ETHEKWINI MUNICIPALITY
Occupational Health & Safety Unit

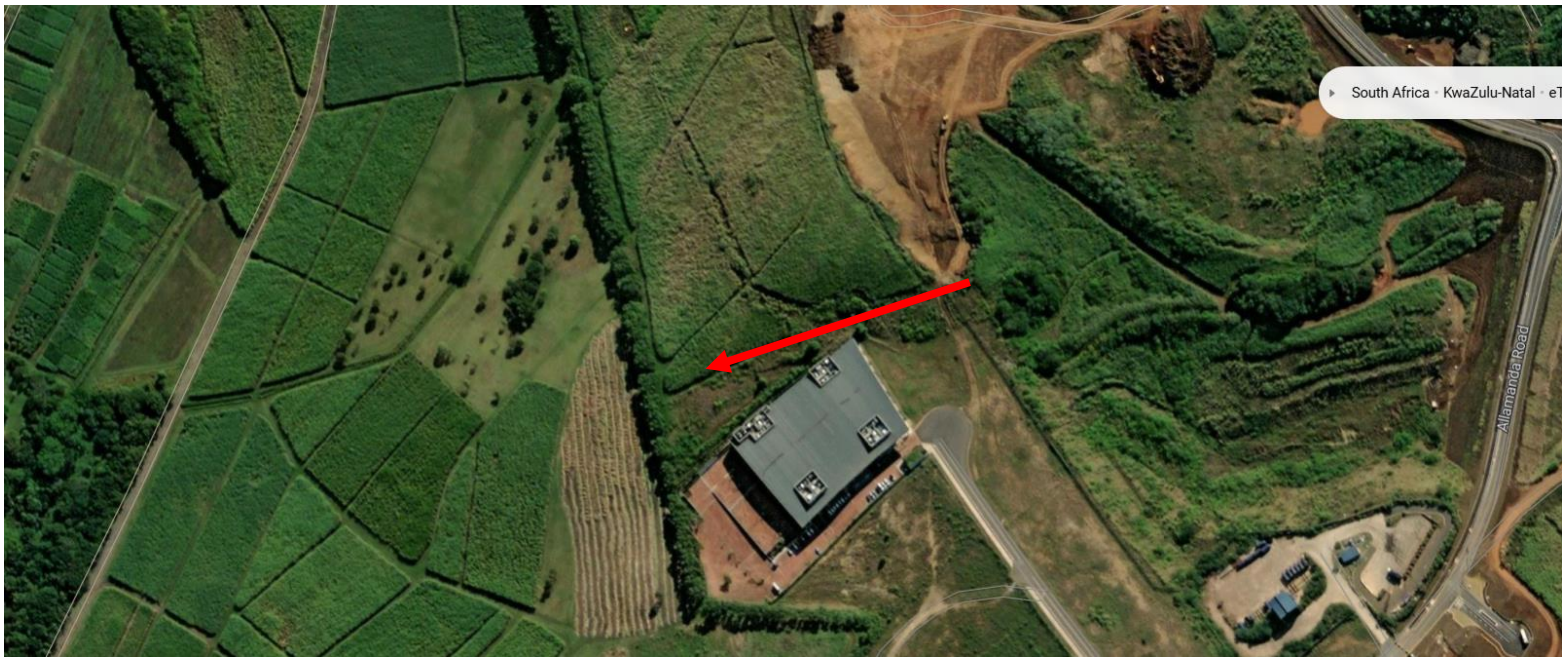
BASELINE RISK ASSESSMENT

Document Title	Baseline Risk Assessment
Client	eThekwini Transport Authority eThekwini Municipality
Project Name	Construction of Cornubia Boulevard, C9 Corridor Work Package 6A
Contract Number	1X-32452
Revision	01
Date	30 April 2025
Internal Reference No.	BRA 265/04/2025
Compiled by Senior Safety Officer	Name: Nombulelo Khanyile
	Signature:
Reviewed by Manager Safety & Risk	Name: Arty Zondi
	Signature:

1. LOCATION OF PROJECT

The construction of the roadway for the Mixed-Use traffic as well as the Right of Way traffic for Cornubia Boulevard extends from Dube West to Dube East and its associated services.

The project is located in Cornubia Boulevard, KwaZulu Natal at approximately -29°705122” and 31°053721”

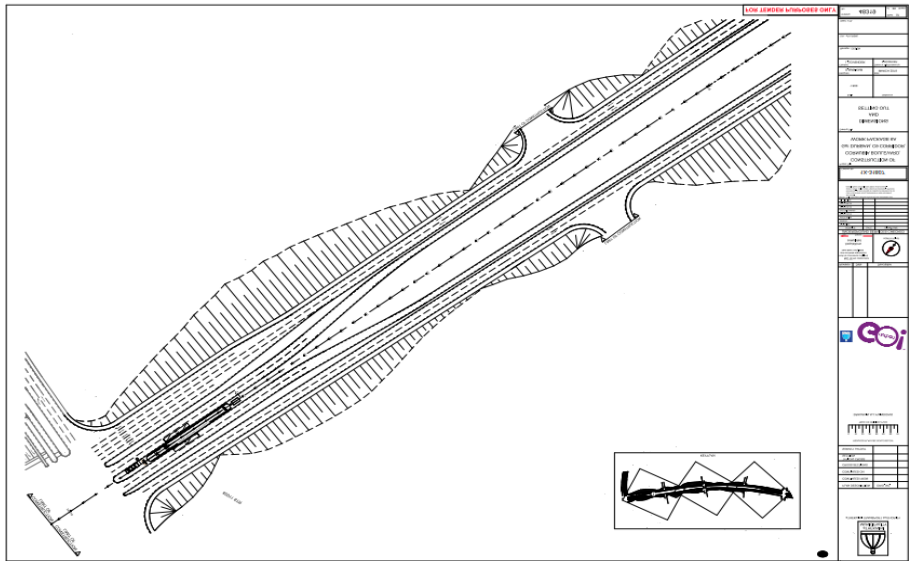


2. PROJECT DESCRIPTION AND BACKGROUND

The eThekwini Municipality's eThekwini Transport Authority (eTA) is in the process of restructuring public transport (PT) within the City to ensure that a sustainable, safe and efficient service is delivered. This vision will materialise through the establishment of an integrated rapid public transport network (IRPTN). The IRPTN has 9 corridors that would make up the proposed public transport network. In the first phase of the IRPTN, 3 Corridors have been designed and are being implemented, those three Corridors being the C1, C3 and C9. The above-mentioned Corridors originate at the Bridge City terminal and terminate at the City Centre, Pinetown Centre, and Umhlanga Rocks Town Centre, respectively. The C9 corridor has been divided into 7 work packages and this contract that is being let out is for the sixth work package of the C9 Corridor. It is for the construction of Cornubia Boulevard. The construction of the roadway for the Mixed-Use traffic as well as the Right of Way traffic for Cornubia Boulevard extends from Dube West to Dube East and its associated services.

The deliverable for this project is comprised of the construction of road works for triple carriageway, pedestrian facilities, sidewalks, stormwater drainage systems, foul water systems, water pipelines, ducts ,landscaping ,street lighting, ancillary works and other works items that forms part of this contract.

Figure below: Site Plan showing the Proposed C9 Route in the Cornubia Boulevard

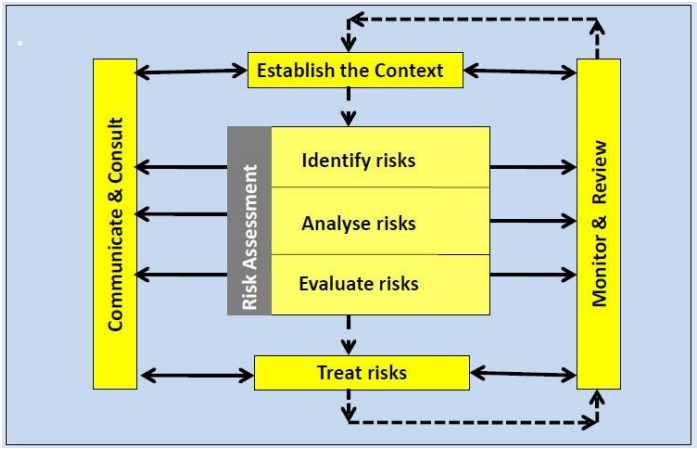


Objective

The purpose of this document is to lay down the standardized methodology and parameters for all risk assessments conducted. This document is applicable to all the construction activities and processes.

Methodology

The Contractor shall adopt the following methodology when assessing the project construction risk: - ○ **Step 1 -** Determine the scope of the assessment ○ **Step 2 -** Identify the hazards ○ **Step 3 -** Analyze the risk ○ **Step 4 -** Evaluate the risk ○ **Step 5 -** Determine control measures needed ○ **Step 6 -** Set priority and administer controls ○ **Step 7** - Monitor and Review Risk



Risk Matrix Criteria

As a minimum the frequency, severity and exposure criteria has been adopted to evaluate the identified risk

The rationale for scoring the BRA is very simple. Any worker should have access to the document. Many sophisticated systems are available, but virtually render the information inaccessible. However, the client may have specific requirements and then those are used as applicable. The approach is conservative, rather score high than low.

The scoring used is related to ‘low’, ‘medium’, and ‘high’, and the numbers 1, 2 and 3 are used as multipliers to a 3x3

table as per the following:

Table 1. Risk rating multiplier.

Risk Rating multiplier: Low = 1; Medium = 2; High = 3

1	4	12
2	6	18
3	8	27

The form of BRA that we choose to use is the residual risk assessment. The aspects measured using the multipliers are the same for the baseline or raw risk, and residual risk scoring.

Table 2: Risk rating parameters.

Likely consequences of an accident	Frequency of Exposure	Probability of harm	Risk rating and risk

The ultimate scoring should be colour coded, as per Table 1. The difference for the raw risk and residual risk should be approximately 50-75% reduction using mitigation aspects.

The frequency is assessed relative to the duration of the design aspect. For example

- Exposure of services could be approximately a week = 1
- Activities that would be up to 50% of the contract duration = 2
- Activities up to 100% of project duration = 3

The scoring for likely consequences and frequency of exposure do not shift when re-scoring during the residual re- assessments. Only the 'probability of harm' will change as should the mitigation aspects not be implemented, the 'likely consequences will occur. The 'frequency of exposure' does not change.

BRA Heading 1:

The reference documents could include the following:

- COLTO/JBCC or standard used;
- Statutory references, and
- Codes (SANS) applicable.

BRA Heading 2: DESIGN ASPECTS PRESENT

Heading 2 indicates the design parameters present. Each activity my change given what has been identified on site

'There may be Overhead Eskom , Telkom lines, underground water, Telkom and Eskom will remove own services where required. PC will expose and protect services. May be illegal connections.'

BRA Heading 3: OBVIOUS PROTECTIVE MEASURES USUALLY PROVIDED BY THE CONTRACTOR

Heading 3 indicates the obvious measures in place by the PC or Contractor. It is suggested that 'worst case scenario'

is used, as one does not know what level of contractor will be appointed.

RISK ASSESSMENT:	Baseline Risk Assessment	DATE:	30 April 2025
CLIENT:	eThekwini Transport Authority - GO! Durban Department	PROJECT LOCATION:	The project is located in Durban, KwaZulu Natal at approximately 29°48'29" S and 31°00'38" E just north of the Umgeni River
BRIEF DESCRIPTION OF WORK/ACTIVITY:	The construction of Road works for triple carriageway, pedestrian facilities, sidewalks, stormwater drainage systems, foul water systems, water pipelines, ducts, landscaping, street lighting, ancillary works and other work items.		

RISK ASSESSMENT TEAM:			**APPROVALS:**		
INITIALS & SURNAME:	**DESIGNATIONS:**	**SIGNATURE:**	**INITIALS & SURNAME:**	**DESIGNATIONS:**	**SIGNATURE:**
N.Khanyile	Pr. CHSA Agent (CR5.5 to CR5.7)			Structural Engineer (Designer: CR6.1)	
N.Khanyile	Risk Assessor (CR9.1)			Civil Engineer (Designer: CR6.1)	
				Electrical Engineer (Designer: CR6.1)	
				Mechanical Engineer (Designer: CR6.1)	

MASTER BASELINE DESIGN RISK ASSESSMENT : 1X-32452 Cornubia Boulevard :C9 Work Package 6A

LOW	MED	HIGH
1	4	12
2	6	18
3	8	27

Risk Rating multiplier: Low = 1; Medium = 2; High = 3

Note: This is a broad overview of the acitivites expected and available during the design stage of the project. Key issues will be addressed during the construction stage, and may be updated during this time. Consolidation of activities where overlap or applicable througout the project (plant, material or other common activities). Compliance with all the applicable legislation is required. Penalties for noncompliances will be appiied where issues not addressed as per the H&S Specification (as amended).

REFERENCES/ABBREVIATIONS: OHSA Occupational Health and Safety Act (applies overall); GAR = General Administration Regulations; GSR = General Safety Regulations; HBR = Hazardous Biological Regulations;
CR = Construction Regulations; HCSR = Hazardous Chemical Substances Regulations; FR = Faciities Regulations; EIR = Electrical Installation Regulations; DMR = Driven Machinery Regulations; PER = Pressure
Equipment Regulations; RTA = Road Traffic Safety Act; SANS = 1200 (unless stated) SANS 10085 = Access Scaffolding; SANS 10083 = Audiometry standards; SARTSM = South African Roads and Traffic Signs Manual; PC = Principal Contractor

			Baseline design risk					**Residual risk**			
LEGAL REF	**DESIGN ASPECTS PRESENT**	**DESCRIBE THE METHODS AND ACTIVITIES USUALLY PROVIDED BY THE PC AND CONTRACTOR**	**LIKELY CONSEQUENCES OF AN**	**FREQUENCY EXPOSURE**	**PROBABILITY OF HARM**	**RISK RATING AND RISK CATEGORY**	**EXTRA CONTROL MEASURES NECESSARY TO REDUCE RISK/ REDESIGN**	**LIKELY CONSEQUENCES OF AN**	**FREQUENCY EXPOSURE**	**PROBABILITY OF HARM**	**RISK RATING AND RISK CATEGORY**
GENERAL: SITE ESTABLISHMENT											
GSR; GAR; CR; DMR15	Minimal on site, no water or any facilities, application for a 500kVa line from the municipailty, not available as yet	Use of generators and mobile plant for power sources, chemical toilets and water supply via tanker	2	1	2	**4**	Competent supervision and registers for managing plant and equipment, ensure safe drinking water. No formaldehyde in the chemical toilets - only bacteria or enzyme based product such as used in septic tanks	2	1	1	**2**
GSR; GAR; CR: HBR; DMR	Potable water will be available, that requires connection and maintenance by the PC.	Use of general labour or SMMEs -Plumbing Contractor to excavate, pipe laying, tie in to potable connections and access to water supply; Pipe sterilisation and pressure testing.	2	1	2	**4**	Method statements and HIRA for each activity, temporary works drawings for slopes, DSTIs and training; minimal use of snow netting, same day closure of excavations where possible; competent supervision and registers.	2	1	1	**2**

	Overhead Eskom, Telkom lines, underground water, Telkom and Eskom will remove own services where required. PC will expose and protect services. May be illegal connections	Hand exposure of and protection services. Demarcation of services with candy tape	3	1	3	**6**	Competent supervision and adequate pre-task training required. All excavations open longer than 24hours to be demarcated with netting or similar, at least .5m away from edge	3	1	2	**4**
GSR; GAR; CR: HBR; DMR; EIR	When power supply is available, tie in and PC to set up appropriate power supply to site	Use of general labour or SMMEs- Electrician - Power supply connection, excavate; use of candy tape to the demarcate excavations, lay cables, switch connections, CoC.	2	3	2	**12**	Method statements and HIRA for each actvity H&S approval of Contractor Certificate of Compliance by Competent Contractor. Daily, monthly and quarterly checks as required.	2	3	1	**6**
GSR; GAR; CR: HBR; DMR; FR	Supply of ablution/sanitary/changing facilities (chemical or general) at site camp and where teams are required to work across the site. Conservancy tanks may be used for sewage collection where flush toilets used at site camp	Use of SMMEs or Contractors to construct facilities; excavations with pipe laying, to tie in to storm water or sewage. Will use portable chemical toilets on site for teams away from the site camp. Use of honeysucker to empty conservancy tanks	1	3	2	**6**	Daily cleaning and regular efflluent removal using competent Contractor based on usage. No formaldehyde to be used in portable chemical toilets, to be managed/provided by PC - only bacteria or enzyme based product such as used in septic tanks	1	3	1	**3**
GSR; GAR; CR: HBR; DMR; EIR; FR	Supply of site offices, and boardrooms	Use of SMMEs or Contractors to establish and erect site buildings, cast decks for park homes and common use areas. Use of SMMEs or Contractors to establish and erect perimeter fence.	2	1	2	**4**	Method statements and HIRA for each actvity, temporary works drawings, controls and competent supervision, DSTIs and training; Daily, monthly and quarterly checks as required for housekeeping. Approval of H&S plans 7 days prior to commencing work, Suppliers lifting equipment records to be available during all work on site	2	1	1	**2**
GSR; GAR; CR: HBR; DMR15; FR	De-establishment of site facilities	Use of SMMEs or Contractors to de-establish site buildings, cast decks for park homes and common use areas. Use of SMMEs or Contractors to remove perimeter fence and any other structural.	3	2	3	**18**	Method statements, HIRA, SWP for eash activity. Training of workers. Competent contractors and adequate supervision. Disposal of waste in correct dumping sites. Noise zones for concrete breakers. Demolition registers to be kept.	3	2	2	**12**

GSR; GAR; CR: HBR; DMR	Security and vehicle/plant access will require strict controls, signage.	Use of security company to control access.	2	3	2	**12**	Procedure for access control, competent access management and system to be in place. Identification of vehicles relative to contractors. Traffic accommodation requirements relative to SARTSM or similar required	2	3	1	**6**
CR; RTA; SARTSM	Access roads and routes, pedestrian management. Traffic controls and signage. Worker transport.	Provision of parking areas, for site staff and visitors, busses. Signage to site and general warnings to public. No control or provision for worker transport	3	3	3	**27**	Method statement and HIRA, SWPs, one way routes of traffic for site required where possible, separation of pedestrians and plant, traffic management plan required at public interface and on site using SARTSM CH 13 Vol 2 or similar. Workers transport to be safe and according to RTA, no workers may be transported to or on site on open vehicles. Controls to be in place and monitored.	3	3	2	**18**
GAR; GSR; HCSR; CR; DMR	General storage of bulk steel, general materials for use, temporary works (structural elements) plant and equipment.	Lay down areas generally identified in the site camp, containers available for some storage, general plant and equipment for PC and Contractors.	3	3	3	**27**	Competent supervision and DSTIs 'Clean as you go' approach' to all stacking and storage areas, including at work areas.	3	3	2	**18**
CR; DMR; FR	Management of Contractors, SMMEs and Visitors, permanent and temporary workers.	Access of plant, equipment and personnel and materials to be controlled. Access control measures implemented. All those working to have medical certificates of fitness	3	3	3	**27**	SMMES used to be provided with an appropriate H&S Specification, approval of H&S plan 7 days prior to commencing work. PC will ensure only competent contractors appointed. Inductions and records thereof to be kept	3	3	2	**18**

CR, DMR; FR	Clearing and grubbing of area for site establishment	Setting out levels, using plant to remove material to spoil sites, lay down areas on or off site. Spoil and fill material will be moved around the site. Contractors may be used for haulage.	3	2	3	**18**	Method statements, HIRAs, SWPs for all activities, competent supervision DSTIs, permit sytems. Registers, monitoring applied to all Contractors. Spoil to designated areas only.	3	2	2	**12**
HAZARDOUS CHEMICAL SUBSTANCES SPECIFIED OR REQUIRED											
CR ; RHCS	Exposure to various specified products containing hazardous chemical substances. Epoxies, Cement to be used	Bringing HCS onto site without linkage into risk assessment system, training or competent supervision.	3	3	3	**9**	Choice of products by PC to be approved by RE, Registers of products, training of workers prior to issue of products. MSDS's available and workers trained. Method statements and risk assessments to include risks relating to products identified.	2	3	2	6
HCSR; CR25	Cement	High levels of volatiles, while Contractors may be used, the Principal Contractor may do this himself. Products could have narcotic effect.	3	1	3	9	Specify controlled means of spraying, use of PPE. Medical surveillance, appropriate respiratory and skin protection.	3	1	2	6
HBRs; HCSR	Sewage: Use of chemical toilets and extraction of conservancy tanks	Raw sewage in conservancy tanks and treated in chemical toilets	1	3	2	**6**	Frequency of cleaning to be determined by numbers using the facilities - recommended 1:10 for chemical toilets if cleaned 1xweek	1	3	1	**3**
HCSR; CR25	Petrol/diesel/lubricants	Storage tanks on site. Fire, spillage, fumes.	2	3	2	12	Local supplier preferred for petrol. Bund walls around diesel tanks, emergency plan, Hazardous chemical store for petrol and lubricants. Supervision.	1	3	2	6
OTHER ASPECTS CONSIDERED											
CRs	Appointment or absorbing of nominated/selected Contractors	Pr.CHSA will commence with nominated/selected contractors, and once approved will be the responsibility of the PC	2	2	2	8	Preparation of the baseline risk assessments and H&S specification, approvals by Pr. CHSA and then hand over to PC	2	2	1	4

CRs	Appointment of domestic or labour only Contractors	Appointment of contractors by Site supervision/ Construction Manager	2	2	2	8	Use of baseline risk assessments and H&S specification to be adapted for the particular work to be done, approval at least 7 days prior to commencing work	**2**	**2**	**1**	4
CR;RTSA	Transport and access to and from site.	Use of open trucks/bakkies to transport.	3	3	3	27	Compliance with the NationalRoad Traffic Safety Act, no workers to be transported with plant or materials on or off site, Applicable on site or between working areas.	3	3	1	9
CR	Work between PCS and Contractors is likely to overlap and sequencing may be difficult between all parties.	General sharing of roads and access to sites	2	3	2	12	Segregation of vehicles and pedestrians for site camps. Provide temporary safe access to different activitiesmeans during construction to ensure safe access, even in small areas of work. DSTIs, SWPs, Access to site to be controlled	2	3	1	6
CR; ERs	Weather to be considered, raised temperatures in summer and possible flooding during raining season	Work stoppage in rain or following rain that would affect the works, work through high summer temperatures	3	2	2	12	Use of weather stations to monitor temperature, Work to be assessed should discomfort index reach 100, work may be stopped at 105. Adequate water intake. Monitoring of rainfall, not allowing work to occur downstream or low lying areas when threats of flooding	3	2	1	6
CR	Decommissioning of site	Site clearing, removal of site camp, containers, fencing, temporary road signs. PC removes key CM and CHSO from site while de establishing/de-commissioning	3	1	3	9	Risk Assessments and Method Statements. No key employees to be removed including site agent, and H&S Officer. Ensure coverage available for defect liability period.	3	1	1	3
SANS 10085; CR	High risk activities: work at height, excavations, road works, hot work, applicable to all contractors	Use of SWPs, HIRAs	3	3	3	27	HIRAs, SWPs, DSTIs, Competent supervision and trained workers, H&S procedures, inductions, management systems, access controls, permit systems	3	3	2	18

CR; SANS 10085; SANS10083	Working at Heights	Use of scaffolding, temporary works, and Ladders	3	3	3	27	Fall protection plan drawn up by competent fall planner. Load calculations and drawings of scaffold kept on site with signed drawings. Erection and inspection by competent persons. Workers trained and properly supervised. Use of PPE as determined from HIRA. Method statements and SWPs.H&S Plans to be approved at least 7 days prior to commencement. Management of plant and equipment, emergency plans competent management and support staff, inductions, method statement and risk assessments for use of tools and equipment, noise management.	3	3	2	18
CR; SANS 10085; SANS 10083	Erection and stripping of temporary works, access scaffolding	Appointment of Contractor to do the design and sometimes the management of temporary works, could only outsource the design, hire components, use of own staff.	3	3	3	27	Fall protection plan drawn up by competent fall planner. Load calculations and drawings of scaffold kept on site with signed drawings. Erection and inspection by competent persons. Workers trained and properly supervised. Use of PPE as determined from HIRA. Method statements and SWPs.H&S documentation by Contractors to be approved at least 7 days prior to commencement. Management of plant and equipment, emergency plans competent management and support staff, inductions, method statement and risk assessments for use of tools and equipment, noise management.	3	3	2	18

LO	ME	HIGH
1	4	12
2	6	18
3	8	27

Risk Rating multiplier: Low = 1; Medium = 2; High = 3

Note: This is a broad overview of the acitivites expected and available during the design stage of the project. Key issues will be addressed during the construction stage, and may be updated during this time. Consolidation of activities where overlap or applicable througout the project (plant, material or other common activities). Compliance with all the applicable legislation is required. Penalties for noncompliances will be appiied where issues not addressed as per the H&S Specification (as amended).

REFERENCES/ABBREVIATIONS: OHSA Occupational Health and Safety Act (applies overall); GAR = General Administration Regulations; GSR = General Safety Regulations; HBR = Hazardous Biological Regulations; CR = Construction Regulations; HCSR = Hazardous Chemical Substances Regulations; FR = Faciities Regulations; EIR = Electrical Installation Regulations; DMR = Driven Machinery Regulations; PER = Pressure Equipment Regulations; RTSA = Road Traffic Safety A ct; SANS = 1200 (unless stated) PC = Principal Contractor

			Baseline design risk					Residual risk			
LEGAL REF	**DESIGN ASPECTS PRESENT**	**DESCRIBE THE METHODS AND ACTIVITIES USUALLY PROVIDED BY THE PC AND CONTRACTOR**	**LIKELY CONSEQUENCES OF AN ACCIDENT**	**FREQUENCY OF EXPOSURE**	**PROBABILITY OF HARM**	**RISK RATING AND RISK CATEGORY**	**EXTRA CONTROL MEASURES NECESSARY TO REDUCE RISK/ REDESIGN**	**LIKELY CONSEQUENCES OF AN ACCIDENT**	**FREQUENCY OF EXPOSURE**	**PROBABILITY OF HARM**	**RISK RATING AND RISK CATEGORY**
EARTHWORKS: CLEARING AND GRUBBING, EXCAVATIONS, PILING, FOUNDATIONS											
CR, DMR; FR	Clearing and grubbing of site. Storage areas for specific spoil and top soil areas are required.	Setting out levels, using plant to remove material to spoil sites, lay down areas on or off site. Spoil and fill material will be moved to designated areas.	3	1	3	**9**	Management of excavations, mechanical plant for haulage of general plant movement. training of workers, inductions, method statement and risk assessments for use of mechanical removal, noise management. Method statements, HIRAs, SWPs for all activities, competent supervision DSTIs, permit sytems. Registers, monitoring applied to all Contractors. Spoil to designated areas only.	3	1	2	**6**

HCSRs	Removal of topsoil, use of herbicides at base of furrows and foundations.	Appointment of Landscaping SMME, or PC uses own workers.	2	1	2	4	H&S documentation by Contractors to be approved by Principal 7 days prior to commencement. Landscaping and excavation contractor to be in consultation with each other. SDSs, training of workers, registers, PPE appropriate for chemical usage	2	1	1	2
HCSRs; CRs	Dust management: a mix of dolerite and sandstone reported in the geotechnical survey, meaning the silica levels are likely to be high with the movement of vehicles and general activiites. Weather can be windy	Use of water trucks watering 2x per day	2	2	3	12	Weather to be monittored, and controls be applied according to dust levels, method statement and also follow instructions of ECO. Dust sampling to be done at the start of the project and every 6 months by an AIA and submitted to the DoL as per Annexure 1 of the HCSRs. Follow up of levels and medical surveillance of workers to include lung function tests	2	2	2	8
SARTSM; RTSA	Traffic accommodation on site and entry and exit points may be required. Other road works may be underway and liaison between contractors is required. General management of trucks, delivery and waste removal vehicles, buses and general vehicles. On site vehicle movement between contractors, workers, and suppliers.	CHSO manages traffic accommodation, use of flag persons, and cones	3	3	3	27	Road Traffic S plan to be submitted to the Engineer, method statements and HIRAs relative to the SARTSM, layouts and ensure communication between contractors, visitors and staff. One way traffic and separation of pedestrians and traffic.	3	3	2	18

EXCAVATIONS											
CR	tie ins will occur for sewer, water and electicity for the exposure of services for the contractors, as well as new services for water supply, electricity and sewage. Excavations should not exceed 3.5m.	Use of TLB or manual labour	2	1	2	4	Method Statements, and appropriate designs, HIRA,competent supervision, DSTIs, All excavations and trenches to have controls in place. Ladders to extend at least 1m above the edge of excavation and be with each team.Barricading, minimum of snow netting, spoil a minimum of1.5m from edge of excavations.	2	1	1	2
CR	Foundations shoring/ bracing allowed for where soil or stablitly is in question	Mechanical excavations, with some hand digging, use of candy tape to demarcate excavations. No shoring.	3	2	3	18	Method Statements, and appropriate designs, HIRA, competent supervision, DSTIs,controls in place, ladders with each team	3	3	1	9
CR; SANS 1200D	Excavations and backfilling for structures approximately 14m for strip footings, ground beams and lift, 2m deep, 14m below natural ground level.	Mechanical excavations, with some hand digging, Use of candy tape to demarcate excavations.	3	2	3	18	Method Statements, and appropriate designs, HIRA, competent supervision, DSTIs, All excavations and trenches to have controls in place. Ladders to extend at least 1m above the edge of excavation and be with each team. Barricading, minimum of snow netting, spoil a minimum of	3	3	1	9
CRs; DMRs ; RTSA; SARTSM	Plant for haulage, 10 tonne tippers, excavators, TLBs, bobcats and Skidsteers, mobile cranes, compaction rollers, jack hammers, generators, small plant	Use of a plant hire Contractor for large plant, own store with small plant and equipment	3	3	3	27	Approval of H&S plan 7 days prior to commencing on site, if plant hire used, competent supervision, and drivers/operators, controls for issue of plant and equipment;	3	3	1	18

Health Act, HCSR	Materials testing, cubes, density, slump tests, use of the troxler	Use of Laboratory Contractor, may have own Troxler	2	2	2	8	Approved H&S plan if contractor used, risk assessment. Competent Supervision. Training in RP and controls for radiation when moving on site and controls for Troxler. Procedures and controls for testing on site.	2	2	1	4
REINFORCED CONCRETE, PILING											
CRs; DMRs; NIHL; GSRs; GARs	Formwork and supportwork for colums and walls, pile caps, ground beams and strip footings, minor structures (storm water etc.), creating concrete joints, and curing time	Either own or 'labour only' carpenters and steel fixing contractors for the formwork, use of own CM to determine appropriate striking time	3	3	3	27	Specific designs by competent designers, approval of H&S plans if contractors used for steel fixing or other.	3	3	2	18
CRs; DMRs; NIHL; GSRs; GARs	Use of mild and high tensile steel for structural concrete (8-32mm); fabric reinforcement	Supply and delivery of steel, set down areas on site, and moved by crane to site	3	3	3	27	Housekeeping, stacking and storage management and 'clean as you go' approach, specific lay down areas, competent supervision, HIRA and method statements	3	3	2	18
CRs; DMRs; NIHL; GSRs; GARs	Delivery of ready-mix concrete, compaction using vibratory pokers and small plant	Use of ready mix contractors, mix small quantities using concrete mixers and manual handling, use of concrete pumps for pours, extended working hours	3	3	3	27	Method statements and HIRA, competent supervision, rotating staff if extended pours to limit overtime and vibration from equipment. Traffic control for plant on site to be applied.	3	3	2	18
CRs; GSRs; GARs SANS codes	Post-stressed concrete slabs, beams and inverted beams	Use of specialist contractor to poststress the beams	3	1	3	9	Competent personnel and supervision, method statements, approved H&S plan and procedures, including all associated documentation; Level 3 first aid cover, Registers for plant, daily checks	3	1	2	6
NIHLR; CRs; GARs; CRs	Finishes of top concrete surfaces with power floats	Use of either own or hired power floats, high noise emissions and vibration levels,	2	3	2	12	Method statements and HIRA, competent supervision, rotating staff limit vibration and noise exposure from equipment.	2	3	1	6

CR; DMR; NIHLR; RTSA; SANS 1200D	Removal and haulage of material and stockpiling	Use of a haulage Contractor to remove excavated material to selected stockpiled area	2	2	3	12	Approval of H&S plan 7 days prior to commencing on site, if plant hire used, competent supervision, and drivers/operators, controls for issue of plant and equipment; ensure ECO involved with topsoil levels, and dust management	2	2	1	4
CR; HCRs; NIHLR; DMRs	Stabilisation of excavations, dewatering, and use of shoring	Use of pumps and generators to de-water	3	3	3	27	Soil type to taken into consideration for appropriate method of dewatering and stabilising of excavations, Method statements, HIRA, SDSs for diesel or relevant fuel, inspection registers, maintenance of pumping equipment. Noise to be managed relative to by-laws. Spoil from excavation to be at least 1.5m from the edge of the excavation.	3	3	2	18

CR; DMR; NIHLR; SANS 10083	Piling: Continuous flight auger (CFA) grouted from base of pile drilling of piling of approximately 600, 750, and 900 ø piles, concrete	Use of drilling rigs,high dust, noise levels.	3	3	2	18	Appointment of competent contractor. Provision of method statements, SWPs and HIRA. Cranes and load bearing tackle to be certified by AIA. Dust suppression as required. Noise zones to be eastablished on site and signage erected. Medical surveillance to include audiometry and lung function testing	3	2	2	12

CR; DMR; NIHLR; HCSRs	Stripping back, trimming the head of the concrete piles, colums are likley to be built directly onto completed piles	Use of breakers, manual labour to remove temporary works	3	2	2	12	Competent supervision, appropriate appointment if not thesame contractor who did the piling. Provision of method statements, SWPs and HIRA. Cranes and load bearing tackle to be certified by AIA. Dust suppression as required. Noise zones to be eastablished on site and signage erected. Medical surveillance to include audiometry and lung function testing	3	2	1	6
CR; SANS 10085; SANS 10083; other SANS codes	Erection and stripping of support work, temporary formwork	Appointment of Contractor to do the design and sometimes the management of temporarry works, could only outsource the design, hire components, use of own staff.	3	3	3	27	Fall protection plan drawn up by competent fall planner. Load calculations and drawings of scaffold kept on site with signed drawings. Erection and inspection by competent persons. Workers trained and properly supervised. Use of PPE as determined from HIRA. Method statements and SWPs.H&S documentation by Contractors to be approved at least 7 days prior to commencement. Management of plant and equipment, emergency plans competent management and support staff, inductions, method statement and risk assessments for use of tools and equipment, noise management.	3	2	2	12

LEGAL REF	DESIGN ASPECTS PRESENT	DESCRIBE THE METHODS AND ACTIVITIES USUALLY PROVIDED BY THE PC AND CONTRACTOR	LIKELY CONSEQUENCES OF AN ACCIDENT	FREQUENCY OF EXPOSURE	PROBABILITY OF HARM	RISK RATING AND RISK CATEGORY	EXTRA CONTROL MEASURES NECESSARY TO REDUCE RISK/ REDESIGN	LIKELY CONSEQUENCES OF AN ACCIDENT	FREQUENCY OF EXPOSURE	PROBABILITY OF HARM	RISK RATING AND RISK CATEGORY
HAZARDOUS CHEMICAL SUBSTANCES SPECIFIED OR REQUIRED											
CR; RHCS	Exposure to various specified products containing hazardous chemical substances. Epoxies, Cement to be used	Bringing HCS onto site without linkage into risk assessment system, training or competent supervision.	3	3	3	**9**	Choice of products by PC to be approved by RE, Registers of products, training of workers prior to issue of products. MSDS's available and workers trained. Method statements and risk assessments to include risks relating to products identified.	2	3	2	6
HCSR; CR	Use of quick releasing agents on formwork (shutter oil)	Use of diesel or commercially available solvent products	2	3	2	12	Choice of products by PC to be approved by RE, Registers of products, training of workers prior to issue of products. MSDS's available and workers trained. Method statements and risk assessments to include risks relating to products identified.	3	2	1	6
HCSR; CR	Cement	High levels of volatiles, while Contractors may be used, the Principal Contractor may do this himself. Products could have narcotic effect.	3	1	3	9	Specify controlled means of spraying, use of PPE. Medical surveillance, appropriate respiratory and skin protection.	3	1	2	6

HCSR; CR25	Petrol/diesel/lubricants	Storage tanks on site. Fire, spillage, fumes.	2	3	2	12	Local supplier preferred for petrol. Bund walls around diesel tanks, emergency plan, Hazardous chemical store for petrol and lubricants. Supervision.	1	3	2	6
HCSR CR	Epoxies (including resins)	Not specified, but will be used. Principal Contractor to ensure use of MSDSs and appropriate protection measures.	2	2	2	6	Access to availability of alternative products to limit the exposure to workers.	2	2	1	4

OTHER ASPECTS CONSIDERED

CRs	Appointment or absorbing of nominated/selected Contractors	Pr.CHSA will commence with nominated/selected contractors, and once approved will be the responsibility of the PC	2	2	2	8	Preparation of the baseline risk assessments and H&S specification, approvals by Pr. CHSA and then hand over to PC	2	2	1	4
CRs	Appointment of domestic or labour only Contractors	Appointment of contractors by Site supervision/ Construction Manager	2	2	2	8	Use of baseline risk assessments and H&S specification to be adapted for the particular work to be done, approval at least 7 days prior to commencing work	**2**	**2**	**1**	4
CR; SARTSM; RTA	Transport and acess to and from site.	Use of open trucks/bakkies to transport.	3	3	3	27	Compliance with the NationalRoad Traffic Safety Act, no workers to be transported with plant or materials, open vehicles not designed to carry passengers. Applicable on site or between working areas.	3	3	1	9
CR; ERs	Weather to be considered, raised temperatures in summer.	Work stoppage in rain or following rain that would affect the works, work through high summer temperatures	3	2	2	12	Use of weather stations to monitor temperature, Work to be assessed should discomfort index reach 100, work may be stopped at 105. Adequate water intake. Monitoring of rainfall, not allowing work to occur downstream or low lying areas when threats of flooding	3	2	1	6

CR	Decommissioning of site	Site clearing, removal of site camp, containers, fencing, temporary road signs. PC removes key CM and CHSO from site while de-establishing/de-commissioning	3	1	3	9	Risk Assessments and Method Statements. No key employees to be removed including site agent, and H&S Officer. Ensure coverage available for defect liability period.	3	1	1	3
OHSA S8	Local Community: Unrest.	Use of security guards.	3	3	3	27	Use of HIRA, and method to manage unrest or potential issues. All site staff, SMMES, public to be protected. Security of site, plant equipment and works is to be ensured.	2	3	3	18
SANS 10085; CR	High risk activities: work at height, excavations, hot work, applicable to all contractors	Use of SWPs, HIRAs	3	3	3	27	HIRAs, SWPs, DSTIs, Competent supervision and trained workers, H&S procedures, inductions, management systems, access controls, permit systems	3	3	2	18

CR; SANS 10085; SANS 10083	Working at Heights	Use of scaffolding and Ladders	3	3	3	27	Fall protection plan drawn up by competent fall planner. Load calculations and drawings of scaffold kept on site with signed drawings. Erection and inspection by competent persons. Workers trained and properly supervised. Use of PPE as determined from HIRA. Method statements and SWPs.H&S Plans to be approved at least 7 days prior to commencement. Management of plant and equipment, emergency plans competent management and support staff, inductions, method statement and risk assessments for use of tools and equipment, noise management.	3	3	2	18

CR; SANS 10085; SANS 10083	Erection and stripping of temporary works, access scaffolding	Appointment of Contractor to do the design and sometimes the management of temporarry works, could only outsource the design, hire components, use of own staff.	3	3	3	27	Fall protection plan drawn up by competent fall planner. Load calculations and drawings of scaffold kept on site with signed drawings. Erection and inspection by competent persons. Workers trained and properly supervised. Use of PPE as determined from HIRA. Method statements and SWPs.H&S documentation by Contractors to be approved at least 7 days prior to commencement. Management of plant and equipment, emergency plans competent management and support staff, inductions, method statement and risk assessments for use of tools and equipment, noise management.	3	3	2	18

LO	ME	HIGH
1	4	12
2	6	18
3	8	27

Risk Rating multiplier: Low = 1; Medium = 2; High = 3

Note: This is a broad overview of the acitivites expected and available during the design stage of the project. Key issues will be addressed during the construction stage, and may be updated during this time. Consolidation of activities where overlap or applicable througout the project (plant, material or other common activities). Compliance with all the applicable legislation is required. Penalties for noncompliances will be appiied where issues not addressed as per the H&S Specification (as amended).

REFERENCES/ABBREVIATIONS: OHSA Occupational Health and Safety Act (applies overall); GAR = General Administration Regulations; GSR = General Safety Regulations; HBR = Hazardous Biological Regulations; CR = Construction Regulations; HCSR = Hazardous Chemical Substances Regulations; FR = Faciities Regulations; EIR = Electrical Installation Regulations; DMR = Driven Machinery Regulations; PER = Pressure Equipment Regulations; RTSA = Road Traffic Safety Act; SANS = 1200 (unless stated) PC = Principal Contractor;

Baseline design risk **Residual risk**

LEGAL REF	DESIGN ASPECTS PRESENT	DESCRIBE THE METHODS AND ACTIVITIES USUALLY PROVIDED BY THE PC AND CONTRACTOR	LIKELY CONSEQUENCES OF ACCIDE	FREQUENCY EXPOSURE	PROBABILITY OF HARM	RISK RATING AND RISK CATEGORY	EXTRA CONTROL MEASURES NECESSARY TO REDUCE RISK/ REDESIGN	LIKELY CONSEQUENCES OF AN	FREQUENCY EXPOSURE	PROBABILITY OF HARM	RISK RATING AND RISK CATEGORY
STRUCTURES											
CR; SANS 10085; DMR; HCSRs	Foundations for Structures of box culverts and bridge. Shoring allowed for.	Appointment of local SMME. Use of mechical and maunal handling	3	3	3	27	H&S Plan to be approved at least 7 days prior to commencement. Management of lifting devices, mechanical plant, temporary works required and to be managed. Fall protection plan to be in place. Load test certificates for lifting equipment. SDSs, training of workers, inductions, method statement and HIRA for use of tools and equipment, noise and dust management. Housekeeping, 'clean as you go' approach. Management of access scaffolding, including competencies	3	2	2	12
CR	Excavations 2 -6m for LI box culverts. Specified finish required.	Mechanical excavations, with some hand digging, use of candy tape to demarcate excavations. No shoring.	3	3	3	27	All excavations to be inspected and on register prior to work, ladders to be on rgister and to extend at least 1m above the edge of excavation	3	2	2	12

CR	Access and drainage including backfilling use of plant for breaking of hard material, drilling dowels, use of grout	Use of SMME for drilling, and inserting dowels. Plant Hire for breaking rock and placing backfill	3	2	3	18	Method statements and risk assessment., Housekeeping and stacking and storage required	3	2	2	12
CR	Thevertical and horizontal formwork will be designed by a registered specialist	Design of formwork by service provider	3	3	3	27	Specialist review and approval of the erected formwork - prior to commencement of work, inspection prior to pours, and stripping of formwork. Use of appropriate standards and codes to ensure safe management and execution of tasks. Working at height to be managed.	3	3	1	9

CR	Demolishing of existing bridge	Appointment of contractor specialising in bridge demolition	3	3	3	27	Demolition method statement, review of SWPs and risk assessments prior to commencement of work. Removal of material to include dust suppression and noise management. Working at height to be managed.	3	3	2	18

CR	Steel reinforcement and steel fixing	placement of steel in position, carrying steel, fixing and cutting	3	3	2	18	Training of steel fixers in safe work procedures, PPE, method statements. Rotation of workers. Housekeeping and stacking and storage required, management of suppliers.	3	3	1	9
CR	Concrete for structures. Cast in situ, casting floor slabs, haunches, beams, wing walls	Use of concrete pump to cast larger structures, hand mixing of small amounts	3	3	3	27	Use of suppliers for concrete supply, use of plant, vibrating tools and generators to be managed. H&S documentation by Contractors to be approved by Principal at least 7 days prior to commencement.	3	3	2	18

CR	Joints, bearings, parapets and drainage	May involve drilling, cutting and grinding, access to underside of deck, pre-cast concrete new jersey barriers	3	3	2	18	H&S documentation by Contractors to be approved by Principal at least 7 days prior to commencement. Management of excavations, lifting devices, mechanical plant required. MSDSs, training of workers, training of workers, inductions, method statements and risk assessments for use of mechanical removal, noise management. Apply SANS 10085 for all access scaffolding, or appropriate codes/ standards	3	3	1	9

CR; SANS 10083; NIHLRs; SANS 10085	Access and drainage including backfilling use of plant for breaking of hard material, drilling dowels, use of grout		3	2	2	12	Approved H&S Plan, HIRA and method statements. Management of plant and equipment, competent supervision and workers, noise and dust management	3	1	2	6
CR; HCRs	Demolishing of existing bridge	Appointment of demolition contractor	3	3	2	27	Demolition method statement, review of SWPs and risk assessments prior to commencement of work. Removal of material to include dust suppression and noise management.	3	3	2	18
CR; DMR; NIHLR; SANS 10083	Steel reinforcement and steel fixing	Appointment of SMME placement of steel in position, carrying steel, fixing and cutting	3	3	2	18	Training of steel fixers in safe work procedures, PPE, method statements. Rotation of workers. Housekeeping and stacking and storage required, management of suppliers.	3	3	1	9

HAZARDOUS CHEMICAL SUBSTANCES SPECIFIED OR REQUIRED

CR; HCSRs	Exposure to various specified products containing hazardous chemical substances.	Bringing HCS onto site without linkage into risk assessment system, training or competent supervision.	3	3	3	**9**	Choice of products by PC to be approved by client, Registers of products, training of workers prior to issue of products. SDS's available and workers trained. Method statements and risk assessments to include risks relating to products identified.	2	3	2	6
HCSRs; CR	Cement	Hand and machine mixing, alkaline mix, may add products	3	3	3	27	Specify controlled means of spraying, use of PPE. Medical surveillance, appropriate respiratory and skin protection.	3	3	2	18

HCSR CR25	Petrol/diesel/lubricants	Storage tanks on site. Fire, spillage, fumes.	2	3	2	12	Local supplier preferred for petrol. Appropriate bund walls around diesel tanks, emergency plan, Hazardous chemical store for petrol and lubricants. Supervision trained workers.	1	3	2	6
HCSR; CR	Prime MC 30,Bitumen (tack coat) (hot road grade) will be used in sprays and in various grades,Retro-reflective Road paint,Lime,Coatings	Use of painting contractor, storage of materials on site	2	3	3	18	Choice of products by PC to be approved by client, Registers of products, training of workers prior to issue of products. SDS's available and workers trained. Method statements and risk assessments to include risks relating to products identified.	2	3	2	12
HCSR; CR	Epoxies (including resins)	Not specified, but will be used. PC to ensure use of MSDSs and appropriate protection measures.	2	2	2	6	Access to availability of alternative products to limit the exposure to workers.	2	2	1	4

OTHER ASPECTS CONSIDERED

CRs	Appointment or absorbing of nominated/selected Contractors	Pr.CHSA will commence with nominated/selected contractors, and once approved will be the responsibility of the PC	2	2	2	8	Preparation of the baseline risk assessments and H&S specification, approvals by Pr. CHSA and then hand over to PC	2	2	1	4

CRs	Appointment of domestic or labour only Contractors	Appointment of contractors by Site supervision/ Construction Manager	2	2	2	8	Use of baseline risk assessments and H&S specification to be adapted for the particular work to be done, approval at least 7 days prior to commencing work	**2**	**2**	**1**	4
CR; SARTSM; RTA	Transport and acess to and from site.	Use of open trucks/bakkies to transport.	3	3	3	27	Compliance with the NationalRoad Traffic Safety Act, no workers to be transported with plant or materials, open vehicles not designed to carry passengers. Applicable on site or between working areas.	3	3	1	9

CR; ERs	Weather to be considered, raised temperatures in summer, localized flooding in raining season	Work stoppage in rain or following rain that would affect the works, work through high summer temperatures	3	2	2	12	Use of weather stations to monitor temperature, Work to be assessed should discomfort index reach 100, work may be stopped at 105. Adequate water intake. Monitoring of rainfall, not allowing work to occur downstream or low lying areas when threats of flooding	3	2	1	6
CR	Decommissioning of site	Site clearing, removal of site camp, containers, fencing, temporary road signs. PC removes key CM and CHSO from site while deestablishing/de-commissioning	3	1	3	9	Risk Assessments and Method Statements. No key employees to be removed including site agent, and H&S Officer. Ensure coverage available for defect liability period.	3	1	1	3
OHSA S8	Local Community: Unrest.	Use of security guards.	3	3	3	27	Use of HIRA, and method to manage unrest or potential issues. All site staff, SMMES, public to be protected. Security of site, plant equipment and works is to be ensured.	2	3	3	18

SANS 10085; CR	High risk activities: work at height, excavations, hot work, applicable to all contractors	Use of SWPs, HIRAs	3	3	3	27	HIRAs, SWPs, DSTIs, Competent supervision and trained workers, H&S procedures, inductions, management systems, access controls, permit systems	3	3	2	18
CR; SANS 10085; SANS10083	Working at Heights	Use of scaffolding and Ladders	3	3	3	27	Fall protection plan drawn up by competent fall planner. Load calculations and drawings of scaffold kept on site with signed drawings. Erection and inspection by competent persons. Workers trained and properly supervised. Use of PPE as determined from HIRA. Method statements and SWPs.H&S Plans to be approved at least 7 days prior to commencement. Management of plant and equipment, emergency plans competent management and support staff, inductions, method statement and risk assessments for use of tools and equipment, noise management.	3	3	2	18
CR; SANS 10085; SANS 10083	Erection and stripping of temporary works, access scaffolding	Appointment of Contractor to do the design and sometimes the management of temporarry works, could only outsource the design, hire components, use of own staff.	3	3	3	27	Fall protection plan drawn up by competent fall planner. Load calculations and drawings of scaffold kept on site with signed drawings. Erection and inspection by competent persons. Workers trained and properly supervised. Use of PPE as determined from HIRA. Method statements and SWPs.H&S documentation by Contractors to be approved at least 7 days prior to commencement. Management of plant and equipment, emergency plans competent management and support staff, inductions, method statement and risk assessments for use of tools and	3	3	2	18

COLTO REF	Design Aspects present	Describe the obvious protective measures usually provided by the Contractor	Likely consequences of an accident	Frequency of Exposure	Probability of harm	Risk rating and risk category	Extra control measures necessary to reduce risk / Redesign	Likely consequences of an accident	Frequency of Exposure	Probability of harm	Risk rating and risk category
12.02	Overhead Eskom, there may be Telkom lines, underground water, Telkom and Eskom will remove own services where required. PC will expose and protect services. May be illegal connections	Hand exposure of and protection services. Demarcation of services with candy tape	2	1	1	2	Competent supervision and adequate pretask training required. All excavations open longer than 24hours to be demarcated with netting or similar, at least .5m away from edge	1	1	1	1
	Potable water is available in the towns and rural water schemes are available for use. Water lines may require moving	Extra water may need to be taken to site, haulage from approved rivers, permits obtained. PC may need potable water connections at accommodation and site camp	2	3	2	12	Treatment of contaminated water will be required, water testing will take place regularly. Tankers of water may be required to be brought in from other sources	1	3	2	6

1400	Construction plant workshops and camps to be established and maintained by the contractor for the duration of the contract.	A number of camps may be established and maintained for various activities to construct what is required to undertake the works. Concrete floors will be cast	2	3	3	18	The PC will be required to submit with his pre-tender H&S plan the method statements, risk assessments and supporting documentation to ensure overall activities are managed. All formwork to adhere to specification and require method statements	2	3	2	12

	Establishment of structures for accommodation for site staff and labour. General plumbing and sanitary systems (sewage)will be required at site camps and accommodation. Building of various concrete structures, electrical supply	General building of structures, concrete floors and laboratory shelving and baths. Carports. May be septic tanks and French drainage system. Temporary chemical toilets for use by workers on site.	2	3	2	12	The ECO to provide the requirements relative to sanitary requirements on site. The PC will be required to submit with his pretender H&S plan the method statements, risk assessments, temporary works drawings and other supporting documentation. Contractors used to complete the works will be provided with an H&S Spec, approval of H&S plan 7 days prior to commencing work on site.	2	3	1	6

1500	Appointment of Traffic safety SMME - Traffic accommodation will be required throughout the project. A major deviation will be required	Appointment of Contractor and submission of H&S plan - Construction drawings from the Consultants will be provided for the standard requirements. Use of TSO's to ensure all traffic requirements are met over 24-hour, 7 day periods. Demarcation to ensure public walkways identified around schools and clinics	3	3	3	27	Any deviations from construction drawings to be in line with SARTSM Ch 13 Vol 2, and approved by RE. Method statements and risk assessments to reflect management of same. TSOs to be adequately trained and use of drawings to be basis of daily checks. TSOs to report to H&S Officer. Fines to be issued for non-compliances. PC will ensure only competent contractors appointed 7 days prior to commencing work	2	3	3	18

1502(a,b)	Traffic accommodation will be required, and traffic drawings are available for typical layouts	Construction drawings from the Consultants will be provided for the standard requirements. Use of TSO's to ensure all traffic requirements are met over 24 hour, 7 day periods. Demarcation to ensure public walkways identified around schools and clinics	3	3	3	27	Any deviations from construction drawings to be in line with SARTSM Ch 13 Vol 2, and approved by RE. Method statements and risk assessments to reflect management of same. TSOs to be adequately trained and use of drawings to be basis of daily checks. TSOs to report to H&S Officer. Fines to be issued for non-compliances. Use of construction plant will comply when required as part of the plant management procedures	2	3	2	12

1502/ 1503 /1504	Officers (TSOs) for the project. Flagmen will be required, as well as management of the traffic along the route	Supply traffic safety teams with appropriately trained TSOs to manage the traffic safety. Management of closures, intersections, any work along route outside of closures requiring drawings traffic accommodation.	3	3	3	27	Adequate competent contractor and TSO's and teams to be appointed according to tender document. TSO shall report to H&S Officer and RE. Use of traffic drawings to be used as registers, and all or any deviation from drawing to be approved by RE at least 24hrs prior to work commencing. Flagmen to be properly trained	3	2	2	12
1512	Temporary culverts will be required and also will require removal at the end of the contract	Excavations using machines, and lifting devices to place 350 to 600 mm dia pipes in place	2	2	2	8	Use of competent supervision, method statement required and only load tested lifting devices with competent operators	1	2	2	4

1512	Material will require haulage through the project. Material will possibly be colleted and stored for use depending on findings of further geotechnical surveys.	Spoil and fill material will be moved around the site. Co-contractors may be used for haulage. Road wetting to manage dust	3	3	3	27	PC will ensure only competent contractors appointed 7 days prior to commencing work, only competent, fit operators to be used	3	3	2	18

	All plant will be heavy vehicles, including tipper trucks, Bell dumpers, loaders.	Tipper trucks, dumpers, loaders, excavators, TLBs, bulldozers graders and rollers	3	3	3	27	CVs, including training and medical certificates required for all operators. Daily records on H&S file may not be more than a week behind. An updated list of daily plant to be kept by the H&S Officer	3	3	2	18
1703/	Clearing and grubbing of areas of work will be required bridges and were road or road reserve not wide enough. Labour intensive (LI) item	Areas where the road is not wide enough, and around the bridges where work will be done, borrows and quarry, site camp	3	3	3	27	Pre-tender H&S plan, method statements, risk assessments and other supporting documentation to ensure all clearing and grubbing activities are adequately managed. Traffic accommodation required	3	3	2	18
1700/ 17.03-07	An SMME will be appointed for the clearing and grubbing of site, hydraulic structures, LI item. some demolition of structures, concrete work and stone pitching. Removal of trees. Poisoning for certain weeds or general control may be required along the route.	Approval of H&S file for contractor. Provision of PPE and training of workers regarding dangers and first aid treatment. Competent supervision during any activities relating to moving large trees. All lifting equipment with load testing certificates and registers and trained, fit operators. Certified weed control certificates available.	3	2	2	12	Provision of H&S Spec, approval of H&S plan 7 days prior to commencing work on site. Training of labour, first aid provision and appropriate medical care to be provided. Use of MSDSs for assessing specific needs. Method statements, risk assessments, competent supervision and training records available for type of plant required (chain saws/lifting devices) as per the H&S Specification	2	2	2	8

1800	Day works are required for various labour and plant	Use of local labour, and SMMEs to provide services and plant	3	3	3	27	Provision of H&S Spec, approval of H&S plan 7 days prior to commencing work on site. Training of labour, first aid provision and appropriate medical care to be provided. Use of MSDSs for assessing specific needs. Method statements, risk assessments, competent supervision and training records available for type of plant required as per the H&S Specification	2	3	2	12
SERIES 2000: DRAINAGE											
2104 / 2216	Use of an SMME for drains. Depth of max 1.5m, use of fin drains, concrete structures, manholes and cleaning eyes, testing of subsoil drains	Appointment of Contractor and submission of H&S plan. Competent supervision of Contractors, if appointed to install Fin drains. Adequate traffic accommodation, daily inspections of tools and equipment	2	2	2	8	Should Fin drains not be used, workers are to rotate to limit musculoskeletal disorders at 3 hourly intervals between activities. Any Conractor to be approved 7 days prior to commencing work. Work on steep slopes to be addressed in method statements and risk assessments	2	2	1	4

	Excavation by machine, to a maximum of 2m, materials are mostly mudstone and shale, may be unstable in places. Areas include catchpits and manholes, around subsoil drains or storm water management systems (V-drains). Power lines cross sections of the works, and the ESKOM standard will be provided to the PC for use during the project. Chutes and downpipes may be on steep slopes	Demarcation of open excavations, competent supervision for excavations appointed, daily registers of plant and equipment, method statements and risk assessments, proof of training. Batter back edges, some shoring may be required	3	3	3	27	CV of appointee responsible for excavations to show training regarding H&S, limit number of open excavations, especially around schools and areas where public access possibly an issue. Demarcation using orange netting or similar and be at least 0.5m away from edge of excavation. Berms at least 1m from edge. Battering or shoring to be approved by RE. Fines will be issued for non compliance	3	3	2	18
2300	Use of SMME for concrete curbing, channelling, chutes and downpipes, and concrete linings for open drains. Some areas are exceptionally steep	Approval of H&S plan. Competent supervision by SMME and checking of all formwork and support work by competent person. Appointment of competent persion, method statements and risk assessments approved by RE; daily inspections on record	3	3	2	18	Provision of H&S Specfication and approval of Contractor H&S plan required 7 days prior to commencement of work. Terrain to be covered and mentod statements and HIRA to be managed accordingly	3	3	1	9

2301 / 2303 / 2307 /2308 / 2309	Formwork and support work will be required. Culverts will have appropriate drawings provided. Required by Designer. Expansion joints, use of grinders, saws and similar equipment	Competent supervision by SMME and checking of all formwork and support work by competent person. Appointment of competent persion, method statements and risk assessments approved by RE; daily inspections on record	3	3	3	27	All drawings to be signed, checked prior to pour and stripping by competent person. Drawings require submission to RE. Denailing areas and attention to housekeeping required. Audiometry testing for workers potentially exposed to noise	3	3	2	18
2302 / 2303	Any materials to be used (ensure MSDSs are available Epoxies / cements - see chemicals at end	MSDSs available and workers trained. Method statements and risk assessments to include risks relating to products identified.	3	3	3	27	Choice of products by PC to be approved by RE, Registers of products, training of workers prior to issue of products,	2	3	2	12
2303	Precast kerbs and cast in situ channels. It is likely that there is a weight implication relating to Kerbs and other precast structures used throughout the project. Likely to be a labour intensive activity.	Mechanical lifting to be done by appropriate lifting devices, competent supervision and competent, fit operators.	2	3	3	18	Rotation of workers to be addressed where necessary for workers working for longer than 3 hours in sustained positions below knee level, or above shoulder height. Contractors used to complete the works will be provided with an H&S Spec, approval of H&S plan 7 days prior to commencing work on site.	2	3	2	12

2400	Bitumen and concrete berms will be cast prior to guard rails being placed in position. Fine continuously graded with 80/100 Penetration grade bitumen. Prime and tack coats (spraygrade 65% emulsion) will be used	Use of sliding shutter or mechanically extruded	2	2	2	8	Adequate supervision and training of workers, management of plant. Workers to be screened for bitumen exposure.	2	2	1	4
	SERIES 3000: EARTHWORKS AND PAVEMENT LAYERS OF GRAVEL OR CRUSHED STONE										
3300	Mass earthworks, widening of cuts, finishing off cut slopes, medians, and interchange areas	Use of large plant to move material, rollers and placing material in situ.	3	3	3	27	Dust and plant management, Where SMMEs used, Supply and approval of H&S documentation prior to commencement 7 days prior to work. Pre-employment and periodic annual medical surveillance required.	2	3	3	18
3207	Haulage of material in trucks, ride on compaction and grid rolling plant will be used. Workers exposed to whole body vibration.	May use haulage SMME - approval of H&S documentation. Dust management, suppression, competent fit operators, daily registers for plant placed in H&S file	3	3	3	27	Note H&S requirements - H&S officer of PC to ensure all documents are adequate. Reverse alarms and sensors roll over protection. Appointment of competent supervision and competent, fit operators. Attention to potential of urinary tract infections	3	3	2	18

3208 / 3209 / 3310 / 3311 / 3312 / 3313	Use of excavators and graders. High fills will be constructed, only relevant to structures, widening will be required and filled. Blasting may be done.	Placement of stone using tipper trucks and bulldozers to place in position. Competent supervision, daily registers of plant. Blasting contractor used to do blasting	3	3	2	18	a/a - Reverse alarms and sensors. Appointment of competent supervision and competent, fit operators. Attention to potential of urinary tract infections. Method statements to be approved by RE, Risk assessments for the use of specialised plant. Supply and approval of H&S documentation prior to commencement 7 days prior to work. All permits and Dept of Labour notification, SAPS to be arranged.	2	3	2	12
3400	Pavement layers of gravel material will be required. Gravel subbase to be chemically stabilised with cement and lime	Placement of stone using tipper trucks and bulldozers to place in position. Competent supervision, daily registers of plant	3	3	2	18	a/a - Reverse alarms and sensors. Appointment of competent supervision and competent, fit operators. Attention to potential of urinary tract infections	2	3	2	12
3500	Layer works require stabilization with cement, chemical stabilizing agent and slaked road lime. Construction drawings will be provided for typical layouts	Placement of bags of lime or cement, spread over road and mixed with basecourse	2	3	3	18	Method statements to be approved by RE, Risk assessments for the use of specialised plant, limit dust and health effects of lime and cement. MSDSs for various products used	2	3	2	12
3806	Use of crushed basecourse G2 material obtained form stockpile, and concrete/surfacing aggregate	Method statements and risk assessments	3	3	3	27	Attention to large plant, traffic accommodation, dust suppression, limit access	2	3	2	12

SERIES 4000: ASPHALT PAVEMENTS AND SEALS											
4101/ B46.01	MC30 cut-back Bituminous single seal with 13,2 mm aggregate and double slurry, Colprime E also specified. Cat 65 spray grade. 80/100 Penetration (hot) bitumen may be applied for the sealemulsion in tack coat and 30% cationnnic emulsion, surfacing aggregate - See end section for details of products specified	Provision of MSDSs, bunded areas for storage on site, first aid cover, fire fighting equipment, regular disposal from site	3	3	3	27	Medical surveillance, liver function testing, increased changes in PPE to ensure visibility and saturation of chemicals. First aid treatment for burns, level 3 first aiders, increased atrrangements for emergencies. Storage areas to be controlled for temporary storage, dust suppression during mixing of materials	3	3	2	18
4103/ B35.01	Distributer, rollers, chip spreader, watercart, slurry batcher, rotary brooms, handtools. Tipper truck, tanker, distributor will most likely be used, to transport	Specialised team to do surfacing, may be contractor. Registers	3	3	3	27	Competent personnel and supervision, method statements, approved H&S plan and procedures, including all associated documentation if contractor appointed; Level 3 first aid cover, burn emergency management. Registers for plant, daily checks	3	3	2	18
4200	60/70 penetration grade bitumen, tack coat of 30% stable-grade bitumen, cement, lime to be used	MSDSs available and workers trained. Method statements and risk assessments to include risks relating to products identified.	3	1	3	9	Competent personnel and supervision, method statements, approved H&S plan and procedures, Level 3 first aid cover, burn emergency management	3	1	2	6

	SMME may use concrete mixer (stationary), mobile mixer, spreader box, some hand spraying in small areas will be required	Limited access, protection from edges of hopper; pretection from conveyor nip points and belt drives	3	3	3	27	Competent supervision and operators; guarding of nip points and spindles/ belt drives; emergency stop button/ safe work procedures (SWPs)	3	3	2	18
SERIES 5000: ANCILLARY ROADWORKS											
5100	Appointment of an SMME for Stone pitching will occur frequently throughout the project as erosion protection. Labour intensive work	Approval of H&S plan, induction of workers, issue of PPE, transportation of workers through site	2	3	2	12	Supply and approval of H&S documentation prior to commencement 7 days prior to work. **C**ompetent supervision, pre-task training, SWPs, Special transportation arrangements to site and from site. No transportation with plant or materials on site. No transportation in open vehicles, adherance to Road Traffic Safety Act. Rotation of labour, detailed in method statements and risk assessments	2	3	1	6
5200	Appointment of an SMME for work will be on slopes, and in cuttings. Stone will be delivered, and baskets filled by hand. Ergonomic risk deemed high	Approval of H&S plan - and systems by the SMME. Use of local labur or contractor, induction, issue of gloves	2	3	2	12	Supply and approval of H&S documentation prior to commencement 7 days prior to work. All workers to be issued with neon green double dipped pvc gloves or similar. Rotation of labour picking and placing stones. Method statement to be submitted to address ergonomic issues	2	3	1	6

5400 / 5405	Appointment of an SMME for Guardrails be required along the route. Pre treated creosote, cut and drilled timber posts are specified.	Approval of H&S plan - and systems by the SMME. Likely use of a Contractor, H&S management, supervision from Principal Contractor	2	2	2	8	Supply and approval of H&S documentation prior to commencement 7 days prior to work. Competent supervision, pre-task training, SWPs, Special transportation arrangements to site and from site. No transportation with plant or materials on site. No transportation in open vehicles, adherance to Road Traffic Safety Act. Rotation of labour, detailed in method statements and risk assessments Issue of PPE for handling poles, daily registers for plant and portable electrical tools	2	2	1	4
5500	Appointment of an SMME for Fencing. Repair of existing fencing may occur. Gates may be required	Approval of H&S plan - and systems by the SMME. Likely use of a Contractor, H&S management, competent supervision from Principal	3	3	2	18	Supply and approval of H&S documentation prior to commencement 7 days prior to work. Competent supervision, pre-task training, SWPs, Special transportation arrangements to site and from site. No transportation with plant or materials on site. No transportation in open vehicles, adherance to Road Traffic Safety Act. Rotation of labour, detailed in method statements and risk assessmentsRotation of labour, gloves appropriate for working with wire	2	3	2	12

5600	Use of SMME for the Erection and removal of road signs will be required along the route. Timber poles, pre-cut and drilled specified	Approval of H&S plan - and systems by the SMME.Lifting of larger signs by crane truck, load testing, use of competent, fit o operators and supervision, use of ladders. Daily registers in H&S file	2	2	2	8	H&S documentation by Contractors to be approved by Principal at least 7 days prior to commencement. PC to ensure work is done in closures still in situ and will remain responsible for all traffic accommodation requirements. Strict control will be applied, focus on high visibility. Attention to excavations and traffic accommodation. Fall protection plan (simple) will be required	2	2	1	4
5700 /	Appointment of an SMME for road marking. Retro Reflective Road marking paint will be required, with road studs. Errors in road marking will need to be discussed with the RE regarding the appropriate management and methodology	Use of a Contractor at various stages of the project. Pre-marking by hand, Spray painting for marking. Sandblasting may be used	3	2	3	18	H&S documentation by Contractors to be approved by Principal at least 7 days prior to commencement. PC to ensure work is done in closures still in situ and will remain responsible for all traffic accommodation requirements. Strict control will be applied, focus on high visibility. Sandblasting xxxxx	3	2	2	12

	Traffic accommodation will be required along the entire route, even though deviations will be applicable. Engineers will supply most typical drawings at tender stage	Approval of H&S plan and H&S system, use of engineer's TA drawings for closures. MSDSs for the paint	3	3	3	27	H&S documentation by Contractors to be approved by Principal at least 7 days prior to commencement. PC to ensure work is done in closures still in situ and will remain responsible for all traffic accommodation requirements. Strict control will be applied, focus on high visibility. TSO to maintain traffic accommodation in line with SARTSM Ch 13 Vol 2. All traffic accommodations requirements are to be managed by the TSO and kept on register. Use of orignal drawings, RE to approve any variations or further requirements. Attention to the volatiles of the road paint, and appropriate protection for workers	3	3	2	18
5800	Appointment of an SMME for landscaping will be required. Hand seeding will be done in areas, as per the advice of Environmental consultant. Work will include rehabilitation at the quarry and borrow pits	Approval of H&S plan, competent supervision, use of local labour, provision of PPE, drinking water, Use of chain saws to cut trees, and mechanical removal of roots.	2	2	2	8	H&S documentation by Contractors to be approved by Principal at least 7 days prior to commencement. Management of excavations, lifting devices, mechanical plant required. MSDSs, training of workers, training of workers, inductions, method statements and risk assessments for use of mechanical removal, noise management	2	2	1	4

5900	Road reserve will be finished off to ensure adequate water run-off and finishing of work. Clearing of drains and stormwater structures	Grading and shaping, winrows to be created. Competent supervision, fit, competent operators, daily registers	2	2	2	8	Method statements and risk assessments for use of mechanical removal, noise management	2	2	1	4