

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

TENDER NO 054/2024/PMID/MCWAP2/RFB

**PART C3.1
SPECIFICATION**

SECTION 23

CONCRETE RETAINING BLOCK WALLS

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SECTION 23

CONCRETE RETAINING BLOCK WALLS

23.1 SCOPE

This Section covers the construction of retaining structures by means of proprietary or custom-built precast concrete block retaining systems such as Löffelstein, Enviro-wall, Terrace block, etc.

It is acknowledged that certain aspects of the Standard Specifications for Road and Bridge Works for State Road Authorities, Committee of Land Transport Officials (COLTO), South Africa, have been used as a guideline in producing this Section.

23.2 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 Where reference is made to a Code, Specification or Standard that has subsequently been withdrawn and not replaced, the intended content will remain relevant unless confirmed otherwise in writing by the Engineer.

23.3 MATERIALS

23.3.1 General

All materials used in construction of retaining systems, as well as all precast units of proprietary or custom-built retaining systems shall be subject to the approval of the Engineer. At least 28 days before commencement of the construction work, the Contractor shall supply to the Engineer, at his own cost, full details and representative samples of the materials he intends using in order for the Engineer to approve the Contractor's design or require amendments to the design of the actual proprietary system that will be used.

When requested by the Engineer, the Contractor shall submit test certificates from an approved independent testing authority to show that the material complies with the specified requirements, or certificates from the patent holders or licensees certifying that the manufactured items comply in all respects with the relevant product specifications.

23.3.2 Concrete Base for Earth Retaining Systems

All materials for concrete bases for earth retaining systems shall comply with the relevant requirements of Section 20 - Concrete Works (Structural).

23.3.3 Precast Concrete Blocks

Precast concrete blocks shall be of the type shown on the Drawings or as scheduled in the Bill of Quantities, or they shall be of an approved alternative type. The blocks shall be uniform in colour and durable and shall not react with soil. All materials for precast concrete blocks shall comply with the relevant requirements of Section 20 - Concrete Works (Structural).

23.3.4 Backfill Material

The backfill material shall be approved granular material, unless otherwise specified on the Drawings. The materials shall be free draining with a PI of less than 12. The maximum size of aggregate shall not exceed 2/3 of the layer thickness.

All gradings shall comply with Table 2 of Section 3 of BS 8006-1:2010 "Walls and Abutments" in that material passing 75 µm sieve size shall be < 15 % for granular fills and 15-45 % for cohesive frictional fills with the maximum size limited to < 125 mm in both cases.

23.3.5 Sub-surface Drainage

The construction of any sub-surface drains behind concrete block retaining walls, as shown on the Drawings or as directed by the Engineer, and the materials used shall be in accordance with Clause 27.4 of Section 27 - Drainage and Erosion Protection.

23.3.6 Reinforced Concrete Retaining Block Walls

Construction of reinforced concrete retaining block walls, as shown on the Drawings or as directed by the Engineer and the geotextile used shall comply with the relevant requirements of Section 27 - Drainage and Erosion Protection.

23.4 CONSTRUCTION**23.4.1 Excavations**

Excavations for the bases of earth retaining systems shall be undertaken in accordance with the provisions of Section 9 - Bulk Surface Excavation and Trenches. The Contractor shall not commence with the construction of the bases before the excavations have been properly cleaned by the Contractor and inspected and approved by the Engineer.

23.4.2 Bases

Bases for earth retaining systems shall be of the type or types shown on the Drawings.

The provisions of Section 20 - Concrete Works (Structural) shall apply to the construction of concrete bases.

The bases shall be constructed in accordance with the dimensions and levels shown on the Drawings subject to the provisions of Clause 20.5.2.

No precast concrete blocks shall be installed until the Engineer has inspected and approved in writing the completed bases.

23.4.3 Installing the Precast Concrete Blocks

Precast concrete blocks shall be installed on completed bases in accordance with the specifications of patent holders or licensees and in accordance with the lines, levels and angles of inclination shown on the Drawings, subject to any variations ordered in writing by the Engineer.

23.5 PATENT RIGHTS

23.5.1 General

The Contractor shall negotiate directly with the patent holders or licensees in connection with royalties payable for the use of patented systems. The Contractor shall arrange for technical assistance by the patent holders or licensees before and during construction.

23.6 MEASUREMENT AND PAYMENT

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.

23.001 Patented earth retaining systems

- | | | |
|----|---|--------------------------------------|
| a) | Löffelstein precast concrete blocks of type (state type) | Unit: square metre (m ²) |
| b) | Enviro-wall precast concrete blocks of type (state type) | Unit: square metre (m ²) |
| c) | Terrace Block precast concrete blocks of type (state type) | Unit: square metre (m ²) |
| d) | Etc. for other patented earth retaining systems and other types of blocks | Unit: square metre (m ²) |

The unit of measurement shall be the square metre of the front face of the earth retaining system placed in position as shown on the Drawings, measured in the vertical. The front vertical face shall be measured from the top of the base to the top level of the earth retaining system.

The tendered rate shall include full compensation for procuring, furnishing, transporting, handling and placing all materials and precast concrete blocks, including the specified backfill material between the blocks, and any additional costs required for placing the blocks in position complete as specified.

23.002 Excavation for patented earth retaining systems

- | | | |
|----|---|--------------------------------------|
| a) | In soft material | Unit: cubic metre (m ³) |
| b) | Extra over sub-item 23.002(a) for excavation in hard material | Unit: square metre (m ²) |

Measurement and payment for excavation shall be as specified for Item 9.001, Section 9 – Bulk Surface Excavation and Trenching except that no additional excavation shall be measured where formwork is required.

**23.003 Concrete bases for earth retaining systems (class of Unit: cubic metre (m³)
concrete indicated)**

The unit of measurement shall be the cubic meter of concrete cast in the concrete bases for earth retaining systems, calculated in accordance with the net approved dimensions of the concrete bases shown on the Drawings.

The tendered rate shall include full compensation for supplying and placing the concrete and constructing the concrete bases, including any formwork which may be necessary, and for all steel reinforcement, and other items required to complete the bases as specified.