SECTION 6400 - STONE WALLS

PART 1- GENERAL

1.01 SCOPE: This Section covers outdoor stone masonry for retaining walls and headwalls. Topics include worker's qualifications, mockups and examples, weather limits, material requirements, base construction, lay-up and joints, and tolerances.

1.02 RELATED WORK: Refer to the following sections for the named related subjects:

Concrete and Reinforcement	Section 4000-Concrete Materials and Methods

1.03 INSTALLER'S QUALIFICATIONS: Installation shall be by an installer with at least three successful installations of stone masonry of similar scope.

1.04 SUBMITTALS: The following material shall be submitted for review:

A. Sieve analysis of bedding and joint sand.

B. References demonstrating installer's experience.

1.05 SAMPLE PANEL: A minimum 24-square foot sample of each stone masonry style shall be prepared using the personnel, materials, and methods to be employed in the final work. This area will be used to determine the joint sizes, laying patterns, colors, and texture of the job. Rejected samples shall be removed and additional samples prepared until Engineer approves sample. Sample shall be the standard from which the work shall be judged. Sample may form part of the final work.

1.06 EXAMPLE: If an example wall is identified in the Special Conditions or drawings, the identified style elements (color, size, lay up, joint size, tooling, and related items) shall supersede the requirements of this Section. If stone masonry is a repair to existing stonework, the existing stonework shall serve as an example for all style elements.

1.07 ENVIRONMENTAL LIMITS: Cold weather protection shall be applied when the air temperature is 40°F and falling during or within 48 hours after placement of stone masonry work.

PART 2 - PRODUCTS

2.01 STONE: Stone shall be hard, durable, ledge limestone with natural parallel flat beds, free from soft or spongy pieces. Triangular and lens shaped stones are not allowed. Maximum length to width ratio shall be 2:1. Stone for the entire project shall be supplied from a single quarry. Tooling shall be limited to squaring up of corner stones, and minor shape or size adjustment necessary to maintain joint sizes. Stone shall be free of dirt, dust, and surface moisture when laid.

2.02 MORTAR: Mortar shall consist of portland cement and sand with the addition of 2 percent integral waterproofing of aluminum stearate, ammonium stearate, or calcium stearate. Sand measured in a

damp loose condition shall be not less than 2-1/4 and not more than 3 times the volume of cement. Add sufficient water to make workable plastic mix. Mortar shall not be retempered.

A. Portland Cement: ASTM C150, Type I / II.

B. Sand: ASTM C144.

C. Integral waterproofing: Grace "Hydratite", Master Builders "Omicron Mortarproofing", Sika "Suconem Red Label", or Sonneborn "Hydrocide".

2.03 REINFORCEMENT: See reference in Part 1.

2.04 WEEPHOLES: Weephole forms shall be 1-1/2-inch schedule 40 rigid PVC pipe.

2.05 TIES: Ties for multiwythe walls shall be adjustable rectangular wire ties, minimum 3/16-inch diameter, cold-drawn steel wire, galvanized finish to ASTM A153, Class B-2.

2.06 PERMEABLE FILL: KDOT Standard Specifications Subsection 1102, CA-5 or Subsection 1108, BD-1, crushed stone or gravel, meeting the following gradation:

CA-5

Sieve Size	Percent Retained
1-inch	0
3/4-inch	0 - 5
3/8-inch	40 - 60
No. 8	95 - 100

BD-1

Sieve Size	Percent Retained
1-1/2-inch	0
1-inch	0 - 10
3/4-inch	10 - 40
No. 4	80 - 100
No. 16	90 - 100
No. 100	98 – 100

PART 3 - EXECUTION

3.01 BASE: If concrete footing is not specified, provide 12-inch layer of compacted permeable fill for base. Aggregate base to extend 6 inches beyond wall.

3.02 LAYING STONE: Lay up shall be guided by stringline and plumbline. Pattern shall be uncoursed roughly square pattern. Stone showing pronounced striation shall be laid on its natural bed. Horizontal joints shall be level. Use small stone and spalls to limit the thickness of mortar in voids. Fill voids full of mortar. If more than one wythe of stone is required to meet the plan dimensions, wythes shall be connected with wire ties or stone penetrating both wythe at a rate of one for every 3-1/2 square feet.

Stones shall be set into full mortar bed. Mortar joints shall be no larger than 1/12 of the narrow dimension of the stone joined. Head and bed joints shall be the same width. Joints shall be slightly raked.

3.03 JOINT REPAIR: Engineer will mark the limits of joint repair in the field. Joints to be repaired shall have deteriorated mortar joints removed to sound mortar or 1/2 the width of the stone or 3 inches, whichever is less. Fresh mortar shall be packed into the joints, and joints finished to match adjacent existing work.

3.04 COLD WEATHER REQUIREMENTS: This requirement applies when air temperature drops below 40°F or when forecast to drop below 40°F within 24 hours of placing. A specific cold weather protection plan shall be submitted to Engineer for review. Depending on severity of weather, the plan may include use of insulating blankets, use of artificial heat source, or other methods. Minimum length of protection shall be 72 hours unless forecast shows daily lows above 40°F. Use of an accelerator is not allowed.

3.05 TOLERANCES: Not including the roughness of the stone faces, the overall finished surface shall be true to plane and line within the following limits:

Item	Tolerance
Surface Planeness	3/4-inch in 10'
Horizontal Line	1-inch in 20' and 1-1/2-inch overall
Vertical Trueness	1-inch in 10'

END OF SECTION 6400