




## ETHEKWINI MUNICIPALITY Occupational Health & Safety Unit

### SITE BASED BASELINE RISK ASSESSMENT

#### Construction Regulations 5.1(a)

Document Title	Baseline Risk Assessment
Client	EThekweni Municipality–Development engineering
Project title	The Provision of Incremental Services within the Northern Region:Amaotana Zwelisha Phase 2 Roads and Associated Stormwater Control-Ward 59.
Contract Number	4V-24401
Revision	00
Date	31/05/2023
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## **BASELINE RISK ASSESSMENT**

**1. INTRODUCTION:** In accordance with the Occupational Health and Safety Act, (Act 85 of 1993) the Legislator places specific requirements on an Employer. One of these is prescribed in Section 8(i) of the Act where it requires the Employer to ascertain the risks and dangers which may occur within the workplace or section of the workplace and then goes on to establish working procedures or practices.

**2. PURPOSE:** This is conducted to create a benchmark of the potential risks that apply to the whole project or business operation.

**3. SCOPE:** This assessment could be approached on a site, regional or national level concerning any facet of the business operation or process or activity.

### **4. REVIEW AND MONITORING PLAN**

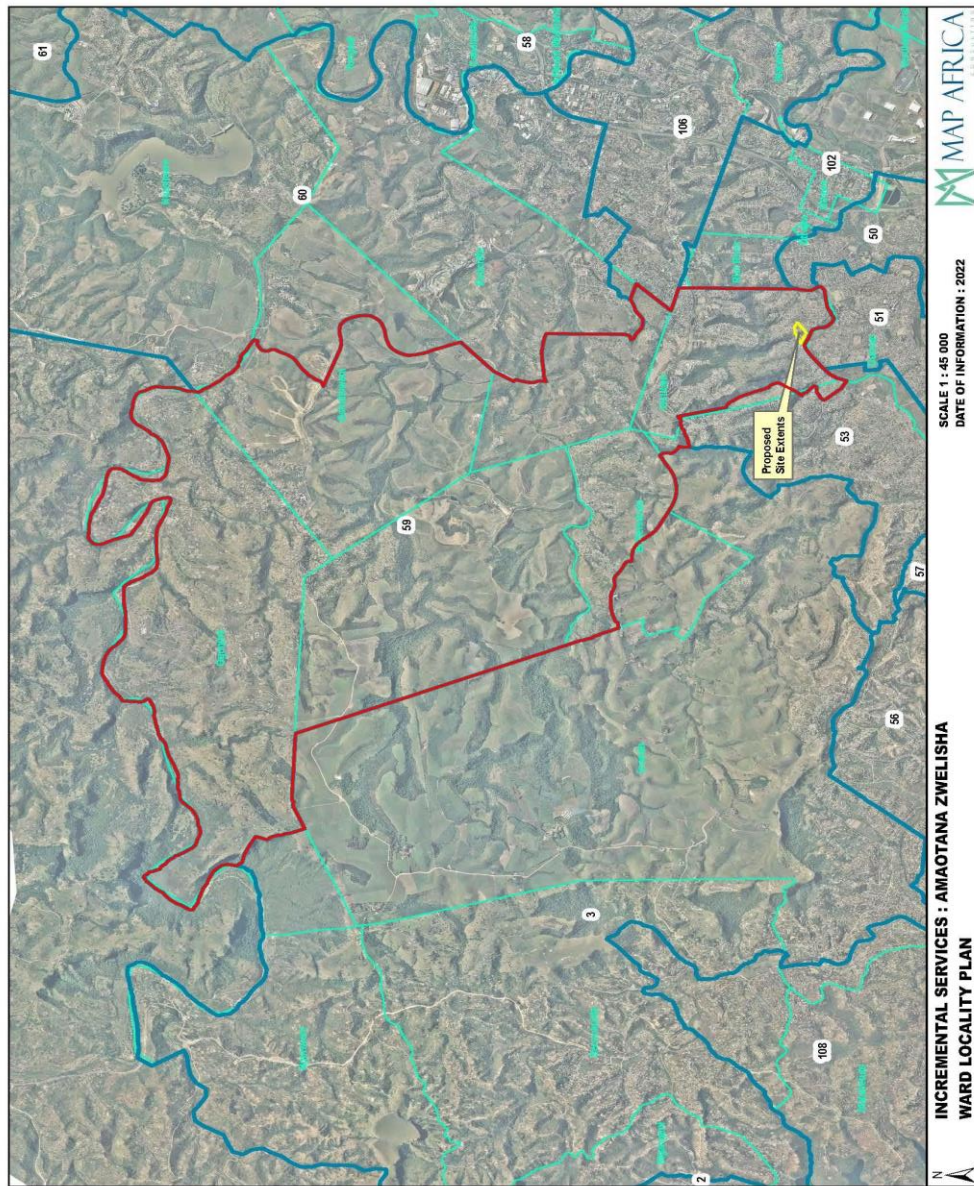
The risk assessment form part of the health and safety plan to be applied on the site and must include the following:

- (a) The identification of the risk and hazards to which to which persons may be exposed.
- (b) An analysis and evaluation of the risk and hazards identified based on a documented method.

### **5. REFERENCES**

- (a) Tender document number 4V–24401
- (b) Occupational Health & Safety Act and its Regulation

## 6. LOCALITY PLAN



**PLEASE NOTE THAT THIS IS A BASELINE RISK ASSESSMENT AND NOT A DETAILED RISK ASSESSMENT OF ALL ANTICIPATED ACTIVITIES ON SITE.**

## **7.SCOPE OF WORK**

### **Description of Works**

<b>Type of Works</b>	<b>Description of Works</b>
<b>i) Site Clearance</b>	General clearance including the removal of vegetation, concrete slabs, kerbs etc.
<b>ii) Drainage</b>	Approximate total length of pipelines = 230m. Manholes, Inlets, Pipelines, 'V' Drains, Headwalls etc. shall form part of the drainage works.
<b>iii) Roadworks</b>	Approximate total length = 320m. Asphalt surfaced roads will be constructed as indicated on the contract drawings.
<b>iv) Protection Works</b>	Approximate area of retaining structures = 160m <sup>2</sup> The following types of retaining structures may need to be constructed: Dry Stack Retaining Walls

### **The following activities were assessed:**

- (a) Access to the site.
- (b) Material delivery to the site.
- (c) Site establishment.
- (d) Site clearance and grubbing.
- (e) Busy residential/industrial area.
- (f) Traffic management.
- (g) Excavation/ earthworks.
- (h) Manual moving of precast products.
- (i) Provision of pipe bedding, laying of pipe and backfilling.
- (j) Construction of manholes and appurtenant drainage works.
- (k) Protection of existing services.
- (l) Construction mobile plant and machinery.
- (m) Construction of protection works.
- (n) Concrete works.
- (o) Layer works.
- (p) Construction of asphalt wearing course.
- (q) Site security.

## 1. RISK ESTIMATION AND EVALUATION

### RISK CLASSIFICATION USING A RISK SCORE TECHNIQUE

<b>Exposure (E) How frequently does the hazardous event occur</b>		<b>Risk level</b>
Continuously .....		10
Frequently (daily) .....		6
Occasionally (weekly) .....		3
Unusually (monthly) .....		2
Rarely (few a year) .....		1

<b>Probability (P) The probability of a loss when the hazardous event does occur</b>		<b>Risk level</b>
Frequent (happens often) .....		10
Probable (quite possible) .....		6
Occasional (unusual, but possible) .....		3
Remotely possible (has happened somewhere) .....		1
Improbable (practically impossible) .....		0.5

<b>Severity (S) Consequences of the hazardous event</b>		<b>Risk level</b>
<b>Catastrophic</b> many fatalities; or interruption of longer than 2 weeks; or asset or environmental damage (or both) exceeding R100m .....		100
<b>Disaster</b> (few fatalities; or interruption between one and 2 weeks; or asset or environmental damage (or both) exceeding R10m) .....		40
<b>Very serious</b> (one fatality; or interruption of 6 days; or asset or environmental damage (or both) exceeding R100,000 .....		7
<b>Important</b> (temporary disability; or interruption between 6 and 24 hours; or damage exceeding R10,000 .....		3
<b>Noticeable</b> (first aid needed; or interruption of less than 6 hours; damage exceeding R1000) .....		1

<b>Risk classification (Risk score = E x P x S )</b>	
<b>Risk score</b>	<b>Risk level</b>
Over 400-----5	Very high risk – discontinue operation or activity
200 to 400 ----- 4	High risk – immediate correction needed
70 to 200----- 3	Substantial risk – correction needed
20 to 70----- 2	Possible risk – attention needed
Under 20 ----- 1	Risk accepted

### BASELINE RISK ASSESSMENT WORKSHEET

	Activity	Hazard	Risk	Risk Evaluation			Risk Score	Risk level
				E	P	S		
1	Access to the site.							
	<ul style="list-style-type: none"><li>Traveling to and from site in a vehicle.</li></ul>	<ul style="list-style-type: none"><li>Safety belts not worn when traveling in or operating a vehicle.</li><li>Vehicle not equipped with safety belts for all passengers.</li><li>Over speeding of vehicles.</li><li>Driving on public roads.</li></ul>	<ul style="list-style-type: none"><li>Injuries caused when in vehicle accident.</li><li>Fatalities when in vehicle accident</li><li>Risk of personnel being injured by over speeding vehicles.</li><li>Involved in accident.</li></ul>	6	6	7	252	4
2	Material delivery to the site.							
	<ul style="list-style-type: none"><li>Loading and offloading of equipment manually.</li><li>Mechanical handling.</li></ul>	<ul style="list-style-type: none"><li>Employee being struck by the load.</li><li>Manual lifting of heavy objects.</li><li>Bending.</li></ul>	<ul style="list-style-type: none"><li>Serious injury.</li><li>Back strain.</li><li>Skeletal damage</li><li>Head, hand, and foot injuries.</li><li>Backache.</li></ul>	3	6	7	126	3
3	Site establishment.							
	<ul style="list-style-type: none"><li>Manual and</li></ul>	<ul style="list-style-type: none"><li>Incompetent</li></ul>	<ul style="list-style-type: none"><li>Injuries,</li></ul>	6	6	7	252	4

	<p>mechanical clearing of the land</p> <ul style="list-style-type: none"> <li>• Off-loading and positioning of containers by mobile crane</li> <li>• Fencing off the site</li> <li>• Installation of temporary water supply, electricity, ablution facilities,</li> </ul>	<p>construction mobile plant operator.</p> <ul style="list-style-type: none"> <li>• Sharp protruding objects.</li> <li>• Manual Handling of equipment and materials.</li> <li>• Uneven surfaces</li> <li>• Driving on dangerous and undulating terrain.</li> <li>• Reckless driving.</li> <li>• Electrocutation</li> <li>• Incorrect/ poor connection of temporary services</li> </ul>	<p>Accidents</p> <ul style="list-style-type: none"> <li>• Hand injuries.</li> <li>• Skeletal injuries</li> <li>• Destruction of services</li> <li>• Death, burns</li> </ul>					
<b>4</b>	<b>Site clearance and grubbing.</b>							
	<ul style="list-style-type: none"> <li>• Clearing of the site using construction mobile plant/labourer</li> </ul>	<ul style="list-style-type: none"> <li>• Overgrown vegetation</li> <li>• Rubble existing on site</li> <li>• Snakes bites.</li> <li>• Bees</li> </ul>	<ul style="list-style-type: none"> <li>• Nuisance, poisonous</li> <li>• Environmental contamination</li> <li>• Death, poison</li> <li>• Accident/</li> </ul>	6	6	7	252	4

		<ul style="list-style-type: none"> <li>• Incompetent driver/operator</li> <li>• Unsafe construction mobile plant</li> <li>• Petrol and oil spillages</li> <li>• Dust accumulation.</li> <li>• Bending.</li> <li>• Noise.</li> <li>• Exposure to vibration.</li> </ul>	<p>property damage. Collision with other vehicles</p> <ul style="list-style-type: none"> <li>• Noise</li> <li>• Respiratory problems.</li> <li>• Back strain.</li> <li>• NIHL.</li> <li>• Blood circulation problems.</li> </ul>					
<b>5</b>	<b>Busy residential/industrial areas.</b>							
	<ul style="list-style-type: none"> <li>• Working next to residential/industrial areas</li> </ul>	<ul style="list-style-type: none"> <li>• Public exposure to construction activities.</li> <li>• Destruction of services in the area.</li> <li>• Other activities in the areas</li> <li>• Strikes in the area</li> </ul>	<ul style="list-style-type: none"> <li>• Injuries public and employees, broken bones, damage to property, death,</li> <li>• Disturbance of personnel activities</li> <li>• Fights, lawsuits, disagreement</li> <li>• Damage to property, injuries to employees</li> </ul>	6	6	7	252	4
<b>6</b>	<b>Traffic management.</b>							



	<ul style="list-style-type: none"> <li>The use of construction vehicle and mobile plant in the public and next to public roads/ streets</li> </ul>	<ul style="list-style-type: none"> <li>Poor/ no traffic management plan in place</li> <li>Lack of traffic management training</li> <li>Unroadworthy plant and vehicle</li> <li>Collision with other vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Accidents, death, broken bones, damage to property</li> <li>Noncompliance with the National Road Traffic Act, Council Road Traffic bi-laws and other applicable Regulations</li> <li>Blockage/ inconvenient access to industrial/ commercial areas</li> </ul>	6	6	7	252	4
<b>7</b>	<b>Excavation/Earthworks.</b>							
	<ul style="list-style-type: none"> <li>Manual and mechanical excavation using construction mobile plants and hand tools</li> </ul>	<ul style="list-style-type: none"> <li>Faulty hand tools</li> <li>Hitting underground services</li> <li>Unsafe machinery/ hand tools</li> <li>Dust accumulation</li> </ul>	<ul style="list-style-type: none"> <li>Hand injuries.</li> <li>Lack of service delivery which may result in community protest</li> <li>injuries to hands,</li> <li>Severe injuries.</li> </ul>	6	6	3	108	6
<b>8</b>	<b>Manual moving of precast product.</b>							

	<ul style="list-style-type: none"> <li>Manual handling and moving of precast product using wheelbarrows,</li> </ul>	<ul style="list-style-type: none"> <li>Unsafe wheelbarrows,</li> <li>Manual handling of precast product</li> <li>Lifting of excess/ heavy load</li> <li>Ergonomics hazards</li> </ul>	<ul style="list-style-type: none"> <li>Injury to hands/ toes</li> <li>Skeletal injuries</li> <li>Slippery surface</li> <li>Tripping hazards</li> <li>Ergonomic risks</li> <li></li> </ul>	3	3	3	27	2
9	<b>Provision of pipe bedding, laying of pipe and backfilling.</b>							
	<ul style="list-style-type: none"> <li>Levelling</li> <li>Compaction</li> <li>Transportation of imported material</li> <li>Offloading and laying of pipe.</li> </ul>	<ul style="list-style-type: none"> <li>Traffic accidents on site when transporting materials.</li> <li>Reversing of trucks and mobile plant.</li> <li>Dust inhalation.</li> <li>Incompetent driver/ operator</li> <li>Dust</li> <li>Vibration</li> <li>Noise</li> <li>Faulty hand</li> </ul>	<ul style="list-style-type: none"> <li>Damage to Property.</li> <li>Respiratory failure</li> <li>Fatigue. Kidney damage. Muscle/ body/ joint pain</li> <li>Noise induced hearing loss</li> <li>Skin irritation</li> <li>Breathing/ respiratory diseases</li> <li>Hand Injuries.</li> <li>Backache.</li> </ul>	3	3	3	27	2

		tools <ul style="list-style-type: none"> <li>Bending and lifting.</li> </ul>						
<b>10</b>	<b>Construction of manholes and appurtenant drainage works.</b>							
	<ul style="list-style-type: none"> <li>Casting and floating of concrete during construction of stormwater systems.</li> <li>Excavation above 1m deep using mobile plant</li> <li>Preparation and laying of concrete pipes using a lifting equipment</li> <li>Construction of above 1m deep manhole using cement, blocks, hand tools and concrete manhole rings/ cover</li> <li>Connection of the stormwater pipes into the existing stormwater drainage system</li> </ul>	<ul style="list-style-type: none"> <li>Collapsing of trenches.</li> <li>Unsafe access to trench</li> <li>Unprotected trenches</li> <li>People exposure to excavations</li> <li>Unsafe lifting devices</li> <li>Incompetent lifting machinery operator</li> <li>Equipment failure</li> <li>Overloading of equipment/ machinery</li> <li>Working/ operating equipment too close to the excavation</li> <li>Contact with and inhalation</li> </ul>	<ul style="list-style-type: none"> <li>Collapsing of trench walls</li> <li>Death, dislocation, trauma/ panic attack</li> <li>Broken bone, dislocation,</li> <li>Falling into excavation.</li> <li>Injury to body. Accidents. Property Damage. Noncompliance with DMR. Noncompliance with stipulated safe working load.</li> <li>Falling into excavation. Property damage.</li> <li>Respiratory diseases. Skin disease/</li> </ul>	6	6	7	252	4

		<ul style="list-style-type: none"> <li>of cement dust</li> <li>• Manual handling of heavy manhole rings and covers</li> <li>• Incorrect connection of stormwater pipes</li> </ul>	<ul style="list-style-type: none"> <li>irritation</li> <li>• Back/ spine problems. Possible of pinch. Skeletal injuries. Injury to hands and toes.</li> <li>• Destruction/ blockage of stormwater drainage system</li> </ul>					
<b>11</b>	<b>Protection of existing services.</b>							
	<ul style="list-style-type: none"> <li>• Maintenance of watermain, sewer, stormwater, electrical etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Disturbance of the services,</li> <li>• Improper connection,</li> <li>• Sewer spillage,</li> <li>• Blockage of sewer and stormwater lines</li> <li>• Exposure to biological agents</li> <li>• Electrocutation.</li> </ul>	<ul style="list-style-type: none"> <li>• No water and electricity, community strikes,</li> <li>• Health hazards</li> <li>• Environmental hazards</li> <li>• Burns, death</li> <li>• Financial costs for replacing damaged cables</li> </ul>	6	6	7	252	4
<b>12</b>	<b>Construction mobile plant and machinery.</b>							
	<ul style="list-style-type: none"> <li>• Use of construction vehicles and mobile plants and</li> </ul>	<ul style="list-style-type: none"> <li>• Unsafe construction plants and equipment</li> </ul>	<ul style="list-style-type: none"> <li>• Accidents. Property damage. Noncompliance</li> </ul>	6	6	7	252	4

	equipment	<ul style="list-style-type: none"> <li>• Incompetent drivers/operators</li> <li>• Uneven surface</li> <li>• Equipment/machinery failure</li> <li>• Running out of control</li> <li>• Noise</li> <li>• Vibration</li> <li>• Oil Spillage</li> <li>• Dust</li> </ul>	<p>with DMR. Noncompliance with stipulated safe working load.</p> <ul style="list-style-type: none"> <li>• Capsizing of mobile construction plants. Jammed construction mobile plants, death</li> <li>• Injury to employees and community, death, loss of limb/disablement</li> <li>• Damage to property</li> <li>• Noise induced hearing loss</li> <li>• Muscular pains, kidney damage,</li> <li>• Environmental contamination</li> <li>• Lung disease</li> </ul>					
<b>13</b>	<b>Construction of protection works.</b>							
	<ul style="list-style-type: none"> <li>• Retaining structure using wire baskets and</li> </ul>	<ul style="list-style-type: none"> <li>• Manual handling of stones/rocks</li> </ul>	<ul style="list-style-type: none"> <li>• Ergonomic risks</li> <li>• Hand injuries.</li> </ul>	6	6	3	108	3

	<p>stones</p> <ul style="list-style-type: none"> <li>• Working with wire mesh</li> <li>• Laying of stones/rocks/blocks.</li> </ul>	<ul style="list-style-type: none"> <li>• Pinch point, sharp and protruding edges</li> <li>• Too much bending.</li> <li>• Faulty hand tools.</li> <li>• Cold temperatures.</li> <li>• Hidden underwater currents.</li> <li>• Exposure to deep depth of the stream.</li> <li>• Hidden debris or underwater hazards including weeds and plants which can entangle people under the water.</li> <li>• Exposure to polluted water.</li> <li>• Steep slimy banks.</li> </ul>	<ul style="list-style-type: none"> <li>• Fingers crushed or trapped by adjacent rock pieces</li> <li>• Backaches.</li> <li>• Illness.</li> <li>• Drowning.</li> <li>• Skin irritation.</li> <li>• Falling and drowning.</li> </ul>					
<b>14</b>	<b>Concrete work.</b>							

	<ul style="list-style-type: none"> <li>• Pre-leveling the area and formwork preparation for footpaths and V-drain.</li> <li>• Exposure to cement.</li> <li>• Hand mixing of cement.</li> <li>• Pouring of ready-mix concrete.</li> <li>• Floating of the concrete.</li> </ul>	<ul style="list-style-type: none"> <li>• Noise.</li> <li>• Vibration.</li> <li>• Dust.</li> <li>• Defective hand tools.</li> <li>• Cement contact with body.</li> <li>• Over bending.</li> </ul>	<ul style="list-style-type: none"> <li>• Injury to employees and community, death, loss of limb/ disablement</li> <li>• Noise induced hearing loss</li> <li>• Lung disease, eye irritation.</li> <li>• Hand injuries.</li> <li>• Backache.</li> </ul>	6	6	3	108	3
15	<b>Layerworks.</b>							
	<ul style="list-style-type: none"> <li>• Levelling</li> <li>• Compaction</li> <li>• Transportation of imported material</li> </ul>	<ul style="list-style-type: none"> <li>• Traffic accidents on site when transporting materials.</li> <li>• Reversing of trucks and mobile plant.</li> <li>• Dust inhalation.</li> <li>• Incompetent driver/ operator</li> <li>• Dust</li> </ul>	<ul style="list-style-type: none"> <li>• Damage to Property.</li> <li>• Respiratory failure</li> <li>• Fatigue. Kidney damage. Muscle/ body/ joint pain</li> <li>• Noise induced hearing loss</li> <li>• Skin irritation</li> <li>• Breathing/ respiratory diseases</li> <li>• Hand Injuries.</li> </ul>	3	3	3	27	2

		<ul style="list-style-type: none"> <li>• Vibration</li> <li>• Noise</li> <li>• Faulty hand tools</li> </ul>						
<b>16</b>	<b>Construction of asphalt wearing course.</b>							
	<ul style="list-style-type: none"> <li>• Compaction</li> <li>• Asphaltting</li> </ul>	<ul style="list-style-type: none"> <li>• Incompetent driver/ operator</li> <li>• Dust</li> <li>• Vibration</li> <li>• Noise</li> <li>• Contact with hot asphalt and prime coat.</li> <li>• Fumes</li> <li>• Faulty hand tools.</li> </ul>	<ul style="list-style-type: none"> <li>• Injuries,</li> <li>• Environmental contamination</li> <li>• Lung disease, eye irritation.</li> <li>• Contamination of the nearest commercial buildings</li> <li>• Fatigue. Kidney damage. Muscle/ body/ joint pain</li> <li>• Noise induced hearing loss</li> <li>• Burns, skin infections</li> <li>• Breathing/ respiratory diseases</li> <li>• Injury to hands</li> </ul>	6	6	3	108	3
<b>17</b>	<b>Site security.</b>							
	<ul style="list-style-type: none"> <li>• Provision of security to staff and property</li> </ul>	<ul style="list-style-type: none"> <li>• Incompetent security personnel</li> </ul>	<ul style="list-style-type: none"> <li>• Loss of property</li> <li>• Theft,</li> <li>• Financial risk</li> </ul>	6	6	3	108	3



		<ul style="list-style-type: none"> <li>• Unguided property</li> <li>• Unprotected/fenced site camp</li> <li>• Working in a high risk zone</li> </ul>	<ul style="list-style-type: none"> <li>• Uncontrolled entry</li> <li>• Hijacking/Mugging</li> </ul>					
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