Contract no: C1049.03

Contract name: UPGRADING OF DIVISIONAL ROAD 1098 (KM5, 47 TO KM8, 79) AND REHABILITATION OF DIVISIONAL ROAD 1098 (KM8, 79 TO KM14, 24)

METHOD STATEMENT 014 – CONCRETE WORKS

BASELINE CIVIL CONTRACTORS (PTY) LTD SUBMISSION FOR ACCEPTANCE				
	Name	**Designation**	**Date**	**Signature**
Prepared	JOHAN LUBBE	Safety Officer		
Approved	MARK CLOETE	Site Agent		
Submitted				

ENGINEERS APPROVAL				
	Name	**Designation**	**Date**	**Signature**
Engineers Acceptance				
Health and Safety Acceptance				
Environmental Acceptance				

WHAT work is to be undertaken?

Construct new and repair existing stormwater structures

WHERE are the works to be undertaken?

JOOSTENBERGVLAKTE, Waarburgh Road.

WHEN are the works to start, what is the anticipated finish date?

Start: November 2023 – End: June 2025

HOW are the works to be undertaken?

1. REFRENCE

1.1. Work scope
1.2. Profile drawings.
1.3. Surveying positions (GPS co-ordinates)
1.4. Foundation drawings
1.5. Geotechnical report
1.6. EMP
1.7. Construction regulations
1.8. OHS ACT
1.9. Risk Assessments
1.10. Quality Test and Inspection Plan (QTIP)

2. RESPONSIBILATIES

The site management is responsible for:

2.1. The compliance of work carried out, as established in this procedure, as well as any supplementary specification and/or procedure, which may apply and which will be conveyed by the RE.
2.2. Hiring and having available the adequate human and material resources, in quantity and specialisation, in order to perform the work.
2.3. Performing the tests defined in this procedure by means of a certified and qualified Test Laboratory.

3. LABOUR, EQUIPMENT AND PPE

3.1. Surveyor foreman
3.2. Skilled, semi-skilled and unskilled labourers
3.3. Subcontractors
3.4. Digger loader
3.5. Excavator
3.6. Mixer trucks
3.7. Tractor and trailer
3.8. Compressor
3.9. 3/4'' Pump
3.10. Generators and power tools
3.11. Concrete vibrators
3.12. Rebar wire ties and wire tying equipment
3.13. Theodolite
3.14. Measuring Tapes
3.15. Steel Re-enforcing

3.16. Smoothing/Chamfering Equipment
3.17. V-Block Clamps
3.18. Cube Manufacturing equipment and slump testing equipment
3.19. Shovels
3.20. First Aid box
3.21. PPE i.e. overalls, safety boots, leather gloves, safety spectacles, face, hearing and dust protection
3.22. Fire extinguisher and fire beaters

4. METHOD

4.1. The concrete supervisor will, after the re-bar cages are installed and signed-off by the client's inspector, inspect the rebar and stubs to ensure that the excavation and shutter structure is ready for casting.
4.2. The concrete supervisor will calculate the concrete required for the foundation and order concrete.
4.3. On arrival of the concrete the concrete supervisor will check the delivery note to see that the correct amount of concrete is batched as per his request. He will also check that the delivery time is within the "2 hour" window.
4.4. The concrete Supervisor will request a slump test from every mix truck and compare it to the slump results from the batch plant. The slump test will be done with in accordance with standard specified in Colto and SANS.
4.5. Cube tests will be done as per the instruction from the client's inspector and will be sent to a laboratory for crush tests as per the above mentioned standards. The cube test block will be clearly labelled with the test reference number and date for future reference.
4.6. When the concrete supervisor is satisfied that the concrete meets all requirements, pouring of concrete can commence.
4.7. Care will be taken not to move the re-bar cage whilst concrete is being poured into the excavation and shutter structure.
4.8. Once the concrete is poured into the structure element, mechanical vibrators are used to rid the concrete of air bubbles that form during pouring of concrete. Curing compound is sprayed onto the concrete (mildly) to prevent cracks forming when drying out.
4.9. The concrete supervisor will ensure that all stubs are still in place as set out by the surveyor.
4.10. The client's inspector will be present when concrete is poured to ensure that the contractor works according to the mentioned method statement. Once he is satisfied that concrete work is to specification he will sign the inspection sheet.
4.11. The concrete supervisor will ensure that barricading is replaced.
4.12. Any concrete spills will be attended to immediately and reported to the site manager. Minor concrete spills will be collected and dumped onto the stockpiles to be used for backfilling. Mixer trucks will only be allowed to rinse shoots onto backfilling stockpiles. No dumping of concrete will be allowed on site.
4.13. Major concrete spills will be collected and dumped into a skip for hazardous waste on site.
4.14. Surplus concrete shall be disposed of at the batching plant.

4.15. Making Slump Tests

4.15.1. Place a base plate on the ground as level as possible.
4.15.2. Fill the cone one quarter with concrete.
4.15.3. Concrete must now be poked 25 times, add another quarter of concrete to the cone and poke 25 times.
4.15.4. Repeat this procedure until cone is full.
4.15.5. Remove the cone carefully and place upside down (on the base plate) next to the concrete.
4.15.6. Placing the poker bar on the cone, over the concrete, a measurement is taken between concrete and poker.
4.15.7. This measurement is called the slump.
4.15.8. If the slump test is according to specifications, concrete can be used for casting.
4.15.9. If the slump is not according to specifications the concrete supervisor will rectify the problem or reject the mix.

5. CONCRETE REPAIRS AND FINISHING

5.1. The following **climatic conditions** must be adhered to:

5.1.1. Product storage – dry, cool conditions.
5.1.2. Application area must be protected from rain and other extreme weather conditions.
5.1.3. The acceptable ambient and substrate temperatures must be checked .

5.2. The following **equipment** must be used:

5.2.1. Power mixing tools and bowel.
5.2.2. Application tools.
5.2.3. Sponge.
5.2.4. Brushes.

5.3. Use only clean potable water, make sure tools are clean and well maintained, remove only concrete as instructed by supervising officer or qualified engineer and consult product data sheets before starting.
5.4. Do not contaminate mixture with other chemicals, do not mix powders from different products and do not add more water than recommended.

5.5. Substrate Preparation

5.5.1. Surface preparation - mark defective concrete.
5.5.2. Concrete removal - using high pressure water jet, 1100 bar (large area), or with hammer drill.
5.5.3. (Medium area), or hammer and chisel (small patch repairs).
5.5.4. Remove tire wires, nails etc.
5.5.5. Remove only defective concrete as instructed.
5.5.6. Do not reduce structural integrity.
5.5.7. Extent of concrete removal - remove concrete minimum 15 mm behind main bars.
5.5.8. Correct substrate preparation - Roughen surface (2 mm minimum), cut sides minimum 90° to avoid undercutting and maximum 135° to reduce de-bonding around edges and substrate must be sound with no loose material.

5.6. Preparing Reinforcement

5.6.1. Cleaning reinforcement – remove all tie wires, rust, mortar/concrete and other loose material.
5.6.2. Removal techniques - Use steel wire brush, abrasive blast cleaning techniques, or high pressure water jetting (1100 bar minimum).

5.7. Reinforcement Corrosion Protection

5.7.1. Application of corrosion protection (if specified) - apply two 1 mm thick layers (total 2 mm minimum).
5.7.2. Allow time for the 1st coat to harden before applying 2nd coat and allow application to dry before applying repair mortar.
5.7.3. Application techniques - hopper sprays for large applications, or brush for small applications.
5.7.4. Inspect bars after to ensure full coverage, use two brushes simultaneously to ensure full application behind bars.

5.8. Bonding Primer

5.8.1. Apply bonding primer (if specified) - wet the substrate, wipe away excess water (small area: with sponge, large area: with air pressure).
5.8.2. Application technique - for small patches brush firmly onto surface, for large areas spray on with hopper gun (point gun at different angles on the surface to ensure even application behind the bars).

5.9. Repair Application by hand

5.9.1. Surface preparation (if bonding primer not applied) - wet the substrate, wipe away excess water.
5.9.2. Application technique - press firmly the repair mortar into the repair area using a trowel (apply 2nd layer when 1st layer is dry if application depth exceeds product's max. layer thickness), profile surface and finish with trowel (finish surface with wooden or PVC trowel for best results, do not spray additional water over the surface).

5.10. Smoothing Mortar

5.10.1. Surface preparation - wet and clean surface with water (180 bar).
5.10.2. Smoothing or levelling mortar - apply vertically using toothed trowel, with trowel approx. 45° to surface (use different size toothed trowel for required layer thickness), when the 1st layer is hard, apply 2nd layer, smooth surface using wooden trowel after product has set (0.25 – 4 hrs).

5.11. After Application

5.11.1. Curing protection – protect application from extreme weather conditions.
5.11.2. Curing methods - plastic sheeting, jute and water or other membranes.
5.11.3. If no subsequent coating is to be applied on surface an approved curing agent could be used.

6. SAMPLES AND TESTS

All materials will be sampled and tested as specified in the project specification, Colto and SANS.

7. HEALTH AND SAFETY

7.1. All employees will be inducted prior to site access.
7.2. Everyone entering the site must sign in and out at the access gates.
7.3. PPE will be provided to ensure that harmful contact with any products and materials does not occur.
7.4. No person will be allowed on site without identification card or temporary visitor's card, except delivery drivers who will be escorted by a member of the site team.
7.5. All existing services will be pointed out to the excavation supervisor.
7.6. Provision of adequate fire-fighting equipment and training.
7.7. Provision of adequate medical aid boxes and trained first aiders.
7.8. Risk assessments will be used to train site personnel on all the risks within their working environment.
7.9. Machine operators will be medically tested and deemed fit.
7.10. Employees will attend annual medical evaluation by an occupational health practitioner to evaluate their health.

7.11. All machine operators will be licensed and competent.
7.12. Daily, weekly and monthly monitoring, reviewing and reporting will be done on site.
7.13. Emergency control numbers and procedures will be readily available on site at all times.
7.14. All the required warning and safety signage will be in place.
7.15. All incidents and accidents will be reported immediately to the H&S Officer.

8. ENVIRONMENTAL

8.1. All employees will be inducted prior to site access.
8.2. All areas used for storing of hazardous products and materials will be pre-approved by the ECO and RE.
8.3. All areas will be demarcated and where this hazardous materials is present there will be a bund area constructed and ground coverage will be placed to reduce the risk of natural ground exposure.
8.4. Storage facilities will be within a safe distance from water sources and plantation.
8.5. Signage will be placed at no-go areas.
8.6. Vehicle access roads on site will be kept in good condition and be provided with regulatory site signs.
8.7. All plant will park at site office compound during non-working hours.
8.8. All works will be monitored and minimum environmental disturbance will be enforced.
8.9. All incidents and accidents will be reported immediately to the ECO and RE.
8.10. Care will be taken by all when smoking on site.
8.11. The minimum clearing will be allowed.
8.12. Toilets on site will be secured to prevent toppling of toilets in strong wind.
8.13. Toilets will be serviced regularly and monitored for additional services, if required.

9. QUALITY ASSURANCE AND CONTROL

9.1. All works will be carried out in accordance with the Project Specification and approved drawings as well as any supplementary specification and/or procedure which may apply.
9.2. Prior to any works commencing, the site manager will confirm with the RE that the information being used is the latest approved revision.
9.3. Any design changes must be conveyed to the site manager by RE in writing and/or on approved revised drawings.
9.4. All setting out will be presented to the RE for approval prior to work commencing.
9.5. All completed repairs will be presented to the RE for approval.
9.6. Repairs will be done in layer thicknesses as specified.
9.7. Each layer will be presented to the RE for approval before the next layer is placed.
9.8. The quantity surveyor will update all relevant inspection sheets as required and make all necessary arrangements for inspections by the RE.
9.9. Once a part of the work has been completed, it will be handed over to the RE with all relevant quality assurance documentation.
9.10. Testing and inspections will be done in accordance with relevant ITP.