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General Construction Overview



A Note from Recon to our Specifiers, Engineers, Wall Installers, and Customers:

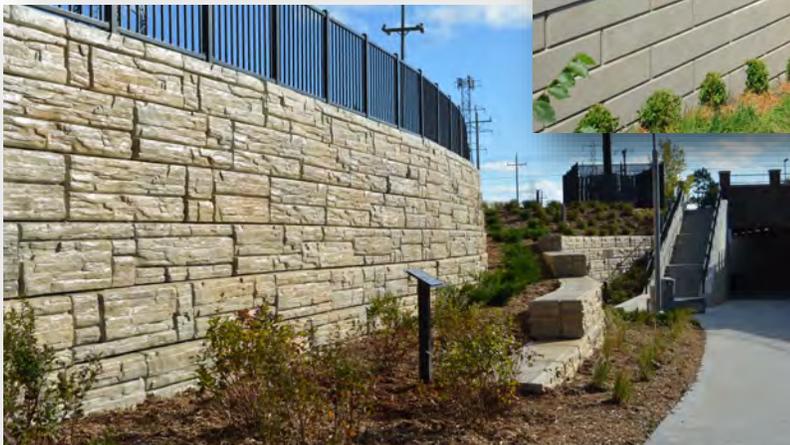
*When we first started Recon Retaining Walls, we set out to do more than just supply a product ... we made it our mission to provide **SOLUTIONS and ADD VALUE**. With this idea in mind, we carefully engineered and crafted each one of our blocks to serve a specific purpose. So, whether your project focuses on scale and aesthetics, durability, site constraints, or construction efficiencies, we are confident that we have a product that will solve your site-specific challenges.*

*As you know, the proper design and construction of a retaining wall is essential. Recon recognizes the important role that YOU; our specifiers, engineers, and installers, play in delivering a site solution that provides long lasting value for your customers. Recon wants to assist you when working on grade separation projects by providing tools that explain the special characteristics of Recon and how they can be used to address the challenges at hand. Recon's Design and Construction Manual includes comprehensive and specific information for each of our block families; Retaining Walls, Fence and Guardrail Walls, and Columns, in a convenient and easy to use format. We recommend that this information be used in combination with the additional material available on our website, **Reconwalls.com**. Armed with these resources, we believe that you will have a successful project and a Recon retaining wall that will perform as designed and remain attractive for years to come.*

If you require any additional information or there is anything that we can help you with, please feel free to contact us.

Sincerely,

The Recon Team



Recon Wall Systems—General Construction Overview

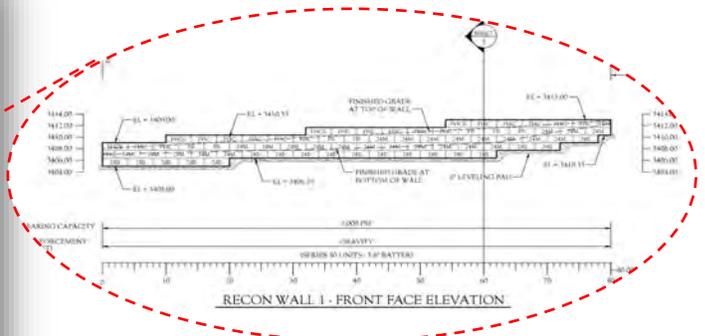
The following procedures comply with generally accepted industry standards for the installation of Precast Modular Block Retaining Walls with special attention given to the unique features of the Recon product line. Every attempt should be made to follow these procedures unless the project specifications, drawings or the final engineered wall design directs otherwise. **Additional guidance, which should be reviewed by the contractor, is provided in the Recon Installation Guidelines and Typical Construction Detail Drawings available at www.Reconwalls.com.**

Documenting the Scope of Work

Although unrelated to the actual installation of the retaining wall, proper preparation of a quote or bid can mean the difference between a profitable project, or working hard to merely break-even. Clearly defining your scope of work during the bidding process can remove ambiguity, allow the customer to better evaluate the bid, and potentially mitigate contractor risk. To request a copy of a typical retaining wall project Scope of Work Checklist, please contact Recon.

Preconstruction Meeting

For a project to run smoothly, it is important that all parties involved fully understand their role in the installation process. Getting the numerous sub-contractors on site to have a common understanding of the timing, coordination, sequencing, and access requirements of each trade is critical. Preconstruction meetings are a good, and often necessary, way to bring everyone together to discuss project roles and coordinate specific site activities.



Engineered Shop Drawings

For an installation contractor, having engineered shop drawings (aka: stamped plans or construction drawings) for the retaining wall, prepared by a qualified retaining wall design engineer, is an essential tool that is necessary for the proper installation of a Recon wall. A variety of information can be obtained from the stamped plan which will guide the installer during the construction process. This information includes items such as: the proper elevation of the wall, the depth of the gravity wall blocks, the length and strength of the geogrids (if applicable), the required bearing capacity of the foundation soils, as well as the location of any curves, corners, or any structure the wall may encounter. Shop drawings can also be used to help coordinate block delivery schedules and set productivity goals for the installation crew.

Site Preparation

Before beginning work, contractors should make sure they have thoroughly studied the project specifications, the engineered shop drawings for the wall and complied with all the requirements for product submittals. Contractors should also have a clear understanding of their scope of work and their responsibilities that may be covered elsewhere in the project specifications and are not in the actual wall construction section.



For projects that do not have a formal set of grading plans or specifications, but do have engineered shop drawings, the contractor should refer to the construction procedures outlined in this manual whenever a topic is not specifically covered.

Make sure to have the retaining wall site properly surveyed and staked by a qualified surveyor. These grade stakes, and elevation hubs, will be the guide for the excavation contractor and will help the retaining wall installer determine the location of the wall. Be sure to have proper stake off-sets to avoid damaging the stakes during the installation process.

Excavation

The contractor should carefully excavate the wall construction area to the lines and grades shown on the construction drawings. Exercise caution to keep the soil undisturbed in areas that will not need modification during wall construction. Be sure to mark the location of any below ground utilities including power lines, communication lines, sewer and drainage structures, etc.



Preparing the Leveling Pad

Using the grade stakes and elevation hubs, excavate the base course trench to a minimum depth of 6-inches and to a width that extends a minimum of 6-inches in front and behind the actual location of the base blocks along their designated placement. It is suggested that a laser transit be used to establish bottom of wall elevation. If the wall layout requires either inside or outside radius curves, it is recommended to increase the width of the leveling pad to accommodate adjustment during wall alignment. Grade stakes should also show where base step-ups are located. It is important to keep in mind that each step-up causes the leveling pad location to step back by one inch due to the integral setback of the Recon block.



Be sure to examine and test any foundation soil that appears inadequate and may not meet the bearing requirements set forth in the engineered plans.

Fill the trench and any over-excavated areas with the specified base material. Unless noted otherwise, this material should generally consist of a well-draining material that also contains enough fines that the leveling pad will hold its shape after compaction. Depending on the region, this material may be referred to as road base, $\frac{3}{4}$ -inch minus, crush-and-run, or Class 5. Fully compact the base material and add or remove material as necessary to keep the leveling pad as close to the final level grade as possible. Where step-ups are located, base material should taper up at roughly a 45-degree angle.

A concrete leveling pad may be required or desirable in lieu of a compacted granular base material. Unless the leveling pad is designed as a true strip footing that extends below frost depth, the concrete should not contain reinforcing and should consist of a relatively weak mix capable of breaking under frost pressure. This type of footing allows for resettlement as the frost dissipates. Concrete leveling pads, however, do not allow for minor adjustments to elevation or pitch once the concrete cures so it is important to take extra care to keep the pad level and any step-ups at their proper height to avoid difficulty in maintaining height tolerances.

Depending on the type of material used for the leveling pad, and how level the pad is to start with, base course leveling may be easier if the leveling pad is topped with up to $\frac{1}{2}$ -inch of clean sand or loose base course material. This increases the ability of the installer to make adjustments to block elevation, maintain a positive wall batter and minimize rotation during soil compaction when large compaction equipment is used.

Base Course Installation

The first (base) course of a Recon wall requires the use of a **Base Block**. This block does not have a groove along the bottom, which makes for easier leveling and provides greater frictional resistance at the interface between the leveling pad and Recon base block.



Walls should generally be built starting at the lowest elevation along the wall. However, if there are corners and/or abutting structures along the wall profile, these locations may be better places to start construction.

As base blocks are laid, ensure that they are in full contact with the leveling pad and check to confirm that the blocks are level both front-to-back and left-to-right. Lay blocks end-to-end and avoid gaps between blocks. The use of a string line will help ensure proper wall alignment along straight sections of wall. Curved base course locations can be established by using the grade stakes and a can of spray paint around the wall radius point.

Extra care should be considered for base course step-ups. Be sure to account for the 1-inch setback when establishing the next course location. If using granular material, the wedge of leveling pad material below the overlapping block must be properly compacted using a hand tamper or vibrating plate compactor. Concrete step-ups should be checked for consistent elevation from one course to the next.

After the base blocks have been placed and before compacting the backfill material behind the wall, compaction to the specified embedment depth should be done in front of the wall.

Backfilling and Compaction

When all the blocks comprising a section of wall at a single elevation have been placed, aligned and leveled, fill the pie-shaped voids between the blocks with a clean crushed rock material at least ½-inch to ¾-inch in size. Use this same material behind the back of the block to a depth of at least 1-foot or as otherwise indicated in the final engineering drawings. Because this material is generally self-compacting, this rock zone reduces the need for installers to operate compaction equipment close to the back of the blocks. In addition, this material can serve as a drainage column behind the block.

At times, a **filter fabric** may be specified behind the drainage aggregate material. This helps keep the drainage zone clean and free from sedimentation. If present, wrap the fabric forward over the drainage aggregate as the other backfill material is placed.



When **drain tile** is used, it should be located as shown in the plans or drawings. Generally, the drain tile runs along the back of the wall and is located near the bottom of the drainage aggregate zone. Drain tile should be installed at an elevation at or slightly above the finished grade level at the front of the wall, unless otherwise specified. Drain tile should daylight through the face of the wall at least every 50-feet along the length as well as at every low point in the wall, unless otherwise specified.

Place the specified backfill material and thoroughly compact the material in 8-inch lifts. Backfill material should be compacted to minimum 95% of standard proctor density. **Improper or inadequate compaction is a primary source of contractor-caused wall settlement and failures.** Close attention should be paid to changes in consistency and moisture content of all backfill material. Depending on the backfill type, it is important to use the proper type of compaction equipment. For sandy or gravelly materials, it is typical to use plate compaction equipment. Clayey materials generally require kneading by using a hand-operated jumping jack or sheep's foot roller. Only hand-operated compaction equipment shall be used within 3-feet of the back of the Recon blocks. Large, heavy compaction equipment should be kept a minimum of 5-feet from the back of the Recon blocks to avoid wall rotation.

Placing Additional Courses

Prior to placing successive courses, remove and keep clean any backfill material from the top of the Recon blocks and make sure that all voids are filled with the proper drainage material. A hand-operated or backpack leaf blower makes quick work of this task. Place the next course in a running bond pattern or as otherwise shown on the engineer's detailed wall elevation. Set the upper block and **slide it forward to engage the groove with the tongue on the block below.** Check and adjust level at every course elevation.

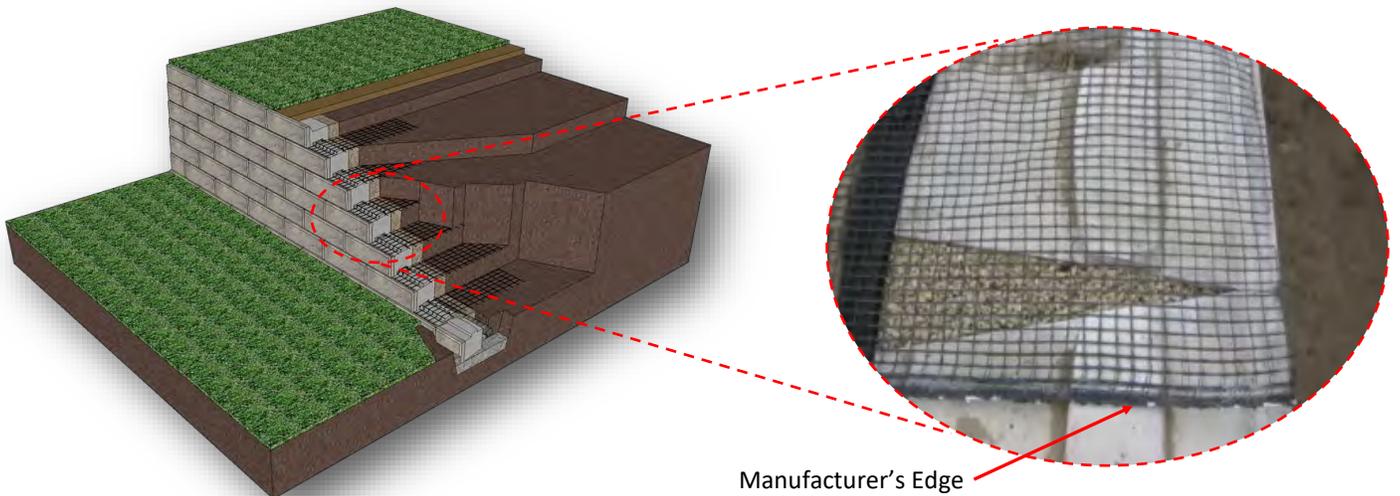
If shimming is required, plastic shims with high compressive strength should be used. Cover as much of the low surface area as possible to achieve the desired result and to minimize any point loading.



Geogrid Placement

When a geosynthetic reinforcement (geogrid) is required, use only the type/s specified. Also, make sure the reinforcement is cut to the proper lengths as indicated on the final engineered plan. Most geogrid types are uni-axial (stronger in one direction) and ***must be laid with the manufacturer's edge perpendicular to the wall face***.

Check the manufacturer's data to insure proper orientation. The geogrid should be laid on the top of the block as near to the front face as possible and extend back over a compacted, level backfill to the length required. Sandwich the reinforcement under the next course of Recon blocks to anchor in place. Pull the tail (loose end) of the grid taut to remove slack or wrinkles. Stake the tail of the geogrid prior to placing backfill material to maintain tension. When placing backfill over a layer of geogrid, start just behind the drainage aggregate and fill toward the tail of the geogrid. Avoid operating backfill equipment directly on the tensioned geogrid as much as possible. A minimum of 6-inches of backfill should be placed over the grid before driving any equipment on top of the grids. Avoid sharp turning and sudden braking with all types of equipment to avoid displacing, wrinkling or damaging the geogrid reinforcement.



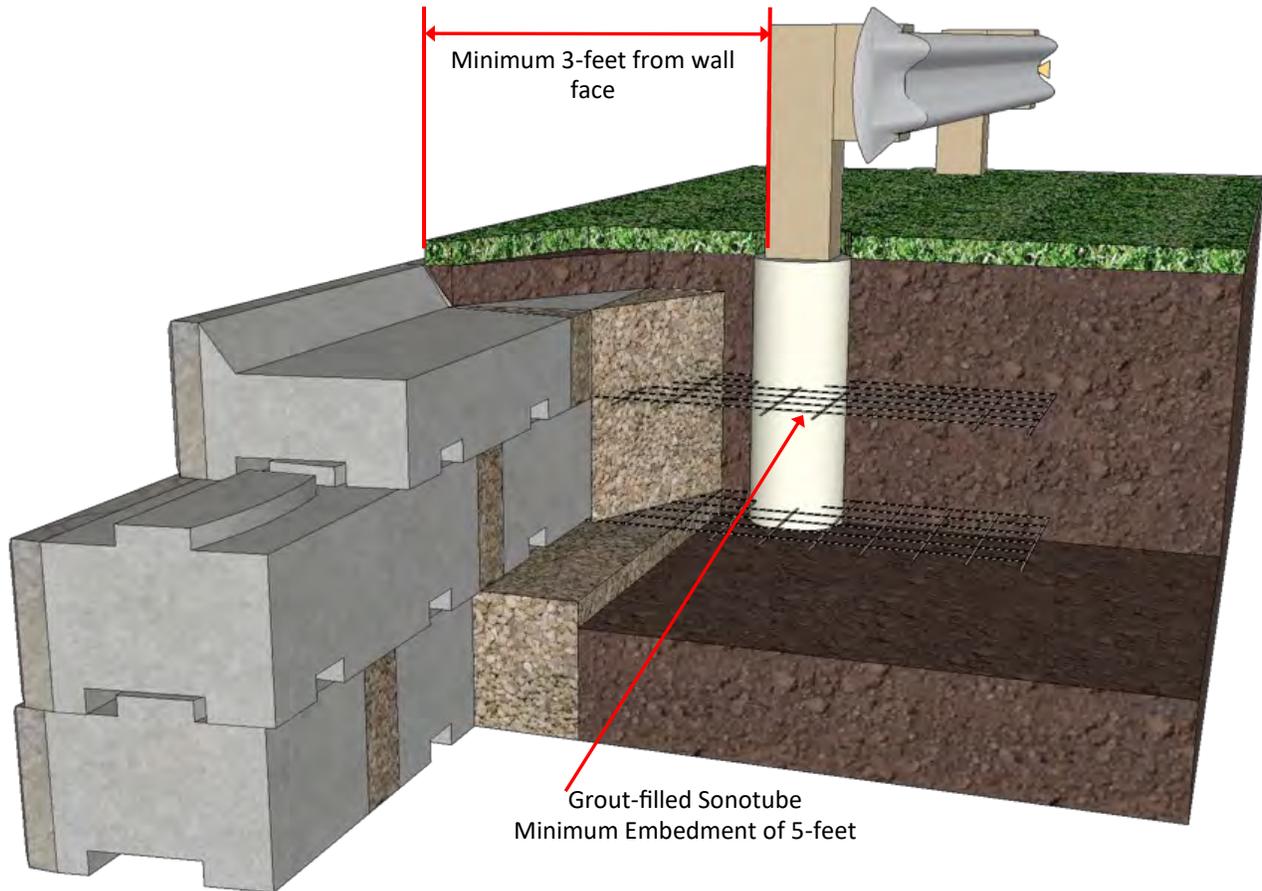
Manufacturer's Edge



Recon Wall Systems — Railings, Fences and Barriers

Independent Pedestrian Railings, Fences, and Traffic Barriers

Independent railings, fences, and barriers placed behind a Recon wall (not attached to or a part of the Recon blocks) may effect the design of the retaining wall. Please refer to Recon’s Design Overview Guide for additional information regarding design.



When constructing independent railings, fences, and traffic barriers, it is important that there is coordination between the wall installer and the contractor that will be installing the independent railing system. This will ensure that both are installed in the most efficient manner possible.

In the case of geogrid reinforced walls, installation of the sonotubes for the railing, fence or traffic barrier will be dependant on various site conditions. If the first layer of geogrid is deep enough below grade and/or the diameter of the hole required is small enough, it may be suitable to auger the holes after the wall installation is complete. Otherwise, installation of the sonotubes will need to coincide with the wall and geogrid installation with the grids being cut to fit around the sonotube.

Integral Pedestrian Railings and Fences

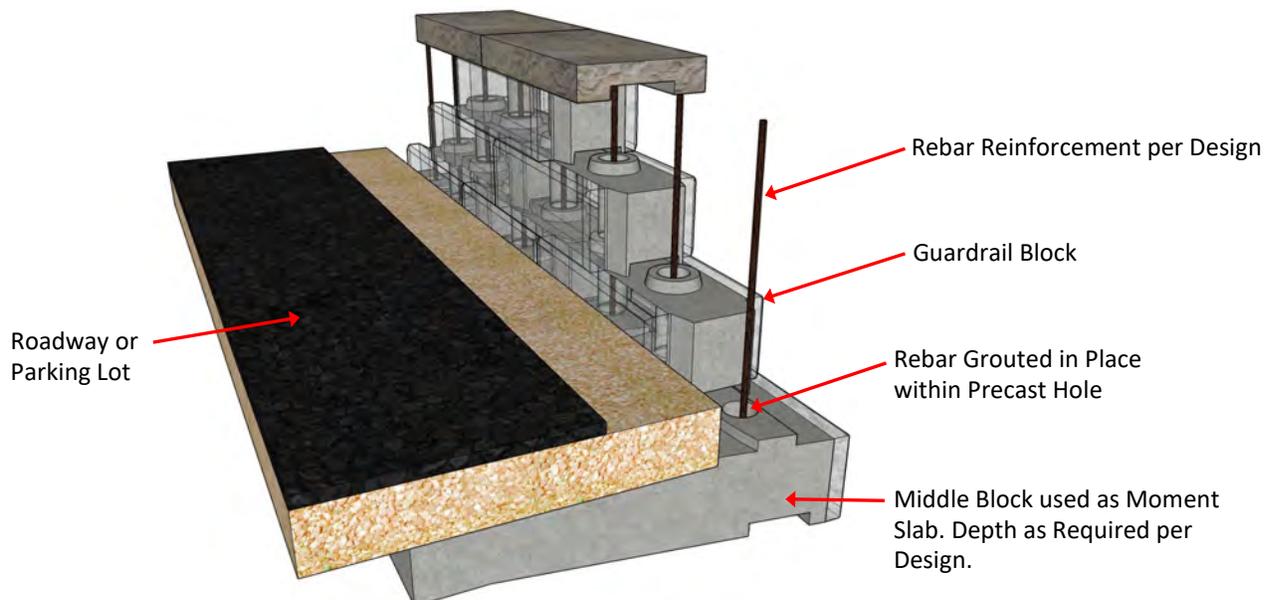
Recon units can be manufactured to accommodate certain types of railings or fences that are attached directly to the Recon block. Refer to Recon's Design Overview Guide for additional information regarding design and analysis. All railings and / or fences should be designed by a qualified engineer before wall construction begins since these structures may impact the design and / or the construction of the wall. The retaining wall installer should specify in the scope of work portion of their quote, whether or not they intend to install the railing or fence. Refer to Recon's typical details for additional installation information.



Traffic Barriers

The construction of a traffic barrier utilizing the Recon freestanding block consists of rebar reinforcement placed into grouted cores. It is critical that the cores align vertically and that the rebar and grout are properly sourced and installed. For further information, refer to the Freestanding Block Installation guide and / or the Design Overview Guide.

With respect to integral Guardrail Block walls, it is important to maintain retaining wall block levelness from front-to-back as the wall is constructed. This ensures that the first course of freestanding block will be installed level as well.



Note: This guide specification should not be included entirely “as-is”. Specification writers must edit areas in red which may or may not be relevant to a specific project or where mutually exclusive choices are referenced.

SECTION 32 32 16 PRECAST MODULAR BLOCK RETAINING WALL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes: Furnishing materials and labor required for the design and construction of a Recon pre-cast modular block retaining wall.
- B. Related Sections:
 - 1. Section 312000 Earth Moving
 - 2. Section 099313.13 Exterior Staining
 - 3. Section 099723 Concrete and Masonry Coatings
 - 4. Section 099623 Graffiti-Resistance Coatings

1.2 REFERENCES

- A. Precast Modular Block Units:
 - 1. ASTM C-33 Specification for Concrete Aggregates
 - 2. ASTM C-39 Test Method for Compressive Strength of Cylindrical Concrete Specimens
 - 3. ASTM C-94 Specification for Ready-Mixed Concrete
 - 4. ASTM C-138 Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete
 - 5. ASTM C-143 Test Method for Slump of Hydraulic-Cement Concrete
 - 6. ASTM C-172 Standard Practice of Sampling Freshly Mixed Concrete
 - 6. ASTM C-260 Specification for Air-Entraining Admixtures for Concrete
 - 7. ASTM C-494 Specification for Chemical Admixtures for Concrete
 - 8. ASTM C1611 Test Method for Slump Flow of Self-Consolidating Concrete
 - 9. ASTM C-1776 Standard Specification for Wet-Cast Precast Modular Block Retaining Wall Units
- B. Drain Pipe:
 - 1. ASTM D-3034 Standard Specification for Type PSM (Vinyl Chloride) (PVC) Sewer Pipe and Fittings
 - 2. ASTM F-2648 Standard Specification for 2 to 60 inch [50 to 1500 mm] Annular Corrugated Profile Wall Polyethylene (PE) Pipe and Fittings for Land Drainage Applications
- C. Geosynthetics:
 - 1. ASTM D-4595 Tensile Properties of Geotextiles - Wide Width Strip
 - 2. ASTM D-4873 Standard Guide for Identification, Storage and Handling of Geosynthetics
 - 3. ASTM D-5262 Unconfined Tension Creep Behavior of Geosynthetics
 - 4. ASTM D-5321 Standard Test Method for Determining the Coefficient of Soil and Geosynthetic or Geosynthetic and Geosynthetic Friction by the Direct Shear Method
 - 5. ASTM D-5818 Standard Practice for Obtaining Samples of Geosynthetics from a Test Section for Assessment of Installation Damage
 - 6. ASTM D-5970 Standard Test Method for Deterioration of Geotextiles from Outdoor Exposure
 - 7. ASTM D-6637 Standard Test Method for Determining Tensile Properties of Geogrids by the Single- or Multi-Rib Tensile Method
 - 8. ASTM D-6638 Standard Test Method for Determining Connection Strength Between Geosynthetic Reinforcement and Segmental Concrete Units
 - 9. ASTM D-6706 Standard Test Method for Measuring Geosynthetic Pullout Resistance in Soil
- D. Engineering Design:
 - 1. NCMA Design Manual for Segmental Retaining Walls, Current Edition
 - 2. AASHTO LRFD Bridge Design Specifications, Current Edition
 - 3. International Building Code (IBC), Current Edition
 - 4. Minimum Design Loads for Buildings and Structures, ASCE 7, Current Edition
- E. Soils:
 - 1. ASTM D-422 Standard Test Method for Particle-Size Analysis of Soils

2. ASTM D-448 Standard Classification for Sizes of Aggregates for Road and Bridge Construction
 3. ASTM D-698 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/f³) (600 kN-m/m³)
 4. ASTM D-1241 Standard Specification for Materials for Soil-Aggregate Subbase, Base and Surface Courses
 5. ASTM D-1556 Standard Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method
 6. ASTM D-1557 Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/f³) (2700 kN-m/m³)
 7. ASTM D-2487 Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
 8. ASTM D-3080 Standard Test Method for Direct Shear Test of Soils Under Consolidated
 9. Drained Conditions
 10. ASTM D-4318 Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
 11. ASTM D-4767 Test Method for Consolidated-Undrained Triaxial Compression Test for Cohesive Soils
 12. ASTM D-6938 Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
 13. ASTM D-G51 Standard Test Method for Measuring pH of Soil for Use in Corrosion Testing
- F. Recon Construction Detail Drawings: www.Reconwalls.com

1.3 DEFINITIONS

- A. Recon Retaining Wall Unit: Concrete, modular facing block provided by an authorized manufacturer under license to Recon Wall Systems, Inc.
- B. Geogrid: A geosynthetic material manufactured of high tensile materials specifically for the purpose of reinforcing and creating a structural soil mass.
- C. Drainage Aggregate: Clean, crushed rock located within and immediately behind Recon units to facilitate drainage and avoid compaction in close proximity to Recon wall units.
- D. Reinforced Soil: Soil zone extending from the Drainage aggregate zone to the back of the embedded geogrid.
- E. Foundation Soil: Soil zone immediately beneath the retaining wall facing units, the wall leveling pad and the reinforced soil zone.
- F. Retained Soil: Soil immediately behind retaining wall facing and drainage aggregate for modular gravity structures or behind the reinforced soil for wall that utilize geogrid.
- G. Construction Drawings: Approved final plan for construction prepared and stamped by the wall design engineer licensed to practice in the state where the retaining wall is located.

1.4 Submittals

- A. Contractor shall submit Manufacturer's product data and installation instructions for approval.
- B. Contractor shall submit Manufacturer's test reports certifying that the Recon units manufactured at their production facility meet the requirements of this specification and the requirements of the Construction Drawings.
- C. Unless provided within these project documents and/or the project drawings, contractor shall submit two sets of the Construction Drawings for all Recon retaining walls on the project.
 1. The design shall be prepared by a Professional Engineer licensed to practice in the state where the retaining wall is located.
 2. The design shall be per NCMA Design Guidelines for Segmental Retaining Walls, or the AASHTO Standard Specifications for Highway Bridges, whichever is applicable as determined by the retaining wall design engineer.
 3. Construction Drawings shall include:
 - a. The retaining wall layout and retaining wall heights.
 - b. Proper placement, lengths and types of geogrid reinforcement where necessary.
 - c. Typical wall sections.
 - d. Types, locations and properties of all drainage materials, appurtenances and special installation requirements not covered in this specification.
 - e. Retaining wall elevation views.
 - f. Any soils information or testing conducted in addition to that included within the project drawings and specifications.

- g. Design assumptions.
- D. If geogrid reinforcement is required in the final engineered construction drawings, submit manufacturer's product literature, product testing reports and a twelve inch or larger sample of each type to be used in wall construction.
- E. Submit gradation reports for aggregates used for the wall leveling pad, unit / drainage fill and for select reinforced fill if required in the final engineered wall design.
- F. All submittals must be provided and reviewed prior to the start of retaining wall construction.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Contractor shall inspect all products at delivery to determine that the proper materials have been delivered and are usable. Damaged material shall not be incorporated into the work.
- B. Recon retaining wall units shall be stored in a location and manner that protects against excessive weathering and damage.
- C. Contractor shall prevent Recon units from excessive soiling and coming in contact with substances which may stain or adhere to the finished visual surfaces of the unit.
- D. Faces of the Recon Block shall be free of excessive chipping, cracking and stains.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Contractor shall have successfully installed at least three projects similar to that of this project within the last two years. Contractor shall maintain at least one mechanic on site at all times that worked on one or more of these previous installations.
- B. Owner shall employ the services of an independent geotechnical or materials engineering firm to provide soil testing and quality assurance inspection for wall construction and soils work. Contractor shall provide any quality control testing or inspection not provided by the Owner.
- C. Retaining Wall Design Engineer Qualifications: The Retaining Wall Design Engineer shall be licensed to practice in the state in which the project is located. Additionally, the Retaining Wall Design Engineer shall be independently capable of performing all retaining wall analysis calculations (internal and external stability, seismic analysis, water analysis, and global stability) and have designed at least three wall projects similar to that of this project.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Only licensed and authorized manufacturers of:
 - 1. Recon Wall Systems, Inc.
7600 West 27th St., #229
St Louis Park, MN 55426
(952) 922-0027 Phone
(952) 922-0028 Fax
www.Reconwalls.com

2.2 MATERIALS

- A. Recon retaining wall units.
 - 1. The block unit shall consist of concrete with the average 28-day compressive strength of no less than 4000 psi.
 - 2. Concrete shall have air entrainment by volume (as measured in the plastic state in accordance with ASTM C172) of:
 - a. 5.5 – 8.5 percent, or
 - b. In conformity with ASTM C94, latest revision.
 - 3. Exterior dimensions of the face shall be 48-inches by 16-inches for full and corner unit, and 24-inches by 16-inches for half unit.
 - 4. Depth of unit should be as per Construction Drawings and is available in depths from 24-inches up to 84-inches (dimensions in inches: 24, 39, 45, 60, 66, 72, 78, 84).
 - 5. Recon Units used shall maintain tolerances of:
 - a. Height: +/- 3/16-inch
 - b. Width: +/- 1/2-inch unless field cut for fitting purposes.
 - c. Depth: No less than the unit design depth (i.e. 24-inch, 39-inch, etc.) with the textured face portion of the block being considered as 4-inches

6. Special shape units should be obtained and used where indicated on the final engineered construction drawings. Reference Recon Drawing #101 for overview of standard unit types.
7. Recon Unit Face Texture **[Specify choice (or choices) as required. Check local availability]:**
 - a. Shall be "LeSueur County Limestone"
 - <or>
 - b. Shall be "North Shore Granite"
 - <or>
 - c. Shall be "Old World"
 - <or>
 - d. Shall be "Rustic"
 - <or>
 - e. Shall be "Weathered Edge"
- B. Geogrid Reinforcement: Geosynthetic reinforcement shall be high tensile geogrid or geotextile manufactured specifically for soil reinforcement applications.
 1. Construction Drawings shall indicate the type, strength, location and lengths of reinforcement used.
 2. The geosynthetic manufacturer shall provide all relevant testing to the wall design engineer for incorporation in the wall design and shall be included in the submittal for the Construction Drawings.
 3. No substitutions of geosynthetic shall be allowed that was not evaluated in the Construction Drawings.
- C. Base Leveling Pad: The wall base leveling pad material shall consist of a compacted crushed stone base or non-reinforced concrete as indicated in the Construction Drawings.
- D. Drainage Aggregate: Drainage aggregate shall consist of clean 3/4" crushed stone or gravel meeting the requirements of the Construction Drawings.
- E. Reinforced Soil: All reinforced soil, borrow or imported, shall meet all requirements of the Construction Drawings. Reinforced soils, by gradation, shall have no more than 35 percent passing the number 200 sieve for walls less than 20-feet in height and no more than 15 percent passing the number 200 sieve for walls greater than 20-feet in height.
- F. Drainage Pipe: If required in Construction Drawings, drainage pipe shall be perforated, slotted or corrugated pipe manufactured in accordance with ASTM D-3034 or ASTM F-2648. Drainage pipe may also be covered with a geotextile filter fabric.
- G. Unit Adhesive: Adhesive shall be a premium, construction grade suitable for concrete and exterior applications.

2.3 FINISHES

- A. Recon retaining wall color **[Specify choice (or color) as required]**
 1. Finished wall shall be left in natural (as-cast) color.
 - <or>
 2. Finished retaining wall shall be stained in accordance with Section 099313.13 "Exterior Staining".
 - a. Acceptable product stains:
 1. Sherwin Williams H & C SHIELD PLUS CONCRETE STAIN
 2. TK Products TRI-SHEEN PIGMENTED STAIN TK-5272
 - b. Color shall match **[Define reference or sample to match]**
 - <or>
 - c. Color shall be **[Designate existing color]**
 3. Sealing **[Optional, list here and specify in Section 099723 Concrete and Masonry Coatings or 099623 Graffiti Resistant Coatings]**
 - a. Acceptable sealers and anti-graffiti coatings
 1. TK Products TK-290 Tri-SILOXANE OTC (sealer)
 2. TK Products 1496 TK Prermaclean OTC (anti-graffiti)

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify locations of utilities and existing structures prior to excavation.
- B. Examine the Project site and evaluate conditions where the Recon retaining wall will be constructed. Notify the proper supervising authority in writing of any conditions that may interfere with the proper construction of the Recon wall or delay completion.
- C. Promptly notify the wall design engineer of site conditions which may affect wall performance, soil conditions observed other than those assumed, or other conditions that may require a reevaluation of the wall design.

3.2 EXCAVATION

- A. Contractor shall excavate to the lines and grades shown on the construction drawings. The contractor shall be careful not to disturb the base beyond the lines indicated.
- B. Foundation soils shall be excavated as required for footing base / leveling pad dimensions shown on the construction drawings, or as directed by the wall engineer.
- C. Over-excavated areas shall be filled with suitable base or backfill material and compacted to 95 percent standard proctor.

3.3 FOUNDATION SOILS PREPARATION

- A. Foundation soils shall be evaluated by a Geotechnical Engineer or Owners Representative to ensure that the bearing soils meet or exceed the design conditions or assumptions.
- B. Compact foundation soil zone to 95 percent standard proctor prior to installing base / leveling pad.

3.4 BASE / LEVELING PAD

- A. Base shall be located as indicated on the Construction Drawings and shall have a minimum thickness of 6-inches. Base materials are to be as specified by the wall engineer (generally crushed stone, 3/4-inch minus, or similar).
- B. Width of the base pad must extend a minimum of 6-inches in front and 6-inches in back of the Recon Base Block footprint.
- C. Base material shall be compacted so as to provide a smooth, hard surface on which to place the first course of units.
- D. Compact base material to 95 percent of standard proctor.
- E. Base shall be prepared to ensure full contact of the wall unit with base material. Spacing or gaps between units shall no exceed 1/2-inch.
- F. Contractor may elect to substitute a portion of the specified granular base materials with a lean, unreinforced concrete topping.
- G. When a reinforced footing is required by the Construction Drawings, it shall be located below the frost line.

3.5 UNIT INSTALLATION

- A. First course of units shall be Base Block units and shall be placed in full contact with the base material.
- B. Check units for level from side-to-side, front to back, and check to maintain unit batter front-to-back.
- C. Place unit faces in contact side to side and avoid any gaps greater than 1/2-inch.
- D. Fill and compact fill to grade in front of embedded units prior to compaction behind the wall units.
- E. Fill voids between Recon units with 3/4-inch clean crushed rock to a distance of one foot behind the unit depth unless otherwise instructed in the Construction Drawings.
- F. Sweep and clean the top of each course before setting additional courses.
- G. Lay each successive course making sure that the bottom recess is in full contact with the unit locators of the course below. Pull unit forward as far as possible. Backfill and compact soil behind the units.
- H. Check and maintain level and wall batter by use of shims when necessary.
- I. Follow Recon recommended procedures to maintain acceptable running bond when constructing curved walls and / or corners. Build in accordance with Construction Drawings or Recon Construction Detail Drawings.

- J. Handle units with proper lifting devices that have been certified for the loads associated with the weights of the units. Avoid applying forces to the lifting loops in excess of the normal force associated with the weight of the unit (i.e., avoid dynamic loads from bouncing or swinging of a unit). If the unit is to be transported over a significant distance in the field, it is recommended that a CABLE be used in lieu of a chain.

3.6 GEOGRID INSTALLATION

- A. Install geosynthetic reinforcement in accordance with manufacturer's recommendations and the Construction Drawings.
- B. Locate geosynthetic reinforcement at elevations and to the lengths shown on the Construction Drawings.
- C. Prior to installation of geosynthetic reinforcement, level and compact backfill material to the level of the reinforcement layer.
- D. Reinforcement design strength direction must be oriented perpendicular to wall face.
- E. Position reinforcement on Recon units over the tongue and groove and to within 2-inches of the front exposed face. The next course of units shall be placed such that the geogrid is deformed over the tongue and groove. The next course of units must be slid forward such that the back edge of the groove on this unit is up against the back edge of the tongue on the lower unit with the geogrid pinched between the tongue and groove. Hold in place by installing the next course of units.
- F. Remove all wrinkles or folds in reinforcement by pulling taut prior to backfill placement. Secure using soil staples, stakes or hand tension until reinforcement is covered with sufficient fill to maintain tensioned position.
- G. Reinforcement shall be continuous throughout the embedment length. Splicing along reinforcement strength direction is not allowed.
- H. Position reinforcement sections side-by-side to provide 100 percent coverage along wall face.
- I. Where curved wall sections cause overlap areas in reinforcement, maintain at least 3-inches of soil between layers where overlap occurs.

3.7 REINFORCED BACKFILL PLACEMENT

- A. Wall fill material shall be placed in lifts no greater than 8-inches in depth and shall be less if necessary to achieve necessary compaction.
- B. Compact backfill material to 95 percent of standard proctor.
- C. Only hand-operated compaction equipment shall be used within 3-feet of the back of the Recon unit. Heavy-duty compaction equipment should be kept a minimum of 5-feet from the back of the Recon unit to avoid wall rotation.
- D. Wherever possible, backfill should be placed beginning at the face of the wall. Backfill shall be placed, spread, and compacted in a manner that minimizes the development of wrinkles, folds or movement of geogrid.
- E. Tracked construction equipment shall not be operated directly on the geogrid. A minimum backfill thickness of 6-inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid.
- F. Rubber tired equipment may pass over the geogrid reinforcement at slow speeds, (less than 10 MPH). Avoid sudden braking and sharp turning.
- G. At the conclusion of each day's work, slope backfill at both the crest and bottom of wall away from wall face to prevent surface drainage from scouring or ponding.
- H. During wall construction, the General Contractor shall be responsible for coordination of other project site operations so as to avoid adjacent construction site drainage from affecting wall construction area.
- I. Upon completion of wall construction work, the General Contractor shall:
 - 1. Ensure finished grading directs normal drainage away from the finished wall.
 - 2. Ensure other trades do not operate heavy equipment or excavate near the wall and reinforced soil zone.

3.8 OTHER CONSTRUCTION DETAILS

- A. Recon provides a number of Construction Detail Drawings (see Section 1.2F) which can be found on Recon's website (www.Reconwalls.com) and should be referred to for guidance on wall specific applications.

3.9 SITE TOLERANCES

- A. Straight walls
 - 1. Vertical Alignment: +/- 1.5-inches over any 12-foot distance and no more than +/- 3-inches over the entire length of wall.
- B. Horizontal Alignment Control:
 - 1. Corners and radius location: +/- 1-foot to theoretical location indicated on the Grading Plan.
 - 2. Radii: +/- 2-feet from theoretical lines indicated on the Grading Plan.
- C. Wall Batter at Completion of Work: +/- 2-degrees from the design batter and no batter less than 2-degrees.

3.10 FIELD QUALITY CONTROL

- A. Contractor shall be responsible for proper installation and quality control of all Recon wall components and appurtenant materials.
- B. Owner shall, at their expense, retain a qualified professional to monitor and perform quality assurance checks of the installer's work.
- C. Quality Assurance should include foundation soil inspection, frequent backfill compaction testing, verification of geotechnical design parameters and compliance with Construction Drawings and Project Specifications.

3.11 CLEANING

- A. After completion of wall installation, remove construction debris and restore any adjacent finished areas affected by wall construction to their pre-construction state.
- B. Wash wall face to remove soiling and stains. Do not use acid or detergents that may "burn" or discolor face.

3.12 STAINING / SEALING (Optional)

- A. Provide samples of stained / sealed faces for approval prior to commencing application to Recon retaining wall units. Samples shall be large enough to demonstrate scope of color variation.
- B. Install stain / sealer in accordance with manufacturers recommended procedures.

Warranty

Each Block will have 28 day compressive strength of at least 4000 PSI for 15 years after proper installation. If a Block does not meet this warranty standard, please notify the manufacturer in writing. If after it has been determined that the Block has not met the specifications, the manufacturer will have shipped to you, replacement Blocks which shall be the manufacturer's sole remedy for breach of this warranty. However, neither the manufacturer nor Recon Wall Systems, Inc. shall have any obligation to install such replacement Blocks.

This warranty shall not apply to any Block which is damaged, defective or fails to meet the warranty standard due to improper installation of the Block, chemical contact, structural design of the wall, or excessive and unforeseen site conditions beyond the manufacturer's or Recon Wall Systems, Inc.'s control.

The above warranty is the exclusive limited product warranty. ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE, ARE DISCLAIMED.