

ANNEXURE 3.2

SCOPE OF WORK

1.1. DESCRIPTION

Rand Water SAM Department has successfully installed the G20 Pipeline at Mondeor, Johannesburg South. During the construction of the pipeline the area was left with a scar. The Rand Water EMS section needs to rehabilitate the footprint. Rehabilitation of the area will be efficient to adhere to Approved Generic Environmental Management Plan for Maintenance Work for Rand Water Pipelines, thus Rand Water need to comply with the above-mentioned legislation. *The areas that require grass seeding on Portion A, C, D and E of the G20 Pipeline is approximately 32 900m²* as per the attached pictures below. The Contractor shall confirm the size of the area to be environmentally rehabilitated as per the scope of work through grass seeding.

1.1.2. OBJECTIVES OF THE REQUIRED WORK

Rand Water was approved to install the G20 Pipeline through Mondeor, Johannesburg South area by the authorities from Department of Water and Sanitation and Gauteng Department of Agriculture and Rural Development. As part of the conditions of the legal requirements Rand Water is obligated to rehabilitate the areas that are affected by the construction of the pipeline. Environmental rehabilitation of the properties of affected areas will reduce environmental issues that may arise such as soil loss through erosion, growth of alien invasive plants and weeds.

- a) To ensure that affected areas are rehabilitated through grass seeding, installation of instant lawn and/or erosion control structures.
- b) To ensure that preventative measures for restricting erosion are put in place.
- c) To ensure that the project adheres and complies with the legal and environmental requirements (i.e., Approved Generic Environmental Management Plan for Maintenance Work for Rand Water Pipelines.)

The key milestones of the project are:

- Area preparation and cultivate the compressed soil to promote the germination of grass and growth.
- Re-vegetate the specified area with seeding.
- Application of fertilizer.
- Supply and installation of instant lawn.
- Removal of rocks/ boulders within the servitude.
- Dispersal of boulders within the pipeline servitude.
- Supply and application of the Biomac (Soil saver).

Maintenance of the area.

- Weeding the site until handover.
- Watering/irrigation.

1.1.3. GRASS SEEDING OF THE AFFECTED AREA

The contractor shall remove all the rocks within the 20m working strip or pipeline servitude prior to scarification and the rocks that might be exposed during scarifying. As part of the area preparation the contractor shall level the area and close all trenches to match the surrounding environment. The pipeline route has portions that have significantly revegetated however the contractor shall seed the bare patches along the route to ensure that sufficient grass cover is achieved post rehabilitation activities. The entire scarred area to be seeded must be scarified either mechanically or manually to provide suitable conditions for grass germination and minimise water/wind disturbances. Soil is to be scarified to a minimum depth of not less than 60 mm and with a scarification spacing of not more than 200mm apart. All rubble, stones and other foreign objects must be removed and disposed of at approved dumping site. Proof of disposal needs to be obtained and submitted to Rand Water.



Figure above depicts the aerial map of the G20 Pipeline route, and the portion partitioned from A-E that require different rehabilitation interventions.

The table below entail the portions that require grass seeding and instant lawn along the G20 Pipeline:

DESCRIPTION OF THE AREAS ALONG THE PIPELINE ROUTE

Portion A	Portion B	Portion C	Portion D	Portion E
63mx20m= 1260m ²	100mx20m= 2000m ²	50mx20m=1000m ²	1479mx20m= 29 580m ²	53mx20m=1060m ²
Grass Seeding Total	32 900m²	Instant lawn Total	2 000m²	

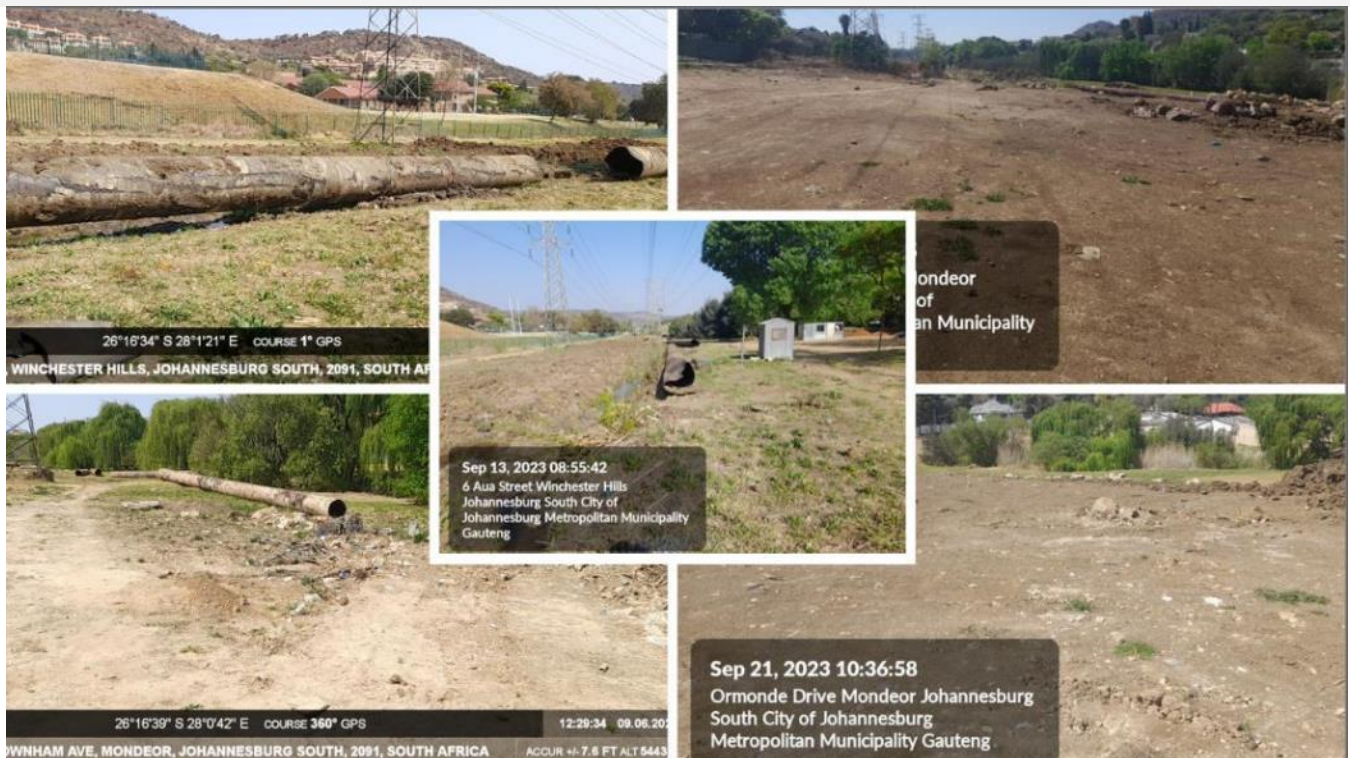


Figure 1: Depicts the area that requires grass seeding along the G20 Pipeline in Mondeor, south of Johannesburg.

1.1.3.1. SEEDING MIXTURE

Rand Water EMS Nursery has to date successfully used a seeding mixture of *Eragrostis teff*, *Digitaria smutsii*, *Chloris gayana*, *Melinis repens* and *Cynodon dactylon*. The mixture ensures adequate variety and blends in well with surrounding grass species. This mixture is recommended yet remains open to further species being added. Should the Contractor wish to recommend additional/replacement indigenous grass species, these must be specified in the tender/quotation together with the Contractors' recommended application rate. Preference will be given to improved seeding mixtures recommended by the Contractor. The mix must mirror the existing grass varieties; the final varieties mix should be approved by EMS.

1.1.3.2. SEEDING RATE

ANTICIPATED PERCENTAGE COVER

It is envisaged that with the above-mentioned seeding mixture and at the given application rate, more than 95% (ninety-five percent) cover can be - obtained by the end of the second growing season. The Contractor shall ensure then that no single area 0.5 m² or larger be left uncovered with a total uncovered area not more than 5% (five percent) over the entire scarred area. Should these conditions not be acceptable to a Contractor, it must be stipulated in writing together with the quote for grass seeding and the Contractors' guaranteed percentage cover. The minimum height of the grass should be 20cm; the contractor must remain accountable until this standard is recognised.

1.1.3.3. APPLICATION OF FERTILIZERS

A selection of fertilizers will be supplied by Contractor and delivered to site for application by the Contractor. The contractor will spread the fertilizer under the supervision of the ECO on site. The contractor will collect the fertilizer from the nursery by arrangement with ECO.

Superphosphate must be applied when seeding or planting and follow up fertilization with 2:3:2 must be applied to establish vegetation cover. Should the site already be established it may be decided to fertilize with 3:2:1 /3:1:5 or 4:1:1 or an alternative applicable fertilizer. Should any problems be experienced or should the Estates Superintendent require soil samples to be taken and a fertilization recommendation made, it will be done at Rand Water's cost.

Superphosphate and 2:3:2 must be applied at a rate of 5kg/100m² over the entire scarred area, at given intervals. Should an alternative fertilizer be used/supplied the relative application rate will be given by the EMS representative together with the relevant fertilizer intervals.

A follow up fertilization with 2:3:2 must be applied, 5kg/100m².

Eight weeks thereafter (twelve weeks after seeding or planting) a second application of 2:3:2 must be applied.

Any additional/alternative fertilizer requirements to ensure continued healthy plant growth must be done in consultation with the Environmentalist Rehabilitation.

1.1.3.4. MULCHING OF SEEDED AREA

On completion of sowing the seed, the site may also be covered with a very light layer of veld grass or chipped materials as mulch. This mulch layer shall be no thicker than 2-3mm deep.

1.1.3.5. WATERING OF GRASS

The installation of a temporary irrigation is not feasible along the road; the contractor will be responsible for providing irrigation as required until the first growing season to ensure the 95% cover as required. Watering of the site should be done four times a month for a period of 3 months.

1.1.3.6. MAINTENANCE OF THE SITE

- The site will be maintained until the first growing season ending February 2024 and/or grass is 20cm in height.
- Keeping adequate barricading up, to prevent pedestrian traffic from damaging the newly germinated grass.
- The contractor should continuously monitor the site and correct when minimal damage occurs on the germinating grass.
- Adequate watering of the area to ensure optimum growth.
- Keeping adequate barricading up, to prevent pedestrian traffic from damaging the newly germinated grass.

- Payment will be linked with rate of application and growth percentage of seeding, germination and 20cm height.
- Seeding payment will be done in parts i.e., during germination and when growth is 20cm.
- Remaining payment will be made with 95% cover and grass with average height of 20cm.
- Maintenance of the seeded area shall be undertaken on weekly basis for three months.

1.1.3.7. WEEDING

All grassed areas must be kept free of weeds, always until the site is handed over. Either by means of physical or chemical weeding. Where chemical weeding is used, the product to be used must first be discussed with the Environmental Control Officer (ECO). Staff applying chemicals must be fully trained, competent, and certified. The MSDS sheets of chemicals must be kept on site at all the times. The appointed contractor will be requested to have the PCO License. Weeding must include invasive alien plant species.

1.1.3.8. RESEEDING

The Contractor shall consistently monitor the germination and the growth of the seedlings. Should there be or the identify bare or die back areas, the Contractor shall take immediate measures to have those areas reseeded or plant plugs at his cost within 14 days from the date of notification by the Environmentalist Rehabilitation.

1.1.3.9. SUPPLY AND INSTALLATION OF GEOJUTE (SOIL SAVER).

The contractor shall be required to supply and install Geojute to protect erosion on the embankment and seed was away. The contractor shall supply and apply the Geojute on the berms to ensure that there is minimal soil erosion that could lead to seeds loss. The contractor shall prepare the soil by raking the area to be free of colds and large stones. The area should not be compacted, and fertilizer should be added prior to be seeded. Seeds and mulch should be distributed evenly over the prepared soil. Geojute: It's a biodegradable Geojute commonly used as a surface stabilizer for pre-vegetated slopes. The product is manufactured from woven natural jute fiber to form a mesh of approximately 10mm x 10mm in aperture, which is staked at 1m² intervals. The jute eventually degrades into an organic mulch after approximately two years, by which time the planted vegetation should have taken its place and be secured by its own rooting system.



Composition		100% Jute fibre	
Mass	Nominal	g/m2	292
Water Retention	Nominal	g/m2	1 300
Yarn Diameter	Nominal	mm	2-4
Open Area	Nominal	%	65-70
Aperture Size	Nominal	mm	10x10
Roll Width	Nominal	M	1.22
Roll Length	Nominal	m	100

1.1.4. SITE CLEAN UP INCLUDING THE REMOVAL DISPOSAL AND/OR DISPERSAL OF BOULDERS IN THE PROXIMITY OF THE PIPELINE.

The contractor shall collect all the rocks that ranges from 75mm and above 150mm to dispose at a registered landfill site. The collection, removal of the rocks shall be undertaken throughout the pipeline route however there's a area that was used for material storage during pipeline construction. The area in question has an area that is approximately 6 160m² that requires proper clean up including the removal of rocks for the handover purpose to the relevant property owner.



Figure depicts the area that requires proper clean up and removal of rocks or Dispersal along the pipeline servitude.

1.1.5. SUPPLY AND APPLICATION OF TOPSOIL AT THE IDENTIFIED AREAS ALONG THE PIPELINE ROUTE.

The contractor shall supply topsoil and apply through the identified area requiring rehabilitation prior to seeding. This is to aid in the revegetation of the site as it has poor soil due to the shallow bedrock and poor topsoil preservation during pipeline construction. The overall area(s) that requires topsoil is 3 986m², the application rate required is 0.10m whereby the volume of compost required on site is 398m³. The topsoil should be spread evenly at a rate of 0.10mm in depth.

GROWING MEDIUM REQUIREMENT:

- Growing medium for planting veld grass. Screened 12mm pH between 5.6 and 6.5.

STANDARD FOR GROWING MEDIUM:

- The mixture must be pH balanced and contain basic nutrients for initial growth as mentioned above.

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STANDARD FOR GROWING MEDIUM:

- The mixture must be pH balanced and contain basic nutrients for initial growth as mentioned above.
- The mixture must be free of weeds, disease, fungal growth, and impurities such as plastic.
- The mixture must contain minimum 45% moisture.
- The mixture must be uniform in structure, pH and elements as supplied in soil analysis throughout supply period.
- The mixture substance must be environmentally friendly/ acceptable.
- The mixture must be accompanied by a soil analysis of that mixture

STANDARD FOR COMPOST ANALYSIS

The growing medium mixture must be analyzed with the Agricultural Laboratory Association S.A. analyses for soil mixes. Soil should be analyzed as follows:

P	Cl	Moist %
Fe	Na	Cond. Micro S/cm
Mn	K	pH
Cu	Mg mg	Lab ref
Zn	Ca mg. 1 ⁻¹	Sample identity

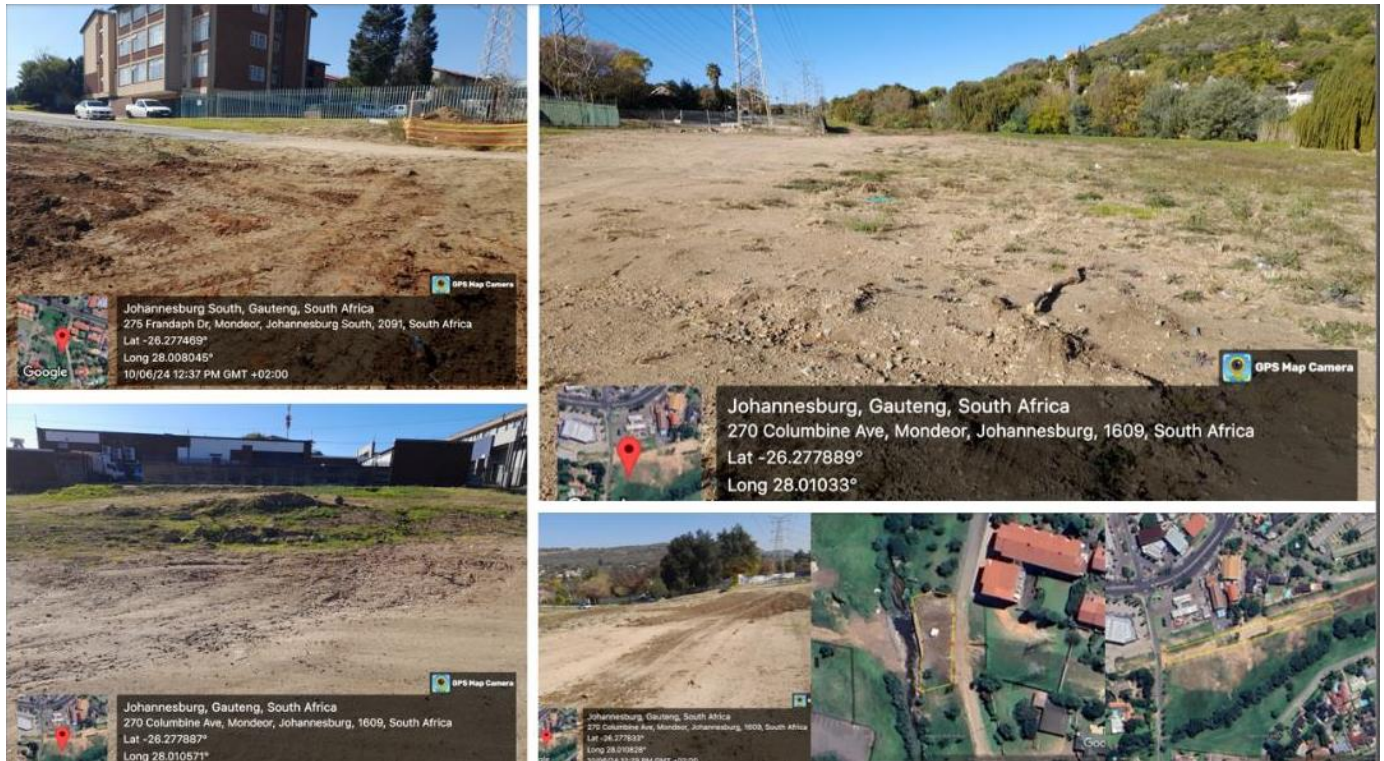


Figure depicts the portion that require application of topsoil along G20 Pipeline.

1.1.6. SUPPLY AND INSTALLATION OF INSTANT LAWN

- The contractor is required to supply, deliver, and lay Grade A Kikuyu lawn sods, cut the previous day.
- A layer of compost not less than 2cm to be applied and worked into the soil.
- The final levels of the area prepared should ensure that once the lawn is laid it tie in with existing instant lawn levels.
- Rubbles, stones, and foreign object to be removed and disposed of at approved dumping site. Proof of dumping need to be provided.
- Lawn sods to be laid in such a manner that they form even carpet.
- Roll before watering using a heavy-duty lawn roller.
- The newly laid grass should then be watered well without forming mud to ensure good contact when rolled.
- Surface should be smooth. The grass sods are to be buttered up close against each other leaving no space in between.
- The gabs between the sods are filled with compost or a lawn dressing.
- The final level of the lawn should be smooth and not uneven.
- There should be no weeds evident in the lawn.
- Ensure that the lawn is well maintained (cut and trimmed once off prior to handover).
- Handover of site will be done once grass is rooted and after three months' maintenance period is over.



Figure 2: Depicts the area that requires to be installed with the instant lawn and the following property respectively.

1.1.6.1. FERTILIZING ☹ Applications of fertilizer shall be made and must be distributed evenly and irrigated afterwards.

1.1.6.2. FERTILIZING INTERVALS:

☹ Superphosphate must be applied when seeding.

1.1.6.3. FOUR WEEKS AFTER SEEDING

☹ A follow up fertilization with 2:3:2 must be applied, 5kg/100m².

1.1.6.4. WATERING OF THE LAWNED AREA

The lawned area should be watered at least twice a week for a period of 4 months, this watering will aid in grass growing in work. The installation of temporary irrigation is not feasible along the road; the contractor will be responsible for providing irrigation as required until the second growing season. The contractor shall ensure that there is adequate watering of the lawned area. Watering should be at least twice a month for three months.

1.6.1.5. MAINTENANCE OF THE SITE

- Keeping adequate barricading up, to prevent pedestrian traffic from damaging the newly planted lawn.
- The contractor should continuously monitor the site and correct when minimal damage occurs on the newly planted lawn.
- Adequate watering of the area to ensure optimum growth.
- Maintenance of the lawn area shall be undertaken twice a week four months.

1.1.7. THE CONTRACTOR MUST

- Be fully conversant with the scope
- Be fully conversant with all environmental legislation and ensure compliance.
- Ensure that all the environmental and safety specifications contained within scope of work are adhered to on site.
- Regularly liaise with the Environmentalist Rehabilitation and Manager Environmental Rehabilitation on matters relating to the environment.
- Confine activities to the demarcated rehabilitation site.
- Ensure that safety comes first in all activities.
- That all requirements of the tender are adhered to and addressed.

1.1.8. STANDARDS THAT APPLY

- Returnable documents
- Agreements and contract data
- Pricing data
- Schedules
- Approved Generic Environmental Management Plan for Maintenance Work for Rand Water Pipelines

1.1.9. DELIVERABLES

- Site to be 95% covered in veld grass as per specification and at a height of 20cm.
- Handover will be done once the standard is met.
- Grass seeded.
- Site should be weed free.
- Watering of the grassed.
- Well germinating grass.
- Installed Lawn
- Dispersed or removed Boulders

1.1.10. TO BE SUPPLIED BY THE CONTRACTOR

- Staff who are fully trained and experienced and comply with all standards set in document.
- Workers who comply with all standards set in document.
- All tools and materials.
- Documents as requested in schedules.
- Photographic progress should be taken and kept throughout project.
- Photographs are to be done on digital format accompanied with one print out.
- Development of Biweekly and Monthly progress report through the project life cycle.
- Fertilizers (organic and inorganic)
- Seeds
- Instant Lawn
- Water/ Irrigation

1.1.11. LABOUR AND EQUIPMENT

The Contractor shall be liable for the provision of labour, including all related costs, the provision of all tools and equipment required, the maintenance and repair of all tools, equipment and vehicles. Competency certificates should be available for all contract staff working on site.

1.1.12. LABOUR

The Contractor is to supply a suitable human resource capacity responsible for project management, staff's physical safety, disciplinary and other requirements. Staff will have to undergo induction training via Rand Water SHEQ Officer. Medical certificates of fitness from an Occupational doctor should be available for all employees working on this site.

1.1.13. COMPLIANCE TO LEGISLATIVE REQUIREMENTS INCLUDES THE FOLLOWING.

- Safety, health and environmental compliance
- Compliance to Authorisation and Environmental management plan.
- Compile and submission of SHE
- Rand Water training induction
- Medical certificates of fitness
- Project Management and other contractual obligations.

1.1.14. HUMAN RESOURCE CAPACITY REQUIRED AS MINIMUM:

- 1 Project Manager
- 1 Site supervisor
- 1 Safety representative
- 1 First Aider
- Minimum of 10 Staff

1.1.15. EQUIPMENT

The plant and equipment etc used shall satisfy the requirements of the OHS Act or any amendments thereof, also regulation as may be framed there under at any time up to and including the date of completion of the Work under this contract. All maintenance of tools and equipment will take place off site or undertaken on site in an environmentally acceptable manner in order to prevent oil/lubricant and diesel/petrol spillages on site. All equipment as specified in the tender document must always be available and good working condition.

The following are minimum essential requirements for the work.

- Relevant tools (Rakes, shovels, spades, Ripper machine to mentioned few)
- 1 Water bowser truck – Watering/Irrigation
- 1x Gazebo
- 1 Table and 10 chairs
- Ablution facilities (Toilet)
- All other relevant tools and equipment that will enable the work execution.

1.1.16. WORK PROGRAM

The tenderer shall submit the proposed start and completion dates. The work is expected to be completed within the period of 3 months excluding the maintenance of the site that should be approximately 3 months.

1.1.17. TO BE SUPPLIED BY RAND WATER

- ⊖ Tender document and order for work
- ⊖ Inspection of work and acceptance of receipt
- ⊖ Payment
- ⊖ Approved Generic Environmental Management Plan for Maintenance Work for Rand Water Pipelines