

ITEM 809

SEGMENTAL RETAINING WALL SYSTEM

PART 1 GENERAL

1.01 DESCRIPTION:

This item shall govern for the construction of Segmental Retaining Wall System or approved equal. All concrete segmental retaining wall units shall be in accordance with specifications herein outlined and in conformity with the required lines, grades, sections and details shown on the plans or as directed by the Engineer.

1.02 SUMMARY

- A. Concrete segmental retaining wall units.

1.03 REFERENCES

American Society of Testing And Materials

- A. ASTM C1372-99a; Standard Specifications for Segmental Retaining Wall Units
- B. ASTM C1262-98; Standard Test Method for Evaluating the Freeze-Thaw Durability of Manufactured Concrete Masonry Units and Related Concrete Units
- C. ASTM C698-91; Standard Test Method for Moisture-Density Relations for Soils and Soil-Aggregate Mixtures Using 5.5-lb Rammer and 12-in Drop (Standard Proctor)
- D. ASTM C1557-91; Standard Test Method for Moisture-Density Relations for Soils and Soil-Aggregate Mixtures Using 10-lb Rammer and 18-in Drop. (Modified Proctor)
- E. ASTM C140-99b; Standard Test Methods of Sampling and Testing Concrete Masonry Units

1.04 SUBMITTALS

- A. Manufacture's literature: Materials Description.
- B. Shop Drawings: Retaining wall system design, including wall heights and drainage provisions. A registered professional engineer, licensed in the state of Texas, shall sign the shop drawings, for wall installations.
- C. Samples
 - 1. Furnish unit in the color and face pattern specified if requested by the Architect. If approved, unit may be used in the finished work.
- D. Test Reports from an independent laboratory stating moisture absorption and compressive strength properties of the concrete wall units meet the project specifications when tested in accordance when tested in accordance with ASTM C140-96, Section 6, 8 and 9.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.05 STORAGE AND HANDLING

- A. To prevent damage, store above ground on wood pallets or blocking. Remove damaged or otherwise unsuitable material, when so determined, from the site.

- a. Faces of the concrete wall units shall be substantially free of chips, cracks and stains.
- b. Prevent excessive mud, wet cement, epoxy, and like material, which may affix themselves, from coming in contact with the materials.

1.06 DEFINITIONS:

- A. Geosynthetic reinforcement is a material specifically fabricated for use as a soil reinforcement.
- B. Concrete retaining wall units are as detail on the drawings and are specified under Item 809 – Segmental Retaining Wall Systems.
- C. Drainage aggregate is a material used around and directly behind the concrete wall units.
- D. Backfill is the soil, which is used as fill behind the drainage aggregate and within the reinforced soil mass if applicable.
- E. Foundation soil is the soil mass supporting the leveling pad and reinforced zone of the retaining wall system.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Concrete Retaining Wall Unit “Anchor Diamond Pro Retaining Wall Unit” as manufactured under license from Anchor Wall Systems or approved equal.
 - 1. Concrete wall units shall meet requirements of ASTM C1372-97 except the maximum water absorption shall be limited to 7.0 percent and unit height dimensions shall not vary more than +/- 1/16 inch from that specified.
 - 2. Concrete wall units are required to have a minimum of 0.94 square foot face area.
 - 3. Color as selected by Architect from manufacturer’s standard selections.
 - 4. Face pattern: Geometry: Beveled or Straight.
 - 5. Texture: Smooth or Split Rock Face.
 - 6. The concrete units shall include an integral concrete shear connection flange/locator.
- B. Base: Material shall consist of drainage aggregate, sand and gravel and/or concrete as shown on the construction drawings. A minimum of 6 inches of compacted base is required.
- C. Drainage aggregate: Fill between units shall consist of free-draining, crushed coarse aggregate that meets the gradation requirements of ASTM 448-86; Standard Classification for Sizes of Aggregate for Road and Bridge Construction, designations 57, 67, 6, 7 or 8.
- D. Backfill: Materials are suitable non-organic soils at a moisture content which enables compaction to the specified densities. Unsuitable soils are organic soils and those soils with the USCS classification symbol of CH, OH, MH, OL, or PT. CL soils with a Plasticity Index (PI) greater than 25 are also considered unsuitable soils.
- E. Drain tile: The drainage collection pipe shall be a perforated or slotted PVC or corrugated HDPE pipe. The pipe may be covered with a geotextile filter fabric to function as a filter.

PART 3 EXECUTION

3.01 CONSTRUCTION METHODS

- A. Examine the areas and conditions under which the retaining wall is to be erected and notify the Civil Engineer or the City Inspector in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected. Promptly notify the wall design engineer of any site conditions, which may affect wall performance or may require a reevaluation of the wall design
 - a. Foundation soil shall be examined by the project geotechnical engineer to ensure that the actual foundation soil strength meets or exceeds that required on the construction drawings.

- B. Excavate to the lines and grades shown on the construction drawings. Over excavation not approved by the owner or duly appointed owner's representative shall not be paid for and replacement with compacted fill and/or wall system components will be required at the Contractor's expense. Do not disturb base beyond the lines shown. The Contractor shall be responsible for the stability of the excavation and its influence on adjacent properties and structures.

- C. Foundation soil shall be excavated as required for footing or base dimension shown on the construction drawings, or as directed by the engineer.
 - a. Soil not meeting the required strength shall be removed, sufficiently oversized from the front of the block and the back of the reinforcement and back-filled with suitable material.
 - b. Over-excavated areas shall be filled with suitable compacted backfill.

- D. Base materials shall be placed as shown on the construction drawings with a minimum thickness of 6 inches.
 - a. Base materials shall be installed upon undisturbed soils, or foundation soils prepared in accordance with letter C above.
 - b. Material shall be compacted so as to provide a level, hard surface on which to place the first course of units.
 - c. Base materials shall be prepared to ensure complete contact of retaining wall unit. Gaps shall not be allowed.
 - d. Base materials shall be to the depths and widths shown on the plans. Reduced the depth of sand and gravel and replace with a 1" to 2" concrete topping. Concrete shall be lean, unreinforced and a maximum of two inches thick. Where a reinforced footing is required, place below the frost line.

- E. First course of concrete wall units shall be placed on the prepared base material. Units shall be checked for level and alignment. The top of all units in base course shall be at the same elevation
 - a. Ensure that concrete wall units are in full contact with base.
 - b. Concrete wall units shall be placed side by side for full length of wall alignment. Alignment may be done, by using a string line or offset of wall line.
 - c. Fill all voids between and within concrete wall units with drainage aggregate.
 - d. A minimum of 12 inches of drainage aggregate shall be placed behind the concrete wall units.
 - e. Drain tile shall be installed at the lowest elevation possible to maintain gravity flow of water to outside of the reinforced zone. The drainage collection pipe shall be day lighted to an appropriate location away from the wall system at not more than every 75-feet and at low points of the wall.
 - f. Remove all excess fill from top of units and install next course. Ensure drainage aggregate and backfill are compacted before installation of next course.

