### “SECTION PM0500: ACCOMMODATION OF TRAFFIC

#### CONTENTS

PM0501	SCOPE
PM0502	GENERAL REQUIREMENTS
PM0503	MATERIALS
PM0504	MEASUREMENT AND PAYMENT

#### PM0501 SCOPE

This section covers the provision, erection and maintenance of the necessary temporary signs and barricades, and everything necessary for the safe and easy passage of all public traffic during maintenance operations on single and dual carriageway roads. This section also covers the requirements and duties of the traffic safety officer.

#### PM0502 GENERAL REQUIREMENTS

- (a) The Contractor shall at all times have the necessary traffic accommodation signs and devices to complete the work as instructed. The signs must be maintained and be in good quality at all times. The submission of any lists of available traffic accommodation signs and devices to the Engineer and the approval, shall not release the Contractor of any responsibilities and time restraints under the contract.
- (b) Traffic Safety Officer
  - (i) General Duties

The Contractor shall designate a competent person that can act as a Traffic Safety Officer (TSO) who shall be the responsible person to fulfil all the duties for the arrangements and maintenance of all accommodation of traffic measures required for the duration of the contract. In addition, each team shall have a Traffic Safety Representative (TSR), who shall be the responsible person for the arrangements and maintenance of all accommodation of traffic measures required for the respective team and assist the TSO.
- (c) The Contractor shall provide, erect, maintain and remove the necessary traffic control facilities, road signs, channelization devices, barricades and warning devices (hereinafter referred to as traffic control facilities) as shown on the drawings and in Chapter 13 of Volume 2 of the South African Road Traffic Signs Manual. The Contractor shall ensure that the abovementioned traffic control devices are present where required at all times and are functioning properly.
- (d) The Contractor shall arrange the work so that the traffic shall at all times have unimpeded one way access to at least one lane of the freeway.
- (e) The contractor shall not permit any vehicle related to the construction to cross the median in an attempt to make a “U” turn. The contractor will be solely responsible for ensuring that no vehicles make “U” turns. The contractor will be penalised at R5 000-00 per occasion if any contractor’s equipment / vehicles make “U” turns on the N3. Traffic shall be accommodated with the least delay and disruption to the public in accordance with the South African Road Traffic Signs Manual (SARTSM) and with the National Road Traffic Regulations, 2000
- (f) Use of the road by the public

The travelling public shall have right of way on public roads. The Contractor shall arrange his activities so as to bring about the least possible disruption to the traffic on the roads on which he works. The Contractor's attention is drawn to the fact that he will be fully responsible for the safe and convenient accommodation of traffic at all times during the construction period. In this regard the Contractor is referred to the N3TC CRITICAL DATES YEAR PLANNER, in which traffic is categorized as A (extremely busy), B (very busy) and C (moderately busy). The critical dates for the remainder of the contract will be similar for the equivalent period and will be issued as they become available.

The Contractor shall table his proposed lane use scenario for all days marked as Category A and B on the Critical Date Planner, at least 14 days prior to such days. This proposal shall take the anticipated directional flow into account. N3TC will approve/amend/reject such proposal seven days prior to the said days.

The closure of more than one lane of traffic per carriageway will not be permitted. Failure or refusal on the part of the Contractor to take the necessary steps to ensure the safety and convenience of the public in accordance with these specifications or as required by the Employer or the traffic authorities shall be sufficient cause for the suspension of all work under this contract. The work will be closed down until all provisions as prescribed have been complied with to the satisfaction of the Engineer.

(g) Failure to comply with provisions for the accommodation of traffic

Failure or refusal on the part of the Contractor to take the necessary steps to ensure the safety and convenience of the public traffic, accommodation of traffic, equipment and personnel in accordance with these specifications or as required by statutory authorities or ordered by the Employer, shall be sufficient cause for the Employer to deduct penalties as follows:

A fixed penalty of R5 000.00 per occurrence will be deducted for each and every occurrence of non-compliance with any of the requirements of Section 500 of the Standard Specifications. In addition, a time-related penalty of R500.00 per hour over and above the fixed penalty will be deducted for non-compliance to rectify any defects in the accommodation of traffic within the allowable time after an instruction to this effect has been given by the Engineer. The Employer's instruction will state the allowable time, which shall be the time in hours necessary for reinstatement of the defects. Should the Contractor fail to adhere to this instruction, the time-related penalty shall be applied from the time the instruction was given.

(h) Hours of work

"Normal working hours" (referred to in Clause A6.5 of the FIDIC Conditions of Contract for Construction.) will, because of heavy peak hour traffic volumes, be restricted to between 30 minutes after sunrise and 30 minutes before sunset.

Programming for accommodation of traffic shall allow for the above restrictions.

PM0504 MEASUREMENT AND PAYMENT

PM0500 ACCOMMODATION OF TRAFFIC

<u>Item</u>	<u>Unit</u>
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PM050.01 Accommodation of Traffic

- |    |   |                      |
|----|---|----------------------|
| a) | Provision of temporary traffic control facilities                                     | provisional sum (PS) |
| b) | The Contractors overhead charges and profit in respect of sub-item PM050.01 (a) above | percentage %         |

Measurement and payment shall be in accordance with the provisions of Subclause 13.5 of the FIDIC Conditions of Contract for Construction, 1999. The tendered percentage is a percentage of the amount actually spent under sub-item M050.01 (a), which shall include full compensation for the overhead charges and profit of the Contractor

<u>Item</u>	<u>Unit</u>
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PM050.02 Accommodation of traffic and maintaining temporary deviations

- |     |   |                      |
|-----|---|----------------------|
| (a) | Provision of accommodation of traffic to external contractors | provisional sum (PS) |
| (b) | The Contractors overhead charges and profit in respect        | percentage %         |

Measurement and payment shall be in accordance with the provisions of Subclause 13.5 of the FIDIC Conditions of Contract for Construction, 1999. The tendered percentage is a percentage of the amount actually spent under sub-item PM050.02 (a), which shall include full compensation for

The overhead charges and profit of the Contractor.

Item	Unit
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PM050.03	Accommodation of traffic and maintaining temporary deviations	month
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The tendered rate shall include full compensation for all costs associated with the accommodation of traffic and maintaining temporary deviations and shall include work constructed and paid under Section M9100. The tendered rate shall also include full compensation for the provision of communication equipment required for regulating the traffic, arranging for the moving of services, solving traffic problems, complying with the legal requirements of all authorities concerned, for providing temporary access to private property, and for the provision and maintenance of temporary drainage. The tendered rate shall also include any cost associated with the provision of flagmen.

## **SECTION M1100: PAVEMENT LAYER REPAIRS**

### **PM1106            MEASUREMENT AND PAYMENT**

Amend item number M110.03 to PM110.03 and amend it as follows.

Add the following sub-item to sub-item (b):

"(iv)	Extra over sub-items (b) (i), (ii) and (iii) for importing crushed stone."	cubic metre (m <sup>3</sup> )
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Add the following to the third paragraph: "for the material excavated from the existing pavement and re-used for backfilling."

Replace the fourth paragraph with the following:

"The tendered rate for emulsion-treated crushed stone for sub-items (b) (i), (ii) and (iii) shall include full compensation for re-using the crushed stone excavated from the existing pavement, and for providing, applying and mixing the stabilising agents. The tendered rate for sub-item (b) (iv) shall include full compensation for procuring and supplying imported crushed stone for backfilling."

**SECTION M1200: REPAIR OF POTHoles, EDGE BREAKS AND SURFACE FAILURES**

PM1206            MEASUREMENT AND PAYMENT

Amend item numbers M121.01 and M122.01 to PM121.01 and PM122.01 respectively and amend the unit of measurements to read "ton (t)" for both items.

## SECTION M1300: CRACK SEALING

### PM1307 MEASUREMENT AND PAYMENT

Amend item number M131.01 to PM131.01 and amend it as follows.

PM131.01      Cleaning of cracks (all types) with hot compressed air and seal the cracks as specified;

<u>Item</u>	<u>Unit</u>
a) Surface, Crocodile or Longitudinal using geofabric (sealmac or similar approved)	square metre (m <sup>2</sup> )
b) Surface, Crocodile or Longitudinal using a prefabricated road patch (AJ Broom or similar approved)	square metre (m <sup>2</sup> )
c) Surface, Crocodile or Longitudinal using a bitumen based Sealant (Bituflex or similar approved)	metre (m)

The unit of measurement for item PM131.01 (a) and (b) shall be the square metre of surface area sealed as specified measured after the cracks have been sealed to the satisfaction of the Engineer.

The unit of measurement for item PM131.01 (c) shall be the metre of crack sealed as specified measured after the crack has been sealed to the satisfaction of the Engineer.

The tendered rate shall include full compensation for furnishing and procuring the materials and equipment and labour, for cleaning the crack with hot compressed air as specified, applying the sealant, re-applications where necessary or applying the seal bandage, cleaning, curing, finishing and all other incidentals necessary for hot sealing the cracks as specified.

## SECTION M1500: CRACK AND JOINT SEALING OF CONCRETE PAVEMENTS

### PM1505 MEASUREMENT AND PAYMENT

Amend item number M150.01 to PM150.01 and amend it as follows.

PM150.01 Preparation and sealing or resealing of old joints and cracks in existing concrete pavements:

<u>Item</u>	<u>Unit</u>
a) Expansion joints and cracks	metre (m)

The unit of measurement shall be the metre of joint or crack prepared and sealed or resealed. No distinction will be made between joints or cracks through areas where the concrete has been repaired and other joints or cracks.

The tendered rates shall include full compensation for all labour, equipment, tools and materials, removing old sealant, backing material and any foreign material, refacing or enlarging the joint faces by sawing, routing of cracks to the specified dimensions, disposing of all debris, all cleaning work involved, installing back-up material where required, installing the bond breaker, applying the primer and mixing and applying the sealant, ensuring acceptable bond with existing work, and for any other operation needed to complete the work as specified and shown on the drawings.

## SECTION M2100: REPAIR AND MAINTENANCE OF INLET AND OUTLET STRUCTURES

### PM2105 MEASUREMENT AND PAYMENT

Amend item number M210.04 to PM210.04 and amend it as follows.

#### PM210.04 Accessories

<u>Item</u>	<u>Unit</u>
a) Concrete manhole covers (Duragrid or similar)	number (No)

The unit of measurement shall be the number of new manhole covers supplied.

The tendered rate shall include full compensation for procuring and furnishing all material, including, hinges, bolts, frames, bases and be placed in position (manhole covers supplied by Employer).



## SECTION M2200: SUBSOIL DRAIN INSTALLATION AND MAINTENANCE

### PM2205 MEASUREMENT AND PAYMENT

Amend item number M220.03 to PM220.03 and add sub-item (d).

PM220.03 Natural permeable material

<u>Item</u>	<u>Unit</u>
d) Cast in-situ no fines concrete	cubic metres (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of approved no-fines concrete in place in the drains calculated in accordance with the authorised dimensions.

The tendered rate shall include full compensation for procuring and furnishing all approved material irrespective of its origin and placing the material as specified.

Add the following item:

<u>Item</u>	<u>Unit</u>
PM220.12 Painting of subsoil inlet, outlet and timber post markers.	square metre (m <sup>2</sup> )

The unit of measurement for painting the subsoil markings shall be a square metre, and the quantity to be paid for shall be the actual surface area of inlet, outlet or post completed in accordance with the instructions of the Engineer.

The tendered rate per square metre as the case may be for painting the subsoil markings shall include full compensation for procuring and furnishing all material, including the retro-reflective beads in the case of retro-reflective paint, and the necessary equipment, and for painting, protecting and maintenance as specified.

## SECTION M2300: CLEANING OF WATERWAY STRUCTURES

### PM2304 MEASUREMENT AND PAYMENT

Add the following items:

<u>Item</u>	<u>Unit</u>
PM230.01 Cleaning of waterway structures, inlet and outlet areas	
(a) Cleaning of waterway structures, inlet and outlet areas	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of actual material excavated and vegetation removed measured down from the existing ground or as instructed.

The tendered rate shall include full compensation for all excavation, plant, equipment and labour to remove the vegetation and material obstructing the waterway.

PM230.02 Overhaul on material hauled in excess of 1,0 km	cubic metre kilometre (m <sup>3</sup> -km)
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The unit of measurement shall be the cubic metre of material hauled in excess of 1,0 km, the volume determined from the rated capacity of the truck multiplied by the overhaul distance. All trucks shall be fully loaded to their rated capacity. The tendered rate shall include full compensation for hauling the material in excess of the free-haul distance."

## SECTION M2400: CLEANING OF PREFABRICATED CULVERTS

Replace M2400 with PM2400 and amend as follows.

### M2401 SCOPE

This section covers the cleaning of prefabricated culverts. The work involved under this section is the removal of silt and debris from the prefabricated culverts and the removal and clearing of vegetation, silt and debris from the inlet and outlet areas as shown on the drawing.

### PM2402 EXECUTION OF WORK

Delete the words “initially within the first two months of the contract period” and “thereafter” in the first paragraph.

### PM2404 INSPECTION OF PREFABRICATED CULVERTS FOR PAYMENT

Replace the contents of this clause with the following:

The Engineer shall then instruct the Contractor regarding the cleaning of such culvert and inlet and outlet areas that do not comply with the acceptance criteria.

Notwithstanding the preceding, the Engineer may also at any time instruct the Contractor to clean any culvert and inlet and outlet areas which, in his opinion, do not comply with the specified criteria.

Failure by the Contractor to comply within the completion time specified in Table C3.1.9/3 in Part C3 of the Project Specifications, shall render the Contractor liable for the penalty specified in this table.”

### PM2405 MEASUREMENT AND PAYMENT

Amend item “M240.01” to read as follows:

<u>Item</u>	<u>Unit</u>
PM240.01      Cleaning of prefabricated culverts, inlet and outlet areas	
(a)      Prefabricated culverts	
(i)    up to and including 500mm	metre (m)
(ii)   exceeding 500mm up to 750mm	metre (m)
(iii)  exceeding 750mm up to 1200mm	metre (m)
(iv)   Overhaul of material hauled in excess of 1.0km free-haul	
Distance.	cubic metre kilometre (m <sup>3</sup> -km)
(v)    Hand excavation	cubic metre (m <sup>3</sup> )
(vi)   Machine excavation	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the metre of culverts, including the inlet and outlet areas as specified, which are cleaned on instruction of the Engineer. Distinction shall be made in terms of the diameter or the vertical dimension of the culverts.

The tendered rate shall include full compensation for cleaning the culvert and inlet and outlet areas, as specified in item M240.02 in the Standard Specifications.”

## SECTION M2500: CLEANING OF CONCRETE DRAINS AND CHANNELS

### PM2505 MEASUREMENT AND PAYMENT

Add the following items:

<u>Item</u>	<u>Unit</u>
add Items PM250.03 sub-items (a) and (b)	
"PM250.03 Excavation	
(a) Hand excavation	cubic metre (m <sup>3</sup> )
(b) Machine excavation	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of material removed as specified on instruction of the Engineer, by means of hand or machine excavation.

The tendered rate shall include full compensation for all labour and equipment required for removing the material from the drainage channels irrespective of the depth of silt and debris, and for loading, off-loading and spreading when material removed is intended for spoiling at approved spoil sites. The tendered rates shall also include for transporting the excavated material to approved spoil sites in excess of the free-haul distance.

Where material is disposed of adjacent to the drainage channels, the tendered rate shall include full compensation for all labour and equipment required for removing the material from the drainage channels irrespective of the depth of silt and debris, spoiling and spreading the material adjacent to the drainage channels where it cannot be washed back into the channel."

## SECTION M2700: EDGE BUILD-UP REMOVAL

### PM2705 MEASUREMENT AND PAYMENT

Amend item M270.01 to read PM270.01 and add sub-items PM270.01 (a) and PM270.01 (b)

<u>Item</u>	<u>Unit</u>
PM270.01 Edge build-up removal	
(a) Remove material up to 1.0m wide	kilometre (km)
(b) extra over item PM270.01 (a) exceeding 1.0 up to 2.5 wide	kilometre (km)
(c) overhaul of material in excess of the free-haul distance of 1km	Cubic metre kilometre (m <sup>3</sup> -km)

The unit of measurement for subitems PM270.01 (a) and (b) shall be the kilometre of edge build-up removed on instruction of the Engineer.

The tendered rates shall include full compensation for labour, tools and equipment for the execution of the work, and disposal of the material including a free-haul of 1,0 km.

The unit of measurement for subitem PM270.01(c) shall be the cubic metre of material, the volume of material measured loose, hauled in excess of 1,0 km, multiplied by the overhaul distance.

The tendered rate shall include full compensation for hauling material in excess of the 1,0 km free haul distance.

**SECTION M3100: FENCING**

PM3100 FENCING

PM3107 MEASUREMENT AND PAYMENT

Amend item M310.02 to PM310.02 and add sub-item PM310.02 (g)

<u>Item</u>	<u>Unit</u>
PM310.02 Erection of new fences	
(g) Wire rope (steel cable)	metre (m)

The unit of measurement shall be the metre of wire rope installed.

The tendered rate shall include full compensation for all labour, tools, including transporting all labour, tools and materials from the Contractor's base to the point of the installation.  
(h), (i), (j), (k), (l) The unit of measurement shall be the number of each element installed

The tendered rate shall include full compensation for all materials, tools, including transporting all labour, tools and material from the Contractor's base to the point of installation. The providing of new material by the contractor is paid under item PM310.05

Amend item M310.03 to PM310.03 and add sub-item PM310.03 (g)

<u>Item</u>	<u>Unit</u>
PM310.03 Repair of existing fences of less than 100 m lengths	
(g) Wire rope (steel cable)	metre (m)

The unit of measurement shall be the metre of wire rope installed.

The tendered rate shall include full compensation for all labour, tools, binding and tying wire for the repair of the wire rope, including transporting all labour, tools and materials from the Contractor's base to the point of the repair.

Amend item M310.04 to PM310.04 and add sub-item PM310.04 (g)

<u>Item</u>	<u>Unit</u>
PM310.04 Repair of existing fences of greater than 100 m lengths	
(g) Wire rope (steel cable)	metre (m)

The unit of measurement shall be the metre of wire rope repaired.

The tendered rate shall include full compensation for all labour, tools, binding and tying wire for the repair of the wire rope, including transporting all labour, tools and materials from the Contractor's base to the point of the repair.

Amend item M310.05 to PM310.05 and add sub-item PM310.05 (l) and (m)

<u>Item</u>	<u>Unit</u>
PM310.05 Supply of fencing material for repaired fences and new fences.	
(l) Concrete (20/19)	cubic metre (m <sup>3</sup> )
(m) Straining post	Number (No)

The quantity of material used shall be determined by measuring the quantities of individual items of material installed in the complete fence. The erection of fences shall be paid under items M310.03 and M310.04.

Add item PM310.11 and PM310.12

<u>Item</u>	<u>Unit</u>
PM310.11 Re-straining of leaning or sagging fences On instruction of the Engineer	number (No)

The unit of measurement shall be the number of sections of the existing fence re-strained measured between corner posts on instruction of the Engineer.

The tendered rate shall include full compensation for re-straining of all the barb wire strands of the existing fence, when measured between any two straining posts. The rate shall include full compensation for all materials, labour, equipment and transport as may be required.

PM310.12 Concrete for footings (20/19)	cubic metre (m3)
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The unit of measurement shall be the cubic metre of concrete placed on instruction of the Engineer.

The rate shall include full compensation for all materials, labour, equipment and transport as may be required.

## SECTION M3200: COLLECTION AND REMOVAL OF DEBRIS AND LITTER

### PM3204 MEASUREMENT AND PAYMENT

Amend item number M320.02 to PM320.02 and amend sub-item PM320.02 (a), (b), (c) (d) add sub-item PM320.02 (e) and add sub-item PM320.02 (f)

Item	Unit
PM320.02 Additional clearing of	
(a) Lay-byes	month
(b) Toll Plazas	month
(c) Interchanges	month

The tendered rate per month shall include full compensation for all labour, tools equipment, litter bags and transport necessary for the collection and disposal of foreign articles as specified in this section on instruction of the Engineer. The tendered rate also includes the clearing of road pavement, rest areas, lay-byes, side drains, all drainage grids, bridge drainage ports and scuppers, interchanges and rubbish bins as specified. The tendered rate shall also include the removal of rubbish bags from the toll plazas.

(e) Road reserve	kilometre (km)
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The tendered rate per kilometre shall include full compensation for all labour, tools equipment, litter bags and transport necessary for the collection and disposal of foreign articles as specified in this section on instruction of the Engineer. The tendered rate also includes the clearing of road pavement, rest areas, lay-byes, side drains, all drainage grids, bridge drainage ports and scuppers, interchanges and rubbish bins as specified. The tendered rate shall also include the removal of rubbish bags from the toll plazas.

(f) Removal and disposal of carcasses	number (No)
---------------------------------------	-------------

The tendered rate shall be for the removal and disposal per number of carcasses removed and shall include full compensation for all labour, tools equipment, and transport necessary for the collection and disposal of the carcasses as specified in this section on instruction of the Engineer.



**SECTION M3300:            SHOULDER REPAIRS**

**PM3107       MEASUREMENT AND PAYMENT**

Amend item "M330.01" to read as "PM330.01" and amend the unit for sub-item "PM330.01 (c )" to "kilograms (kg)".

add item "PM330.03 Sweep loose material from the road surface"

PM330.03            Sweep loose material from the road            surface square metre (m<sup>2</sup>)

The unit of measurement shall be the square metre of surface swept as per instruction of the Engineer, by means of hand or machine.

The tendered rate shall include full compensation for all labour and equipment required for sweeping and removing the material from the surface and for loading, off-loading and spreading when material removed is intended for spoiling at approved spoil sites. The tendered rates shall also include for transporting the material to approved spoil sites in excess of the free-haul distance.

## **SECTION 3400: MAINTENANCE OF ARRESTOR BED**

### **PM3405 MEASUREMENT AND PAYMENT**

Amend item "M340.01" to read as "PM340.01" and add sub-item "PM340.01 (d)"

PM340.01 (d) Raking and Levelling of gravel square metre (m<sup>2</sup>)

The unit of measurement shall be the square metre of the gravel in the arrestor bed levelled by hand or machine.

The tendered rate shall include full compensation for all labour and equipment required to level the gravel in the arrestor bed after a vehicle entered the arrestor bed has been removed and removing the material from the surface and for loading, off-loading and spreading when material removed is intended for spoiling at approved spoil sites. The tendered rates shall also include for transporting the material to approved spoil sites in excess of the free-haul distance

## **SECTION M4100: ERECTION AND REPAIR OF PERMANENT ROAD TRAFFIC ROAD SIGNS**

### **PM4107 MEASUREMENT AND PAYMENT**

Replace Item M410.03 with PM410.03 and amend as follows:

"PM410.03 Reference marker boards

- |     |                                 |             |
|-----|---------------------------------|-------------|
| (a) | Reference marker board and post | number (No) |
| (b) | Reference marker board (only)   | number (No) |

The unit of measurement for sub-item PM410.03 (a) shall be the number of reference marker boards including posts erected in accordance with the drawings. The tendered rate shall include full compensation for all labour, excavation, backfilling with soil or concrete as may be necessary for completing the work in accordance with the details shown on the drawings. (post and RMB to be supplied by the Employer)

Sub-item PM410.03 (b) is for the attachment of the reference marker board only excluding a post, where boards are missing or old boards only are to be replaced. The unit of measurement for sub-item PM410.03 (b) shall be the number of reference marker boards only supplied and erected in accordance with the drawings. The tendered rate shall include full compensation for procuring and furnishing the bolts and nuts, and for all labour, as may be necessary for completing the work in accordance with the details shown on the drawings. (RMB to be supplied by the Employer)

Replace item M410.10 with PM410.10

PM410.10 Hazard plates (w401 and w405) number (No)

The unit of measurement for item PM410.10 shall be the number of hazard markers installed, including installing the posts, erected in accordance with the drawings. The tendered rate shall include full compensation for all labour, excavation, backfilling with soil or concrete as may be necessary for completing the work in accordance with the details shown on the drawings. The timber post will be paid under item M410.02. (hazard markers be supplied by the Employer)

## SECTION M4200: ROAD SIGN CLEANING AND REMOVAL OF ILLEGAL SIGNS

### PM4204 MEASUREMENT AND PAYMENT

Replace Item M420.01 with PM420.01 and add sub-items (iv) and (v)

PM420.01 (iv) Hazard plates (all sizes)	Number (No)
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PM420.01 (v) Reference marker boards	Number (No)
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The unit of measurement for sub-items PM420.01 (iv) and (v) shall be the number of hazard markers or reference markers boards cleaned.

The tendered rates shall include full compensation for all labour, material and equipment necessary for cleaning the signs. It shall include for the provision and application of the specified cleaning detergent.

replace Item M420.03 with PM420.03 and amend sub-items PM420.03 a) and (b) as follows;

PM420.03 Painting and treating of road sign elements

a) Sign supports	metre (m)
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b) Sign frames	square metre (m <sup>2</sup> )
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The unit of measurement for sub-items PM420.03 (a) shall be the metre of sign post treated or painted and sub-item PM420.03 (b) shall be the square metre of sign painted.

The tendered rates shall include full compensation for the supply and application of the paint and or creosote or similar approved materials. The tendered rate shall also include for cleaning and preparation of the elements to be treated and for all labour, material and equipment necessary for treating the elements of the sign.

## **SECTION M4300: ROAD STUDS**

### **PM4305 MEASUREMENT AND PAYMENT**

Replace Item M430.01 and M430.02 with PM430.01 and PM430.02 and amend as follows;

PM430.01 Installation of road studs	Number (No)
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PM430.02 Removal of road studs	Number (No)
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The unit of measurement for item PM430.01 shall be the actual number of studs placed.

The tendered rate shall include full compensation for all labour and tools necessary to install the studs.

The unit of measurement for item PM430.02 shall be the actual number of studs removed.

The tendered rate shall include full compensation for all labour and tools necessary to remove the studs irrespective of the surface type and disposal thereof. The tendered rate shall include for backfilling of the holes left after the removal of studs.

## **SECTION M4400: GUARD-RAIL ERECTION AND MAINTENANCE**

Replace the whole of M4400 with PM4400 as follows.

### **“SECTION PM4400: GUARDRAIL ERECTION AND MAINTENANCE**

#### **CONTENTS**

PM4401	SCOPE
PM4402	EXECUTION OF WORK
PM4403	ACCEPTANCE CRITERIA
PM4404	MATERIALS
PM4405	MEASUREMENT AND PAYMENT

#### **PM4401 SCOPE**

This section covers the supply and installation of new guardrails, and the maintenance and refurbishment of existing guardrails as well as the installation and repair of wire rope safety fence (WRSF).

This section also includes the removal, straightening, realignment, renovation and re-erection of damaged guardrails.

#### **PM4402 EXECUTION OF WORK**

##### **(a) Erection of new guardrails**

New guardrails shall be erected at locations as directed by the Engineer.

The holes for timber posts shall be of sufficient size to permit the proper setting of the posts and to allow sufficient room for backfilling the hole and tamping the filling. At least 1,0 m of a post shall be embedded in the ground.

The posts, spacer blocks and guardrails shall be completely erected and set true to line and level so that the guardrail will be at the required height above the level of the road shoulder.

Where jointed, the end of the guardrail which overlaps on the side of the traffic shall point in the direction of the traffic movement. The guardrail shall be suitably braced to prevent any movement, and all bolts shall be tightened prior to any holes being backfilled.

After the Engineer has approved the guardrails so erected, the holes shall be backfilled with an approved sandy soil soilcrete mix a 1:12 cement soil mixture. The material shall be mixed with the correct quantity of water to ensure that the mixture will be placed while at or near the optimum moisture content. The mixture shall then be placed and thoroughly rammed in layers not exceeding 100 mm of compacted thickness.

The approach ends, where the guardrail has to be bent down and anchored, and the trailing ends shall be constructed as shown on the drawings.

The edges and the centre of the guardrails shall touch either the spacer block or the post where no spacer blocks are used. All splices of guardrails shall be at posts, and guardrails shall make contact over the entire area of the splice.

Guardrail posts other than timber shall be erected and fixed as shown on the drawings or as instructed by the Engineer.

Reflective plates shall be fixed in accordance with the details shown on the drawings. The reflective surfaces shall be arranged with the colours as shown on the drawings.

(b) Removing, renovating and re-erecting damaged guardrails

The Engineer shall approve removal, renovation and re-erection of guardrails.

(i) Removing the guardrails

All guardrails, reflective plates and end units shall be carefully dug out and the holes shall be filled and compacted in 150 mm layers. Items used for fixing, such as bolts, nuts and washers, together with the reflective plates, shall be placed into bags, after which all the material shall be transported to a store approved by the Engineer and all stored in groups by type.

Where material is intended for reuse, it shall first be unpacked for inspection by the Engineer for deciding which material will be suitable for reuse. Suitable material shall then be stored separately from material, which is unsuitable for reuse. Unsuitable material shall be scrapped and removed from site at the Contractor's cost.

(ii) Renovated or refurbished guardrails

Units suitable for reuse shall be refurbished on site by removing the rails and removing rust and flaking paint, the rails are to be painted using an approved proprietary product.

Posts suitable for reuse shall be cleaned and treated with a timber preservative. Bolts, nuts and washers to be reused shall be cleaned and all rust removed, and shall then be oiled.

The units damaged but suitable for renovation shall be straightened by means of a hydraulically or electrically powered machine capable of straightening guardrails to their original profile. If necessary, holes shall be redrilled to original positions. Rust shall be completely removed and minor indentations hammered out and the galvanising re-instated using a bitumen paint.

No additional payment will be made for renovating the guardrails and timber posts. All costs for renovating the material must be included in the rate tendered under payment item PM440.07.

(iii) Re-erection

The guardrails shall be erected in the positions as indicated and all the removed material suitable for reuse and as much supplementary new material as may be necessary shall be used. Re-erection shall be as specified for new guardrails, including fixing the retro-reflective plates.

(c) Realignment of existing guardrails

The Engineer may require that the horizontal and vertical alignments of existing guardrail lines be improved.

Some of the soil around the guardrail post shall be removed to loosen the posts prior to correcting the alignments. The raising of guardrails to the required height. The post hole shall be backfilled using a 1:12 soil cement mixture and then be thoroughly rammed in underneath the end of the post to keep the post at the correct height above the shoulder.

(d) Installation and repair of wire rope safety fence (WRSF)

The existing Wire rope safety fence shall be repaired or erected at locations as directed by the Engineer. The installation and re-tensioning of wire rope safety fence is regarded as specialised work and shall be executed by a specialist Contractor.

(i) Installation of wire rope safety fence

Wire rope safety fence shall be installed in accordance with the manufacturer's specifications and drawings.

The erection of the wire rope safety fence shall be completely erected as shown on the drawings and set true to line and level so that the wire rope safety fence will be at the required height above the level of the road shoulder. Posts shall be placed into steel sleeves in precast concrete post footings, unless otherwise shown on the drawings.

(ii) Repair and re-tensioning of wire rope safety fence

Repair or replacement of damaged parts, due to traffic accidents, shall be done as specified in the Project Specifications. Failure by the Contractor to comply with these requirements will make him liable for penalties as specified in the Project Specifications.

The periodic re-tensioning of the wire rope safety fence is required. This shall be done by the manufacturer on instruction of the Engineer. On completion of the re-tensioning operation the manufacturer shall provide to the Engineer a re-tensioning certificate validating the work completed.

The manufacturer shall provide the Engineer with two installation and repair manuals specific to the WRSF for each contract.

PM4403 ACCEPTANCE CRITERIA

All guardrail posts shall be rigid and vertical and the guardrail shall be firmly fixed to the post.

The completed guardrail shall have a neat appearance and shall not show any visible deviation from the required line and grade.

The guardrails shall overlap in the direction of traffic and the end wings bolted firmly on top of the guardrail.

The wire rope safety fence shall comply with the requirements for road safety barriers set out in the European CEN Standards (Comité Européen de Normalisation).

The wire rope safety fence shall comply with the requirements of the manufacture specifications.

PM4404 MATERIALS

(a) Guardrails

Guardrails shall comply with the requirements of SANS 1350 and shall be supplied together with all bolts, nuts, washers and fixing materials required including the bolts for fixing the guardrails to the posts. The length of the guardrail will be measured according to its effective length equal to 3,81 m.

Galvanising of guardrails, bolts, nuts and washers shall comply with SANS 763.

(b) Guardrail posts

(i) Timber posts

Timber posts shall be supplied in lengths as shown on the drawings and shall comply with the requirements of SANS 457 and shall carry the SANS mark.

Posts shall be shaped and drilled as shown on the drawings and shall have a top diameter of not less than 150 mm or more than 230 mm. The posts shall not exhibit excessive cracking and posts which in the opinion



of the Engineer, exhibit a degree of cracking that would render them unfit for service during a much shorter than normal life, shall not be used.

Timber posts and spacer blocks shall be treated in accordance with SANS requirements for timber preservation. New timber posts and spacer blocks shall be treated with a creosote preservative.

Posts shall not be sawn, drilled or shaped after treatment. Where, however, the cutting of posts is unavoidable the Engineer may permit the required length to be cut off from the bottom of the post, provided that the exposed area is subsequently thoroughly treated with creosote.

(ii) Other guardrail posts

Normally only timber posts shall be used for supporting the guardrails but under certain circumstances other types of posts may be required. The type and size of other posts shall be as shown on the drawings.

(c) Guardrail reflectors

V-shaped reflective plates shall be manufactured from 1,5 mm thick mild steel plate to the dimensions shown on the drawings. When supplied with the galvanised guardrails, they shall also be galvanised and when supplied with painted guardrails, they shall be finished in white baked enamel. The outer surface shall be coated with Engineering-grade retro-reflective material, which complies with the provisions of CKS 191 in the colours shown on the drawings. Holes for fixing shall be drilled before the reflective plates are galvanised or painted.

(d) Wire rope safety fence (WRSF) materials

All materials inter alia cables, posts, footings, anchor blocks, reflectors and all other related and accompanying materials used in the installation and repair of wire rope safety fence must be provided by the manufacturer and meet the manufacturer's specifications. Repair materials must be readily available to the Contractor.

PM4405 MEASUREMENT AND PAYMENT

PM4400 GUARDRAIL ERECTION AND MAINTENANCE

<u>Item</u>	<u>Unit</u>
PM440.01 Erection of guardrails using new or recovered guardrails	
a) Erection of guardrails	metre (m)
b) Install timber posts	Number (No)
c) Install end wings	Number (No)
d) Install terminal sections where single guard-rails are used	Number (No)
e) Install terminal sections where double guard-rails are used	Number (No)
f) Install guard-rail reflectors (all types)	Number (No)
g) Install spacer blocks	Number (No)

The unit of measurement for subitem PM440.01 (a) shall be the metre of guardrail erected in position and measured in place. The tendered rate shall include full compensation for erecting the guardrail complete.

The unit of measurement for subitems PM440.01 (b) shall be the number of guardrail posts backfilled with soilcrete or concrete. The tendered rate shall include full compensation for

provision of soilcrete or concrete for backfilling to guardrail posts as instructed by the Engineer or as detailed on the drawings

The unit of measurement for subitems PM440.01 (c) shall be the number of end units of each type erected.

The tendered rates shall include full compensation for all labour, equipment required for installing the end units as shown on the drawings.

The unit of measurement for subitems PM440.01 (d) and (e) shall be the number of end units of each type erected.

The tendered rates for sub-item PM440.01 (f) shall be the number of reflectors installed including compensation for all labour, constructional equipment and material.

The unit of measurement shall be the number of guardrail reflectors installed.

The tendered rate shall include full compensation for supplying all materials and labour required for manufacturing, painting and fixing guardrail reflectors as specified and as shown on the drawings.

The unit of measurement for subitem PM440.01 (g) shall be the number of spacer blocks installed.

<u>Item</u>	<u>Unit</u>
PM440.06 Removal of damaged guardrail material	
(a) Remove guardrails	metre (m)
(b) Remove end wings	number (No)
(c) Remove terminal sections with single guardrails	number (No)
(d) Remove terminal sections with double guardrails	number (No)
(e) Remove guardrail posts	number (No)
(f) Remove guard-rail reflectors (all types)	number (No)
(g) Remove spacer blocks	number (No)

The unit of measurement for subitem PM440.06 (a) shall be the metre of guardrails removed and re-erected including the post with spacer blocks, excavating, backfilling the post holes and removing any surplus excavated material.

The unit of measurement for subitems PM440.06 (b), (c) and (d) shall be the number of units removed.

The tendered rates shall include full compensation for constructional equipment, labour and tools required to remove the guardrails, including loading, transporting between any two points on the site and off-loading the material. The providing of renovated material shall be paid under item M440.07 and new material under item PM440.08.

The tendered rate shall also include for the loosening of bolts and the adjacent sections of guardrails in order to adjust their position to accommodate the recovered, renovated or new sections of guardrails.

The unit of measurement for subitem PM440.06 (e) shall be the number of guardrail posts removed. The tendered rate shall include full compensation for removing the guardrail posts complete with spacer blocks, bolts, nuts, washers, and reinforcing plates.

The unit of measurement for subitem PM440.06 (f) shall be the number of guardrail reflectors removed. The tendered rate shall include full compensation for removing the complete reflector with bolts, nuts, washers, and reinforcing plates.

The unit of measurement for subitem PM440.06 (g) shall be the number of additional guardrail spacer blocks removed. The tendered rate shall include full compensation for removing the guardrail spacer blocks with spacer blocks, bolts, nuts, washers, and reinforcing plates.

<u>Item</u>	<u>Unit</u>
PM440.08 Providing of new material required for the re-erection of guard-rails	
(a) New guardrails	Metre (m)
(b) New curved guard-rails	metre (m)
(c) New timber posts	number (No)
(d) New steel post	Number (No)
(e) New spacer blocks	number (No)
(f) Guardrail reflectors	
(i) New Post reflector (diamond grade reflective)	number (No)
(ii) New Type D1 (B)	number (No)
(g) New end wings	Number (No)
(h) New terminal section with single guard-rails	Number (No)
(i) New terminal section with double guard-rail	Number (No)

The unit of measurement for subitems PM440.08 (a) and PM440.08 (b) shall be the metre of guardrail erected in position and measured in place.

The tendered rate shall include full compensation for furnishing all materials and labour for erecting the guardrail complete with posts, spacer blocks, bolts, nuts, washers and reinforcing plates.

The unit of measurement for subitems PM440.08 (c), (d) (e), (f), (g), (h) and (i) shall be the number of additional items provided such as posts, spacer blocks, end units and guardrail reflectors.

The tendered rates shall include full compensation for all labour, constructional equipment and material, required for installing the posts, spacer blocks, reflectors and end units as shown on the drawings including posts, fittings and the bending of turned-down sections, excavations, backfilling and the removal of surplus backfilling.

<u>Item</u>	<u>Unit</u>
PM440.09 Reinstatement of concrete to guardrail posts (specify class)	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of concrete placed in accordance with the authorised dimensions.

The tendered rate shall include full compensation for procuring and furnishing all materials, mixing, transporting, placing and compaction of the concrete.

<u>Item</u>	<u>Unit</u>
PM440.10    Realignment of guardrails	metre (m)

The unit of measurement shall be the metre of guardrail realigned in position on the instruction of the Engineer.

The tendered rate shall include full compensation for labour, tools, equipment and materials required for the realignment of guardrails as specified.

<u>Item</u>	<u>Unit</u>
PM440.11    Painting of guardrails	metre (m)

The unit of measurement shall be the metre of guardrails painted. The tendered rate shall include full compensation for all labour, material and equipment required for the cleaning and painting (with an appropriate bitumen/galvanised paint) of the guardrail.

<u>Item</u>	<u>Unit</u>
PM440.12    Repair of damaged wire rope safety fence and re-erection of wire rope safety fence with recovered, renovated or new material	
(a)            Repair of wire rope safety fence	metre (m)
(b)            Post footings	number (No)
(c)            Anchor blocks	cubic metre (m <sup>3</sup> )
(d)            Re-tensioning of wire rope safety fence	metre (m)

The unit of measurement for subitem PM440.12 (a) shall be the metre of wire rope safety fence repaired and shall be measured between the two posts that are not damaged. The tendered rate shall include full compensation for all labour, equipment and traffic accommodation required for the removal of damaged wire rope safety fence and re-erection of wire rope safety fence with recovered, renovated or new material which will be procured by the Employer.

The unit of measurement for subitems PM440.12 (b) shall be the number of post footings and subitem PM440.12 (c) shall be the cubic metre of anchor blocks repaired. The tendered rate shall include full compensation for the removal of damaged post footings and anchor blocks and disposal thereof, and all labour, equipment and material required for the installation of new post footings and anchor blocks.

## **PM4505 MEASUREMENT AND PAYMENT**

### **PM4500 DAZZLE SCREEN ERECTION AND REPLACEMENT**

<u>Item</u>	<u>Unit</u>
PM450.01 Erection of dazzle screens	
(a) Metal	metre (m)

The unit of measurement shall be the metre of dazzle screen fixed in position and measured in place as specified or instructed by the Engineer.

The tendered rate shall include full compensation for all materials and labour, the manufacturing, treating the materials as required, erecting the screens complete with bolts, nuts and markers. Dazzle screens to be supplied by the employer.

<u>Item</u>	<u>Unit</u>
PM450.02 Erection of dazzle screens supporting posts	
(a) Metal	number (No)

The unit of measurement shall be the number of supporting posts erected.

The tendered rates shall include compensation for all materials and labour, manufacturing, treating the material as required, erecting the posts in position, backfilling the post holes including concrete backfill where required and removing any surplus excavated material. Steel posts to be supplied by the Employer.

<u>Item</u>	<u>Unit</u>
PM450.03 Removal of damaged dazzle screens and supporting posts	metre (m)
PM450.04 Repair and re-erect recovered dazzle screens and posts	metre (m)

The unit of measurement shall be the metre of actual of screens removed.

The tendered rate shall include full compensation for equipment, labour and tools required to remove the screen sections and posts including loading, transporting to the campsite, and offloading and stacking the material.

New material shall be used for re-erecting screens at the section removed and payment shall be made under the relevant items for erecting new dazzle screens and supporting posts.

Damaged material shall be repaired where possible and used for re-erecting at the section removed and payment shall be made under the item PM450.04

**SECTION M4600: ROAD MARKINGS (Does not form part of this contract)****PM4613 MEASUREMENT AND PAYMENT**

Replace item "M460.02 with PM460.02" and amend as follows;

<u>Item</u>	<u>Unit</u>
PM460.02 Retro-reflective road-marking paint:	
a) White lines (broken or unbroken)	
(i) 100mm	metre (m)
(ii) 150mm	metre (m)
(iii) 300mm	metre (m)
b) Yellow lines (broken or unbroken)	
(i) 150mm	metre (m)
(ii) 200mm	metre (m)
(d) White lettering and symbols	square metre (m <sup>2</sup> )
(e) Yellow lettering and symbols	square metre (m <sup>2</sup> )
(f) Transverse lines, painted island and arrestor bed markings (any colour)	square metre (m <sup>2</sup> )

The unit of measurement for painting the lines shall be a kilometre or metre of each specified width of line and the quantity paid for shall be the actual length of line painted in accordance with the instructions of the Engineer, excluding the length of gaps in broken lines.

The unit of measurement for painting the lettering, symbols, transverse lines or painted island and arrestor bed markings shall be a square metre, and the quantity to be paid for shall be the actual surface area of lettering, symbols or transverse lines, painted island and arrestor bed markings completed in accordance with the instructions of the Engineer.

The tendered rate per metre, kilometre or per square metre as the case may be for painting the road markings shall include full compensation for procuring and furnishing all material, including the retro-reflective beads in the case of retro-reflective paint, and the necessary equipment, and for painting, protecting and maintenance as specified, including the setting-out of lettering, symbols and transverse lines, painted island and arrestor bed markings, but excluding setting out and pre-marking the lines.

## SECTION M5100: GENERAL EROSION PROTECTION

### PM5105 MEASUREMENT AND PAYMENT

Add the following items; PM510.08, PM510.09 and PM510.10

"Item	Unit
PM510.08 Excavation of termite mounds	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of material excavated as specified on instruction of the Engineer, by means of hand or machine excavation.

The tendered rate shall include full compensation for all labour and equipment and chemicals required for removing of the termites and the mounds. For loading, off-loading and spreading when material removed is intended for spoiling at approved spoil sites. The tendered rates shall also include for transporting the excavated material to approved spoil sites in excess of the free-haul distance.

"Item	Unit
PM510.09 Installation of environmental nets	square metre (m <sup>2</sup> )

The unit of measurement shall be the square metre of environmental net placed as specified and on instruction of the Engineer.

The tendered rate shall include full compensation for all labour and equipment required for installing the environmental nets and securing it in place.

"Item	Unit
PM510.10 Backfilling of erosion gullies	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of material used to backfill the eroded gully as instructed by the Engineer.

The tendered rates shall include full compensation for all equipment and labour backfilling the eroded gully and compacting the material in layers not exceeding 150mm at the materials optimum moisture content.

## SECTION 5200: GABION PROTECTION

### PM5205 MEASUREMENT AND PAYMENT

add the following item;

Item	Unit
PM520.06 Existing Gabions	
PM520.06 a) Unpacking of existing gabions or mattress and repack Using the recovered material.	cubic metre (m <sup>3</sup> )

The unit of measurement shall be the cubic metre of the rock removed from the baskets or mattresses and repacked to fill the cages. The quantity shall be calculated from the dimensions of the actual gabions unpacked and refilled gabions as instructed by the Engineer, irrespective of any deformation or bulging of the completed gabions.

The tendered rates shall include full compensation for supplying all the materials, tying and connecting wires, loading, transporting and off-loading, the assembling and filling of the cages, and any other work necessary for constructing the gabions



## **SECTION M6100: CONTROLLING VEGETATION GROWTH: MOWING AND CUTTING**

Does not form part of this contract

### **PM6106 MEASUREMENT AND PAYMENT**

Amend items "M610.01" and "M611.01" to read as items "PM610.01" and "PM611.01" and add the following sub-items:

<u>Item</u>	<u>Unit</u>
PM610.01 c) Median Mow	kilometre (km)

The unit of measurement shall be the kilometre of median mowed and removal of grass cuttings operation for section as instructed.

The tendered rate shall include full compensation for furnishing all equipment and labour for each mow and removal operation, regardless of whether the grass is cut by machine or manual labour, and shall include all costs for the picking up and disposal of grass cuttings, all as specified in Clause M6102.

<u>Item</u>	<u>Unit</u>
PM611.01 Cutting of designated areas	
PM611.01 a) Sight triangles at intersection, road signs and Marker boards	hectare (ha)

The rate shall include full compensation for furnishing all equipment and labour, for all mow and removal operations regardless of the quantities, or whether the grass is cut by machine or manual labour, and shall include all costs for picking up and disposal of grass cuttings as specified.

No separate payment will be made for cutting grass on steep or rocky slopes.

The tendered rate shall include full compensation for furnishing all plant, equipment and labour for each mow operation, regardless of whether the grass is cut by machine or manual labour, all as specified.

## SECTION M6200: CHEMICAL CONTROL OF VEGETATION AND ERADICATION OF UNDESIRABLE VEGETATION

Does not form part of this contract

### PM6205 MEASUREMENT AND PAYMENT

Amend items "M620.01" and "M620.02" to read as items "PM620.01" and "PM620.02" and replace them with the following:

<u>Item</u>	<u>Unit</u>
PM620.01 Chemical eradication of undesirable vegetation	
(a) Chemical control within the road reserve	hectare (ha)
The unit of measurement shall be the hectare chemical eradication of undesirable vegetation per section as specified, and described in sub-clause M6202 (b). A selective herbicide shall be used. The Contractor is to assess the number of different types of chemicals that will be required to eradicate the areas of undesirable vegetation.	

The tendered rate shall include full compensation for all labour, equipment and chemical required for the spraying of the chemicals in accordance with the manufacturer's specifications. The tendered rates shall be fully inclusive of any costs arising from restricted working conditions due to the nature of the site or traffic flow.

Payment will be made as follows:

- (a) 60% will be payable when visible results are obtained
- (b) The remaining 40% will be payable when at least 90% of the treated vegetation has been controlled in the opinion of the Engineer.

<u>Item</u>	<u>Unit</u>
PM620.02 Additional chemical eradication of undesirable vegetation and control of vegetation growth on instruction of the Engineer	
(c) Shoulder weed spray	kilometre (km)

The unit of measurement for the items shall be as specified, for the additional chemical eradication of undesirable vegetation and control of vegetation growth on instruction of the Engineer, as described in sub-clause M6202 (a).

The herbicides to be used per sub-clause M6202 (a) are as follows:

- items (i), (ii) and (iv) - selective herbicide
- items (iii), (vi) and (vii) - non-selective herbicide with three months residual
- item (v) - contact herbicide

The Contractor is to assess the number of different types of chemicals that will be required to eradicate the areas of undesirable vegetation and control the vegetation growth.

The tendered rate shall include full compensation for all labour, equipment and chemical required for the spraying of the chemicals in accordance with the manufacturer's specifications. The tendered rates shall be fully inclusive of any costs arising from restricted working conditions due to the nature of the site or traffic flow.

Payment will be made as follows:

- (a) 60% will be payable when visible results are obtained
- (b) The remaining 40% will be payable when at least 90% of the treated vegetation has been controlled in the opinion of the Engineer."

## SECTION M6300: REMOVAL OF UNDESIRABLE VEGETATION: PHYSICAL ERADICATION

### M6304 MEASUREMENT AND PAYMENT

Amend item "M630.01" to read "PM630.01" and replace sub-item (a) with the following:

<u>Item</u>	<u>Unit</u>
PM630.01 Eradication of undesirable vegetation	
(a) Initial eradication	
(i) Undesirable vegetation and trees with a girth of 0 to 150 mm (specify section and km distance incl interchanges)	hectare (ha)

The unit of measurement is hectare, for the eradication of undesirable vegetation and as described in sub-clause M6302 (a), on the instruction of the Engineer. The felling of declared trees described in sub-clause M6302 (a) with a girth greater than 500 mm will be measured and paid for under item M630.02.

The tendered rates shall include full compensation for all labour and equipment necessary for the cutting of the vegetation, trees and branches including cutting trunks and branches into manageable sizes, and painting all cut faces with herbicide where necessary, loading, off loading and spreading and hauling to an approved dump site."

Amend item "M630.04" to read as "PM630.04" and add sub-items (a) and (b)

<u>Item</u>	<u>Unit</u>
PM630.04 Additional eradication of undesired vegetation ordered By the Engineer.	
a) From paving blocks and other surfaced areas	square metre (m <sup>2</sup> )

The unit of measurement for sub-item PM630.04 (a) shall be the square metre of additional control of weeds and shall include full compensation for all labour, equipment and material required for control of vegetation and eradication of weeds.

The Contractor is to assess the number of different types of places where application of chemicals will be required and to make provision accordingly for the fluctuating chemical demand per section of road.

The tendered rate shall include full compensation for the supply of chemicals, equipment and labour for the spraying of the chemical liquids in accordance with the manufacturer's specifications.

The tendered rates shall be fully inclusive of any costs arising from restricted working conditions due to the nature of the site or traffic flow.

## SECTION M6400: MAINTENANCE AND ESTABLISHMENT OF PLANTS, TREES AND SHRUBS

### PM6404 MEASUREMENT AND PAYMENT

Amend items "M640.02 and M640.04" to read as item "PM640.02 and PM640.04" and add sub item PM640.02 (b) and PM640.02 (c):

<u>Item</u>	<u>Unit</u>
PM640.02 Trimming of shrubs and hedges	
(a) Trimming of shrubs and hedge plants	kilometre (km)
(b) Partial trimming of shrubs and hedge plants	kilometre (km)
(c) Pruning of trees	number (No)

The unit of measurement for sub-item PM640.02 (a) and (b) is the kilometre of trimming per section as specified and shall include full compensation for the equipment and labour required for trimming shrubs and hedges to the specified size. The unit of measurement for sub-item PM640.02 (c) will be the number of trees pruned. The items also includes the removal and haul of all debris arising from the operation to an approved dumpsite.

### PM640.04 Preparing plant holes

(a) Trees, shrubs and hedge plants	cubic metre (m <sup>3</sup> )
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The unit of measurement shall be the cubic metre of holes prepared as prescribed.

The tendered rate shall include full compensation for all equipment, labour and tools required for excavating the hole, backfilling the hole with topsoil, and furnishing and mixing in manure or compost and the specified fertiliser, for watering the hole prior to planting and for disposing of the excavated material. It shall include for furnishing and placing crushed stone in the bottom of the hole as prescribed.

## SECTION M6500: ESTABLISHMENT OF GRASS

### 6505 MEASUREMENT AND PAYMENT

Amend item "M650.07" to read as "PM650.07" and add sub-item (d) and add item PM650.08:

Item	Unit
PM650.07 Grassing	
d) Vetiver grass planting	number (No)

#### Vetiver grass

The unit of measurement for planting vetiver grass plants shall be the number of established grass plants with an acceptable grass cover.

The tendered rate shall include full compensation for planting the vertiver, watering, weeding, and replanting if necessary, and all other incidentals which may be necessary for establishing an acceptable cover and maintaining the grass, except mowing

Item	Unit
PM650.08 Install grass fence	metre (m)

The unit of measurement for installing the grass fences shall be per metre of grass fence installed in place.

The tendered rate shall include full compensation for the grass fence installed in place, secure with stakes and the necessary excavations, labour, equipment and the materials.

## SECTION M7100: EMERGENCY STANDBY TEAM

### PM7102 EXECUTION OF WORK

Delete the third paragraph in item (c) relating to the requirement for an electronically illuminated high visibility sign.

### M7103 MEASUREMENT AND PAYMENT

Amend item "M710.01" to read as item "PM710.01" and add sub-items (e) and (f) as follows:

Item	Unit
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PM710.01 Emergency standby	
----------------------------	--

- |    |  |             |
|----|--|-------------|
| e) | Removal of lost load up to 2m <sup>3</sup>                           | number (No) |
| f) | Removal of lost load exceeding 2m <sup>3</sup> up to 5m <sup>3</sup> | number (No) |

Payment under sub-item PM710.01 (e) and (f) shall be the number of call outs to the point of incidents to remove the lost load. The tendered rates shall include full compensation for the lost load and disposal of the material/items at an approved dump site or recycle agent.

## **SECTION C: ENVIRONMENTAL MANAGEMENT PLAN**

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## **A: MANAGEMENT OF ENVIRONMENTAL ISSUES DURING THE OPERATIONS AND MAINTENANCE PHASE**

The management of all potentially negative environmental impacts during the Operations and Maintenance phase are dealt with through specific management and mitigation plans. Each environmental component that requires management and mitigation has been identified.

The specific and detailed management and mitigation plans for the Operations and Maintenance phase are included in this document. This allows for allocating management and mitigation plans to relevant Road Operations and Maintenance activities.

The specifications governing the various actions under the management and mitigation plans are detailed in separate procedures.

The management and mitigation plans, listed in the table below, are applicable to the Operations and Maintenance phase of the N3 Toll Highway:

**Table A.1: List of Management and Mitigation Plans**

<b>Annexure Number</b>	<b>Management &amp; Mitigation Plan</b>
<a href="#"><u>A1</u></a>	Public and Authority Communication
<a href="#"><u>A2</u></a>	Protection of Heritage Resources
<a href="#"><u>A3</u></a>	Airborne Noise Management
<a href="#"><u>A4</u></a>	Road Reserve Maintenance
<a href="#"><u>A5</u></a>	Water Management
<a href="#"><u>A6</u></a>	Emergency Preparedness and Response
<a href="#"><u>A7</u></a>	Waste Management
<a href="#"><u>A8</u></a>	Ecological Management
<a href="#"><u>A9</u></a>	Material Management
<a href="#"><u>A10</u></a>	Construction Activity Management
<a href="#"><u>A11</u></a>	Environmental Awareness Training

The detail Management and Mitigation plans follow below:



### 1. PURPOSE

The purpose of the Public and Authority Communication plan is to ensure that interested and affected parties are informed of Operations and Maintenance activities, new initiatives, incidents and accidents that could impact on them. It also provide an opportunity to interested and affected parties to report any issues, complaints or compliments to the Concessionaire. It further stipulates the required environmental reporting requirements.

The plan also serves to ensure that there is ongoing feedback on project progress as well as environmental management performance relative to the defined objectives and targets.

### 2. COMPONENTS

The plan is made up of the following components:

- a. Environmental Liaison Committee
- b. Customer Care Line
- c. N3TC Website
- d. Annual Environmental Report
- e. Public Involvement Program.

### 3. MANAGEMENT AND MITIGATION

#### a. Environmental Liaison Committee

##### ***Objectives***

An Environmental Liaison Committee is required in terms of Annexure Two of the Concession Contract. The committee shall consists of at least one representative from each of the SANRAL, the Concessionaire, the Independent Engineer, the Lenders (if required by the Lenders) and any other role player deemed necessary by the members of the committee. The objective of the Committee is to ensure that sound environmental principles and policies are adhered to and would track environmental performance during the Operations and Maintenance phase.

##### ***Targets***

- Compliance to the Concession Agreement requirements.
- Arrange Environmental Liaison Meetings on a bi-annual basis.
- Strive towards a quorum of 75% attendance / representation by all members or alternates at meetings.

##### ***Method Statements***

- The Environmental Liaison Meeting shall continue throughout the concession period.
- Membership shall consist of the following:
  - SANRAL.
  - The Independent Engineer.
  - The Independent Environmental Consultant.
  - The Concessionaire (N3 Toll Concessions (RF) Proprietary Limited).
  - Lender's representatives (Only if required by the Lenders).
- Membership shall be adjusted or change as determined by the committee.

**b. Customer Care Line (N3TC Cares)**

***Objectives***

- To establish and maintain a Customer Care Line to improve road safety.
- To timeously and effectively address all complaints and queries and to investigate and act on fraud claims received.

***Targets***

- Establish processes and procedures to effectively address all complaints and queries received.
- Respond effectively to all complaints received within 48 hours, unless additional information and / or clarification are required.
- Respond to and resolve queries received during the first communication.

***Method Statements***

- A customer care line shall be established to provide information, obtain information, log complaints and provide advice on issues relating to the N3 Toll Highway Project in order to improve road safety.
- The Concessionaire shall notify the public and advertise the contact telephone number/s of the Customer Care Line (0800 63 43 57), should they wish to make use of it.
- Where requested, anonymity shall be provided for any crime related reporting.
- Complaints shall be logged in a Complaints Register.
- For complaints received through the Customer Care Line the following shall apply: The person receiving the complaint shall record the following in the Complaints Register:
  - The date and time of the complaint
  - Personal details of the complainant, which were provided by the complainant or if no such details were provided, a note to that effect
  - The nature of the complaint; and
  - The action to be taken by the Concessionaire in relation to the complaint.
- Following investigation of the complaint, the relevant person shall update the Complaints Register to include:
  - Actions taken to resolve the complaint
  - If no action was taken, the reasons why no action was taken; and
  - The date and time of follow-up contact with the complainant.

**c. N3TC website**

***Objectives***

- To maintain ongoing liaison and communication with all interested and affected parties by providing a fully operational website that is user-friendly and that provides clear links to the relevant information in order to facilitate easy access to the information.

***Targets***

- Annual renewal of domain name.
- 99% availability of the website.

***Method Statements***

- The current established website, [www.n3tc.co.za](http://www.n3tc.co.za), must be retained and domain renewal shall timeously be undertaken.
- The website shall be regularly updated to ensure relevant content.
- The website will provide details of the Concessionaire's organisational structures, roles and responsibilities and other project related information.
- All complaints received via the website shall be included in the complaints register.

#### **d. Annual Environmental Report**

##### ***Objectives***

To develop and publish an annual Environmental Report to ensure proper reporting on the Environmental Status of the N3 Toll Highway Project.

##### ***Targets***

- Compliance to all statutory, RoD, permit and contractual requirements.
- To compile an annual Environmental Report for submission to the annual Environmental Liaison Committee.

##### ***Method Statements***

- An annual Environmental Report for the N3 Toll Highway shall be submitted to the Environmental Liaison Committee.
- The annual Environmental Reports shall be submitted to the Project Lenders.
- The annual Environmental Report shall be made available to all interested and affected parties on request.

#### **e. Public Involvement Program**

##### ***Objectives***

In terms of Section 8.2 of Annexure Two of the concession agreement a public involvement program shall be implemented. As the initial construction phase has been completed the continued public involvement has fallen away. Public involvement associated with the Operations and Maintenance phase of the Project shall be managed on a needs based principle. Full public involvement programs shall be implemented for all new developments, expansion and Environmental Applications where public participation is required.

##### ***Targets***

- Compliance to all statutory, RoD, permit and contractual requirements.
- Capture all inputs from the public.

##### ***Method Statements***

- Any requests by the public to arrange a meeting to discuss problems, complaints or compliments shall be complied with.
- Minutes of all public involvement meetings shall be kept.
- Minutes of each public meeting held for new developments, expansion and Environmental Applications shall be kept.
- For new developments, expansion and Environmental Applications, detailed issues and response report shall be prepared.
- For new developments, expansion and Environmental Applications, public involvement meetings shall be properly advertised.
- Meetings requests relating to normal Operations and Maintenance activities shall only be advertised if requested by the public representatives requesting the meeting.

#### **4. MONITORING**

##### ***Parameter***

The following parameters shall be monitored:

- a. Complaints received
- b. Environmental Liaison Committee
- c. Environmental compliance (Annual Environmental reporting).

## **Procedure**

### **a. Complaints received.**

A Complaints Register shall be established for all complaints received. A monthly Complaints Report shall be compiled providing a summary of all the complaints received and distributed to all relevant parties. All complaints received including those logged on the Customer Care Line as well as on the website shall be logged. The report shall contain the following information as a minimum:

- The date and time of the complaint
- Personal details of the complainant, which were provided by the complainant or if no such details were provided, a note to that effect
- The nature of the complaint
- The action taken/to be taken by the Concessionaire in relation to the complaint and
- Overall compliance to the target of resolving all complaints within 48 hours.

### **b. Environmental Liaison Committee**

The bi-annual Environmental Liaison Committee shall be convened on a bi-annual basis. Minutes of each meeting shall be kept and distributed following each meeting.

### **c. Environmental compliance (Environmental reporting).**

A bi-annual Environmental Report shall be submitted to the Environmental Liaison Committee. As a minimum, an overview of environmental management of the project for the year, with specific reference to the following issues shall be provided:

- Environmental Concerns
- Environmental Incidents
- If any of these issues indicate detrimental impacts caused by the project, steps taken to remedy such impact shall be included in the report
- Environmental Non-compliances
- Summary of Waste management
- Summary of new environmental applications
- Summary of relevant heritage finds or information
- Information on training undertaken during the reporting period.

## **Frequency**

### **a. Complaints received.**

The Complaints report shall be produced on a monthly basis.

### **b. Environmental Liaison Committee.**

Environmental Liaison meetings shall be held bi-annually.

### **c. Environmental Report.**

The Environmental Status report shall be prepared on a bi-annual basis.

**Instrumentation** Not applicable.

## **Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

## **Responsibility**

All reports shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited. Arranging the Environmental Liaison Committee meeting as well as keeping of minutes shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.

## A2: PROTECTION OF HERITAGE RESOURCES

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### 1. PURPOSE

The purpose of the heritage resources management and mitigation plan is to ensure that heritage sites, structures older than 60 years, and archaeological or paleontological sites, either inside or in close proximity of the road reserve, that are protected through law, are identified and any potential negative impacts on these sites avoided or mitigated.

### 2. COMPONENTS

The plan is made up of the following components:

- a. Protected heritage resources
- b. Chance heritage finds
- c. Maintenance of known heritage structures.

### 3. MANAGEMENT AND MITIGATION

#### a. Protected heritage resources

##### **Objectives**

To ensure no damage to existing or new heritage structures and buildings within or close to the road reserve during the Operations and Maintenance phase.

##### **Targets**

- Compliance to all statutory requirements.
- No impact on any protected heritage resource during the Operations and Maintenance phase.

##### **Method Statements**

- Summarise all protected heritage resources as defined in the National Heritage Resources Act (No. 25 of 1999) that could potentially be affected during the Operations and Maintenance phase in a Heritage Register.
- Any new building or structure that has its status changed during the Operations and Maintenance phase shall be added to the Heritage Register.
- The location of all heritage structures in or in close proximity to the road reserve, as well as the protection requirements for these shall be communicated to employees and sub-contractors.
- Any work undertaken close to existing heritage structures shall be strictly monitored to ensure no impacts on the heritage structures occur.
- Graves and other significant heritage sites within the road reserve should be fenced and protected.
- All permit conditions shall be adhered to during the Operational and Maintenance period.

#### b. Chance Heritage Finds

##### **Objectives**

To effectively manage the discovery of chance heritage finds and the disturbance thereof and how to address the same during the course of Operation and Maintenance activities.

##### **Targets**

- Compliance to all statutory, RoD and permit requirements.
- Any structure, object, remain(s) or deposit(s) that is of demonstrable or suspected to be of an archaeological or historical nature whether *in situ* or not shall be reported to the relevant Authorities.
- Reporting of any chance heritage find shall be done within 24 hours of its discovery.

### **Method Statements**

- All operational works shall be carried out with sensitivity to the possible unearthing of heritage materials or objects, artefacts / graves.
- In the event of the discovery of heritage materials or objects, artefacts or graves, relevant activities in the specific area of the find shall cease pending further investigation.
- Nothing may be moved or removed from site and a Heritage Practitioner shall be notified immediately to consult with the relevant Heritage Authority.
- A Heritage Practitioner is to assess the site to establish its status and to categorise it as either:
  - (A): Heritage sites, structures older than 60 years and archaeological or paleontological sites or
  - (B): Grave(s) or human remains.

### **c. Maintenance of Known Heritage Structures**

#### **Objectives**

To ensure known heritage structures within the road reserve are properly maintained.

#### **Targets**

- Compliance to all statutory, RoD and permit requirements.
- To maintain known heritage structures during the Operations and Maintenance phase.

### **Method Statements**

- Any new building or structure within the road reserve that has its status changed to Heritage shall be added to the Heritage Register and shall be evaluated to determine the maintenance requirements.
- All permit conditions relating to maintenance shall be adhered to during the operational period.

## **4. MONITORING**

### **Parameter**

The following parameters shall be monitored:

- a. All Heritage Resources

### **Procedure**

A Heritage Register shall be compiled for all heritage resources affected by the Project.

The Register shall contain the following information as a minimum:

- All protected heritage resources as defined in the National Heritage Resources Act (No. 25 of 1999) that are inside or in close proximity of the road reserve.
- A summary of any chance heritage finds that might have been made during the reporting period
- Maintenance undertaken on any heritage structures during the reporting period.

Relevant information from the Heritage Register shall be included in the bi-annual Environmental Report and reported to the Environmental Liaison Committee.

### **Frequency**

The Heritage Report shall be updated every five (5) years.

### **Instrumentation**

Not applicable.

**Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

**Responsibility**

The five yearly Heritage Report shall be the responsibility of N3 Toll Concessions (Pty) Ltd.

### 1. PURPOSE

The purpose of the airborne noise management and mitigation plan is to ensure that operational and maintenance activities resulting in airborne noise, are managed appropriately.

### 2. COMPONENTS

The plan is made up of the following components:

- a. Noise generated by the road
- b. Operational and maintenance activities creating noise.

### 3. MANAGEMENT AND MITIGATION

#### a. Noise Generated by the Road

##### **Objectives**

To ensure appropriate noise mitigation measures during the operational period.

##### **Targets**

- Compliance to all statutory, RoD and permit requirements
- Compliance to SANS 10103:2004.

##### **Method Statements**

- Existing noise mitigation measures shall be maintained on a regular basis.
- Regular testing and monitoring shall be undertaken to evaluate noise levels and obtain noise trend lines.
- An annual Noise report shall be developed to summarise noise monitoring results and to present noise trend lines.
- Regular testing and monitoring shall be undertaken to evaluate continued effectiveness of noise mitigation measures.
- The noise impact of any changes in the road infrastructure shall be investigated and if required, additional noise mitigation measures shall be implemented.
- The noise impact of any changes to the volumes of traffic on the road shall be investigated and if required, additional noise mitigation measures shall be implemented.
- Designs of any new road infrastructure shall be informed by the potential noise impact resulting from the planned changes and appropriate noise mitigation measures shall be included.

#### b. Operational and Maintenance Activities Creating Noise

##### **Objectives**

To implement an acceptable Operations and Maintenance phase noise management and mitigation plan.

##### **Targets**

- Compliance to all statutory, RoD and permit requirements.
- Compliance to SANS 10103:2004.
- Where the existing average background noise is higher than that specified in the SANS 10103:2004 guidelines, average maintenance noise at the closest sensitive receiver shall not exceed that existing background noise level.
- Noise levels associated with maintenance activities will not exceed the maximum noise standards for 95% of the time over a 24-hour period.



### **Method Statements**

- Having due regard for the proximity to the road of local communities and dwellings, N3TC shall restrict all of its operation and maintenance operations which result in undue noise disturbance to the hours of 06:00 to 18:00.
- Sub-contractors shall equip noisy machinery with standard silencers and take care not to increase ambient noise levels unreasonably, bearing in mind the works and the machinery required.
- Modern low noise emission vehicles and equipment shall be favoured on site.
- Night time maintenance shall be avoided as far as possible.
- Where possible, noisy maintenance activities shall be scheduled to occur at the same time, so as to minimize the total duration of the noise impacts.
- If during critical operational required maintenance, noise levels are exceeded, specific mitigation measures shall be developed and implemented.
- Noise levels associated with maintenance activities shall not exceed the maximum noise standards for 95% of the time over a 24-hour period.
- During the operation of the road, the N3TC shall ensure that the road infrastructure is maintained such that noise levels in identified noise sensitive areas associated with road traffic do not exceed the legally acceptable level specified for affected communities or households.

## **4. MONITORING**

### **Parameter**

The following parameters shall be monitored:

- a. Noise generated by the road

### **Procedure**

An annual Noise Report shall be compiled providing a summary of all the results of noise monitoring undertaken during a specified reporting period. These measurements are to be done routinely but also in response to specific complaints that may be received. The measurements are to be conducted in a manner that is representative of the possible noise disturbance, and for associated potential receptors and within the requirements of *SANS 10103:2004. Code of Practice for: The measurement and rating of environmental noise with respect to annoyance and speech communication*.

The report shall contain the following information as a minimum:

- A summary of noise complaints received during the reporting period
- A summary of actions taken to resolve the complaints
- Noise monitoring results confirming continued effectiveness of existing noise mitigation measures
- Noise monitoring results taken at pre-defined positions in order to develop trends for planning purposes.

Detailed noise studies shall be undertaken in areas where noise exceedances are identified.

### **Frequency**

The Noise Report shall be produced on an annual basis.

### **Instrumentation**

A dedicated Class 1 sound level measuring instrument shall be used to measure noise levels. The sound level measuring instrument shall have a valid calibration certificate.

**Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

**Responsibility**

Noise monitoring shall be conducted by a competent registered Environmental Scientist.

The annual Noise Report shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.

### 1. PURPOSE

The purpose of the road reserve maintenance management and mitigation plan is to ensure that activities associated with road reserve management are managed appropriately.

### 2. COMPONENTS

The plan is made up of the following components:

- a. Fencing
- b. Fire Management
- c. Erosion inside the road reserve
- d. Mowing of grass and trimming of trees.

### 3. MANAGEMENT AND MITIGATION

#### a. Fencing

##### **Objectives**

To ensure fencing is maintained and repaired at all times.

##### **Targets**

- Compliance to all statutory requirements.
- Damaged or stolen fences shall be replaced, repaired or temporarily barricaded within 24 hours of it being reported.

##### **Method Statements**

- The clearing of vegetation for fencing shall be limited to the removal of trees and shrubs within 1m of the fence line. Where possible, the fence line must be aligned to retain trees or tree groups. There shall be no removal of the grass cover or topsoil within this width.
- Any fences damaged during the operation and maintenance period shall be repaired as soon as practical.
- Any waste materials from fence repairs must be collected and removed to the identified collection points. Under no circumstances must pieces of wire or metal be left in the road reserve, since it could interfere with grass mowing or pose a danger to vehicles which may drive in the road reserve.
- Suitable sub-contractors shall be appointed to ensure that damaged fencing is promptly and affectively repaired.

#### b. Fire Management

##### **Objectives**

To control and minimize the impact of fires within the road reserve during the Operation and Maintenance phase.

##### **Targets**

- Compliance to all Statutory and RoD requirements.

##### **Method Statements**

- N3TC shall form part of the regional Fire committee appointed in terms of the Act.
- A Firebreak Program shall be developed and implemented in fire sensitive areas.
  - The Firebreak Program shall stipulate the making of firebreaks at regular intervals to prevent the spreading of fire.
  - The Firebreak program shall be implemented to reduce fuel loads in the road reserve without

- implementing a fire frequency that is too high for the affected vegetation.
  - Firebreaks shall be 5m wide & 200m apart and burnt across the median of dual carriageway sections of the road.
- It is recommended that the firebreaks in non-sensitive areas shall be alternated as follows:
  - Making a firebreak immediately next to the road for a distance of 5 meters from the edge of road,
  - Making a firebreak on the fence line, five meters wide,
  - Making a firebreak on the property adjacent to the road reserve,
  - Utilising a herbicide on the fence line to make a fire break
- It is recommended that the above alternative be rotated and that a four-year cycle be established.
- Any fire noticed shall immediately be reported and controlled.
- A plan of action shall be negotiated with adjoining landowners for the general control of veld fires.

#### **c. Erosion inside the Road Reserve**

##### ***Objectives***

To successfully stabilize unstable or potentially unstable slopes and control erosion inside the road reserve.

##### ***Targets***

- Compliance to all Statutory, RoD and Water Use License requirements.

##### ***Method Statements***

- Regular inspection on vegetation quality and erosion control shall be undertaken within the road reserve.
- Any erosion channels which develop during the Operations and Maintenance phase must be suitably backfilled, compacted and restored to a proper condition (i.e. vegetated etc.).
- Special measures shall be applied in areas where erosion shall be addressed in sandy, highly erodible soils during the Operations and Maintenance phase. Traffic and movement will be restricted and controlled over stabilised areas, and damage to stabilised areas will be repaired and maintained.
- Any erosion or unstable areas within the road reserve shall be promptly stabilised to prevent possible erosion and siltation.
- Appropriate maintenance shall be implemented to ensure long term survival of vegetation cover.
- The various protective measures that were installed during the construction phase must be properly maintained. These include but are not limited to the following:-
  - Vegetation of road verges and cut faces must be inspected and maintained on a regular basis. This is particularly important on steep slopes.
  - Water runoff conduits and storm water swales must be monitored for undercutting and piping. Any sign of deterioration must be attended to promptly.
  - Any new activity such as installation of underground services must be scrutinised for possible impacts on the water regime of the road and road reserve.

#### **d. Mowing of Grass and trimming of trees**

##### ***Objectives***

To successfully mow and manage grass growing within the road reserve.

##### ***Targets***

- Compliance to all Statutory and contractual requirements.

### **Method Statements**

- Only indigenous and endemic trees shall be planted in the road reserve.
- No protected indigenous trees/shrubs/bulbous plants or wild orchids shall be removed from the road reserve without the consent of the Conservation Authority.
- Grass shall be mowed as follows:
  - Grass shall be mowed at least twice per year: a full width winter cut before the end of July and a restricted width summer cut during November to February of each year.
  - Mowing shall be at an average height of 100mm above ground level.
  - Mowed grass shall be baled and removed from the road reserve before the end of August of each year.
  - The winter cut shall preferable be completed at the end of June to reduce the risks of veld fires.
  - Mowed grass shall be bailed and removed as soon as practical from the road reserve.
  - All grass cuttings, which is unsuitable for bailing, shall be collected and disposed of at appropriate sites. Such grass may be used to protect bare areas from erosion. It could also be used to fill dongas and erosion gullies to collect sediment and accelerate re-establishment of vegetation.
  - Under no circumstance shall the grass cuttings be burned in or away from the road reserve.
- Trees and shrubs in the road reserve may be trimmed when such trimming enhances the maintenance operations, the appearance of the tree/shrub or is in the interest of public safety. Indigenous tree saplings may also be removed if it poses a maintenance or safety risk.
- Trees and shrubs within fences or in positions, which inhibits visibility for the road user, shall be removed.
- Material collected from the trimming of trees and shrubs can be chipped and distributed within the road reserve. The chips shall be spread at a thickness not exceeding 50mm.
- Care shall be taken that drains and side drains are clean from material generated by the mowing of grass or trimming of trees, to prevent blockages and ensure free water movement.

## **4. MONITORING**

### **Parameter**

The following parameters shall be monitored:

- a. Fencing
- b. Fire Management
- c. Erosion inside the road reserve
- d. Mowing of grass and trimming of trees.

### **Procedure**

- a. and b. Fencing and Fire Management

A Complaints Register shall be established for all complaints received. A monthly Complaints Report shall be compiled providing a summary of all the complaints received. All complaints related to fencing and Fire Management shall be recorded in the register. Refer to Section A. – A1 Public and Authority Communication – Management and Mitigation Plan for more detail.

Road Maintenance Supervisors shall undertake daily site inspection to identify problem areas and address these.

c. Erosion inside the road reserve

An annual Vegetation Quality Report shall be compiled providing a summary of all the areas along the road alignment requiring rehabilitation. Areas impacted by erosion and loss of soil shall be listed on this report. The detail contents of the Vegetation Quality Report can be found in Section A – A.8 Ecological Management – Management and Mitigation Plan.

d. Mowing of grass and trimming of trees

An annual Vegetation Quality Report shall be compiled providing a summary of the mowing schedules of all the areas along the road alignment during the reporting period. Areas where tree trimming was undertaken shall also be listed. The detail contents of the Vegetation Quality Report can be found in Section A – A.8 Ecological Management – Management and Mitigation Plan.

**Frequency**

The Complaints Register shall be prepared on a monthly basis. The Vegetation Quality Report shall be undertaken on an Annual basis during the winter period.

**Instrumentation**

Not applicable.

**Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

**Responsibility**

The reporting shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.

### 1. PURPOSE

Operations and Maintenance activities have the potential to impact on the water environment, specifically surface and ground water. This management and mitigation plan ensures that Operations and Maintenance activities are managed in such a manner that any negative impacts are mitigated or prevented.

### 2. COMPONENTS

The plan is made up of the following components:

- a. Storm water runoff and discharge
- b. Bridges crossing water courses
- c. Sanitation Facilities
- d. Grootvlei Pan.

### 3. MANAGEMENT AND MITIGATION

#### a. Storm Water Runoff and Discharge

##### **Objectives**

To prevent erosion from taking place especially near rivers, streams and wetlands and to reduce and manage the erosive effects of storm water run-off.

##### **Targets**

- Compliance to all Statutory, RoD and Water Use License requirements.
- No erosion within the road reserve.

##### **Method Statements**

- Identified areas where erosion could occur and that have been appropriately protected by drainage works shall be maintained.
- Unpolluted storm water runoff shall under no circumstances be used to dilute seepage, effluent or water containing waste resulting from the Operations and Maintenance phase.
- Any erosion channels which develop during the Operations and Maintenance phase shall be suitably backfilled, compacted and restored to a stable condition.
- Identified areas where erosion could occur shall be appropriately protected by immediately installing temporary protection measures and followed with permanent protection measures as soon as possible and by taking other appropriate measures to prevent water from being concentrated in sensitive areas and from scouring slopes, banks or other areas.
- Additional gabions or storm water control structures shall be used in the road reserve to disperse storm water flows and/or prevent and control erosion where necessary along rivers or streams.
- The following storm water control measures could be considered if erosion has been identified:
  - use of silt screens;
  - use of straw bales as filters, which are placed across the flow of overland storm water flows;
  - channelling storm water run-off through natural grassland buffer areas (at least 20m);
  - gabions or storm water control structures shall be used to disperse storm water flows and/or prevent and control erosion where necessary along rivers or streams;

- regular inspections by competent personnel need to be undertaken at especially:
  - inlet and outlet points of drainage structures
  - storm water release points and
  - along sections where drainage structures are buried on steep slopes.
- New storm water channels entering rivers or streams shall be angled in line with the flow of water and no perpendicular connections shall be allowed.

#### **b. Bridges Crossing Water Courses**

##### ***Objectives***

To prevent and mitigate disturbance and change to the riparian zones and in-stream habitats of water courses during the Operation and Maintenance phase.

##### ***Targets***

- Compliance to all Statutory, RoD and Water Use License requirements.
- No disturbance to riparian zones.

##### ***Method Statements***

- Bridge structures and culverts shall be regularly cleaned and cleared of all debris to maintain flood clearance (to avoid blockages) as well as flood width (to minimise backwater effects).
- Siltation building up around bridge structures and culverts are only allowed to be removed up to natural ground level. No excavations are allowed.
- Siltation can only be removed up to the border of the road reserve. Any work outside of the road reserve would require appropriate approval.
- If vegetation cover is destroyed during siltation removal, the river/stream bed or drainage channel shall be replanted with appropriate indigenous species after completion of the maintenance works.
- Vegetation establishment around water courses shall be encouraged to ensure proper growth and coverage.
- Attention shall be paid to ensure no informal pathways are created linking the top of the structures with the ground level at all bridges.
- Only indigenous grass shall be planted at and close to all river and stream crossings – no kikuyu grass.
- No unauthorised activities shall be allowed within the 1:100 year flood line at any river or stream crossing.
- Potential erosive water discharge from bridges shall be managed to ensure stability of all river and stream crossings.
- Structures shall be regularly inspected at all river and stream crossings to ensure no damming takes place that could impact on the flow of the water.

#### **c. Sanitation Facilities**

##### ***Objectives***

To ensure proper permanent sanitation facilities during the Operation and Maintenance phase.

##### ***Targets***

- Compliance to all Statutory, RoD and Water Use License requirements.

##### ***Method Statements***

- Where possible, effluent releases from offices, temporary sites and facilities shall be connected to serviced municipal sewer systems.
- Where no connection to a serviced municipal sewer system is possible, effluent water shall be disposed of in a properly designed and constructed system which will be situated so as not to adversely affect water sources (streams, rivers, pans dams, etc.).



- All septic tanks shall be pumped on an annual basis according to a preventative maintenance program.
- French drains shall be regularly checked for the presents of any ponding surface water. If ponding surface water is noticed, the drains shall be pumped.

#### **d. Grootvlei Pan**

##### ***Objectives***

To ensure long terms sustainability of the Grootvlei Pan.

##### ***Targets***

- Compliance to all Statutory, RoD and Water Use License requirements.
- No erosion within the road reserve.

##### ***Method Statements***

- The site must be fenced off and regular inspections shall be made to ensure the site is secure.
- No farming and residential activities shall be allowed on site
- The site shall regularly be checked for erosion and re-vegetated where necessary.
- Only indigenous trees shall be planted on the site.
- The bio-filter was installed parallel to the road boundary to prevent any water run-off pollution shall be checked on a quarterly basis.
- Opportunities should be presented to interested environmental groups to visit the pan.

## **4. MONITORING**

### **Parameter**

The following parameters shall be monitored:

- a. Water Quality
- d. Grootvlei Pan.

### **Procedure**

- a. Water Quality

Water quality shall be determined on an annual basis along the road alignment. Sampling shall also be undertaken at selected rivers and streams along the alignment. Results shall be summarised in an Annual Water Quality Report.

The following shall be defined for each monitoring point in the monitoring program:

- Reason for each monitoring point
- Variable to be monitored and how these variables were determined
- Performance and compliance for each monitoring point
- Area description, including other factors that may influence the data
- Each monitoring pint must be registered with a digital photograph and GPS coordinate.

Analyses shall be undertaken by an accredited laboratory in terms of SANS 241 – 2006: South African Standards for Drinking Water.

- d. Grootvlei Pan

An annual Vegetation Quality Report shall be compiled providing a summary vegetation and tree quality at the pan. Any erosion shall also be listed. The detail contents of the Vegetation Quality Report can be found in Section A – A.8 Ecological Management – Management and Mitigation Plan.

A bi-annual Environmental Report shall be compiled highlighting the findings at the bio-filter during the quarterly inspections. The detail contents of the bi-annual Environmental Report can be found in Section A – A.1 Public and Authority Communication – Management and Mitigation Plan.

**Frequency**

Chemical analyses of water at rivers and streams shall be done annually. The Water Quality Report shall be prepared on an annual basis. The Environmental Report shall be prepared bi-annually.

**Instrumentation**

Water sampling shall be undertaken by making use of the correct samplers. Water shall be kept in clean sampling bottles and kept at a temperature of below 10°C. Samples shall be submitted within 24 hours to an accredited laboratory for chemical analyses.

**Data recording**

All reports shall be kept in electronic format. Laboratory reports shall also be included. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

**Responsibility**

All reporting shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.

### 1. PURPOSE

Emergency preparedness and response is an important aspect to be considered and managed during the Operations and Maintenance phase. This document does not focus on the emergency preparedness and response, but rather on the potential environmental impact associated with an emergency and the associated response.

### 2. COMPONENTS

- a. Emergency preparedness and response
- b. Fire control.

### 3. MANAGEMENT AND MITIGATION

#### a. Emergency Preparedness and Response

##### ***Objectives***

To implement emergency preparedness and response programs in order to minimize the potential environmental impact associated with emergency situations.

##### ***Targets***

- Compliance to all Statutory and RoD requirements.
- Undertake an annual emergency drill.

##### ***Method Statements***

- An Incident register shall be kept of all incidents occurring on the N3 Toll Highway project.
- An environmental preparedness and response program related to potential environmental impacts following an emergency shall be developed by the relevant contractors for the Operations and Maintenance period.
- The environmental preparedness and response program shall be incorporated into standard, company – wide emergency response plans.
- Links shall be established with local emergency services to participate in emergency preparedness and response programs.
- All personnel shall be trained on emergency preparedness and response.
- Emergency drills shall be regularly undertaken to prepare all staff and neighbouring communities on this potential eventuality.
- Any chemical or hazardous substance spill shall be treated with the highest urgency and importance. A qualified contractor shall be contacted to assist if the N3TC's emergency and maintenance teams cannot cope with cleanup of the area.
- All accidents that result in a chemical or hazardous substance spill, these are typical incidents of 50 litres and higher, shall be reported to the local Environmental Authority within 48 hours after the incident.
- Any incident that may cause water pollution shall immediately be reported to the Department of Water Affairs in accordance with the relevant provisions of the National Water Act.
- In all cases the following criteria shall be followed:
  - Containment of the substance
  - Prevention of contamination by the substance
  - Recovery of the substance
  - Recycling of the substance

- Removal of the substance
- Rehabilitation of the area affected.

#### **b. Fire Control**

##### ***Objectives***

To ensure proper emergency services planning and coordination to minimise the impact of fire.

##### ***Targets***

- Compliance to all Statutory and RoD requirements.
- Undertake an annual emergency drill.

##### ***Method Statements***

- Contact with all emergency services shall be maintained.
- Response drills to determine emergency services' response, reaction time and performance to the drill shall regularly be undertaken.
- Emergency drills to prepare all staff and neighbouring communities on this potential eventuality shall regularly be undertake.
- Maintenance on all firefighting equipment shall be undertaken annually according to a preventative maintenance program.
- Fire extinguishers shall be serviced according to a preventative maintenance program by a registered service provider.
- All employees shall regularly be trained on fire risks and control methods.
- Environmental sensitive areas shall be identified and prioritized to minimise fire risks.

#### **4. MONITORING**

**Parameter** Reporting shall be monitored.

##### **Procedure**

All Emergency Preparedness and Response aspects that result in environmental impact would be separately investigated. A summary of all incidents and accidents shall be included in the bi-annual Environmental Report. The detail contents of the bi-annual Environmental Report can be found in Section A – A.1 Public and Authority Communication – Management and Mitigation Plan.

##### **Frequency**

The Environmental Report shall be produced on a bi-annual basis.

**Instrumentation** Not applicable.

##### **Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

**Responsibility** All reporting shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.

### 1. PURPOSE

This Operations and Maintenance phase management and mitigation plan covers the handling and disposal of waste generated during this phase, inclusive of domestic and Operational and Maintenance waste.

### 2. COMPONENTS

The plan is made up of the following components:

- a. Generation of solid waste and litter
- b. Waste minimization and recycling
- c. Refuse removal
- d. Generation and disposal of hazardous waste
- e. Hazardous spillages
- f. Bitumen waste products
- g. Recycled Asphalt Product (RAP).

### 3. MANAGEMENT AND MITIGATION

#### a. Generation of Solid Waste and Litter

##### ***Objectives***

To collect and dispose of domestic solid waste in such a way as to prevent littering and any form of pollution.

##### ***Targets***

- Compliance to all Statutory and RoD requirements.
- No littering or Waste in the road reserve.

##### ***Method Statements***

- The general waste management principles enunciated in the National Environmental Management – Waste Act, to prevent, minimize, recycle, recover or reuse, with disposal as a last option, shall apply to the project.
- Adequate containers or bins for litter removal shall be supplied and regularly maintained at all offices, temporary sites and facilities.
- Waste shall be collected from all bins and containers at all offices, temporary sites and facilities on a daily basis.
- Programs shall be implemented on identifying activities and/or actions that can reduce waste generation following the Waste Management Hierarchy – minimize, re-use, recover, recycle with disposal as last option.
- Care shall be taken not to dispose of hazardous materials with the domestic waste – hazardous materials shall be disposed of separately – see item (d) below.
- All accident debris shall be collected from the road reserve and remove to the dedicated collection points.
- Damaged road signs, guardrails and wooden posts shall be collected and removed to the dedicated collection points.
- Biodegradable absorbent material shall be used to clean up oil, greases and other mechanical and hydraulic fluids. The spent absorbent material can be disposed of at an approved disposal site with normal domestic waste. This would generally only be applicable for a spillage of up to 50 litres of any one of the listed materials.

## **b. Waste Minimization and recycling**

### **Objectives**

To implement waste minimization and recycling strategies.

### **Targets**

- Compliance to all Statutory and RoD requirements.
- No littering or waste in the road reserve.

### **Method Statements**

- Devise and implement an Integrated Waste Management Policy according to the National Environmental Management – Waste Act, requirements.
- A Method Statement shall be developed and programs shall be implemented to minimize all generated waste.
- Recyclable materials shall be recycled as far as possible.
- Waste that cannot be re-used or recycled shall be disposed of at an appropriately authorised waste disposal facility.
- Where feasible, waste materials like glass, papers and cardboard, metals (other than aluminium), aluminium, organic waste and plastic should be recycled.
- A Method Statement shall be developed to ensure that containers used for recycling shall be suitably marked and stored in a covered and enclosed area, protected from the elements and scavengers.
- Recycling shall be done by staff wearing suitable PPE such as gloves and dust masks.
- Separated materials shall be taken to recycling centres or could be collected by recycling contractors.
- All hydrocarbon waste shall be collected separately and recycled through a registered and authorised recycler such as the Rose Foundation.
- A Method Statement shall be developed on how records of proper waste disposal / recycling shall be kept.
- No waste shall be burned *in lieu* of disposal.

## **c. Refuse Removal**

### **Objectives**

To implement a proper waste disposal system.

### **Targets**

- Compliance to all Statutory and RoD requirements.

### **Method Statements**

- Litter in and around the offices, temporary sites and facilities shall be picked up and removed on a daily basis.
- Litter and waste within the linear sections of the road reserve shall be removed on a bi-weekly basis.
- Collection points shall be established along the entire route. These collection points shall be conveniently situated and shall regularly be monitored. All collection points shall be properly fenced and access be controlled.
- Waste collected from bins and containers shall be stored in larger, scavenger proof and waterproof containers, positioned at the dedicated collection points.
- A registered service provider shall collect waste from all facilities for disposal at an appropriately authorised waste disposal site.
- Service providers responsible for refuse removal shall be registered and approved in terms of the Statutory requirements.

- The storage containers or bins shall be emptied on a regular basis as required.
- No waste shall be burned *in lieu* of disposal.

#### **d. Generation and Disposal of Hazardous Waste**

##### ***Objectives***

To implement a proper hazardous waste disposal system.

##### ***Targets***

- Compliance to all Statutory and RoD requirements.

##### ***Method Statements***

- A register with valid waste disposal certificates issued for disposal of hazardous waste shall be kept in a central location.
- Hazardous waste shall be placed in separate containers clearly marked for the purpose.
- Care shall be taken not to dispose of hazardous materials with domestic waste – hazardous materials shall be disposed of separately.
- Hazardous waste containers shall be water and scavenger proof.
- Hazardous waste shall be disposed of at an appropriately authorised waste disposal facility.
- All hydrocarbon waste shall be collected separately and recycled through a registered and approved recycler.
- Bituminous waste generated by road milling shall be recycled through utilisation in shoulder repair. If no recycling options are available the milling shall be disposed off as hazardous waste.
- Service providers responsible for hazardous waste removal shall be registered and approved in terms of the statutory requirements.

#### **e. Hazardous Spillages**

##### ***Objectives***

To ensure that hazardous spillages generated during the Operations and Maintenance phase are properly managed.

##### ***Targets***

- Compliance to all Statutory and RoD requirements.
- Hazardous spillages to be cleaned immediately.

##### ***Method Statements***

- All hazardous spillages shall be cleaned immediately.
- A hazardous spillage procedure shall be developed to facilitate cleaning and disposal.
- Staff shall receive training in the use of hazardous spillage kits.
- Spill kits shall be appropriately placed at identified risk areas.
- Hazardous spill kits shall be kept in stock to replace spent spill kits immediately.
- Hazardous waste shall be placed in separate containers clearly marked for the purpose.
- Hazardous waste shall not be mixed with domestic or other waste.
- Hazardous waste containers shall be water and scavenger proof.
- Hazardous waste shall be disposed of at an appropriately authorised waste disposal facility.
- A register with valid waste disposal certificates issued for disposal of hazardous waste shall be kept at workshops.
- Care shall be taken to ensure hazardous spillages do not enter water courses / resources
- Clean up of hazardous spillages will be approached as follows:
  - Retention
  - Recovery

- Re-use
- Disposal.

**f. Bitumen waste products**

***Objectives***

To ensure that bitumen waste products generated through normal Operational and Maintenance activities is properly managed and disposed of.

***Targets***

- Compliance to all Statutory and RoD requirements.

***Method Statements***

- The spoiling and uncontrolled disposal of bituminous products shall be prohibited. Unused or rejected bituminous products will be removed from site and taken to the supplier's production plant as the first option. If not possible the bituminous products shall be disposed of as hazardous waste.
- All bituminous products shall be stored in properly designed bunded areas. Any leakages into bunded areas would, as a first option, be recovered and re-used. If re-use is not possible due to contamination the bituminous products shall be recycled. Disposal as hazardous waste is the last option.
- Any bituminous products recovered from cleaning pits or washout areas shall be recovered and re-used as a first option. If re-use is not possible due to contamination the bituminous products shall be recycled. Disposed as hazardous waste is the last option.
- Paper, plastic or any other material that might come into contact with bituminous products during nozzle and pipeline cleaning shall be disposed of as hazardous waste.

**g. Recycled Asphalt Product (RAP)**

***Objectives***

To ensure that Recycled Asphalt Product (RAP) generated during the Operations and Maintenance phase is properly managed.

***Targets***

- Compliance to all Statutory and RoD requirements.
- Increase the use of RAP inside the road reserve.

***Method Statements***

- RAP shall at all times be treated as a potential hazardous waste.
- Stockpiling of RAP material for later use shall comply to the requirements set for stockpiling as set in Section A – A.9 Material Management – Management and Mitigation Plan (Stockpiling).
- If RAP material is made available to private individuals or organizations for recycling purposes, a detailed log shall be kept of the details of the receiver, the volume taken and the end use of the RAP. The receiver shall sign an indemnification on receiving the RAP.
- All RAP material placed in stockpile for later use shall be used within 24 months from date of milling.
- Operations and Maintenance activities should focus on finding innovative ways of using RAP material within the road reserve in order to increase the recycling of this product.



#### **4. MONITORING**

The following parameters shall be monitored:

- a. Generation of solid waste and litter
- b. Waste minimization and recycling
- c. Refuse removal
- d. Generation and disposal of hazardous waste
- e. Hazardous spillages.

##### **Procedure**

A Waste Register shall be kept of all quantities of non-aqueous waste that is generated and removed for disposal from the Project. The register shall be used to inform the section dealing with Waste in the bi-annual Environmental Report. The section on waste shall contain the following information as a minimum:

- Volumes of general waste disposed
- Volumes of hazardous waste disposed
- Activities on waste minimization and recycling undertaken during the reporting period
- Volumes of recycled hydrocarbons
- Details of service providers responsible for waste removal
- Details of training and education initiatives undertaken during the reporting period.
- Details of Deposal certificates issued for waste removed.

The detail contents of the bi-annual Environmental Report can be found in Section A – A.1 Public and Authority Communication – Management and Mitigation Plan.

##### **Frequency**

All waste aliquots removed from the various sites are to be logged with the data being summed for monthly totals of waste in the Waste Register. The Waste section shall be included on a bi- annual basis in the Environmental Status Report.

**Instrumentation** Not applicable.

##### **Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

**Responsibility** All reporting shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.

### 1. PURPOSE

The purpose of the ecological management and mitigation plan is to ensure minimal environmental impact on the ecology during the Operations and Maintenance phase.

### 2. COMPONENTS

The plan is made up of the following components:

- a. Weeds and alien vegetation
- b. Indigenous flora management
- c. Management of fauna
- d. Landscaping/ Vegetation management
- e. Rehabilitation
- f. Ecological sensitive areas
- g. Red data plant species.

### 3. MANAGEMENT AND MITIGATION

#### a. Weeds and Alien Vegetation

##### ***Objectives***

To eradicate and prevent the influx of weeds and alien vegetation into the road reserve during the Operations and Maintenance phase.

##### ***Targets***

- Compliance to all Statutory and RoD requirements
- Eradication of all weeds and alien vegetation within the road reserve
- An annual alien vegetation report shall be compiled.

##### ***Method Statements***

- An annual Alien Vegetation Report shall be compiled during the summer months.
- The report shall identify the species and location of all declared alien vegetation growing inside the road reserve.
- All declared weeds and alien vegetation growing in the road reserve shall be removed or controlled.
- Alien vegetation growing within newly seeded areas shall be removed by cutting or slashing as not to cause root disturbance and loosen soils again. Resulting vegetative material shall be removed by hand and burned off – site. Seed from Category One alien vegetation shall be burned on site, during off peak periods and with the required traffic accommodation or bagged and burned off site.
- A registered pest control operator, registered for the industrial application of herbicides, will apply herbicides, or will supervise the application of herbicides, in compliance with the terms of the Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947).
- The use of herbicides shall not be permitted within identified sensitive areas. Removal of alien vegetation within these areas must be undertaken by hand aided by limited use of herbicides, specifically registered for use in sensitive areas.
- All herbicides shall be clearly identified and stored in a dedicated area, demarcated as poisonous.
- Only registered herbicides shall be used and empty containers shall be disposed of as hazardous waste.

## **b. Indigenous Flora Management**

### ***Objectives***

To protect and minimize disturbance to indigenous flora.

### ***Targets***

- Compliance to all Statutory and RoD requirements.
- Maintain all indigenous flora within the road reserve.

### ***Method Statements***

- The natural vegetation encountered within the road reserve shall be conserved and left as intact as possible.
- Only indigenous trees and shrubs directly affecting Operations and Maintenance activities or public safety, may be felled or cleared.
- A permit shall be obtained from the relevant Department prior to the removal or damage of any protected tree species.
- Ongoing monitoring and maintenance of re-vegetation works shall be undertaken during the Operations and Maintenance phase.
- Only indigenous trees shall be planted within the road reserve.
- Material collected from the trimming of trees and shrubs can be chipped and distributed within the road reserve. The chips shall be spread at a thickness not exceeding 50mm.

## **c. Landscaping/Vegetation Maintenance**

### ***Objectives***

Undertake regular landscaping / vegetation maintenance to ensure that road reserve vegetation is in good condition.

### ***Targets***

- Compliance to all Statutory and RoD requirements.
- Undertake an annual vegetation inspection and produce a report.

### ***Method Statements***

- Undertake an annual vegetation inspection to evaluate the landscaping and vegetation condition within the road reserve during the winter months.
- Recommendations shall be made in a report format regarding areas where additional vegetation establishment and maintenance may be required.
- Erosion within the road reserve shall be listed.
- Recommendations shall be made on the method, grass species selection and fertiliser requirements.
- The findings of the inspection shall be included in an annual Vegetation Quality Report.

## **d. Rehabilitation**

### ***Objectives***

To successfully rehabilitate disturbed areas after new construction and/or maintenance work and to maintain quality vegetation during the Operations and Maintenance phase.

***Targets*** Compliance to all Statutory and RoD requirements.

### ***Method Statements***

- A specification for the ecological rehabilitation of disturbed areas shall be developed.
- This plan will detail, amongst others, the following:

- Top soiling requirements on cuts and fills.
- Exposed areas with a slope of less than 1 horizontal: 1,5 vertical shall be rehabilitated with a grass mix that blends in with the surrounding vegetation.
- For steeper slopes and in areas where the geology does not allow sufficient vegetation cover, the vegetation established shall only have an aesthetic purpose and stabilization would need to be designed and constructed.
- The selected grass mix shall consist of a mix of quick covering grasses (pioneer species mat - forming grasses (e.g. Digitaria eriantha, Chloris gayana) and tufted grasses (to ensure prompt and adequate coverage of the exposed soil whilst also achieving long-term stability.
- Method of grassing to be adopted such as sodding, seeding or hydro seeding.
- Monitoring of newly re-vegetated areas every 3 months during the first year and twice a year thereafter for coverage and exotic weeds and invader species.
- Re-vegetated areas showing less than 30 % coverage after one growing season shall be prepared and re-vegetated from scratch.
- An annual vegetation quality inspection shall be compiled during the winter months.
- During this inspection the following shall be evaluated and recorded:
  - The vegetation coverage inside the road reserve.
  - Rehabilitation of the road reserve and highlight the areas that require re-work.
  - Highlight the measures that shall be implemented for the repair of any damage to re-vegetated areas.
- The findings of the inspection shall be included in an annual Vegetation Quality Report.

#### **e. Ecological Sensitive Areas**

##### ***Objectives***

To protect and minimally impact on the sensitive fauna, flora, avifauna, wetlands, river crossings and others occurring along the route alignment.

##### ***Targets***

- Compliance to all Statutory and RoD requirements.

##### ***Method Statements***

- Identify all ecologically sensitive areas occurring along the route alignment before work starts in the area.
- Ensure that all staff and sub-contractors are familiar with the ecologically sensitive areas.
- Impact on areas highly sensitive like the Grootvlei, Lincoln and Alex Pans, shall be avoided as far as possible.
- Riparian vegetation shall remain intact and may not be altered, disturbed or removed in any way, where not authorized, due to the actions or activities of the Operations and Maintenance phase.
- Road staff and sub-contractors working or entering ecologically sensitive areas on how to operate with least impact on these areas.
- Ecologically sensitive areas include:
  - Wetlands
  - River crossings
  - Red data plant habitats
  - Streams and drainage canals
  - Conservation areas
  - Dams and lakes.

## **4. MONITORING**

### **Parameter**

The following parameters shall be monitored:

- a. Weeds and alien vegetation
- b. Indigenous flora management
- c. Management of fauna
- d. Landscaping/ Vegetation management
- e. Rehabilitation
- f. Ecological sensitive areas
- g. Red data plant species.

### **Procedure**

Reporting requirements

An annual Alien Vegetation Report shall be compiled. The Alien Vegetation Report shall contain the following information as a minimum:

- The location of declared alien vegetation within the road reserve
- The species of alien vegetation within the road reserve
- A picture of the alien vegetation
- Details on control and eradication.

An annual Vegetation Quality Report shall be compiled providing a summary of all the areas along the road alignment requiring rehabilitation and improvement in vegetation cover. These areas could result due to disturbance, vegetation die-back, fire or die-back. The Vegetation Quality Report shall contain the following information as a minimum:

- Location of area requiring rehabilitation
- Reasons why rehabilitation is required
- Details on rehabilitation actions required
- Evaluate topsoil loss, erosion and siltation
- Evaluate grass cover condition
- Evaluate the condition of landscaped areas and tree planted
- Prioritise areas requiring rehabilitation in terms of visual impact.

### **Frequency**

The Alien Vegetation Report shall be compiled on an annual basis during the summer. The Vegetation Quality Report shall be compiled on an annual basis during the winter.

**Instrumentation** Not applicable.

### **Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

**Responsibility** All reporting shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.

### 1. PURPOSE

The purpose of the material management and mitigation plan is to ensure that Operational and Maintenance activities impacting on soil materials, are managed appropriately.

### 2. COMPONENTS

The plan is made up of the following components:

- a. Quarries and Borrow Pits
- b. Stockpiles
- c. Spoiling.

### 3. MANAGEMENT AND MITIGATION

#### a. Quarries and Borrow Pits

##### ***Objectives***

To ensure appropriate quarry and borrow pit management during the operational period.

##### ***Targets***

- Compliance to all statutory, RoD and permit requirements.

##### ***Method Statements***

- A Mining License or Permit for the establishment, operation and closure of a quarry or borrow pit shall be approved by the Department prior to the commencement of activities.
- The rehabilitation of a quarry or borrow pit shall be appropriately planned and approved prior to undertaking any activities on site.
- Rehabilitation shall be undertaken in terms of the Mining License or permit issued for the quarry or borrow pit.
- Adequate financial provision shall be made for rehabilitation prior to mining activities commencing.
- After utilization and rehabilitation of a quarry or borrow pit, a closure certificate shall be obtain from the relevant authorities.
- If material is purchased form a private individual or commercial quarry, N3TC shall ensure that the required Mining License or Permit are in the possession of the owner of the material.
- Mining or industrial waste shall be preferred to the development of a quarry or borrow pit.

#### b. Stockpiles

##### ***Objectives***

To ensure appropriate stockpile management during the operational period.

##### ***Targets***

- Compliance to all statutory, RoD and permit requirements.

##### ***Method Statements***

- The areas chosen for any temporary stockpiling shall have no naturally occurring indigenous trees and shrubs present that may be damaged during stockpiling operations.
- Care shall be taken to preserve all vegetation in the immediate area of these temporary stockpiles. During the life of the stockpiles N3 Toll Concessions shall at all times ensure that they are:
  - Positioned and sloped to create the least visual impact;
  - Constructed and maintained so as to avoid erosion of the material and contamination of

- surrounding environment;
- Not positioned within 50 meters of the 1:100 year flood line of any drainage line;
- Not positioned in any wetland or on top of hydric or saturated soils;
- Positioned as to prevent any storm water sheet flow from flowing through the stockpile; and
- Kept free from all alien/undesirable vegetation.
- After the stockpiled material has been removed, the site shall be re-instated to its original condition.
- Material milled from the existing road surface that is temporarily stockpiled shall comply to the following requirements:
  - Milled material shall only be stored inside the road reserve;
  - Milled material shall be positioned and sloped to create the least visual impact;
  - Milled material stockpiles shall be constructed and maintained so as to avoid erosion of the material and contamination of surrounding environment;
  - Milled material stockpiles shall not be positioned within the 1:100 year flood line of any drainage line;
  - Milled material stockpiles shall not be positioned in any wetland or on top of hydric or saturated soils; and
  - Milled material stockpiles shall be kept free from all alien/undesirable vegetation.

### c. **Spoiling**

#### **Objectives**

To ensure appropriate spoiling management during the operational period.

#### **Targets**

- Compliance to all statutory, RoD and permit requirements.

#### **Method Statements**

- Should spoiling be required during the operational phase, N3 Toll Concessions shall be responsible for the safe positioning, operation, maintenance and closure of any spoil site.
- This shall include existing spoil sites that are being re-entered.
- Dumping of material over embankments shall not be permitted.
- No spoiling shall take place within the 1:100 year flood line of any drainage line.
- Spoil sites shall be shaped to fit the natural topography.
- In rehabilitating spoil sites, the sites shall receive a minimum of 75mm topsoil and be grassed with a suitable seed mixture.
- Slopes of spoil sites shall not exceed a vertical: horizontal ratio of 1:3.

### **. MONITORING**

#### **Parameter**

The following parameters shall be monitored:

- a. Quarries and Borrow Pits
- b. Stockpiles
- c. Spoiling.

#### **Procedure**

A Soil Register shall be kept of all soil aspects on the Project. The register shall be used to inform the section dealing with Material Management in the bi-annual Environmental Report. The section on soil shall contain the following information as a minimum:

- Volumes of material mined and used
- Volumes of recycled material used
- Volumes and position of material stockpiled for future use

- Volumes and position of material spoiled.

The detail contents of the bi-annual Environmental Report can be found in Section A – A.1 Public and Authority Communication – Management and Mitigation Plan.

**Frequency**

The Soil Register shall be compiled and included in the bi-annual Environmental Report.

**Instrumentation**

Not applicable.

**Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

**Responsibility**

All reporting shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.



### 1. PURPOSE

The purpose of the material management and mitigation plan is to ensure that construction activities associated with the Operational and Maintenance phase, are managed appropriately.

### 2. COMPONENTS

The plan is made up of the following components:

- a. Construction and Camp Sites
- b. Storage of Hazardous Substances and Fuel
- c. Preparation and Cleaning of Machines, Trucks and Equipment
- d. Bitumen Coating of Chips
- e. Water abstraction.

### 3. MANAGEMENT AND MITIGATION

#### a. Construction and Camp Sites

##### **Objectives**

To ensure that construction camps, staff accommodation, production plants, storage and stockpiling areas and testing facilities are appropriately management during the Operational and Maintenance period.

##### **Targets**

- Compliance to all statutory, RoD and permit requirements.

##### **Method Statements**

- If Construction and Camp sites are located outside of the road reserve the necessary landowner approval shall be obtained and provided to The Employer.
- If the site traverses watercourses, streams and rivers, the offices (and in particular the ablution facilities, aggregate stockpiles, spoil areas and hazardous material stockpiles) shall be located as far away as possible from any watercourse, and downstream of water bodies.
- The Construction and Camp sites shall be neat and acceptable to the travelling motorist passing these areas next to the road – specifically when tents are utilised.
- Suitable sanitary arrangements shall be made at Construction and Camp sites and along the work site for all employees. These facilities must be easily accessible (within 500m from any point of work).
- Toilets shall be provided at the preferred ratio of 1 toilet per 15 workers.
- Toilets shall not be placed inside the 1:100 year flood line of any drainage line.
- The entrances to toilets shall be adequately screened from public view.
- Only approved chemical, digester type or suction pit toilets will be used and will be emptied as required where reticulation systems are not available.
- Open fires shall only be permitted at Construction and Camp sites in facilities or equipment specially constructed for this purpose.

#### b. Storage of Hazardous Substances and Fuel

##### **Objectives**

To ensure appropriate management of the storage of dangerous substances and fuel during the Operational and Maintenance period.

### **Targets**

- Compliance to all statutory, RoD and permit requirements.

### **Method Statements**

- Fuel, oils and identified hazardous substances shall only be stored under controlled conditions. All hazardous materials shall be stored in a secured, appointed area that is fenced and has restricted entry. Storage of bituminous products shall only take place using suitable containers.
- An adequate bund wall (110% volume) shall be provided for fuel, diesel, bituminous products and hazardous substances storage areas to accommodate any spillage or overflow of these substances. The area inside the bund wall shall be lined with an impervious lining to prevent infiltration of the fuel into the soil. The bunding shall be undertaken as per the requirements of SABS 089:1999 Part 1.
- Bunding of products with high viscosity can be done with properly packed sand bag walls (110% volume) around the base of the container and with a plastic base liner covered with sand.
- The Contractor shall ensure that an emergency plan is in place for implementation in case of leakage or spillage of fuel or hazardous material which can be harmful to an individual or the environment.
- Suitable and adequate supplies of absorbents shall be available at all times to control and absorb any spillages.
- Used oil, lubricants and cleaning materials from the maintenance of vehicles and machinery shall be collected in a holding tank and recycled.
- Water generated inside the workshop shall pass through an oil trap to separate the water and oil. Oils collected in this manner, shall be retained in a safe holding tank and recycled.
- Oil collected by a mobile servicing unit shall be stored in the service unit's sludge tank and discharged into the safe holding tank for recycling.
- All used filter materials shall be stored in a secure bin for disposal as hazardous waste.

### **c. Preparation and Cleaning of Machines, Trucks and Equipment**

#### **Objectives**

To ensure appropriate management of the preparation and cleaning of machines, trucks and equipment normally associated in the road construction industry, during the Operational and Maintenance period.

### **Targets**

- Compliance to all statutory, RoD and permit requirements.

### **Method Statements**

- All equipment shall be in good working order.
- In order to reduce the generated noise levels, adequate noise mufflers and proper exhaust systems shall be fitted to all noise generating machines, trucks and equipment.
- Concrete trucks shall only be washed in dedicated washing pit areas. The resulting concrete waste shall be allowed to solidify and then be recycled or disposed of.
- The cleaning of nozzles and piping of all machines and equipment using bituminous products shall be done in a dedicated pit or wash area. The pit or wash area shall not be permeable and retain all bitumen and other hydrocarbon products.
- The pit or wash area shall be equipped with a holding tank where all free product will be stored for re-use or recycling. Solid bituminous waste shall be recycled as far as possible or alternatively disposed off as hazardous waste.
- During emergency cleaning on-site, paper plastic or any other material shall be used to prevent the bituminous from contaminating soils or water.
- Paper, plastic or any other material that might be used and come into contact with bituminous

products during nozzle and pipeline cleaning shall be disposed off as hazardous waste.

**d. Bitumen Coating of Chips**

***Objectives***

To ensure appropriate management of coating chips with bitumen, during the Operational and Maintenance period.

***Targets***

- Compliance to all statutory, RoD and permit requirements.

***Method Statements***

- The bitumen coating of chips shall take place as far as possible inside the road reserve.
- Specific landowner approval is required if bitumen coating of chips takes place outside of the road reserve.
- Bitumen storage shall be as specified in section (a) above.
- Topsoil shall be removed in preparation of the site where the bitumen coating of chips will take place.
- A cover-layer of clean chips shall be placed on the ground to absorb any excess bitumen during the mixing process.
- Stockpiles of bitumen coated chips shall not be positioned within the 1:100 year flood line of any drainage line.
- Stockpiles of bitumen coated chips shall not be positioned in any wetland or on top of hydric or saturated soils.
- Stockpiles of bitumen coated chips shall be placed as to prevent storm water sheet drainage from running through the stockpiles.
- Stockpiles shall be covered during periods of high rainfall.
- Bitumen covering of excess chips shall not be allowed. Only cover as much as is needed.

**e. Water Abstraction**

***Objectives***

To ensure appropriate management of water abstraction during the Operational and Maintenance period.

***Targets***

- Compliance to all statutory, RoD, Water Use License/General Authorization and permit requirements.

***Method Statements***

- Where water is obtained from municipal water lines, approval from the local authority responsible for the area shall be obtained. The volumes of water used shall be recorded.
- Water abstracted from a river/stream shall only be abstracted based on an issued Water Use License or a General Authorization.
- Where water used is obtained from an entity enlisted in an irrigation scheme or that has a registered water use, written agreement for that water use shall be presented.
- All boreholes inside the road reserve shall be registered and a Water Use License or General Authorization specifying the allowable abstraction shall be obtained.
- Boreholes inside the road reserve and not in use shall be sealed as to prevent any contamination of surface water recharge.

- Prevention and mitigation measures must be implemented to ensure water quality is not adversely affected by such extraction (No surface run-off of oils, cement, litter, paints etc. which could pollute nearby streams and rivers).

#### **4. MONITORING**

##### **Parameter**

The following parameters shall be monitored:

- a. Construction and Camp Sites
- b. Storage of Hazardous Substances and Fuel
- c. Preparation and Cleaning of Machines, Trucks and Equipment
- d. Bitumen Coating of Chips
- e. Water Abstraction.

##### **Procedure**

Quarterly audits shall be undertaken on construction sites and the findings shall be summarised in the bi-annual Environmental Report.

The detail contents of the bi-annual Environmental Report can be found in Section A – A.1 Public and Authority Communication – Management and Mitigation Plan.

##### **Frequency**

Quarterly audits shall be undertaken and the findings summarised in the bi-annual Environmental Report.

##### **Instrumentation**

Not applicable.

##### **Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

##### **Responsibility**

All reporting shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.

### 1. PURPOSE

The purpose of the environmental awareness management and mitigation plan is to entrench a culture of continued environmental awareness training during the Operational and Maintenance phase. The training shall focus on various levels in the organization from general worker to management level. Training shall also be extended towards Contractors and sub-Contractors.

### 2. COMPONENTS

The plan is made up of the following components: Tool box talks & Management training.

### 3. MANAGEMENT AND MITIGATION

#### a. Tool Box Talks

##### ***Objectives***

To sensitise general worker and operator grade level personnel on relevant environmental issues affecting them and informing them on how they can contribute to improve or remedy issues.

##### ***Targets***

- Compliance to all Statutory and RoD requirements.
- Develop a monthly training program for general workers and operators

##### ***Method Statements***

- Implement a training program covering relevant environmental information for all general labour and operator grades.
- Develop and implement specific programmes aimed at maintenance teams and how they can minimise their impact on the environment during execution of maintenance activities.
- Select environmental topics that are relevant and of interest and will contribute to the overall improvement of environmental performance of the project.
- Allow flexibility to the training program to allow for inclusion of a new relevant topic should the need arise.
- Include environmental issues related to emergency preparedness and response as part of the training program.
- Include environmental issues related to safety and security, including fire control, as part of the training program.
- Training shall be focussed on promoting staff awareness regarding the importance of conserving water at all times.
- Training shall be focused on identifying activities and/or actions that can reduce water usage and waste generation following the Water Management Hierarchy – use, minimize, recycle, treatment with disposal as last option.

## **b. Management Training**

### **Objectives**

To sensitise all levels of management on relevant and interesting environmental issues affecting them and informing them on how they can contribute to further improve their environmental performance.

### **Targets**

- Compliance to all Statutory and RoD requirements.
- Develop a six monthly training program for management.

### **Method Statements**

- Implement a training program covering relevant environmental information for all levels of management.
- Develop training material and to allow for six monthly training sessions to management.
- Allow flexibility to the training program to allow for inclusion of a new relevant topic should the need arise.
- Include environmental issues related to emergency preparedness and response as part of the training program.
- Include environmental issues related to safety and security, including fire control, as part of the training program.
- Subject specialists shall be used where required to undertake the specialist and detailed subject specific training.
- Training shall be focussed on promoting staff awareness regarding the importance of conserving water at all times.
- Training shall be focused on identifying activities and/or actions that can reduce water usage and waste generation following the Water Management Hierarchy – minimize, re-use, recover recycle with disposal as last option.

## **4. MONITORING**

### **Parameter**

The following parameters shall be monitored:

- a. Tool box talks
- b. Management training.

### **Procedure**

A bi-annual Environmental Report shall be submitted to the Environmental Liaison Committee. As a minimum, an overview of environmental management of the project for the year, with specific reference training undertaken during the reporting period.

The detail contents of the bi-annual Environmental Report can be found in Section A – A.1 Public and Authority Communication – Management and Mitigation Plan.

### **Frequency**

The Environmental Status report shall be prepared on a bi-annual basis.

### **Instrumentation**

Not applicable.

**Data recording**

All reports shall be kept in electronic format. These records are to be captured within the document control system of the Concessionaire and must be easily accessible if required.

**Responsibility**

The bi-annual Environmental Report shall be the responsibility of N3 Toll Concessions (RF) Proprietary Limited.

**SECTION E: REQUIREMENTS OF THE OCCUPATIONAL HEALTH AND SAFETY ACT AND REGULATIONS**

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## **1.0 SCOPE**

- 1.1 This part of the specification has the objective to assist principal contractors entering into contracts with the Employer that they comply with the Occupational Health and Safety (OH&S) Act, No. 85 of 1993 including the Construction Regulations 2014. The Contractor's attention is drawn to the Government Notice, dated 7 July 2015, whereby temporary exemptions of the Construction Regulation 3 was officially communicated. Compliance with this document does not absolve the principal Contractor from complying with minimum legal requirements and the principal contractor remains responsible for the health and safety of his employees and those of his Mandataries. Principal and other contractors should therefore insist that this part of the specification form part of any contract that he may have with other contractors and/or suppliers.
- 1.2 This section covers the development of a health and safety specification that addresses all aspects of occupational health and safety as affected by this contract. It provides the requirements that principal contractors and other contractors shall comply with in order to reduce the risks associated with this contract that may lead to incidents causing injury and/or ill health.

## **2.0 GENERAL OCCUPATIONAL HEALTH AND SAFETY PROVISIONS**

### **2.1 Hazard Identification and Risk Assessment (Construction Regulation 9)**

#### **2.1.1 Risk Assessments**

Item 4 contains a generic list of risk assessment headings that have been identified by the Employer as possibly applicable to this contract. It is, by no means, exhaustive and is offered as assistance to contractors intending to tender.

#### **2.1.2 Development of Risk Assessments**

Every principal contractor performing construction work shall, before the commencement of any construction work or work associated with the aforesaid construction work and during such work, cause a risk assessment to be performed by a competent person, appointed in writing, and the risk assessment shall form part of the OH&S plan and be implemented and maintained as contemplated in Construction Regulation 9 (1).

The risk assessment shall include, at least:

- the identification of the risks and hazards to which persons may be exposed
- the analysis and evaluation of the risks and hazards identified
- a documented plan of safe work procedures to mitigate, reduce or control the risks and hazards that have been identified
- a monitoring plan and
- a review plan

Based on the risk assessment, the principal contractor shall develop a set of site-specific OH&S rules that shall be applied to regulate the OH&S aspects of the construction. The risk assessment, together with the site-specific OH&S rules shall be submitted to the Employer before construction on site commences. Despite the risk assessments listed in paragraph 4, the principal contractor shall conduct a baseline risk assessment and the aforesaid listed risk assessment shall be incorporated into the baseline risk assessment. The baseline risk assessment shall further include the standard working procedures and the applicable method statements based on the risk assessments.

All variations to the scope of work shall similarly be subjected to a risk assessment process.

#### **2.1.3 Review of Risk Assessment**

The principal contractor shall review the hazard identification, risk assessments and standard working procedures at each production planning and progress report meeting as the contract work develops and progresses and each time changes are made to the designs, plans and construction methods and processes. The principal contractor shall provide the Employer, other contractors and all other concerned parties with copies of any changes, alterations or amendments as contemplated in paragraph 2.1.3.

## 2.2 Legal Requirements

A principal contractor shall, as a minimum, comply with:

- The Occupational Health and Safety Act and Regulations 2014 (Act 85 of 1993), an up-to-date copy of which shall be available on site at all times.
- The Compensation for Occupational Injuries and Diseases Act (Act 130 of 1993), an up-to-date copy of which shall be available on site at all times.
- Where work is being carried out on a “mine”, the contractor shall comply with the Mines Health and Safety Act and Regulations (Act 29 of 1960) and any other OH&S requirements that the mine may specify. An up-to-date copy of the Mines Health and Safety Act and Regulations shall be available on site at all times.

## 2.3 Structure and Responsibilities

### 2.3.1 Overall Supervision and Responsibility for OH&S

It is a requirement that the principal contractor, when he appoints contractors (subcontractors) in terms of Construction Regulations 7(1) (c), 7(1) (c) (x), 7(1) (f), 7(1) (c) (iii) and 7(3) includes in his agreement with such contractors the following:

- OH&S Act (85 of 1993), Section 37(2) agreement: “Agreement with Mandatary”
- OH&S Act (85 of 1993), Section 16(2) appointee/s as detailed in his/her/their respective appointment forms.

### 2.3.2 Further (Specific) Supervision Responsibilities for OH&S

The contractor shall appoint designated competent employees and/or other competent persons as required by the Act and Regulations. Below is a generic list of identified appointments and may be used to select the appropriate appointments for this contract. The contractor shall note that it is a generic list only and is intended for use as a guideline.

#### Ref. Section/Regulation in OH&S Act

Batch Plant Supervisor	(Construction Regulation 8(1))
Construction Vehicles/Mobile Plant/Machinery Supervisor	(Construction Regulation 23)
Demolition Supervisor	(Construction Regulation 14)
Drivers/Operators of Construction Vehicles/Plant	(Construction Regulation 23)
Electrical Installation and Appliances Inspector	(Construction Regulation 24)
Emergency/Security/Fire Coordinator	(Construction Regulation 29)
Excavation Supervisor	(Construction Regulation 13)
Explosive Powered Tool Supervisor	(Construction Regulation 21)
Fall Protection Supervisor	(Construction Regulation 10)
First Aider	(General Safety Regulation 3)
Fire Equipment Inspector	(Construction Regulation 29)
Formwork & Support work Supervisor	(Construction Regulation 12)
Hazardous Chemical Substances Supervisor	(HCS Regulations)
Incident Investigator	(General Admin Regulation 9)
Ladder Inspector	(General Safety Regulation 13A)
Lifting Equipment Inspector	(Construction Regulation 22)
Materials Hoist Inspector	(Construction Regulation 19)
OH&S Committee	(OH&S Act Section 19)
OH&S Officer	(Construction Regulation 8(6))
OH&S Representatives	(OH&S Act Section 17)
Person Responsible for Machinery	(General Machinery Regulation 2)
Scaffolding Supervisor	(Construction Regulation 16)
Stacking & Storage Supervisor	(Construction Regulation 28)
Structures Supervisor	(Construction Regulation 11)
Suspended Platform Supervisor	(Construction Regulation 17)
Tunneling Supervisor	(Construction Regulation 15)
Vessels under Pressure Supervisor	(Vessels under Pressure Regulations)
Working on/next to Water Supervisor	(Construction Regulation 26)
Welding Supervisor	(General Safety Regulation 9)

In addition the Employer requires that a Traffic Safety Officer be appointed (see 0500 of the Standard Specifications). The above appointments shall be in writing and the responsibilities clearly stated together with the period for which the appointment is made. This information shall be communicated and agreed with the appointees. Notice of appointments shall be submitted to the Employer. All changes shall also be communicated to the Employer.

The principal contractor shall, furthermore, provide the Employer with an organogram of all contractors that he/she has appointed or intends to appoint and keep this list updated and

prominently displayed on site. Where necessary, or when instructed by an inspector of the Department of Labour, the principal contractor shall appoint a competent safety officer.

### 2.3.3 Designation of OH&S Representatives (Section 17 of the OH&S Act)

Where the principal contractor employs more than 20 persons (including the employees of other contractors (subcontractors) he has to appoint one OH&S representatives for every 50 employees or part thereof. General Administrative Regulation 6 requires that the appointment or election and subsequent designation of the OH&S representatives be conducted in consultation with employee representatives or employees. (Section 17 of the Act and General Administrative Regulation 6 & 7). OH&S representatives shall be designated in writing and the designation shall include the area of responsibility of the person and term of the designation.

### 2.3.4. Duties and Functions of the OH&S Representatives (Section 18 of the OH&S Act)

The principal contractor shall ensure that the designated OH&S representatives conduct continuous monitoring and regular inspections of their respective areas of responsibility using a checklist and report thereon to the principal contractor. OH&S representatives shall be included in accident or incident investigations. OH&S representatives shall attend all OH&S committee meetings.

### 2.3.5. Appointment of OH&S Committee (Sections 19 and 20 of the OH&S Act)

The principal contractor shall establish an OH&S committee, which shall meet as specified in the Regulations.

## 2.4. Administrative Controls and the Occupational Health & Safety File

### 2.4.1. The OH&S File (Construction Regulation 7 (7))

As required by Construction Regulation 7 (7), the principal contractor and other contractors shall each keep an OH&S file on site. The following list is not exhaustive and shall only be used as a guide:

- Latest copy of OH&S Act (General Administrative Regulation 4)
- A copy of the completed Annexure A (Notification to Department of Labour) (Construction Regulation 4) as well as proof that the Notification was sent to the Department of Labour.
- Copies of all the relevant legal appointments (signed by both parties) as well as the competency of each appointee which should be at least a CV depicting knowledge, training, experience and qualifications, specific to the relevant appointments.
- A list of all contractors and copies of Section 37(2) agreements with the relevant contractors. (If necessary)
- Safe work procedures.
- A fall protection plan, signed by the relevant competent person. (If necessary)
- Proof that the following training was given:
  - Induction training
  - Training in the content of the safe work procedures
  - Training in the content of the risk assessments
- Copies of the medical fitness certificates under the following regulations. (If applicable.)
  - CR 20 – Crane Operators
  - CR 21 – Construction vehicles and mobile plant operators
  - C3 8 – Persons working at height (Roof work or working from scaffolding.)
- Employee transport shall be carried out in terms of the National Road Ordinances. The H&S Plan shall detail the arrangements and methods of the transportation of workers.
- Proof of registration and good standing with COID Insurer (Construction Regulation 5 (1) (j)).
- OH&S plan agreed with the Client including the underpinning Risk Assessments for all activities on site. Risk assessments should have a Risk Matrix, signed by appointed person. (Construction regulation 7 (1))
- Copies of OH&S committee and other relevant minutes
- Designs/drawings (Construction Regulation 7 (1) (e))
- Registers as follows (if applicable):
  - Accident/Incident register (Annexure 1 of the General Administrative Regulations)
  - Ablution facilities
  - Asbestos demolition and stripping register

- Batch plant inspections
- Construction vehicles and mobile plant inspections by controller
- Cranes logbook
- Daily inspection of vehicles, plant and other equipment by the operator/driver/user
- Demolition inspection register
- Designer's inspection of structures record
- Excavations inspection
- Explosive powered tool inspection, maintenance, issue and returns register (incl. cartridges and nails)
- Fall protection inspection register
- First aid box contents
- Fire equipment inspection and maintenance
- Formwork and support work inspections
- Hand tools
- Hazardous chemical substances record
- Ladder inspections
- Lifting equipment register
- Materials hoist inspection register
- Machinery safety inspection register (incl. machine guards, lock-outs etc.)
- OH&S representatives' inspection register
- Portable electrical tools
- PPE issued
- Scaffolding inspections
- Stacking and storage inspection
- Structures inspection
- Suspended platforms inspections
- Temporary electrical installations, -equipment and -appliances (including portable electrical tools)
- Tunnelling operations inspections
- Vessels under pressure inspections
- Welding equipment inspections
- Work conducted on or near water inspections
- All other applicable records including traffic safety officer reports (Accommodation of traffic.).

The Employer will conduct an audit on the OH&S file of the principal contractor from time-to-time.

#### 2.5. Notification of Construction Work (Construction Regulation 4)

The principal contractor shall, where the contract meets the requirements laid down in Construction Regulation 4, within 7 working days, notify the Department of Labour of the intention to carry out construction work and use the form (Annexure A in the Construction Regulations) for the purpose. A copy shall be kept on the OH&S file and a copy shall be forwarded to the Employer for record keeping purposes.

#### 2.6. Training and Competence

The contents of all training required by the Act and Regulations shall be included in the principal contractor's OH&S plan. The principal contractor shall be responsible for ensuring that all relevant training is undertaken. Only accredited service providers shall be used for OH&S training. The principal contractor shall ensure that his and other contractors' personnel appointed are competent and that all training required to do the work safely and without risk to health, has been completed before work commences. The principal contractor shall ensure that follow-up and refresher training is conducted as the contract work progresses and the work situation changes. Records of all training must be kept on the OH&S file for auditing purposes.

#### 2.7 Consultations, Communication and Liaison

OH&S liaison between the client, the principal contractor, other contractors, the designer and other concerned parties will be through the OH&S committee as contemplated in paragraph 2.3.5. In addition to the above, communication may be directly to the client or his appointed agent, verbally or in writing, as and when the need arises.

Consultation with the workforce on OH&S matters will be through their supervisors, OH&S representatives and the OH&S committee. The principal contractor shall be responsible for the dissemination of all relevant OH&S information to the other contractors e.g. design changes agreed with the client and the designer, instructions by the client and/or his/her agent, exchange of information between contractors, the reporting of hazardous/dangerous conditions/situations etc. The principal contractors' most senior manager on site shall be required to attend all OH&S meetings.

## 2.8 Checking, Reporting and Corrective Actions

### 2.8.1. Monthly Audit by Client (Construction Regulation 5 (1) (o))

The Employer will conduct monthly audits to comply with Construction Regulation 5 (1) (o) to ensure that the principal contractor has implemented and is maintaining the agreed and approved OH&S plan.

### 2.8.2. Other Audits and Inspections by the Employer

The Employer reserves the right to conduct other ad hoc audits and inspections as deemed necessary. This will include site safety walks.

### 2.8.3 Contractor's Audits and Inspections

The principal contractor is to conduct his own monthly internal audits to verify compliance with his own OH&S management system as well as with this specification.

### 2.8.4 Inspections by OH&S Representative's and other Appointees

OH&S representatives shall conduct weekly inspections of their areas of responsibility and report thereon to their foreman or supervisor whilst other appointees shall conduct inspections and report thereon as specified in their appointments e.g. vehicle, plant and machinery drivers, operators and users must conduct daily inspections before start-up.

### 2.8.5 Recording and Review of Inspection Results

All the results of the abovementioned inspections shall be in writing, reviewed at OH&S committee meetings, endorsed by the chairman of the meeting and placed on the OH&S File.

## 2.9 Accidents and Incident Investigation (General Administrative Regulation 9)

The principal contractor shall be responsible for the investigation of all accidents/incidents where employees and non-employees were injured to the extent that he/she/they had to be referred for medical treatment by a doctor, hospital or clinic. The results of the investigation shall be entered into an accident/incident register listed in paragraph 2.4.1.

The principal contractor shall be responsible for the investigation of all minor and non-injury incidents as described in Section 24 (1) (b) & (c) of the Act and keeping a record of the results of such investigations including the steps taken to prevent similar accidents in future.

## 2.10 Reporting

The principal contractor shall provide the Employer with copies of all statutory reports required in terms of the Act within 7 days of the incident occurring.

### **3.0 OPERATIONAL CONTROL**

#### **3.1 Operational Procedures**

Each construction activity shall be assessed by the principal contractor so as to identify operational procedures that will mitigate against the occurrence of an incident during the execution of each activity. This specification requires the principal contractor:

- to be conversant with Regulations 8 to 29 (inclusive)
- to comply with their provisions
- to include them in his OH&S plan where relevant.

#### **3.2. Emergency Procedures**

Simultaneous with the identification of operational procedures (per paragraph 3.1 above), the principal contractor shall similarly identify and formulate emergency procedures in the event an incident does occur. The emergency procedures thus identified shall also be included in the principal contractor's OH&S plan.

#### **3.3 Personal & Other Protective Equipment (Sections 8/15/23 of the OH&S Act)**

The contractor shall identify the hazards in the workplace and deal with them. He must either remove them or, where impracticable, take steps to protect workers and make it possible for them to work safely and without risk to health under the hazardous conditions.

Personal protective equipment (PPE) should, however, be the last resort and there should always first be an attempt to apply engineering and other solutions to mitigating hazardous situations before the issuing of PPE is considered.

Where it is not possible to create an absolutely safe and healthy workplace the contractor shall inform employees regarding this and issue, free of charge, suitable equipment to protect them from any hazards being present and that allows them to work safely and without risk to health in the hazardous environment.

It is a further requirement that the contractor maintain the said equipment, that he instructs and trains the employees in the use of the equipment and ensures that the prescribed equipment is used by the employee/s.

Employees do not have the right to refuse to use/wear the equipment prescribed by the employer and, if it is impossible for an employee to use or wear prescribed protective equipment through health or any other reason, the employee cannot be allowed to continue working under the hazardous condition/s for which the equipment was prescribed but an alternative solution has to be found that may include relocating or discharging the employee.

The principal contractor shall include in his OH&S plan the PPE he intends issuing to his employees for use during construction and the sanctions he intends to apply in cases of non-conformance by his employees. Conformance to the wearing of PPE shall be discussed at the weekly inspection meetings.

#### **3.4 Other Regulations**

Wherever in the Construction Regulations or this specification there is reference to other regulations (e.g. Construction Regulation 24: Electrical Installations and Machinery on Construction Sites) the principal contractor shall be conversant with and shall comply with these regulations.

#### **3.5 Public Health & Safety (Section 9 of the OH&S Act)**

The principal contractor shall be responsible for ensuring that non-employees affected by the construction work are made aware of the dangers likely to arise from said construction work as well as the precautionary measures to be observed to avoid or minimise those dangers. This includes:

- Non- employees entering the site for whatever reason
- The surrounding community
- Passers- by to the site

## 4.0 PROJECT/SITE SPECIFIC REQUIREMENTS

4.1 List of Risk Assessments. The following list is not exhaustive and shall only be used as a guide.

- Clearing and Grubbing of the area/site
- Site establishment including:
  - Office/s
  - Secure/safe storage for materials, plant and equipment
  - Ablutions
  - Sheltered eating area
  - Maintenance workshop
  - Vehicle access to the site
- Dealing with existing structures
- Location of existing services
- Installation and maintenance of temporary construction electrical supply, lighting and equipment
- Adjacent land uses/surrounding property exposures
- Boundary and access control/public liability exposures (NB: the employer is also responsible for the OH&S of non-employees affected by his/her work activities.)
- Health risks arising from neighbouring as well as own activities and from the environment e.g. threats by dogs, bees, snakes, lightning etc.
- Exposure to noise
- Exposure to vibration
- Protection against dehydration and heat exhaustion
- Protection from wet and cold conditions
- Dealing with HIV/Aids and other diseases
- Use of portable electrical equipment including
  - Angle grinder
  - Electrical drilling machine
  - Circular saw
- Excavations including
  - Ground/soil conditions
  - Trenching
  - Shoring
  - Drainage of trench
- Welding including
  - Arc welding
  - Gas welding
  - Flame cutting
  - Use of LP gas torches and appliances
- Loading and offloading of trucks
- Aggregate/sand and other materials delivery
- Manual and mechanical handling
- Lifting and lowering operations
- Driving and operation of construction vehicles and mobile plant including
  - Trenching machine
  - Excavator
  - Bomag roller
  - Plate compactor
  - Front end loader
  - Mobile cranes and the ancillary lifting tackle
  - Parking of vehicles and mobile plant
  - Towing of vehicles and mobile plant
- Use and storage of flammable liquids and other hazardous substances
- Layering and bedding
- Installation of pipes in trenches
- Pressure testing of pipelines
- Backfilling of trenches
- Protection against flooding
- Gabion work
- Use of explosives
- Protection from overhead power lines
- As discovered by the principal contractor's hazard identification exercise

- As discovered from any inspections and audits conducted by the client or by the principal contractor or any other contractor on site
- As discovered from any accident/incident investigation.



EMPLOYERS RISK ASSESSMENT AND DESIGNERS RISK MANAGEMENT ACTION

## N3 TOLL CONCESSION (RF) PROPRIETARY LIMITED.

Contract No		Project Number	Date	Employers Representative
RM-2021-600:			02-Nov-15	COE/Technical Manager
		Department RRM - In-house		Project Manager Route Maintenance Manager
Description	ROUTINE ROAD MAINTENANCE OF THE N3 TOLL ROAD			
Document Type	EMPLOYERS RISK ASSESSMENT AND DESIGNERS RISK MANAGEMENT ACTION.			
Scope of Works	Refer to Contract RM-2021-600 Volume 3 Part C4 Site Information for details of the scope of works.			
Schedule of Responsible Persons	To be completed before the Commencement of the Works.			

## Employers Risk Assessment and Designers Risk Management Action

(1)  Ref	(2)  Activity/Process/Material/Element	(3)  Hazard	(4)  Stage of Work	(5)  Risk Assessment: Severity / Likelihood / Risk	(6)  Designer Risk Control Measures: Design action taken, record of decision process including option considered, design constraints.
<b>A General</b>					
A1	Working on roads open to the public. In vicinity of high speed traffic and restricted working space	Injury / Fatality	Maintenance/ Construction	Major / Likely / Extreme. Traffic safety officer to be appointed. Effective traffic management to be provided at all times. Detailed specifications and drawings to be provided to ensure legal compliance.	The N3 Toll Road is a highly trafficked route and maintenance /construction will be done under traffic. Access is via interchanges. There are toll plazas. Traffic Management to be put in place in accordance with the SA Road Traffic signs manual and according to the specifications and drawings. In planning traffic management, consultations must be made beforehand with relevant Local Authorities and Incident Management Team. The site management team to ensure that staff and persons visiting site are made aware of safe working procedures w.r.t. live traffic and that appropriate risk assessments are undertaken. Refer to Section 0500.
A2	Abnormal loads traversing the site.	Conflicts with maintenance or construction equipment and damage to temporary traffic accommodation signs	Maintenance/ Construction	Significant / Likely / Substantial. Abnormal loads on the N3 are a regular occurrence. Contractor to be made aware of abnormal loads and to make provision for accommodating through work area	Contractor is made aware of the possibility of abnormal loads. N3TC route control centre to assist with pre-warning where possible. Abnormal load permit office to be made aware of the maintenance activities and lane restrictions. Good relationships with RTI to be maintained.
A3	Field access and domestic entrances	Access to be maintained	Use (as workplace)	Insignificant / Unlikely / Substantial. No access to the toll plaza buildings	Take cognisance of accommodation works drawings for accommodating accesses
A4	Temporary access roads and temporary diversions	Fatality Risk of traffic accidents to the public and construction worker	Maintenance/ Construction	Significant / Likely / Substantial.	Traffic Management including the design of temporary diverted roads, shall be put in place in accordance with the Traffic Signs Manual. In planning traffic management, consultations must be made beforehand with relevant Local Authorities, Gardaí and residents. Appropriate Signage to be put in place for temporary diversions. Contractor should put in place Public lighting on temporary

(1)  Ref	(2)  Activity/Process/Material/Element	(3)  Hazard	(4)  Stage of Work	(5)  Risk Assessment: Severity / Likelihood / Risk	(6)  Designer Risk Control Measures: Design action taken, record of decision process including option considered, design constraints.
					diverted roads where required and maintain public lighting on existing roads.
A5	Pedestrian activity during maintenance / construction. Along the N3 Toll Road there are locations where those on site must take particular care to watch for pedestrian. Cognisance to be taken of operations activities in the toll plaza area.	Pedestrians are more likely to be found in the toll plaza area, Howick, Mooi River Estcourt, Van Reenen Harrismith, Warden or Villiers	Maintenance/ Construction	Significant / Likely / Substantial. Maintenance activities to take cognisance of operations within the toll plaza area. High pedestrian activity at areas indicated.	Maintenance Traffic and public Traffic Management designer should be alert to pedestrian movement at all times. Temporary work fencing and warning signs to isolate pedestrians from site vehicles and works where appropriate.
A6	Noise and dust related activities	Injury and nuisance	Use (as workplace)	Significant / Likely / Substantial. Noise dust and vibration related to construction activities, e.g. excavation, milling, compaction	Contractor to provide relevant PPE to workers. Where necessary, apply dust suppressant
A7	Work involving rock blasting/deep excavation/earthworks transportation to accommodate new road alignments	Injury / Accident	Maintenance/ Construction	Significant / Likely / Substantial. Excavation is related to milling of pavement layers and sub soil drain excavation. Step off after milling to be managed	Milled areas to be kept closed to traffic until corrected. Temporary ramps to be provided is necessary. Excavations to be protected and closed to traffic
A8	Work involving handling of heavy prefabricated unit at structures including bridges, culvert, gantries signs and other structures	Fatality	Maintenance/ Construction	Significant / Likely / Substantial. Culvert units to be handles with due care as per manufacturers specification.	Adequate safety harnesses to be provided. Storage of units on site to be demarcated
A9	Conflict with existing live services	Striking existing services	Maintenance/ Construction	Significant / Likely / Substantial. Underground services exist within the site. All known services are to be identified and included in the contract documents.	Before commencing works on site, the Contractor should review the existing services information provided with the contract Document and consult with service providers to recheck location of older service and review newly installed services. Contractor to prove and expose services by hand excavation where required.
A10	Working adjacent to or over waterways	Damage to structure or possible fall event	Maintenance/ Construction	Significant / Likely / Substantial. Work on bridge decks include milling asphalt, replacing asphalt and replacing bridge joints. Dead load is not being altered significantly.	Contractor to ensure that load limit of bridge is not exceeded. Compaction to be restricted to minimum required without excessive use of high amplitude vibration.

(1)  Ref	(2)  Activity/Process/Material/Element	(3)  Hazard	(4)  Stage of Work	(5)  Risk Assessment: Severity / Likelihood / Risk	(6)  Designer Risk Control Measures: Design action taken, record of decision process including option considered, design constraints.
				Road over feature open to public exists. Refer to EMP for risk of water contamination.	Special precaution to be taken where working on bridges over features open to public.
A11	Working adjacent to rehabilitation activities	Conflict with other contractors.	Construction / Maintenance	Significant / Likely / Substantial. There will be ongoing road rehabilitation activities / works in progress during the routine maintenance period. Contractor to be made aware of external activities and be given sufficient warning of rehabilitation activities	The Contractors will be made aware of impending rehabilitation activities and the contact details for the relevant site staff including the TSO
A12	Driving and operating maintenance/construction vehicles and construction equipment.	Accident / Injury / Fatality	Construction / Maintenance	Significant / Likely / Substantial. Ensure that the Contractor complies with OHS Act and Regulations relating to the operation of all construction vehicles and equipment. All notifications, permits where applicable and mandatory appointments to be in place before construction commences.	OHS Act and Construction Regulations apply. Refer to Section E.
<b>Works Activities</b>					
B1	Access to site	Conflicts with traffic	Construction / Maintenance	Moderate / Likely / Substantial. Construction vehicles enter and depart work areas into the normal traffic flow. Toll plaza access roads to remain open.	Site access layouts to be properly planned by Contractor, giving consideration to a non-exhaustive list of items such as set-down areas for materials, internal and external site traffic management, one-way systems and turning circles, fencing and security. Training to be provided to all plant and vehicle operators relating to conduct on the site and when entering and exiting the site.
B2	Maintenance / Construction projectiles striking workmen or public	Projectile strike causing injury.	Construction / Maintenance	Significant / Likely / Substantial During mowing, milling and sweeping activities, there is a likelihood of solid particles becoming projectiles with a risk of striking a person.	Contractor to carry out risk assessment and mitigate strike risks.
B3	Handling and placing hot products. Bituminous road surfacing material	Burns and major injuries from hot works	Construction / Maintenance	Significant / Likely / Substantial. The works include the production, transport and placing of bituminous	Contractor to provide workers with protective gear and safety equipment where appropriate when within the close proximity of the works.

(1)  Ref	(2)  Activity/Process/Material/Element	(3)  Hazard	(4)  Stage of Work	(5)  Risk Assessment: Severity / Likelihood / Risk	(6)  Designer Risk Control Measures: Design action taken, record of decision process including option considered, design constraints.
				products that are heated to high temperatures. E.g. Asphalt	Visitors to be made aware of danger of close proximity to materials at high temperature.
B4	Handling of bituminous products and other hazardous petrochemicals.	Exposure to hazardous material	Construction / Maintenance	Significant / Likely / Substantial Bitumen and petrochemicals are classified as a hazardous material. The works include the production, transport and placing of bituminous products.	Contractor to take cognisance of guidelines relating to the handling bituminous materials and petrochemicals.
B5	Road level tie-ins	Unsafe step alignment tie-ins.	Construction / Maintenance	Significant / Likely / Substantial. During the overlay operations, the new road level will be higher than the adjacent shoulder.	During the overlay operations, the new road level will be higher than the adjacent shoulder. The works provides for the construction of a new shoulder. Where the step-off during construction exceeds 75mm, provisional arrangements for safety to be made.
	Contact with biological hazards associated with vermin	Infection of workers	Construction / Maintenance	Significant / Likely / Substantial Gerbil colonies are present on the site, especially N3-10 km 41 to km 43. Contractor to be made aware of potential risk of rabies infection.	Tool box talks to include avoidance of all rodents and immediate notification of supervisor if bitten.
B7	Site offices and Laboratory	Hygiene, exposure to electricity, fire and hazardous materials.	Construction / Maintenance	Significant / Likely / Substantial. Planning of offices and laboratory to provide for safety and bylaw compliance.	Contractor to plan and provide all necessary safety certification, safe storage areas and safety equipment. Laboratory ventilation to take cognisance of hazardous methods and products used in testing. All equipment to be calibrated and certified.
B8	Facilities on site for workmen	Hygiene, exposure and dehydration.	Construction / Maintenance	Significant / Likely / Substantial. The site is remote from normal services. Adequate provision to be made for latrines and protection from elements.	Contractor to provide at each work area. <ul style="list-style-type: none"> <li>• Mobile latrines.</li> <li>• Shaded rest facilities.</li> <li>• Potable water.</li> </ul>
B9	Mowing and baling of grass cuttings	Projectile strike causing injury and working on steep slopes	Construction / Maintenance	Significant / Likely / Substantial During mowing and baling activities, there is a likelihood of solid particles becoming projectiles with a risk of striking a person.	Contractor to carry out risk assessment and mitigate strike risks. Ensure that all the necessary PPE is provided, e.g. eye protection etc. Traffic Accommodation and flag persons.

(1)  Ref	(2)  Activity/Process/Material/Element	(3)  Hazard	(4)  Stage of Work	(5)  Risk Assessment: Severity / Likelihood / Risk	(6)  Designer Risk Control Measures: Design action taken, record of decision process including option considered, design constraints.
B10	Working at Heights	Maintenance of buildings, structures and maintenance, erection and cleaning of road signs,	Construction / Maintenance	Significant / Likely / Substantial During the erection, cleaning, maintenance of signs, and maintenance of structures and buildings activities, there is a likelihood of falling with a risk of injury to a person.	Contractor to carry out risk assessment and mitigate the risks. Ensure that all the necessary PPE is provided, fall protection etc. Traffic Accommodation and flag persons.
B11	Animal or dead carcasses	Injury or toxins released by dead carcasses along the route	Construction / Maintenance	Significant / Likely / Substantial The release of toxins when removing of animals or dead carcasses,	Contractor to carry out risk assessment and mitigate the risks. Plan or pre-determine the disposal site. Ensure that all the necessary PPE is provided,

# PART C4: SITE INFORMATION

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## C4.1 PROJECT DESCRIPTION

### C4.1.1 SCOPE

This section provides the description of the project and the general requirements for executing the work. The work required is the routine road maintenance of a portion of the N3 Toll Road between Cedara in KwaZulu Natal and the Heidelberg South I/C in Gauteng.

### C4.1.2 DESCRIPTION OF THE WORKS

#### C4.1.2.1 Description of site

##### (a) Location of site

The general locality of the site and the limits of each Package is indicated in Table C4.1 below and on the locality plan.

Table C4.1: Description of RRM Packages

Package 1: N3-4 km 1.6 to N3-4 km 37.6	Cedara to Nottingham Rd IC
Package 2: N3-4 km 37.6 to N3-5 km 5.06	Nottingham Rd IC to Tambookies Kraal Overpass
Package 3: N3-5 km 5.06 to N3-5 km 38.0	Tambookies Kraal Overpass to Frere IC
Package 4: N3-5 km 38.0 to N3-6 km 20.2	Frere IC to Bergville IC
Package 5: N3-6 km 20.2 to N3-6X km 60.4	Bergville IC to KZN/FS border
Package 6: N3-7X km 0.0 to N3-7X km 63	KZN/FS border to Meul River
Package 7: N3-8X km 0 to N3-8 km 48.8	Meul River to Holspruit
Package 8: N3-9 km 0.0 to N3-9 km 39.5	Holspruit to Schaaprand (R34 IC)
Package 9: N3-9 km 39.5 to N3-10 km 5	Schaaprand (R34 IC) to Vaaldraai IC
Package 10: N3-10 km 5 to N3-11 km 15.1	Vaaldraai IC to Heidelberg (S) IC

The term "Site" as defined in the FIDIC Conditions of Contract for Construction, 1999, will comprise the road reserve of existing National Route 3, N3 Toll Road, Packages 1 to 10, the limits of which may change will be communicated from time to time.

This includes all on-ramps and off-ramps forming part of an interchange, as well as overpasses and underpasses within the national road reserve up to the limits of the N3TC/SANRAL's responsibility. Excluded are provincial, municipal and private cross roads, which are not accessible from the road reserve of the national road, but the overpass and underpass structures are part of the "Site".

The "Site" will also include all road signs within 500 metres of an intersection or interchange, which form part of the road signs layout for the national road.

The "Site" will also include land not provided by the Employer, where equipment and/or materials for use in the permanent works of the contract can be stored and/or stockpiled with the proviso that the land selected for this purpose be approved by the Engineer. The Contractor must make the Contractor's own arrangements for the use of such land and must obtain written approval from the owner(s) concerned. The contractor will have to make their own arrangements for camp sites, which will not be allowed within the road reserve.

##### (b) Access to the site

Access to the site shall be from established interchanges, intersections and approved accesses.

#### C4.1.2.2 Nature of work

The description of the project contained in this section is merely an outline of the contract works and shall not limit the work to be carried out by the Contractor under this contract. Approximate



quantities of each type of work to be carried out in accordance with the contract documents are listed in the Schedule of Quantities bound in this volume.

The nature of work to be carried out under this contract includes:

- Establishment of camps on site
- Inspection of the road and night inspections
- Accommodation of traffic
- Pavement layers repairs
- Crack sealing and patching of asphalt pavements
- Repair of slope failures and washaways
- Stabilisation of slopes and cuttings
- Construction of drainage works to combat erosion
- Cleaning of all drainage structures, including removal of grass and debris from grids, as well as clearing bridge drainage ports and scuppers
- Repairing damaged fencing
- Clearing refuse from the road reserve, lay-byes and interchanges
- Installation or repairing damaged road signs
- Cleaning of road signs and removal of illegal signs
- Installation and replacement of road studs
- Repairing damaged guardrails
- Eradication of weeds and undesirable plant growth
- Supply, planting and maintenance of trees and shrubs
- Supply and spreading of topsoil
- Emergency assistance
- Minor road works done under daywork
- Maintenance of arrestor beds
- Dazzle screen erection, repairs and replacement.
- Sub-soil maintenance and installation
- Overhaul of material

The contractor shall be required to attend meetings relating to the Works and the site, *inter alia*, Farmers' Association, and Fire Protection Association.

#### C4.1.2.3 Detailed description of the project

The route description of the national route sections for which routine road maintenance will be provided is as follows:

(a) The route description of National Route 3 Sections 4 to 11:

(i) The N3 Toll Road Starts at N3-4 km 1.6 and ends at N3-11 km 15.1  
The limits of the RRM Packages are indicated in Table C4.1 above

- |                       |   |                                       |
|-----------------------|---|---------------------------------------|
| • Type of carriageway | = | <i>dual and single</i>                |
| • Surfacing           | = | <i>Concrete and asphalt</i>           |
| • Interchanges        | = | <i>27</i>                             |
| • Toll Plazas         | = | <i>4 mainline &amp; 2 ramp plazas</i> |
| • Road reserve width  | = | <i>(60m) excluding interchanges</i>   |
| • Median description  | = | <i>grass</i>                          |

(ii) List of interchanges

The Interchanges are indicated on the N3 Route Card (locality plan) in Section E

(iii) List of Toll Plazas

Mooi River Mainline Plaza - N3-4 km 49.6  
Mooi River (S) Ramp Plaza - N3-4 km 49.0  
Mooi River (N) Ramp plaza – N3-4 km 52.6  
Bergville Ramp Plazas – N3-6 km 20  
TugelaMainline Plaza – N3-6 km 35.2  
Tugela East Ramp Plaza (R103) Keeversfontein I/C

- (b) The limits of the RRM Packages will change from time to time and will be communicated to the contractor in writing.

**C4.1.2.4 Time for completion**

The Time for Completion of the Works shall be two years (24 months). The Employer, however, reserves the right to extend this period, at his sole discretion and by mutual agreement.

**C4.1.3 DRAWINGS**

The that form part of the contract document are available on the N3TC website.

Any information in the possession of the Contractor, which the Engineer requires to record as-built information, shall be supplied to the Engineer before a Taking-Over Certificate will be issued.

Only figured dimensions shall be used and drawings shall not be scaled unless so instructed by the Engineer. The Engineer will supply all figured dimensions omitted from the drawings.

**C4.1.4 POWER SUPPLY AND OTHER SERVICES**

The Contractor shall make their own arrangements concerning the supply of electrical power and all other services. No direct payment will be made for the provision of electrical and other services. The cost thereof shall be deemed to be included in the rates and amounts tendered for the various items of work for which these services are required

**C4.1.5 CONSTRUCTION IN CONFINED AREAS**

It may be necessary for the Contractor to work within confined areas. Except where provided for in the specifications, no additional payment will be made for work done in such confined areas. In certain instances the width of the work to be undertaken may decrease to zero and the working space may be confined. The work method in such confined areas will be determined by the Contractor's constructional equipment.

However, the Contractor must note that measurement and payment will only be made in accordance with the authorised dimensions, irrespective of the method used for achieving these dimensions and that the tendered rates and amounts shall include full compensation for all special equipment and construction methods and for all difficulties encountered when working in confined areas and narrow widths, and at or around obstructions, and that no extra payment will be made nor will any claim for additional payment be considered in such cases.

**C4.1.6 CONTRACTOR'S CAMP SITE**

The Contractor shall provide at their own cost a suitable site for the Contractor's camp, which will not be within the road reserve.

**C4.1.7 ADDITIONAL REQUIREMENTS FOR CONSTRUCTION ACTIVITIES**

In addition to the requirements specified in the Standard Specifications, the Contractor shall adhere to the following requirements.

**C4.1.7.1 Accommodation of traffic**

Reference shall be made to the requirements shown on the drawings as well as to Section M0500 of the Standard Specifications where temporary traffic control measures and limitations regarding lane closures, work areas and the unoccupied spacing of such closures are detailed. It is a condition of this contract that traffic is accommodated taking into account the provisions of the latest edition of the South African Road Traffic Signs Manual (SARTSM). The latest version for use in the accommodation of traffic is volume 2, chapter 13 of the June 1999 edition. Copies of this publication are available from Government Printers: Elsa Herbst Tel: (012) 334

4509 e-mail elsa.herbst@gpw.gov.za. The Drawings contain the relevant detail as required for this Contract.

The contractor shall not permit any vehicle related to their maintenance activities to cross the median in an attempt to make a "U" turn. The contractor will be solely responsible for ensuring that no vehicles make "U" turns. The contractor will be penalised at R 5 000-00 per occasion if any contractor's equipment / vehicles make "U" turns on the N3.

Any cost associated with the accommodation of traffic must be included in the relevant payment items under Section M0500.

#### C4.1.7.2 Crack sealing and pavement failure repairs

Crack sealing and pavement failure repairs shall be ordered by the Engineer as specified in Series M1000 of the Standard Specifications. Crack sealing shall normally be ordered in late winter or early spring before the summer rains, although further crack sealing may be required in summer.

The Contractor will be supplied with a schedule of work to be undertaken on the affected sections and the programming of the execution thereof is to be agreed with the Engineer.

#### C4.1.7.3 Construction of drainage works to combat erosion

The Engineer may instruct the Contractor to construct new drains or to repair drainage works damaged by stormwater. Under normal circumstances, this work will generally not require the use of specialist skills or equipment and will be limited to minor earthworks and concrete works.

#### C4.1.7.4 Cleaning of drainage structures

The Contractor shall clean concrete drainage structures to maintain the acceptance criteria as specified. The Engineer may order the cleaning of earth drainage channels.

#### C4.1.7.5 Clearing of the road reserve

The Contractor shall have sufficient resources available to clear the entire road reserve included in this contract, at least at the times and frequencies as specified in the Specifications.

The Engineer may order additional clearing during peak traffic periods, particularly during the months of July and December.

#### C4.1.7.6 Repairing damaged fencing, road signs and guardrails,

Damage to fencing, road signs and guardrails identified by the contractor shall be reported to the Engineer who will instruct the action to be taken by the Contractor. The damaged guardrails and fences will remain the property of the employer and will only be disposed of on instruction from the employer.

The Contractor shall control all vegetation growth around road signs in such a way necessary to prevent any damage to the road signs due to veld fires. The Contractor shall replace all road signs damaged due to veld fires at the Contractor's own cost.

#### C4.1.7.7 Replacement of road studs

The Contractor shall only replace road studs as specified in Section M4300 of the Standard Specifications, when and as instructed by the Engineer.

#### C4.1.7.8 Environmental requirements

Trees and shrubs established in landscaped areas of interchanges and in the road reserve may under no circumstances be disturbed without specific instruction from the Engineer for their removal. Trees and shrubs inadvertently destroyed by the Contractor shall be replaced with the equivalent at the Contractor's own cost.

Disposal of any bituminous-based material shall only be at an approved location and by means of an approved method, arranged beforehand with the Engineer. Bituminous binders shall not be disposed of on the Site, but shall be returned to the supplier for disposal.

**C4.1.7.9 Mowing of grass, Road Marking and Chemical Control and Eradication of Undesirable Vegetation**

The mowing of grass, Road Marking and Chemical control, does not form part of this contract. It shall be implemented separately unless otherwise ordered by the Engineer.

**C4.1.7.10 Fire breaks**

The burning of fire breaks does not form part of this contract.

**C4.1.7.11 Maintenance and establishment of plants, trees, shrubs and grass**

Topsoiling and seeding (grassing) of sparse areas may be ordered by the Engineer as specified in Series M6000 of the Standard Specifications. If ordered, this work will normally be undertaken in early spring or late summer when mowing operations are not envisaged.

The Contractor will not be expected to handle individual areas on a piecemeal basis, but will be supplied with a schedule of areas to be treated and be given an opportunity to agree a programme for this work with the Engineer. These comments are also applicable to the application of fertiliser and herbicides, and the planting of additional trees and shrubs.

Maintenance of trees and shrubs shall be undertaken as specified in Section M6400 of the Standard Specifications. Such maintenance may include hoeing around trees and shrubs, trimming and watering. Additional watering of trees and shrubs may be ordered by the Engineer in dry periods and shall be paid for under the appropriate payment item.

**C4.1.7.12 Emergency assistance**

The emergency assistance as specified in Series M7000 of the Standard Specifications shall normally be ordered in the event of natural and unnatural events in the road reserve or on the road surface. This can include accidents involving commercial or passenger vehicles, clearing of spillages, sheltering of animals and safeguarding of dangerous areas, removal of dropped loads.

The Contractor may also be required, in full liaison with and under the instruction of the Engineer assist with the clearing of accident scenes so as to ensure that the road is reinstated to a safe condition.

**C4.1.7.13 Daywork**

Sub-clause 13.6 of the FIDIC Conditions of Contract for Construction, 1999, refers.

The Contractor shall tender the rates applicable to daywork, as provided for in the Schedule of Quantities. These rates will be taken into account in the adjudication of tenders.

The tendered rates shall be considered to include full compensation for the work to be performed, including supervision of labour, all plant operators and other operating costs, overheads and profit. Hourly rates for transport and equipment shall apply to the actual number of hours for which the vehicles or equipment are required for a specific item of work, including travelling time if applicable.

The Contractor shall maintain a hard cover duplicate book on site for the purposes of recording daywork. The Contractor shall record the total time claimed under each relevant item of the Bill of Quantities and the applicable instruction of the Engineer, and shall ensure that the total times claimed are agreed and signed daily by the Engineer's representative on site.

The Contractor shall not claim daywork for any work for which an applicable rate has been tendered or agreed to in writing by the Engineer.

The cost of materials used and paid for by the Contractor, as authorised by the Engineer, shall be reimbursed at net cost, exclusive of Value Added Tax, plus the percentage as tendered for the Contractor's overhead charges and profit.

In the event where no allowance has been made for a specific item in the Schedule of Quantities, the Engineer may order daywork according to sub-clause 13.6 of the FIDIC Conditions of Contract for Construction, 1999.

#### **C4.1.7.14 Safety**

The contract will be executed under traffic conditions and the travelling public shall have the right of way on public roads. The contractor shall make use of approved methods to control the movement of his equipment and vehicles so as not to constitute a hazard on the road. Failure to maintain road signs, warning signs and flicker lights shall constitute ample reason for the Employer to suspend work and apply the penalties as stated in the contract until such road signs and road safety ancillaries have been repaired or reinstated to the Employer's satisfaction. The Contractor shall nominate a safety officer and a traffic control officer who shall be responsible at all times, including after hours, nights, weekends and public holidays, for the safety of the work area and the accommodation of traffic. The Contractors' vehicles and construction equipment may not be parked within 6m of the travelled lane edge outside normal working hours as defined in the General Conditions of Contract. All powered vehicles used on the contract shall be fitted with warning sign boards mounted across the back and front of the vehicle. These boards shall be the same width as the vehicle, 400mm high, display the word "Maintenance" in bold black letters on a yellow background and be subject to the approval of the Engineer. In addition, all vehicles and items of mobile equipment operating on site shall have fitted 2 electrically operated amber rotating/flashing beacons of robust construction clearly visible from all directions for a minimum of 300 metres in all light conditions. No additional payment shall be made for the furnishing of these boards and flashing /rotating beacons. The Contractor shall provide, at his expense, reflective waistcoats, overalls, protective goggles, gloves, hard hats, waterproof clothing etc. which may be necessary for the execution of the contract.

The Contractor may not commence maintenance activities before adequate provision has been made to accommodate traffic in accordance with the requirements of this document, the standard specifications and the South African Road Traffic Signs Manual Chapter 13. Typical road sign layouts are contained in Chapter 13 of the SA Road Traffic Signs Manual and are the minimum requirements.

All normal work in the road reserve will be limited to the period between half an hour after sunrise and half an hour before sunset.

### **C4.1.8 FEATURES REQUIRING SPECIAL ATTENTION**

#### **C4.1.8.1 Existing Services**

The Contractor shall make himself acquainted with the position of all existing services before any excavation or other work likely to affect the existing services is commenced.

The positions of known existing services as well as existing structures are shown on the drawings or the lists provided in volume 4. The lateral support system is to be installed so as not to interfere in any way with the serviceability of these services of structures. The exact positions and depths of known services are to be determined by the Contractor by hand excavation or other approved methods, provided it is supervised by the relevant authority.

Should any other services be found or should any services be damaged during the course of the works, the Engineer shall be notified immediately. N3TC to provide services schedule in Volume 4.

The agricultural corridor above the cut slope acts as a conduit for the Telkom and Neotel Optic Fibre cable. This corridor is not to be disturbed in any way.

#### **C4.1.8.2 Survey beacons**

The Contractor shall take special precautions to protect all permanent survey beacons or pegs such as bench-marks, stand boundary pegs and trigonometrical beacons, regardless

whether such beacons or pegs were placed before or during the execution of the Contract. If any such beacons or pegs have been disturbed by the Contractor or his employees, the Contractor shall have them replaced by a registered land surveyor at his own cost.

#### **C4.1.8.3 Disposal of spoil or surplus material**

The Contractor shall dispose of all surplus and unsuitable material in legal spoil areas of his own choice. He shall be responsible for all arrangements necessary to obtain such spoil sites.

#### **C4.1.8.4 Overhaul**

No payment will be made for overhaul on this contract unless provision is made therefor in specific items.

### **C4.1.9 ALLOWANCE FOR OTHER CONTRACTORS AND ACCOMMODATION OF OTHER CONTRACTS**

In addition to the requirements of clause 4.6 of the FIDIC Conditions of Contract for Construction, 1999 the Contractor must take note of the presence of other Contractors on the site and make allowances for them on the site. This may involve adapting the Contractor's programme to accommodate the work of other Contractors and ensuring access to their sites.

Although details of such contracts are not known it may include, *inter alia*, periodic maintenance, special maintenance, and rehabilitation and upgrade contracts. Depending on the scope of works for these contracts, the Contractor may be relieved of his responsibilities on the relevant section of the site during the construction period only, and this may include a reduced scope of work on performance based items where applicable.

The contracts which may be implemented during the Time for Completion of this contract by the Employer and may run concurrent with this contract is as follows;

Any contract undertaken by the Employer's appointed contractor or agent deemed necessary for rehabilitation of this section of the route.

Any contract undertaken by the Employer's appointed contractor or agent in upgrading of this section of the route.

#### **C4.1.10 PROGRAMME, RESTRICTION AND COMPLETION OF ACTIVITIES**

This clause covers matters relating to the programme of work, restriction on certain maintenance activities, completion and responding time of specified activities, compliance with the specifications, and related delay damages and penalties.

##### **C4.1.10.1 Programme**

The Time for Completion of the Works is specified in the Contract Data, including an option for an extension at the sole discretion of the Employer.

The Engineer will determine the extent and frequency of the work to be executed in terms of the contract, as certain activities are dependent upon the climatic conditions encountered during the period of the contract.

The frequency and commencement period of some of the key activities, some of which are only on the instruction of the Engineer, are scheduled in Table C4.1.9/1

<b>TABLE C4.1.9/1: FREQUENCY AND COMMENCEMENT PERIOD OF ACTIVITIES</b>		
<b>Activity</b>	<b>Frequency</b>	<b>Start period</b>
M3200: Clearing of road reserve	Twice a month	As instructed
M3200: Additional Cleaning of lay-byes, interchanges Toll plazas	Monthly	As instructed
	Two time a week	As instructed
	Weekly	As instructed
M3400: "Fluffing" of arrestor bed	Monthly	As instructed

#### C4.1.10.2 Restriction on maintenance activities

Certain maintenance activities will be restricted on days with increased traffic flows. These days will be, for example, the day of school closure, over long weekends and public holidays. The Contractor must allow for these restrictions in his programme and no extension of time or claims in this regard will be considered.

Normal routine maintenance involving lane closures (except in the event of emergency normalisation) shall be restricted on the days and for the periods stated in the N3TC Critical Date Planner, a copy of which will be supplied at the commencement of the contract by N3TC. A copy of the 2021 critical date planner is attached.

The travelling public shall have right of way on public roads. The Contractor shall arrange his activities so as to bring about the least possible disruption to the traffic on the roads on which he works.

The Contractor's attention is drawn to the fact that he will be fully responsible for the safe and convenient accommodation of traffic at all times during the maintenance period. In this regard the Contractor is referred to the N3TC CRITICAL DATES YEAR PLANNER 2016, in which traffic is categorized as A (extremely busy), B (very busy) and C (moderately busy). The critical dates for the remainder of the contract will be similar for the equivalent period and will be issued as they become available. The table below provides an explanation of the Category A, B, and C days, as well as the restriction with regards to working on the road and closures.

**CRITICAL DAYS EXPLANATION TABLE**

Dual Divided			Dual Undivided			
Day	Work SB	Work NB	Work NB	Work SB	Closure NB *	Closure SB *
A	No	No	No	No	No	No
As	No	No (permission required for special cases only)	No	No	Yes (1 lane only)	No
An	No (permission required for special cases only)	No	No	No	No	Yes (1 lane only)
B	No (permission required)	No (permission required)	No (permission required)	No (permission required)	Yes (1 lane only)	Yes (1 lane only)
Bn	No (permission required)	No (permission required)	No (permission required)	No (permission required)	Yes (1 lane only)	Yes (1 lane only)
Bs	No (permission required)	No (permission required)	No (permission required)	No (permission required)	Yes (1 lane only)	Yes (1 lane only)
C	Yes with caution	Yes with caution	Yes with caution	Yes with caution	Yes (1 lane only)	Yes (1 lane only)
					* subject to Sec. 1500 conditions	

The Contractor shall table his proposed lane use scenario for all critical days marked on the Critical Date Planner, at least 14 days prior to such days. This proposal shall take the anticipated directional flow into account. N3TC will approve/amend/reject such proposal seven days prior to the said days.

Failure or refusal on the part of the Contractor to take the necessary steps to ensure the safety and convenience of the public in accordance with these specifications or as required by the Engineer or the traffic authorities shall be sufficient cause for the suspension of all work under this contract. The work will be closed down until all provisions as prescribed have been complied with to the satisfaction of the Engineer.

#### **C4.1.10.3 Completion time of specified activities and penalties**

Generally the maintenance activities covered by this contract will be on a continuous basis. However, certain specified activities are considered to be a priority or are critical, and it is a condition of contract that they shall be completed or responded to as specified, after receiving an instruction from the Engineer.

Should the Contractor fail to complete the specified activity or respond timeously, or comply with the specifications, he shall be liable for delay damages or a penalty as specified in Table C4.1.9/3.

##### Definitions:

Completion time:

Completion time is defined as that period from the date on which an instruction is received by the Contractor from the Engineer, to the date of full completion.

Responding time:

Responding time is defined as that period from the time on which an instruction is received by the Contractor from the Engineer, to the time of reporting at the place of the required activity, by the designated standby supervisor and team.

These activities, specified times, delay damages, and including penalties for work not complying with the specifications, are indicated in Table C4.1.9/3.

##### **Notes:**

- (a) Indicated day means a calendar day.
- (b) There shall be no reduction of delay damages or penalty for partial completion of works.
- (c) Delay damages and penalties as specified in Table C4.1.9/3, as well as elsewhere in the Scope of Work shall be deducted from the amount owing to the contractor.
- (d) Payment of delay damages or a penalty shall not absolve the Contractor of any claims, or relieve the Contractor of any of his duties, obligations or responsibilities under the contract.

#### **C4.1.10.4 Hours of Work**

"Normal working hours" (referred to in Clause A6.5 of the FIDIC Conditions of Contract for Construction) will, because of heavy peak hour traffic volumes be restricted to between 30 minutes after sun rise and 30 minutes before sun set.



TABLE C4.1.9/3: SPECIFIED ACTIVITY PERIODS, DELAY DAMAGES AND PENALTIES					
Activity	Completion time	Responding time	Penalty for late responding	Penalty for late completion	Penalty for not to specification
M0500: Accommodation of traffic 1. Lane closure not to specification 2. Sign not to specification 3. Time Delay	inspection daily				R5000/closure R100/sign R500/hour
M1200: Repair of potholes, edgebreaks and surface failures 1. Temporary repair of potholes and surface failures 2. Permanent repair of failure 3. Temporary repair of edgebreaks	1 days 1 weeks 14 days			R1000/day R1000/day R100/m	R2000/section
M1700: Repair of slope failures and washaways	4 weeks			R500/day	
M2300: Cleaning of waterway structures	1 week			R500/day	
M2400: Cleaning of prefabricated culverts	inspection monthly				R5000/section
M2500: Cleaning of concrete drains and culverts	inspection monthly				R5000/section
M2600: Cleaning and maintenance of existing earth drains	1 month			R500/day	
M2700: Edge build-up removal	inspection monthly				R5000/section
M3200: Collection and removal of debris and litter	inspection daily				R1000/incident
M4100: Erection and repair of permanent road traffic signs 1. R-Series 2. W-Series 3. G-Series ( after delivery) 4. Information (after delivery)	2 days 2 days 4 days 4 days			R500/day R500/day R500/day R500/day	
PM4400: Guardrail erection and maintenance 1. Repair 2. Safeguard area	2 weeks 4 hours			R500/day R500/day	
M6100: Controlling vegetation growth: Mowing and cutting 1. Shoulder mowing 2. General mowing 3. Mowing operation more than 7.0 km ahead of labourers finishing behind 4. Designated areas	6 weeks 2 months			R500/day R500/day	R1000/week R5000/section
M7000: Emergency assistance 1. Accident restoration and clearing of spillages 2. Sheltering of animals 3. Fire fighting 4. Safeguard of dangerous areas		1 hour 1 hour 1 hour 1 hour	R250/hour R250/hour R250/hour R250/hour		
M9000: Daywork	As instructed	1 week	R500/day	R500/day	
GENERAL 1. OH&S Plan 2. Quality Assurance System 3. Other specified or programmed activity 4. Any particular, routine or non-routine activity on instruction of the Engineer	As specified As specified  As instructed	   As instructed	   R500/day	   R500/day	R1000/incident R1000/incident

#### **C4.1.11 MANAGEMENT OF THE ENVIRONMENT**

The Contractor shall be responsible for construction according to an Environmental Management Plan in terms of Section C of the Scope of Work.

The Contractor must take the utmost care to minimise the impact of his establishment and other construction activities on the environment and must adhere to the requirements as set out in Section C of the Scope of Work. The contractor is to recycle as much of the litter and debris collected along the toll route, including tyre tread. Where the contractor fails to adhere to these requirements, the specifications in Section C provide the methodology and cost liability of the remedy.

#### **C4.1.12 OCCUPATIONAL HEALTH AND SAFETY**

This part of the specification has the objective to assist the contractor entering into contracts with the Employer that they comply with the Occupational Health and Safety (OH&S) Act, No. 85 of 1993, as well as all applicable Regulations. Compliance with this document does not absolve the contractor from complying with legal requirements and the contractor remains responsible for the health and safety of his employees and those of his Mandataries. The contractor shall therefore include this part of the specification to any contract that he may have with subcontractors and/or suppliers.

This section covers the development of a health and safety specification that addresses all aspects of occupational health and safety as affected by this contract. It provides the requirements that the contractor shall comply with in order to reduce the risks associated with this contract, which may lead to incidents causing injury and/or ill health. In this matter the spirit and intention of Regulation 5(1)(l) of the Construction Regulations, 2014 regarding negotiations between the parties, related to the contents and approval of the Health and Safety Plan, must be complied with. Section E of the Scope of Work contains the specification that regulates the Contractor's construction methods to ensure health and safety of his employees, subcontractors and the public.

#### **C4.1.13 CHANGES TO SCOPE OF WORK**

It is a condition of this contract that the employer reserves the right to limit the total expenditure on the Works due to possible budget constraints. Should the tender sum exceed the budgeted amount, the scope of the works may be reduced at any time before or during the contract period to ensure that the final contract amount does not exceed the budgeted amount. Reference is made to the particular amendments to the standard specifications M0208 (i) in Section B of the Scope of Work.

#### **C4.1.14 REQUIREMENTS OF THE GOVERNMENT'S PROGRAMME FOR BROAD-BASED BLACK ECONOMIC EMPOWERMENT**

It is a requirement of this project that contractors are familiar with the specifications that relate to the transformation of the construction industry through the following;

Employment of Black Enterprises (BE's),  
Construction using labour maximization principles.

It is a requirement of this contract that the Contractor actively pursues participation within local communities adjacent to the project, awareness of the need to bring work opportunities to the nearest indigent populations remains a priority.

It is compulsory for the Contractor to appoint local EME sub-contractors to execute the activities of the maintenance work that the Employer has identified and listed below. N3TC may add to the list below other activities to be executed by local EME sub-contractors.


- : M2500: Cleaning of drains
- M3200: Litter collection
- M4200: Cleaning of road signs (on instruction of N3TC)
- M4300: Road Stud Installation (on instruction of N3TC)

It is a condition of this Contract that the Contractor remains compliant with the requirements of a PDE, which is defined as an organization that has a minimum shareholding of 50,1% of persons who according to racial classification did not have the right to vote prior to the 1994 elections. The Employer reserves the right to terminate the Contract immediately without any further recourse by the Contractor, should the Contractor at any time fail to comply with the PDE requirements.

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## **PART C5: LAYOUT PLAN, N3TC DATE PLANNER**

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RRM Packages	Route Sections	Route Markers	Interchange / Landmark	Interchange Destination	
		15.1 km	Heidelberg (IC 59)	Heidelberg S/ Sanderton	
	NS-11	8.7 km	51.1 km	Die Hoek Plaza	
Package 10		40.9 km			
	NS-10	28.5 km	Grootevlei (IC 28)	Grootevlei	
		15.0 km			
		5.0 km	Vaalkraai (IC 5)	Sallour/ Verveninging	
		0.0 km	77.2 km	Vaal River	
Package 9		75.0 km	Villiers (IC 189)	Villiers S/ Frankfort	
			Wings Plaza		
	NS-9	39.5 km	Frankfort (IC 133)	Frankfort/ Vrede	
Package 8		13.3 km	Roadside (IC 107)	Roadside/ Riet	
		0.0 km	48.8 km		
	NS-8	30.0 km	Warden N (IC 78)	Vrede/ Villiers	
Package 7		21.0 km	Warden Town		
	NS-8X	18.5 km	Warden S (IC 82)	Guthrie/ Coetzee St	
		0.0 km	63.0 km		
		37.8 km			
		33.8 km	Hamersmith N (IC 34)	Warden Street	
Package 6	NS-7X	28.1 km	Hamersmith S (IC 29)	Hamersmith/ Guthrie/ Phuthi/ Riba	
		24.0 km	Blackspan River		
		13.5 km	Sandton		
		0.0 km	60.4 km	Van Rooyen Town	
Package 5	NS-6X	38.0 km	Keevefontein (IC 248)	Ladysmith	
			Tagula East Plaza		
			Tagula Main Plaza		
	NS-6	20.2 km	Bergville (IC 230)	Bergville	
			Bergville Ramp Plaza		
Package 4		0.0 km	54.0 km	Tagula River	
		51.2 km	Colenso (IC 207)	Colenso/ Winterton	
		38.0 km	Ficks (IC 194)	Bergville/ Colenso/ Greytown	
	NS-5	24.0 km	Esicourt N (IC 179)	Esicourt N/ Grant's Castle	
Package 3		19.3 km	Wimberley (IC 175)	Esicourt/ Wimberley/ Grant's Castle	
		12.3 km	Esicourt S (IC 168)	Esicourt S	
		5.08 km		Tamboekes/Kraai Overpass	
		0.0 km	61.6 km		
		58.4 km	Hidcoke (IC 152)	Hidcoke	
Package 2		52.6 km	Township Ramp Plaza		
			Township (IC 148)	Moot River N/ Grant's Castle	
		49.3 km	Moor Main Plaza		
			Moot River (IC 143)	Moot River S/ Greytown	
			Moor South Ramp Plaza		
	NS-4	37.6 km	Nillingham Rd (IC 132)	Nillingham Road	
		30.6 km	Blackhook (IC 125)	Salgroom/ Curry's Post	
Package 1		20.2 km	Woodlands (IC 114)	Ums River/ Curry's Post	
		12.9 km	Tweedie (IC 107)	Howick N/ Tweedie	
		11.0 km	Umpeni River		
		9.5 km	Midmar (IC 103)	Howick/ Midmar	
		5.4 km	Mamvale (IC 99)	Howick S/ Underberg	
		1.6 km	Cedara (IC 98)	Cedara	

N3 Route Card: RRM 2021 PACKAGES

MARCH 2021



**N3TC: CONSTRUCTION CRITICAL DATES YEAR  
PLANNER: 2021**

YEAR	DAY	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Mon	Tue		
2021	Jan-21					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
						Cs	Bn	An					Cn		Cn					Cs		Cn					Cs		Cn	Cn	Cn			Cs		Cn				
	Feb-21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28											
					Cs		Cn						Cs	A	A					Cs		Cn					Cs		Cn											
	Mar-21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31								
					Cs		Cn						Cs		Cn				B	Cn	BsAn						Cn													
	Apr-21				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						
					A	A		Cn	A				Cs		Cn					Cs		Cn					As		Cn		BsAn									
	May-21						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31			
														Cs		Cn					Cs		Cn					Cs		Cn										
	Jun-21		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30								
					Cs		Cn						Cs		Cn					Cs		Cn					Cs		Cn											
Jul-21				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
				Cs	Cn	Cn						Bs		Cn					Cs		Cn						Cs		Bn											
Aug-21						1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				
						Cn						Bs	Bs	Cn	BsAn				Cs		Cn					Cs		Cn												
Sep-21			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30								
				Cs		Cn						Cs		Cn					Cs		Cn					Bs	Bs		A											
Oct-21				1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31						
Nov-21	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30										
				Cs		Cn						Cs		Cn					Cs		Cn					Cs		Cn												
Dec-21			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31							
				Cs		Cn						Cs	Cs	Cs					Bs	Bs	Bs																			
2022	Jan-22					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31				

**LEGEND**

**A =** Extremely busy - Unlikely to solve total demand, delays likely  
**B =** Very busy  
**C =** Moderately busy, roadway should normally cope, beware incidents!  
**n =** Northbound  
**s =** Southbound  
**Example B n =** Very busy northbound where lower case omitted,