



C185 SYSTEM: SPECIFICATION GUIDELINES

Section _____ (323223- Segmented Retaining Walls)

Part 1- General

Scope:

Work includes furnishing and installing concrete retaining wall units to the lines and grades designated on the construction drawings and as specified herein.

Description:

SmartSlope Living Wall System is a complete segmented vegetated retaining wall system, comprised of individual 20" wide by 8" high x 15" deep modules and accessory pieces. The modules are segmented retaining wall units designed as planting containers providing two functions – structural wall facing and plant growth. SmartSlope Living Retaining Wall System is designed to be installed in accordance with these specifications and the installation manual (www.smartslope.com). Also following the lines and grades designated on the drawings/plans. Work shall include foundation, drainage, reinforcement, and related accessories per engineering specification.

1.01 Related Sections

1. Site Preparation
2. Earthwork

1.02 References

1. ASTM C 1372-03 Standard Specification for Segmented Retaining Wall units
2. ASTM D 698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort
3. ASTM C 140 Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units

1.03 Definitions

1. Module: SmartSlope modules are wet cast composite concrete/polymer, formed in molds to produce uniform units.
2. Geosynthetic Reinforcement: SmartGrid: Polymeric strapping reinforcement system replaces geogrid rolls with improved connection values.
3. Drainage aggregate: Stone material (if used) behind the modules.
4. Filter Fabric: Used to separate soils, aggregates and/or around drain pipes.
5. Backfill Zone: Area behind the wall that is backfilled with specified material and compacted to specified compaction.

Part 2- Products

SmartSlope Living Retaining Wall Modules (as produced by a licensed manufacturer)

Modules weigh approximately 77 lbs and maintain minimum compressive strength of 5,000 psi at 28 days with 5% to 7% air entrainment. The polypropylene liner and all accessory parts contain 100% post consumer recycled material.

SmartGrid

Bundles of closely packed high strength synthetic fibers encased in a tough and durable polymeric sheath.

SmartBatter

Small form fitted blocks that provide a consistent register at both 50 and 60 degrees of batter.

SmartShield

Form fitted pieces used between modules to inhibit soil wash out. Intended for use in area subjected to occasional water immersion.

SmartRadius

Polypropylene trusses that drop into module when turning tight radiuses. These trusses broaden the bearing surface which is needed when stacking radii that shifts bearing points away from the side rails.

2.01.1 Submittals

1. Shop drawings: Retaining wall design calculations and drawings are to be stamped by a registered Professional Engineer licensed in the state of the project.
2. Product data: Material description and installation manual for each product specified.

2.01.2 Delivery, Storage & Handling

1. Contractor shall check the materials upon delivery to assure the proper materials have been received.
2. Exposed faces of concrete modules are to be free of chips, cracks, stains and other imperfections and additional materials are free of defects.
3. Contractor shall protect the materials from damage, as damaged materials shall not be used in the project (ASTM C 1372).

2.01.3 Manufacturer

SmartSlope, LLC
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Fax: (443) 874-7466
Email: wagee@smartslope.com
Web: www.smartslope.com

Part 3- Execution**3.01 Excavation**

Contractor shall excavate to the lines and grades shown on the construction drawings. Use care when excavating to prevent disturbance of the base beyond the lines shown. Contractor shall follow all local, state, and federal laws regarding earthwork.

3.02 Leveling Pad

Foundation soil shall be excavated as required for the leveling pad to the depths and locations shown on the plan sheet or as directed by the design engineer. The exposed foundation soil shall be observed by the on-site soils engineer prior to construction to verify that the exposed material is suitable for a net design bearing pressure of (per design) psf and that the base of the excavation is free of loose soil, non-compacted fill, water, or frozen material. Undercut any unsuitable soil. Undercut areas shall be filled with crushed limestone and compacted to at least 95% of the material's standard Proctor maximum dry density. Construct the crushed rock leveling pad to the lines and grades shown on the plans.

3.03 Base Course

Install the first course of modules on the leveling pad. Modules should be level side to side. The tails of the modules should be half a bubble higher than the faces on a level. The modules shall be placed 14" apart in accordance with the diagrams to yield a 34" center-on-center spacing. Fill units, and spaces between units, with selected unit fill to a level even with the tops of the side rails. If soil fill, the material must be stepped on to give some compaction to ensure the trough is properly filled. Screed off the rail tops to ensure the next course will set evenly on the side rails and install the next course in a running bond stack.

3.04 Unit Installation

Each module straddles two modules on the course below creating a checker board pattern of planting pockets. Pull the units forward into contact with either the rear face of the lower module or the desired SmartBatter spacer to establish a (70, 60 or 50) degree wall batter. On any given lift, always fill the entire course of modules before placing mass backfill. Backfill behind the modules to the cut embankment or ends of the geogrids and continue construction in sequence. Each course of modules must be stacked and completely backfilled before the next course is placed. No double stacking (multiple courses before filling) shall be allowed. Radius walls may require smaller or larger spacing between the units to maintain the running bond. When off-bond (upper module not evenly straddling lower module), then addition of the SmartRadius supports may be installed in order to ensure peak performance of the system. Drain pipes are to be installed as specified and run to daylight at low points and/or periodically along wall alignment as shown on plans.

3.05 Reinforcement

Where reinforcement is required, SmartSlope Living Retaining Wall System includes a true mechanical connection through the module itself (no need for additional pins, rods, pipes, or other means of attachment) creating high connection values regardless of wall height. SmartSlope Living Retaining Wall Systems are designed to be reinforced with a unique, woven and coated polymer strip reinforcement called SmartGrid. SmartGrid comes on small diameter, densely packed rolls that can easily be carried by a single laborer. Once the modules of a reinforced course have been placed on the wall column, each module must be flipped up to rest down on its face. The tag end of the SmartGrid shall be inserted from the top (inside the trough) into the connection aperture in the bottom of each module. Then the module may be tilted back into a normal installed position. The SmartGrid may now be pulled taught evenly into the backfill zone for each module of the course at the elevations shown on the plans. The terminal ends of the strip should be at the same distance from the module and spread apart no more than the center-to-center width of the modules, which is 34". SmartGrid placed outside a plus or minus 4" zone of the placement design elevation will not be accepted. Slack in the SmartGrid shall be removed prior to placing backfill. Initial mass backfill should be placed on the tails of the strips in order to hold them taught. Remaining backfill shall be placed and /or pushed in a rearward direction, starting from the modules moving toward the rear of the fill zone. Construction equipment shall not be operated directly on the SmartGrid material.

3.06 Backfill

Wall backfill material shall be placed in maximum (8") loose lifts and compacted to at least 95% of the material's maximum dry density as determined by the standard Proctor method. Backfill shall be placed, spread and compacted in such a manner that minimizes wrinkles and movement of the reinforcement. Field density testing shall be conducted by a qualified soils technician to verify that at least the minimum degree of compaction is being obtained. The finished grade above the structure should include a drain swale and must be sloped in such a manner to drain all water away from the wall. (Go to the SmartSlope website www.smartslope.com for even more views and details).

3.07 Planting

SmartSlope Living Retaining Walls were designed from their inception to be planted and grown over. The system is intended to be the most reliable means available for creating strong, economical structures that quickly disappear into the natural landscape. All of our design efforts have gone into making a system that will disappear once complete and yield an end-product that blends into the surrounding landscape as opposed to separating it. Once complete, the face of the finished system should be brushed off to dislodge any over-filling of the pockets which would quickly slough off on its own. If planting instead of hydro seeding, planting must start from the top course and continue down the face of the wall until every pocket is filled with at least one plant. The planting pocket is designed large and the fill volume is high, so each pocket can accommodate multiple plugs or larger potted species. Live plants should be centered in the “sun receiving” area of the pocket (not under the upper module). As an alternative, modules can be either hydro-seeded or seeds can be hand sewn. (Hand sowing in the most efficient) Plants must be watered in and fertilized in accordance with the project plans. Maintenance could be required for the first year in order to ensure a proper grow-in. Walls are low to no maintenance thereafter. Always consult with the owner and/or their representatives early in the project to determine all responsible parties with regard to plants, quantity, design, maintenance and feeding.

3.08 Irrigation (If needed)

The modules have been designed to provide ¼” drip irrigation to be placed in the void on each side rail to run a continuous water line.

3.09 Maintenance

The modules do not require maintenance.

Maintenance and care of the vegetated portions of the wall system is required at least until the vegetation is established (grown in). The initial and continuing maintenance required will depend on the type of vegetation, local weather conditions, and exposure.

Technical Support

SmartSlope, LLC staff is available at (443) 874-7465 or www.smartslope.com for information and technical advice.

Availability and Cost

SmartSlope Living Retaining Wall Systems are available through the manufacturer, SmartSlope, LLC. (443) 874-7465
Call for pricing and ordering details.

3.10 Warranty

SMART SLOPE, LLC warrants to its customers that each SmartSlope retaining wall Module is manufactured in accordance with current ASTM standards on compression strength, and absorption for concrete masonry Modules for 15 years after it is properly installed. If a Module does not meet this warranty standard, the customer shall notify SMART SLOPE, LLC in writing and, pursuant to Smart Slope’s directions, such customer shall return the applicable Modules to the manufacturer or destroy them. SMART SLOPE, LLC shall ship to its customer, as applicable, at SMART SLOPE’s expense, replacement Modules which shall be SMART SLOPE’s sole remedy for breach of this warranty. SMART SLOPE, LLC shall have no obligation to install such replacement Modules.

This Warranty shall not apply to any Module which is damaged or defective or fails to meet the warranty standard due to the manner in which it was installed, any chemicals coming in contact with the Module, the design of the structure in which a Module is used, excessive or unforeseen site conditions, soil conditions, manufacturing defects, or other conditions beyond SMART SLOPE LLC’s control. THE ABOVE SETS FORTH THE

SOLE WARRANTY FROM SMART SLOPE LLC REGARDING THE PRODUCT AND IS MADE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND SMART SLOPE, LLC SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

Warranty information should be sent to:

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