

**MOKOLO AND CROCODILE
WATER AUGMENTATION PROJECT
PHASE 2 (MCWAP-2)**

TENDER NO 054/2024/PMID/MCWAP2/RFB

**PART C3.1
SPECIFICATION**

SECTION 14

**SPOIL, BORROW AND EXCAVATED
MATERIALS**

PART C3.1 SPECIFICATION

SECTION 14 SPOIL, BORROW AND EXCAVATED MATERIALS

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SECTION 14

SPOIL, BORROW AND EXCAVATED MATERIALS

14.1 SCOPE

This Section deals with obtaining borrow materials for the bedding and backfilling of pipelines, for fills for embankments, terraces and roadworks and for use in the Works, including excavating trial holes, stripping and stockpiling any excess of unsuitable overburden, crushing and screening to meet specifications, spoil unsuitable material and finishing off the borrow and spoil areas.

14.2 DEFINITIONS, ABBREVIATIONS AND REFERENCES

14.2.1 Definitions

- a) **“Borrow material”** means any gravel, sand, soil or boulders obtained from designated areas or other approved sources for the construction of the pipelines, embankments, terraces and fills for roadworks. It does not include crushed stone or sand obtained from commercial sources.
- b) **“Borrow areas or structural excavation area”** means any areas within designated boundaries, approved for the purpose of obtaining borrow material.
- c) **“Borrow pit”** means the excavated pit in a borrow area.
- d) **“Slope”** means the inclination of a surface expressed as 1 unit of rise or fall for so many horizontal units.
- e) **“Spoil”** means excavated material, which is unsuitable for use in the Permanent Works and material which is surplus to the requirements of the Permanent Works.
- f) **“Stockpile”** is a pile of material that has been selected, because of its properties, for particular purpose and moved to a designated area into a pile for later use.
- g) **“Spoil areas”** means areas within designated boundaries, approved for the purpose of spoiling unsuitable or excess material.
- h) **“Unsuitable material”** is material which does not comply with the Specification.

14.2.2 Abbreviations

AASHTO	:	American Association of State Highway and Transportation Officials
BS	:	British Standard
MHSA	:	Mine Health and Safety Act, 1996 (Act 29 of 1996)
OH&S	:	Occupational Health and Safety
SANS	:	South African National Standard
TMH	:	Technical Methods for Highways

14.2.3 References

When reference is made to a Code of Practice, Specification or Standard, the reference shall be taken to mean the latest edition or replacement at time of tender of the Code, Specification or Standard; including addenda, supplements, modifications and revisions thereto. Where a previous version is intentionally used, it will be indicated as such. Where reference is made to a Code, Specification or Standard that has subsequently been withdrawn and not replaced, the intended content will remain relevant unless confirmed otherwise in writing by the Engineer.

14.3 OBTAINING BORROW MATERIALS

14.3.1 General

The Contractor shall be responsible for obtaining suitable borrow material (as construction material) from excavations and/or from the designated borrow areas or from such other sources as may be approved by the Engineer. Alternative commercial sources may be proposed by the Contractor.

The Contractor shall be responsible for the quality and quantities of the construction material to be excavated from the designated borrow areas. The results of investigations on the quality and quantity of the construction materials which have been undertaken by the Employer are given in the Geotechnical Data contained in Part C4.

Prior to commencing with borrow activities, the Contractor shall take full cognisance of the Environmental Authorisation issued for a particular borrow area, and the Environmental Management Programme (EMPr) as approved by the Department of Minerals and Energy, and then the Contractor shall submit the following:

- a) A site specific Method Statement for each borrow area shall be prepared indicating his methods of obtaining bedding, backfill and construction materials for the Works including the removal of topsoil and fertile soil, overburden, the excavation methods including equipment specifications, the sequence of excavation with respect to the time and volume of material required and the processing of the different materials. In addition the Method Statement shall consider the backfill of the borrow area with spoil from the Works as well as ultimate rehabilitation thereof. The pre-development and final proposed levels and resultant ground profile in relation to the surrounding areas shall also be indicated. The Method Statement shall be provided at least 28 days prior to work commencing on the borrowing or structural excavations.
- b) Results of materials tested as proof of compliance with Specification.

The Contractor will not be permitted to commence with borrow and excavation operations before the Engineer has given his written approval for the above, including approval for the way in which the borrow area(s) and materials from the excavations are to be used.

The approval of the Engineer to any borrowing shall not relieve the Contractor of his responsibility for the provision of construction material of suitable quality and quantity.

To ensure materials complying with the Specification are used, the Contractor shall test the materials prior to their use in the Permanent Works. If the natural material does not fulfil the requirements of the Specification, the Contractor shall process the material by wetting, drying, mixing, crushing, screening, washing or other means in order to ensure that the material conforms to the Specification.

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c) Management of borrow pit area.

The Contractor will be responsible for:

- The development of a mine plan and the submission of the same to the Engineer for approval, for onward submission to the Department of Mineral Resources and Energy;
- A performance assessment, monitoring, and evaluation report that must be submitted annually to the Engineer, for onward submission to the Department of Mineral Resources and Energy;
- All roles and responsibilities including accountability are arrangements that are intended to make sure that the Mine Health and Safety Act (MHSA) requirements are met and the mine operates in a safe and healthy environment. As the operator of the mine, the Contractor shall make legal appointments as required by MHSA Section 3(1), including the Mine Manager who has to be qualified and competent and who will be responsible for (but not limited to);
 - i) Providing and maintaining a working environment at the mine that is safe and without risk to health;
 - ii) Ensuring that the legal requirements of MHSA are met;
 - iii) Putting in place an effective health and safety programme taking into account the views of the health and safety committee;
 - iv) Providing time, money, equipment and people including competent line managers and supervisors to put the programme into practice;
 - v) Staffing the mine taking into consideration health and safety; for example, considering their training and capabilities in health and safety before assigning tasks to them;
 - vi) Making sure that workers have the information, instruction, training and supervision by competent persons to enable them to become familiar with workplace hazards and work safely;
 - vii) Providing adequate supply of health and safety equipment including PPE, medical and first aid facilities;
 - viii) Making sure line managers and supervisors are trained, supported with the right resources and also held answerable for meeting their health and safety responsibilities under MHSA;
 - ix) Making arrangements for worker consultation including the election of safety representatives, setting up the health and safety committee and providing them time and means to carry out their functions successfully;
 - x) Developing health and safety policies and procedures such as codes of practice and making arrangements to put them into practice, monitoring and reviewing them;
 - xi) Putting in place an effective system for identifying hazards, assessing and controlling their risks to health and safety, keeping records and make it easy for workers to check the records;
 - xii) Investigating accidents, cases of serious illness and any incident that is a danger to the health of people at work. Make sure employees or their representatives are consulted and an Inspector may be required to take part in the investigation;

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- xiii) Conducting occupational hygiene measurements of the exposure levels of workers at the mine, for example, noise, radiation, temperature and humidity levels;
- xiv) Conducting medical surveillance of employees who are exposed to dangerous substances including coal and silica dusts, asbestos, chemicals and biological agents, and physical hazards such as noise and radiation; and
- xv) Complying with the requirements of the OH&S Specification for this project.

14.3.2 Licensing and Negotiations with Owners, Occupiers and Authorities

The necessary licenses, permits and agreements for the development and use of these borrow and spoil areas shall be obtained by the Employer as required by the relevant legislation. The Contractor is not required to allow for any cost associated with such agreements between the Landowner of the borrow and/or spoil area and the Employer. Where the Contractor, at own initiative, plans to obtain materials from alternative borrows, he may only use materials from borrows that have the necessary licenses, permits and agreements in place, and such proof must be submitted to the Engineer.

14.3.3 Borrow Pits

All designated borrow material will be provided at no cost to the Contractor. Borrow pits shall be established by the Contractor in the designated areas as directed or approved by the Engineer. The information provided in this document regarding materials from the borrow areas reflects the results of site investigations and laboratory tests conducted by or for the Employer and is supplied in good faith as to the quantity and quality of the material for the due and proper completion of the Works.

The positions of these proposed borrow areas are indicated in the Geotechnical Data contained in Part C4 as well as on the Drawings. The Contractor must however investigate these borrow areas by means of test pits and laboratory testing for the Engineer's approval to confirm suitability, prior to borrowing operations. The test pits shall be at least at a 30 m x 30 m grid, with testing results in accordance with TMH1.

Except as detailed in Item 14.003 for removal of topsoil, fertile soil and overburden, no classification for materials, whether hard or soft as defined in Section 9 - Bulk Surface Excavations and Trenching, will be made in borrow pits.

If, at any time during construction, it appears that the quality or quantity of material available in a borrow area or from a structural excavation is insufficient, the Contractor shall make use of other borrow areas or structural excavation areas approved by the Engineer.

The Contractor shall provide all assistance in the form of equipment; trained personnel and labour for prospecting and testing for further borrow areas as may be required by the Engineer. Payment for such additional work shall be made at Bill or Daywork rates, as applicable.

The Contractor shall plan his exploitation of the borrow pits or borrow areas in such a manner that the various materials excavated can be selected and either be loaded directly for use or be stockpiled in the borrow area for later loading. No borrow material reserved for a specific purpose shall be used for other purposes without the written approval of the Engineer.

The Contractor shall be solely responsible for the exploitation of borrow materials and any temporary stockpiling required for whatsoever reason will not be reimbursed.

14.3.4 Use of Additional Borrow Materials

The Contractor shall at any stage of the Works operate from that approved source of supply which is the most suitable with regard to quality, quantity and location, of the various types of materials available. No payment shall be made for moving the Contractor's Equipment from one location to another.

The Contractor may propose the use of borrow areas other than designated borrow areas. In doing this, the Contractor shall take due cognisance of the time required to obtain the required licences, permissions, and access authorisations from the relevant authorities and owners of the land for such use. Due to legislation regulating borrow areas such proposed development of new borrow areas by the Contractor may not be approved. The Contractor shall also undertake sufficient tests and submit the results to the Engineer for his approval before commencing any work in such alternative borrow areas. The consultation process with landowners in order to undertake these tests shall be undertaken by the Contractor taking due cognisance of the requirements of Section 3 – Social Management and Socio Economic Requirements.

Should the Contractor elect to obtain material from sources other than those designated by the Engineer he shall excavate the necessary trial holes, take such samples and perform or have such tests and environmental impact assessments performed as are deemed necessary by legislation and by the Engineer, without additional payment. The Contractor shall submit the results to the Engineer in sufficient detail to satisfy him that the quality and quantity of the material available in the proposed borrow area are acceptable for the intended use. All such borrow areas shall comply to all requirements as prescribed by the regulatory Act (Mineral and Petroleum Resources Development Act, Act 28 of 2002), the National Environmental Management Act, 1998 (Act 107 of 1998), and the National Water Act, 1998 (Act 36 of 1998) before any borrowing may commence.

Approval of additional borrow pits or borrow areas shall apply only to those portions of the pit or area from which acceptable material can be obtained or produced. The use of alternative sources shall be subject to the approval in writing by the Engineer.

14.3.5 Materials for the Works

Suitable materials derived from essential excavations for the Works shall be used in preference to identified borrow pits.

Materials for fill in embankments, terraces, roadworks and as backfill to structures and as bedding and backfill for pipelines shall be obtained from the trench excavations, designated borrow pits, structural excavations or from other essential excavations for the Works and shall comply with the specifications contained in Section 15 – Backfilling and Bedding.

14.3.6 Bedding Material

Materials for pipe bedding and backfill shall be obtained from the trench excavations, excavations for the Works, commercial sources or designated borrow pits (as indicated in the Geotechnical Data included in Part C4). The pipe Bedding Material (Bed, Bedding Cradle Selected Fill Blanket) and Main Backfill shall comply with the specifications contained in Section 15 – Backfilling and Bedding.

Where necessary, the required crushing and screening Equipment shall be made available at the borrow pits to ensure compliance of material with a particular use specification. The minimum Equipment that may be required may include but not be limited to crushing and screening.

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Materials for temporary access roads (for construction and including haul roads) and permanent access roads and tracks shall be obtained from the designated borrow areas as indicated in the Geotechnical Data included in Part C4.

14.4 OPENING AND WORKING BORROW PITS AND SPOIL AREAS

14.4.1 General

All borrow and spoil areas shall be managed in accordance with the Environmental Authorisation and concomitant Environmental Management Programme Report issued and approved by the Department of Mineral Resources and Energy. Furthermore, all borrow and spoil areas shall be managed in accordance with the Water Use Licence and specifically Regulation 704, as issued by the Department of Water and Sanitation. Such documentation will be provided to the Contractor. The Contractor shall be responsible for all costs associated with the opening, working, closing, and rehabilitation of used borrow and spoil areas. At least 28 days prior to commencing borrow and spoil operations the Contractor shall submit, for the Engineer's approval, a proposed borrow and spoil area plan of action together with the Site Specific Method Statement (Clause 14.3.1), as appropriate, which shall contain at least the following:

- a) Description of access routes to the borrow and spoil area, including haul routes to the Works;
- b) Position of fences to be erected;
- c) Plan for incremental clearing of vegetation, topsoil and overburden to minimise disturbance to the environment;
- d) Positions and approximate dimensions of topsoil stockpiles, overburden stockpile and borrow material stockpiles;
- e) Positions and approximate dimensions of all working areas required, including crusher and haul road layouts and positions;
- f) Mining and backfilling plan;
- g) Production rates;
- h) Methods of dealing with storm water, waste water, groundwater and any water treatment measures;
- i) Dust suppression measures;
- j) Noise suppression measures;
- k) Normal working / operating hours;
- l) Final forms, slopes and approximate dimensions of excavation;
- m) Survey of original ground levels;
- n) Pre-development photographic record of the borrow area;
- o) Landscaping, rehabilitation and closure measures and landscaping; and
- p) Programme in bar chart format of borrow and spoil area development, operation and rehabilitation.

Provision is made in the Bill of Quantities for the removal of topsoil, fertile soil and overburden over the planned borrow pits and spoil areas which material shall be stockpiled for rehabilitation on completion of the borrow and spoil operations.

Access roads to the borrow and spoil areas shall be established and maintained as part of the operating and management procedure of the borrow pit and spoil site.

14.4.2 Specific Considerations

The approved Borrow Pits 39A and SS1 fall within the 1:100 year floodline of the Matlabas River, and in certain instances within the 1:10 year floodline and the Crocodile River (West). The Contractor's Method Statement shall consider the environmental, social and safety restrictions due to this location, and specify specific mitigating and control measures to ensure the protection of the river and its banks, as well as safety control measures for working within the 1:100 floodline.

14.4.3 Overburden

The Contractor shall advise the Engineer in good time of his intention to operate from any borrow or spoil area before any excavation at such borrow area or spoiling at such spoil area is commenced, in order that surveys and trial pits by the Contractor can be made for the purpose of determining the minimum quantity of overburden which has to be removed. Refer to Section 5 - Survey and Setting Out for details of survey requirements prior to excavation or removal of topsoil and overburden. Geotechnical Data contained in Part C4 provides indicative depths of overburden in the area.

The Contractor shall limit the removal of overburden to a minimum. No removal of overburden or any other operations shall proceed until agreement has been reached between the Engineer and the Contractor in regard to the depth and quantity of such overburden. Overburden shall only be removed on areas to be mined.

Overburden shall be stockpiled clear of the proposed borrow and spoil areas, but still within the defined servitude area. If the size of an area is later increased, the overburden shall be moved further away or be placed in worked out areas of the borrow pit or spoil area already backfilled with spoil to final levels.

14.4.4 Excavation of Borrow Materials

Borrow material shall be excavated within the limits of depth and area as directed by the Engineer, in a manner that will not prejudice the use of the material for the intended purpose, and that will optimise the use of the available material, and which will, in addition minimise any detrimental environmental impacts.

The Contractor shall exercise all reasonable care to avoid contamination of approved borrow material by the inclusion of unsuitable material from the floor of the borrow pit, from overburden, from unsuitable layers or from areas beyond the approved limits of the borrow area. Oversize material shall be removed at source.

During the course of borrow operations and especially when excavating near the floor and outer boundaries of borrow areas, the Contractor shall operate in such a way that the amount of work that will be necessary for the finishing off of the borrow pits is reduced as far as possible. In particular the creation of vertical walls shall be avoided. Indiscriminate excavation without due regard for the desired final shape of the borrow pit will not be permitted, and shall be rectified at the Contractor's expense.

Borrow material shall be excavated in a manner that will minimise any detrimental environmental impacts and in particular:

- a) All sensitive areas (i.e. specific flora or archaeological sites) shall be fenced and clearly demarcated or be dealt with as per Section 47;

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- b) The Contractor shall remove and stockpile the topsoil and fertile soil, prior to the commencement of any mining activities. The details of this activity shall be planned in collaboration with the Engineer. The handling and stockpiling of topsoil and fertile soil shall comply with the requirements of Section 7- Clearing Site;
- c) The Contractor shall ensure that fauna is not disturbed or destroyed during the clearing and mining operations. Any animal life encountered shall be relocated safely to beyond the border of the borrow area;
- d) Any watercourse shall be protected during the borrow operations in terms of the requirements of Section 1 - General and Section 8 - Dealing with Water. Should watercourses or drainage lines be disturbed, these will be reinstated in its original position during closure; and
- e) The Contractor shall take steps to minimise the visual intrusion of mining activities (particularly lights and vehicular movements) on adjacent landowners by screening the properties with appropriately located stockpiles.

14.4.5 Control at Borrow, Structural Excavations and Spoil Areas

The Contractor shall carry out sufficient tests on the material being excavated from the borrow and structural excavation areas in order to satisfy himself and provide proof that the quality of the material being excavated complies with the specified requirements of the particular purpose for which it is to be used. Test pits shall be made on a 30 m x 30 m grid, the material tested and graded in accordance with TMH1.

If there is any doubt concerning the quality of borrow material being excavated at any time, the Contractor shall notify the Engineer immediately, and in any case before such material is processed. The results of all tests carried out by the Contractor shall be submitted to the Engineer on request. After further testing or inspection, if necessary, the Engineer will instruct the Contractor regarding the use of the material in the borrow or excavated area, or he may order that the unsuitable and surplus material excavated from the pipeline and structures be spoiled within the confines of the borrow pit and the borrow area be finished off and abandoned. No other waste material shall form part of the spoil.

Surplus and unsuitable material from the trench may require temporary stockpiling at the borrow and spoil areas before final placement in the pit as part of the final closure and rehabilitation process.

14.4.6 Fencing of Borrow and Spoil Areas

Unauthorized access to borrow pits and spoil areas, including the access road, the areas occupied by crushing / screening / washing equipment and stockpiles of processed material, shall be prevented by the erection of a temporary fence (5-string barbed wire or game fence) as specified in Section 6 – Fencing. The fence shall be erected after approval of designated borrow and spoil areas by the Engineer and prior to commencement of work in the area. Where necessary for access, appropriate gates shall be provided as specified in Section 6 - Fencing.

14.4.7 Dust and Noise

Borrow material shall be excavated in a manner that will minimise any detrimental environmental impacts. The Contractor shall ensure that the dust and noise control measures specified in Section 1 - General and Section 4 – Integrated Environmental Management and included in the respective Method Statements are implemented during borrow and spoil operations. In this regard the Contractor shall ensure that during periods when a specific borrow pit or spoil areas is not active, the environmental control measures remain in place.

14.4.8 Waste Management

The Contractor shall, in particular, manage spoiling in a borrow pit so as to ensure that no waste materials as defined in Section 4 - Integrated Environmental Management, other than spoil from excavations, are disposed of in the borrow areas.

14.5 FINISHING OFF BORROW, EXCAVATED AND SPOIL AREAS

All borrow and spoil areas shall be rehabilitated in accordance with the requirements of the approved Environmental Management Programmes (EMPrs) to the satisfaction of the Engineer and the Department of Mineral Resources and Energy, as well as the requirements of Section 47 – Landscaping and Rehabilitation.

During the course of borrow or spoil operations, the Contractor shall plan his operations in such a way that the amount of work that will be necessary for the finishing off of borrow and spoil areas is reduced as far as possible. Indiscriminate spoiling without due regard for the desired final shape of the borrow and spoil areas will not be permitted, and shall be rectified at the Contractor's expense.

Prior to the onset of rehabilitation activities, the Contractor shall ensure that the remains of site infrastructure (if any) are demolished, removed from site and appropriately disposed of. Where directed by the Engineer, access roads shall be obliterated by breaking the surface crust and erecting earth embankments to prevent erosion.

On completion of operations in a borrow or spoil area the Contractor shall reinstate the entire area so that it blends in with the surrounding area and topography and is suitable for the re-establishment of vegetation. For this purpose the borrow or spoil area shall be shaped to even contours with no slopes steeper than 1: Vertical in 5: Horizontal, except where agreed to by the Engineer, in rocky material or where, in the opinion of the Engineer, it is impractical to do so.

All material in and around the borrow or spoil area, whether spoil from structural excavations, excess stockpiled material, oversize material left in the borrow pit, material resulting from clearing and grubbing operations or excess overburden shall be used or disposed of as directed by the Engineer.

Material not capable of supporting vegetation shall be buried and used in shaping the borrow and spoil areas and subsequently be covered with stockpiled soft overburden material. All available overburden shall be spread evenly to the thickness directed. Material to be backfilled in borrow and spoil areas shall be spread and placed in 500 mm thick layers and compacted to 90% MOD AASHTO using a pad foot roller. Dumping of solid waste will not be permitted in any borrow or spoil area and this as well as building rubble must be disposed of in accordance with Section 1 – General and Section 4 – Integrated Environmental Management.

The spreading of overburden from stockpiles shall be evenly spread, contoured and finished over the entire borrow pit and spoil area where after it shall be rehabilitated and vegetated as per guidelines in Section 47 - Landscaping and Rehabilitation and in accordance with the Environmental Management Programme.

The shaping and finishing off of the borrow pits and spoil areas shall be undertaken in such a manner that the final shape of the borrow pit shall blend with the surrounding areas, and these and spoil areas shall be properly drained. Care shall be taken to ensure that there will be no ponding of water in a finished borrow and spoil area. Where required the Contractor shall place earth banks to divert any surface water away from the borrow and spoil areas. The edges of the borrow pits and spoil areas shall be rounded off.

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Erosion protection in borrow pits and spoil areas shall be constructed as indicated on the Drawings, ordered or specified in accordance with the provisions of Section 47 - Landscaping and Rehabilitation and payment shall be effected under that Section.

After rehabilitation of the borrow pits and spoil areas the Contractor shall be instructed to either leave or remove the fence. Fencing around the borrow pits and spoil areas shall be left in position to enclose the damaged area until the vegetation has established itself and to enclose any area which is dangerous to livestock or for reasons as directed by the Engineer.

All heaps of stockpiled material including overburden shall be flattened so that no significant heaps of material are visible.

Access roads and Equipment areas shall be scarified and reinstated to conditions existing prior to the areas being used.

The finishing off of any borrow pit or spoil area shall be as directed by and to the satisfaction of the Engineer. Once the Engineer has signed off the borrow pit or spoil area as rehabilitated in accordance with requirements, the Contractor shall also provide to the Engineer letters signed by both the Contractor and the landowner, or occupier, discharging the Contractor and the Employer from all further liabilities in respect of any agreements, damage to crops, and borrow and spoil areas.

14.6 HAUL ROADS

Only designated haul roads shall be used to access the borrow and spoil areas. Where new haul roads are required, these shall be subject to prior approval by the Engineer.

The Contractor shall minimise any disturbance to the environment during the construction and operation of any haul roads. The Contractor shall fence haul roads.

The Contractor shall ensure that haul roads are maintained in a satisfactory condition and that appropriate steps, as detailed in this Specification, are taken to prevent air pollution and erosion. The Contractor's staff, including those of his Subcontractors, shall not be permitted to use any road or track other than the established haul roads.

Temporary haul roads shall be reinstated on completion as specified in Section 1 - General and Section 47 - Landscaping and Rehabilitation.

14.7 TESTING OF MATERIAL

Testing of borrow or excavated material shall be carried out in accordance with TMH1 and the relevant material specifications pertaining to the part of the Works for which the material is designated.

14.8 MISCELLANEOUS REQUIREMENTS

14.8.1 Power Supply

The Contractor shall be fully responsible for the provision, maintenance and removal of power supplies to borrow pits, spoil areas and excavations and no separate provision will be made in this regard for payment under the Contract. In this regard the Contractor shall ensure compliance with the provisions of the relevant Clauses under Section 1 - General.

14.8.2 Water Supply

The Contractor shall be fully responsible for the provision, maintenance and removal of all water supplies to borrow pits and spoil areas and no separate provision will be made in this regard for payment under the Contract. In this regard the Contractor shall ensure compliance with the provisions of the relevant Clauses under Section 1 - General.

14.8.3 Noise Pollution

The Contractor shall comply with the requirements with respect to noise pollution under this Contract and relevant legislation.

14.8.4 Dust Pollution

The Contractor shall take measures, such as regular spraying of water over haul roads and working areas, to minimise the creation of dust in areas in which he is working. The Contractor shall comply with the requirements of Section 4: Integrated Environmental Management and all relevant legislation with respect to dust pollution.

14.8.5 Safety and Security at Borrow and Spoil Areas

The Contractor shall take adequate measures to safeguard property and Equipment at borrow pits and spoil areas and shall adhere to safety and security requirements as called for in Section 2 - Occupational Health and Safety.

14.9 MEASUREMENT AND PAYMENT**14.9.1 General**

The rates tendered under this Section shall not include for the general obligations, Contractor's Equipment and work deemed to be covered by the items provided in Section 1 - General.

The rates tendered in the Bill of Quantities shall be based on the excavation and full exploitation of material from borrow areas.

Excavation for pipe trenches and excavations for the Works will not be included in the items under this Section but will be measured and paid under the relevant items of Section 15 – Backfilling and Bedding, Section 9 – Bulk Surface Excavations and Trenching, Section 25 – Roadworks and Paving and Section 26 – Road Maintenance.

The finishing off of borrow pits and spoil areas shall be deemed to be included in the rates tendered.

Unless otherwise stated, all measurement for payment purposes will be made in cut / in-situ.

14.9.2 Excavation in Borrow Areas

No separate measurement will be made for the procuring and furnishing of borrowed material for the Works under this Section. Rates tendered shall be as stated in relevant clauses of Section 15 – Backfilling and Bedding, as well as Section 26 – Road Maintenance. Removal and spoiling of unsuitable and surplus material at borrow pits shall be paid for under relevant items in Section 15 - Backfilling and Bedding. Where required, trench Main Backfill material and Bedding Material shall be screened at the borrow pit to comply with the material specifications (refer Section 15 – Backfilling and Bedding).

14.9.3 Scheduled Items**14.001 Opening of borrow and spoil areas and access roads Unit: Sum**

The rate tendered shall be for all work and management required to open and operate any borrow pit or spoil area as well as the provision and maintenance of haul roads. The rate shall also be deemed to include for all double handling that may be required for spoiling, in the borrow pits, unsuitable material such as that from the trench excavations.

14.002 Removal and replacement of topsoil Unit: cubic metre (m³)

The rate tendered shall be for the removal and stockpiling of topsoil to a depth as specified in Section 7 – Clearing Site from the borrow pit or spoil area, stockpiling to a maximum height of 2 m and at completion the placing thereof in even thickness over the borrow pit and spoil area, spreading and levelling to final levels after placement of fertile soil as part of the rehabilitation process. This layer shall be measured in thickness and area stripped to determine the volume of material removed and placed.

14.003 Removal and replacement of fertile soil Unit: cubic metre (m³)

The rate tendered shall be for the removal and stockpiling of fertile soil below the topsoil to a depth as specified in Section 7 – Clearing Site from the borrow pit or spoil area, stockpiling to a maximum height of 2 m and at completion the placing thereof in even thickness over the borrow pit or spoil area, spreading and levelling to final levels after placement of overburden as part of the rehabilitation process. This layer shall be measured in thickness and area stripped to determine the volume of material removed and placed.

14.004 Removal and replacement of overburden Unit: cubic metre (m³)

Removal of overburden necessary for the procuring and furnishing of material for the Works shall be measured in place in terms of Section 5 - Survey and Setting Out, before stripping and such measurement shall be based on the depth of overburden measured in trial pits excavated by the Contractor in a square pattern at intervals of 30 m over the whole area concerned. Alternatively the Engineer may allow the overburden volumes to be calculated based on cross-section surveys or drone surveys undertaken prior to and after stripping of the overburden.

The rate tendered shall include full compensation for digging the trial pits (30 m x 30 m grid), stripping, removing and stockpiling the overburden prior to the excavation of borrow material and at completion returning the overburden to and spreading, covering up of vegetative waste in the borrow and spoil area and the levelling, rehabilitation and scarifying thereof all in accordance with the Rehabilitation requirements.

14.005 Boundary fencing and gates

Payment for borrow and spoil area boundary fencing and gates will be made under Section 6 - Fencing.

14.006 Handling of imported materials at the borrow and spoil areas prior to the commencement of finishing processes as per Clause 14.5

- a) **Spoiling of rock / boulders, material unsuitable for structural backfilling and surplus excavated material** **Unit: cubic metre (m³)**

The rate tendered for handling of spoiling the materials above shall include management of selective tipping, spreading, mixing, shaping, watering, compacting and testing for the density specified.