

PART 1 – GENERAL**1.1 Description**

The work covered by this section includes the furnishing of all labor, materials, equipment and incidentals for the design, inspection and construction of a modular concrete retaining wall including drainage system as shown on the Construction Drawings and as described by the Contract Specifications. The work included in this section consists of, but is not limited, to the following:

- a) Excavation and foundation soil preparation.
- b) Furnishing and placement of the levelling base.
- c) Furnishing and placement of geotextiles.
- d) Furnishing and placement of segmental retaining wall facing units.
- e) Furnishing and compaction of granular backfill and retained soils.

1.2 Related Work

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| .1 | Site Grading | Section 02210 |
| .2 | Topsoil and Finish Grading | Section 02260 |

1.3 Approved Products

1. Pisa2[®] Segmental Retaining Wall System as supplied by Authorized Manufacturer.
2. Colour to be Sierra Grey.

1.4 The Contractor

1. The term Contractor shall refer to the individual or firm who will be installing the retaining wall.
2. The Contractor must have the necessary experience for the project and have successfully completed projects of similar scope and size.

1.5 Delivery, Material Handling and Storage

1. The installing contractor shall check all materials delivered to the site to ensure that the correct materials have been received and are in good condition.
2. The Contractor shall store and handle all materials in accordance with manufacturer's recommendations and in a manner to prevent deterioration or damage due to moisture, temperature changes, contaminants, breaking, chipping, or other causes.

1.4 Scheduling

- .1 Schedule installation of retaining wall prior to green construction and topsoil placement.

PART 2 - PRODUCTS**2.1 Materials**

1. Concrete Segmental Retaining Wall Units
 - a) The concrete wall modules shall be 150 x 200 x 300 mm (6 x 8 x 12 inches) with a maximum tolerance of plus or minus 3 mm (1/8 in.) for each dimension.
 - b) The retaining wall modules shall be solid units and have a minimum weight of 20.4kg (45 lbs.) per unit.
 - c) The concrete wall modules shall have an integral shear key connection that shall be offset to permit a minimum wall batter of 1H : 8V.
 - d) The concrete wall modules shall have a minimum 28-day compressive strength of 35 MPa (5000 psi) as tested in accordance with ASTM C 140. The concrete shall have a maximum moisture absorption rate of 5 percent to ensure adequate freeze-thaw protection.
2. Retained Soil
The retained soil shall be on site soils unless specified otherwise in the Construction Specifications or as directed by the Contract Administrator.
3. Foundation Soil
The foundation soil shall be the native undisturbed on site soils. The foundation soil shall be examined and approval by the Contract Administrator prior to the placement of the base material.
4. Levelling Base Material
The footing material shall be non-frost susceptible, well graded compacted crushed stone as shown on the Construction Drawings.
5. Geotextile Filter
The non-woven geotextile shall be installed as specified on the construction drawings. Although selection of the appropriate geotextile specifications is site soil specific, a commonly used geotextile for filtration will have an Apparent Opening Size ranging between 0.149 and 0.210 mm (U.S. Sieve Sizes 100 to 70) and a minimum unit weight of 135 grams per square meter (5.0 oz / square yard). The coefficient of permeability will typically range between 0.1 and 0.3 cm/second.
6. Concrete Adhesive
 - a) The adhesive is used to permanently secure the coping stone to the top course of the wall. The adhesive must provide sufficient strength and remain flexible.

PART 3 - EXECUTION**3.1 Design Geometry**

- A) The length, height, and overall elevations of the retaining wall must comply with the requirements of the proposed elevation detail and site grading plan.
- B) The structures' design height, shall be measured from the top of the leveling pad to the top of the wall where ground surface intercepts the wall facing.

C) Slopes above and below all sections of the segmental retaining wall are detailed in the site grading plan.

3.2 Installation of Modular Concrete Retaining Wall Units

A) The bottom row of retaining wall modules shall be placed on the prepared levelling base as shown on the Construction Drawings. Care shall be taken to ensure that the wall modules are aligned properly, levelled from side to side and front to back and are in complete contact with the base material.

B) The wall modules above the bottom course shall be placed such that the tongue and groove arrangement provides the design batter (i.e. setback) of the wall face. Successive courses shall be placed to create a running bond pattern with the edge of all units being approximately aligned with the middle of the unit in the course below it.

C) The wall modules shall be swept clean before placing additional levels to ensure that no dirt, concrete or other foreign materials become lodged between successive lifts of the wall modules.

D) The contractor shall check the level of wall modules with each lift to ensure that no gaps are formed between successive lifts.

E) Care shall be taken to ensure that the wall are not broken or damaged during handling and placement.

3.3 Retained Soil

A) Retained soils shall be placed and compacted behind the drainage material in maximum lift thickness of 150 mm (6 in.). The retained soils shall be undisturbed native material or fill compacted to a minimum density of 95% Standard Proctor.

B) No heavy compaction equipment shall be allowed within 1 m (3 ft.) of the back of the wall modules.

3.4 Finishing Wall

A) Coping units shall be secured to the top of the wall with two 10mm (3/8 inch) beads of the approved flexible concrete adhesive positioned 50mm (2 inches) in front and behind the tongue of the last course of retaining wall units.

B) Finish grading above the wall to direct surface run off water away from the segmental retaining wall. Use a soil with a low permeability to restrict the rate of water infiltration into the retaining wall structure.

3.5 Acceptance

A) The Contract Administrator is responsible for verifying that the contractor meets all the requirements of the specification. This includes the use of approved materials and their proper installation.

B) The Contractor's field construction supervisor shall have demonstrated experience and be qualified to direct all work related to the retaining wall construction.

Construction Tolerances

The following tolerances are the maximum allowable deviation from the planned construction,

Vertical Control: +/- 30mm over a 3.0m distance, +/- 50mm total

Horizontal Control: +/- 30mm over a 3.0m distance, +/- 50mm total Rotation: +/- 2 degrees from planned wall batter

Bulging: 25mm over a 3.0m distance