NOTE TO CONSULTANTS: Edit with Track Changes turned on, any text in this section that appears in bold and italics then turn off the bold and italics for the final approved version. (Remove this Note).

PART 1 - GENERAL

1.01 Description: Provide all labor, materials, and equipment to perform the following work of the Contract, including incidentals related to that work and coordination and support of other work specified elsewhere in the Contract Documents:

1.02 Related Sections: Coordinate the work of this section with the work of other related specifications which include:

Section 03 30 00 - Cast-in-Place Concrete
Section 31 00 00 - Earthwork
Section 32 11 23 - Mineral Aggregates

1.03 Reference Standards:

A. American Society for Testing and Materials (ASTM), most recent edition of referenced Materials, Testing, or Procedural Specification.

B. City of Seattle Standard Specifications and Plans for Road, Bridge, and Municipal Construction, (most recent edition).

1.04 Quality Assurance:

A. Inspection Notice: Notify the Engineer at least two (2) working days before inspection will be required. Call the **SPR Inspection Request Line @ (206) 684-7034 or by email at parksconstruction.inspection@seattle.gov** to make arrangements for inspections. Inspection will be required immediately prior to any intended pours or placement of concrete.

B. Salvaged Materials: Concrete Masonry Units shall be as selectively salvaged from existing stock on-site. The best materials of the available stockpile shall be incorporated into the work.

C. The work shall be performed by, or under the direct supervision of, a Journey-level Mason.

D. The Work shall not commence until the preparation of the sub-grade and base, performed under other Sections of the Specifications, has been approved by the Engineer as adequate to receive the Work of this Section.

1.05 Pre-qualifications and Submittals:

A. The Contractor shall submit written certification, prior to start of work, that the following requirements related to the installation of the specified Concrete Modular Units have been met:

1. Have been successfully utilized on a minimum of three (3) similar projects, i.e., height, soil fill types, erection tolerances, etc.
2. Have been successfully installed on a minimum of 10 thousand (10,000) square feet of retaining wall.

B. The Contractor shall submit a list of three (3) previously constructed projects of similar size and magnitude by the wall installer where the specific retaining wall system has been constructed successfully. Contact names and telephone numbers shall be listed for each project.

C. The Engineer shall provide soil testing and quality assurance inspection during earthwork and wall construction operations. The Engineer's quality assurance program does not relieve the contractor of responsibility for wall performance.

D. Submit Mix Design for Concrete Masonry Mortar.

PART 2 - PRODUCTS

2.01 Wall Base: Wall Base shall be a cast in place concrete footing as defined by the Contract Drawings and constructed per the requirements of Section 03 30 00 - Cast-in-Place Concrete and as approved by the Engineer as suitable to receive the Work.

2.02 Concrete Modular Units (CMU):

A. Selection: Approved, unbroken salvaged concrete rubble acquired by the selective demolition and disassembly of existing Mortared Rubble Walls, on-site.

B. Preparation: Bonding surfaces of each salvaged Concrete Masonry Unit (CMU) shall have sufficient existing mortar removed to ensure a strong, durable bond. Individual units may be stripped of large accumulations of well-bonded mortar that may interfere with the assembly process with a rock hammer, chisel, or chisel-pointed pry-bar. Use only approved mechanical means. Remove loose mortar and scale with high pressure water (3000 psi or greater) applied at multiple angles.

2.03 Portland Cement: Type II Portland Cement, as specified in the City of Seattle Standard Specifications (most recent edition), and AASHTO M 85. Alternatively, Type III cement, meeting the requirements of AASHTO T131 on approval, as conditions warrant.

2.04 Aggregates: Fine Aggregate for Mortar shall be City of Seattle Standard Specification (most recent edition), Class 1 or Class 2 as appropriate for the conditions and as approved by the Engineer.

2.05 Water: Generally, use water from a potable source. Comply with the requirements of the Seattle Standard Specifications (most recent edition), titled "Water for Concrete".

2.06 Mortar Mix:

A. Provide proportions of approved cement, aggregates, and water appropriate for the application, generally 1:2.5 with sufficient water to achieve a consistency adequate for the Work.

B. Admixtures: Do not add calcium chloride.

2.07 Grout: Use only approved non-shrinking grout.

2.08 Backfill: Backfill per Section 31 20 00 - Earthwork.

PART 3 - EXECUTION

3.01 Inspection: Do not commence the Work of this Section until preparation of the sub-grade, wall base, and any utility connections through the designed alignment of the wall have been completed and approved by Engineer. Report to the Engineer any physical conflicts between the Work of other trades and the construction of Mortared Retaining Walls for resolution prior to commencing.

3.02 Layout Control: Coordinate vertical and horizontal control of the layout with control established per the requirements of other trades. Provide stringlines establishing alignment and level of each successive course. Provide a temporary fabricated or permanent manufactured jig to maintain design batter. Report conflicts to the Engineer for resolution prior to proceeding. Re-establish Layout Control and/or revise Layout as directed by the Engineer.

3.03 Mortar: Mix Mortar only in such quantities as can be used without adding additional water or admixtures. Apply Mortar only to properly dampened surfaces and uniformly in quantities appropriate for the size and weight of the CMU to be used and design depth of joints.

3.04 Patterns: Select CMU's such that a modified running bond pattern can be established. CMU installation pattern shall result in no vertical joints occurring within the outer third of the face of the CMU above and below the joint. Vertical joints of alternating courses may wander out of plumb with each other as a result of the varying dimensions of the stock. Field adjustment of CMU sizes is acceptable within the following parameters:

A. No CMU under 12" in any dimension (other than thickness) shall be used in the construction of Mortared Retaining Walls.

B. No newly broken, unweathered surface shall be visible on the face of a completed wall.

3.05 Joints:

A. Horizontal Joints

1. General: Horizontal joints shall be a minimum of 1" deep between courses at the face of the wall and shall consist of a continuous, unbroken application of Mortar from the outer edge to the normalized, average dimension to the back of the wall. Work Mortar into place in a manner that eliminates voids.
2. Depth from face: Hold outside edge of the Mortar bed 1" back from the face of the supporting course. Adjust outside edge to an "idealized" line to allow for irregularities in the CMU.

B. Vertical Joints

1. Fill vertical gaps between adjacent CMU's prior to placing the closing unit. Maintain a ¾" to 1-1/4" width allowing for irregularities in the CMU.
2. Hydraulic Relief (Weepholes) Maintain ¾" to 1-¼" un-mortared vertical gap as hydraulic relief as follows:
   a. 3'-5' O.C., beginning with the first course, holding a minimum of two CMU's from corners and ends. Where this arrangement eliminates any appropriate location within a straight run, refer to the Engineer for location. No section of wall shall be without hydraulic relief.
   b. Provide weepholes every third course, staggering locations.
3. Hold Vertical Joints ½" back from face of adjoining CMU.

3.06 Initial and Subsequent Courses:

A. Layout and Approval: Identify the design ends and all corners prior to beginning. Temporarily mark locations for unmortared vertical joints (weepholes) for approval. Hold weepholes a minimum of two CMU's from ends and corners.

B. Establish a level-line guide at an elevation that allows for a 1" Mortar bed plus the averaged depth of the CMU, at the idealized design face edge, allowing for irregularities in the materials.

C. Proceed with the initial course upon approval of the setup.

D. Backfill successive courses as installed per Section 31 20 00 - Earthwork.

E. Secure the approval of the Engineer that the installation of the initial course is acceptable prior to proceeding with subsequent courses in a like manner.

3.07 Meet Existing Wall: Match to existing Mortared Masonry Walls in a manner that staggers new vertical joints in a stepped manner upward and away from the new work. Clean all exposed surfaces of existing wall materials of organic material and loose mortar, concrete, aggregate, and grit.

3.08 Corners: Select salvaged CMU for two neat, weathered, adjacent faces at 90° to each other, ± 5°. Construct corners such that the design batter of the intersecting wall faces bisect neatly and apparently.

3.09 Wall Ends:

A. Terminal End at Grade: When walls "die at grade", provide a minimum of two courses below grade. The terminal CMU of the top course shall be a whole unit, minimum surfaces are 3sf. Support the terminal CMU of the top course on a bed of crushed CMU waste and mortar where the underlying unit falls short of the design end.

B. Freestanding Terminal End: Select CMU for freestanding terminal ends for shapes and sizes appropriate to the task, measuring carefully to maintain the design batter on both sides of the structure. Field-cut selected units by non-mechanical means in a manner that minimizes the number of new, unweathered faces. Construct freestanding terminal ends with the design batter neatly and apparently bisecting adjacent faces, including the end face.

3.10 Top Course:

A. Materials Selection: Select CMU that has been salvaged from the top course of those portions of the Mortared Masonry Wall that have been selectively disassembled to provide a consistent weathered appearance.

B. Install Top Course of CMU along a neat, level line.

C. Reverse the design batter for the Top Course to establish a drip edge and shadow line of an approximately 1" overhang.

D. Mortar vertical joints to within 1" of the top of wall elevation. Allow mortar sufficient curing time. Tightly grout joints flush to the surface of the top course and outer edge of adjoining units. Do not tool joints. Clean excess grout from exposed surfaces before drying.

3.11 Cleaning:

A. Remove loose mortar and grout materials from

B. Leave premises clean and free of residue from work in this section, including trash, materials containers, mason line, and CMU or Mortar rubble.

END OF SECTION