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MORTAR-PLACED STONE ASSEMBLIES – SECTION 04853

PART 1 GENERAL

1.1 Section Includes

- A. Section includes solid masonry construction of base supported natural full stone veneer, set in cement mortar, with a structural back-up of masonry or metal lath on a structural backing.
- B. Section includes special decorative cut stone shapes for trim.
- C. Section includes installation of built-in accessories.

1.2 Related Sections

- A. Section 03300 - Cast-In-Place Concrete: Concrete foundations.
- B. Section 03300 - Cast-In-Place Concrete: Concrete supporting wall.
- C. Section 04810 - Unit Masonry Assemblies: Masonry supporting wall.
- D. Section 05500 - Metal Fabrications: Lintels, shelf angles, structural supports, anchors and other built-in components for building into stone masonry by this section.
- E. Section 05400 - Cold-Formed Metal Framing: Formed steel framed supporting wall.
- F. Section 06112 - Framing and Sheathing: Wood frame supporting wall.
- G. Section 07620 - Sheet Metal Flashing and Trim.
- H. Section 07900 - Joint Sealers: Sealant for perimeter and control joints.
- I. Section 09220 - Cement Plaster: Metal lath and scratch coat back-up supporting walls.

1.3 References

- A. ASTM A153 - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
- B. ASTM A580 - Standard Specification for Stainless Steel Wire.
- C. ASTM A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
- D. ASTM C91 - Standard Specification for Masonry Cement.
- E. ASTM C97 - Standard Specification for Absorption and Bulk Specific Gravity of Dimension Stone.
- F. ASTM C144 - Aggregate for Masonry Mortar.
- G. ASTM C150 - Standard Specification for Portland Cement.
- H. ASTM C170 - Standard Specification for Compressive Strength of Dimension Stone.
- I. ASTM C270 - Mortar for Unit Masonry.
- J. ASTM C503 - Standard Specification for Marble Dimension Stone (Exterior).
- K. ASTM C568 - Standard Specification for Limestone Dimension Stone.
- L. ASTM C615 - Standard Specification for Granite Dimension Stone.
- M. ASTM C780 - Preconstruction Evaluation of Mortar for Plain & Reinforced Masonry.
- N. ASTM C880 - Standard Specification for Flexural Strength of Dimension Stone.
- O. ACI 530/ASCE 5/TMS 402 - Building Code Requirements for Masonry Structures.
- P. ACI 530.1/ASCE 6/TMS 602 - Specifications for Masonry Structures.
- Q. National Concrete Masonry Association TEK 8-2A for masonry cleaning.

1.4 System Description

- A. Design Requirements: Perform Work in accordance with ACI 530/ASCE 5/TMS 402 Building Code Requirements for Masonry Structures, ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures and the applicable Building Code.

1.5 Submittals

- A. Submit under provisions of Section 01300.
- B. Product Data: Quarry of natural stone data sheets on stone and mortar mix to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
 - 4. Cleaning methods.
- C. Design Data: Submit design mix when Property specification of ASTM C270 is to be used, with required environmental conditions, and admixture limitations.

- D. Selection Samples: For each stone product specified, submit two samples, minimum size 48 inches (1216 mm) square, representing actual product, color, and texture.
- E. Samples: Submit samples of mortar representing actual mortar color and color range.
- F. Quarrier's Certificate: Certify stone properties and mortar mix will conform to specified requirements.
- G. Construct sample panel at location indicated or directed, and as follows:
 - 1. Recommended Size: 8 feet by 8 feet (2.4 m by 2.4 m) or a size that satisfies the architect. This size should be no less than 4 feet x 4 feet (1.2 m by 1.2 m).
 - 2. Include all stone unit types and sizes to be used including a typical corner condition, special shapes and mortar joint treatment. Clean the sample panel using the same materials and tools as planned for the final stone masonry construction.
 - 3. Obtain architect's acceptance of sample panel before beginning construction activities of this section.
 - 4. Do not remove sample panel until construction activities of this section have been accepted by the architect.

1.6 Qualifications

- A. Stone Quarrier: Company specializing in manufacturing products specified in this section with minimum five years documented experience.
- B. Stone Masonry Company: Company specializing in performing work of this section with minimum five years documented experience.

1.7 Quality Assurance

- A. Preconstruction Meetings: Conduct preconstruction meetings including the architect, contractor, stone masonry subcontractor, and the flashing subcontractor to verify project requirements, substrate conditions, manufacturer's installation instructions and other requirements. Comply with Division 1 requirements.

1.8 Delivery, Storage, and Handling

- A. Store products on pallets, under cover and in manufacturer's unopened packaging until ready for installation.
- B. Store stone materials on pallets on a dry level surface. Pallets shall not be stacked and shall be covered with tarps.
- C. Store mortar under cover and in an area where temperature is maintained between 4 degrees C (40 degrees F) to 43 degrees C (110 degrees F).

1.9 Project Conditions

- A. Hot and Cold Weather Requirements: In accordance with ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures.
- B. Ambient temperature shall be 40 degrees F or above during erection of stone masonry. When ambient temperature falls below 50 degrees F, mortar mixing water shall be heated.

PART 2 PRODUCTS

2.1 Manufacturers

- A. Acceptable Stone Quarrier: Buechel Stone Corporation, W3639 Highway H, Chilton, Wisconsin 53014-9643, Phone: 800.236.4473, Fax: 920.849.8229 or Buechel Stone Corporation, N4399 Highway 175 South, Fond du Lac, Wisconsin 54937-9266, Phone: 920.922.4790, Fax: 920.922.5298.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.2 Veneer Stone

- A. Fond du Lac Castle Rock: Material shall be machine split four sides with heights of 6, 8, 12 and 18 inches (152, 203, 304 and 457 mm) and is furnished in random lengths up to 40 inches (up to 1016 mm) to and a nominal depth of 4 to 5 inches (102 mm to 127 mm) plus or minus 1/2 inch (12.5 mm). The bedface is to be exposed. Color shall be a full range of gray to buff. A change of color in one piece is acceptable. Material shall conform to ASTM C568 with the following properties:
 - 1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 - 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 - 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 - 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- B. Full Color Castle Rock: Material shall be machine split four edges in heights of 6, 8, 12 and 18 inches (152, 203, 304 and 457 mm) and is furnished in random lengths up to 40 inches (up to 1016 mm) to and a nominal depth of 4 to 5 inches (102 mm to 127 mm) plus or minus 1/2 inch (12.5 mm). The bed face is to be exposed. A change of color in one piece is acceptable. Color shall be a full range of lavenders, browns and grays. Material shall conform to ASTM C568 with the following properties:
 - 1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 - 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 - 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 - 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- C. Fond du Lac Country Squire: Material shall be 100 percent machine split and is furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 8 inches (50 to 204 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). The splitface is to be exposed. Color shall be a full range gray to white. Material shall conform to ASTM C568 with the following properties:

1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- D. Chilton Country Squire: Material shall be 100 percent machine split and is furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 6 inches (50 to 152 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). The splitface is to be exposed. Color shall range from gray to charcoal and occasional mauve. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- E. English Tudor: Material shall be furnished in random lengths from 6 inches to 14 inches (152 to 355 mm), a random rise from 3 to 5 inches (76 to 127 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). The bedface is to be exposed. Color shall be a full range of lavenders, browns and grays. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- F. Fond du Lac Rustic: Material shall be furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 6 inches (50 to 152 mm) and a nominal depth of 4 to 6 inches (102 to 152 mm) plus or minus 1 inch (32 mm). The weathered edge is to be exposed. Color shall be a range of soft beige, tan and gold. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- G. Chilton Rustic: Material shall be furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 6 inches (50 to 152 mm) and a nominal depth of 4 to 6 inches (102 to 152 mm) plus or minus 1 inch (32 mm). The weathered edge is to be exposed. Color shall be shades of browns to reds. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- H. Imperial Weathered Edge: Material shall be furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 7 inches (50 to 178 mm) and a nominal depth of 4 to 8 inches (102 to 204 mm) plus or minus 1 inch (32 mm). The weathered edge is to be exposed. Color shall be a range of browns to reds (deep stratifications). Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- I. Fond du Lac Tailored Blend: Material shall be furnished in lengths of 6 inches to 48 inches (152 mm to 1216 mm) and in 4 separate rises of 20 percent - 2 1/4 inches (56 mm); 40 percent - 5 inches (127 mm); 30 percent - 7 3/4 inches (197 mm); 10 percent - 10 1/2 inches (267 mm). All beds are sawn, the ends are split, and the bedface is to be exposed. Color shall be a range of colors from gray to buff. Material to conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- J. Chilton Tailored Blend: Material shall be furnished in lengths of 6 inches to 48 inches (152 mm to 1216 mm) and in 4 separate rises of 20 percent - 2 1/4 inches (56 mm); 40 percent - 5 inches (127 mm); 30 percent - 7 3/4 inches (197 mm); 10 percent - 10 1/2 inches (267 mm). All beds are sawn, the ends are split, and the bedface is to be exposed. Full color range of

lavenders, browns, and grays. Material shall conform when tested in accordance with ASTM C568 with the following properties:

1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

K. Fond du Lac Tailored Blend 50 percent Rockfaced (50 percent bedface): Material shall be furnished in lengths of 6 inches to 48 inches (152 mm to 1216 mm) and in 4 separate rises of 20 percent - 2 1/4 inches (57 mm); 40 percent - 5 inches (127 mm); 30 percent - 7 3/4 inches (197 mm); 10 percent - 10 1/2 inches (267 mm). All beds are sawn and the ends are split. Exposed face to be a blend of 50 percent bedface and 50 percent rock faced. All 2 1/4 rise material shall be bedface only. Colors shall range from light gray to buff. Material shall conform when tested in accordance with ASTM C568 with the following properties:

1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

L. Chilton Tailored Blend 50 percent Rockfaced (50 percent bedface): Material shall be furnished in lengths of 6 inches to 48 inches (152 mm to 1216 mm) and in 4 separate rises of 20 percent - 2 1/4 inches (57 mm); 40 percent - 5 inches (127 mm); 30 percent - 7 3/4 inches (197 mm); 10 percent - 10 1/2 inches (267 mm). All beds are sawn; the ends are split. The exposed face to be a blend of 50 percent bedface and 50 percent rockfaced. All 2 1/4" rise material shall be bedface only. Full color range of lavenders, browns, and grays. Material shall conform when tested with ASTM C568 with the following properties:

1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- M. Fond du Lac Cambrian Blend: Material shall be furnished in lengths from up to 40 inches (up to 1016 mm), a random rise from 2 to 6 inches (50 to 152 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). This blend exposes 75 percent splitface material that ranges in color gray to white and 25 percent weathered edge that range from soft beige, tan and gold. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- N. Chilton Cambrian Blend: Material shall be furnished in lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 6 inches (50 to 152 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). This blend exposes 75 percent splitface material that will offer a full color range of gray to charcoal and occasional mauve. There shall be 25 percent weathered edge material that shall provide a range of color from brown to red. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- O. Fond du Lac Heritage Blend: Material shall be furnished in lengths from 4 inches to random and a nominal depth of 4 to 5 inches (102 to 127 mm) plus or minus 3/4 inch (19 mm). This stone exposes a random mix of rough and irregular shaped bedface and splitface pieces. Color range shall range from gray to buff. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- P. Chilton Heritage Blend: Material shall be furnished in lengths from 4 inches to random and a nominal depth of 4 to 5 inches (102 to 127 mm) plus or minus 3/4 inch (19 mm). This stone exposes a random mix of rough and irregular shaped bedface and splitface pieces. Color shall be a naturally wide range of red, brown, cream and beige. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- Q. Fond du Lac Kensington Blend: Material shall be furnished in lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 8 inches (50 mm to 204 mm) and a nominal depth of 4 inches to 5 inches (102 to 127 mm) plus or minus 1/2 inch (12.5 mm). This blend exposes 70 percent splitface material that will offer a full range from gray to white and 30 percent bedface that ranges in color from light gray to buff. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- R. Chilton Kensington Blend: Material shall be furnished in lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 8 inches (50 mm to 204 mm) and a nominal depth of 4 inches to 5 inches (102 to 127 mm) plus or minus 1/2 inch (12.5 mm). This blend exposes 70 percent splitface material that will offer a full range from gray to charcoal and occasional mauve and 30 percent bedface that ranges in color from lavenders, browns, and grays. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- S. Fond du Lac Custom Country Blend: Material shall be furnished in lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 8 inches (50 to 204 mm) and a nominal depth of 4 inches to 5 inches (102 to 127 mm) plus or minus 1/2 inch (12.5 mm). This blend exposes 65 percent splitface material that will offer a full range from gray to white and 25 percent weathered edge material shall provide a naturally wide range of soft beige, tan and gold and 10 percent bedface that ranges in color from gray to buff. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- T. Chilton Custom Country Blend: Material shall be furnished in lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 8 inches (50 to 204 mm) and a nominal depth of 4 inches to 5 inches (102 to 127 mm) plus or minus 1/2 inch (12.5 mm). This blend exposes 65 percent splitface material that will offer a full range of gray to charcoal and occasional mauve and 25 percent weathered edge material shall provide a full range browns to reds and 10 percent bedface with full range of lavenders, browns and grays. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- U. Fond du Lac Web Wall: Material shall be furnished in random irregular sizes ranging from 1 to 4 SF (.09 to .37 sm). The depth of this material shall be 4 inches to 5 inches (102 to 127 mm) plus or minus 1/2 inch (12.5 mm). Material shall be installed exposing 100 percent bedface and color shall range from light gray to buff. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- V. Chilton Web Wall: Material shall be furnished in random irregular sizes from 1 to 4 SF (.09 to .37 sm) The depth of this material shall be 4 inches to 5 inches (102 to 127 mm) plus or minus ½ inch (12.5 mm). Material shall be installed as exposing 100 percent bedface and color shall range from lavenders, browns, and grays. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- W. Fond du Lac Antique Web Wall: Material shall be furnished in random irregular sizes ranging from 1 to 4 SF (.09 to .37 sm). The depth of this material shall be 4 inches to 5 inches (102 to 127 mm) plus or minus 1/2 inch (12.5 mm). Material shall be installed as exposing 100 percent bedface and color shall range from light gray to buff. Material that is rockfaced is to be exposed. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- X. Chilton Antique Web Wall: Material shall be furnished in random irregular sizes ranging from 1 to 4 SF (.09 to .37 sm). The depth of this material shall be 4 inches to 5 inches (102 to 127 mm) plus or minus ½ inch (12.5 mm). Material shall be installed as exposing 100 percent bedface and color shall be a full range of lavenders, browns and grays. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- Y. Fond du Lac Colonial Pavers: Material shall be furnished in a nominal size of 5 inches x 5 inches (126 mm x 126 mm) or 10 inches x 10 inches (252 mm x 252 mm) with a natural bed top and 2 sawn edges and split 2 edges, then tumbled at the quarry. Thickness to be 3 ½ inches to 4 ½ inches (88mm to 114 mm). Color is a range of gray to buff. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- Z. Chilton Colonial Pavers: Material shall be furnished in a nominal size of 5 inches x 5 inches (126mm x 126mm) or 10 inches x 10 inches (252 mm x 252 mm) with a natural bed top and 2 sawn edges and 2 split edges, then tumbled at the quarry. Thickness to be 3 ½ inches to 4 ½ inches (88 mm to 114 mm). Color is a range of lavenders, browns, and grays. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- AA. Victorian Blend River Rock: Material shall be furnished in lengths of 6 inches to 48 inches (152 mm to 1216 mm) and in 4 separate rises of 20 percent - 2 1/4 inches (56 mm); 40 percent - 5 inches (127 mm); 30 percent - 7 3/4 inches (197 mm); 10 percent - 10 ½ inches (267 mm). All beds are sawn, the ends are split, then the product is tumbled at the quarry. The bedface is to be exposed. Full color range of lavenders, browns, and grays. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- BB. Palace Blend River Rock: Material shall be furnished in lengths of 6 inches to 48 inches (152 mm to 1216 mm) and in 4 separate rises of 20 percent - 2 1/4 inches (56 mm); 40 percent - 5 inches (127 mm); 30 percent - 7 3/4 inches (197 mm); 10 percent - 10 1/2 inches (267 mm). All beds are sawn, the ends are split, then the product is tumbled at the quarry. The bedface is to be exposed. Color shall be a range of colors from gray to buff. Material to conform when tested is accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- CC. Stratford Cross: Material shall be 100 percent machine split and is furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 6 inches (50 mm to 152 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). The splitface is to be exposed. The color range is 50 percent Chilton colors of tray to charcoal and occasional mauve and 50 percent Fond du Lac colors gray to white. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- DD. Gray Cobble Creek: Material shall be 100 percent machine split and is furnished in random lengths of 8 inches to 16 inches (202 mm to 404 mm), a random rise from 3 inches to 8 inches (76 mm to 202 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). The splitface is exposed. Color shall be a full range of gray to white. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- EE. Charcoal Cobble Creek: Material shall be 100 percent machine spilt and is furnished in random lengths of 8 inches to 16 inches (202 mm to 404 mm), a random rise from 3 inches to 8 inches (76 mm to 202 mm) and the nominal bed depth of 4 inches (102 mm) plus or minus $\frac{3}{4}$ inch (19 mm). The spiltface is exposed. Color shall be a full range of gray to charcoal and occasional mauve. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- FF. Stratford Cross Cobble Creek: Material shall be 100 percent machine spilt and is furnished in random lengths of 8 inches to 16 inches (202 mm to 404 mm), a random rise from 3 inches to 8 inches (76 mm to 202 mm) and the nominal bed depth of 4 inches (102 mm) plus or minus $\frac{3}{4}$ inch (19 mm). The split face is exposed. Colors shall be a 50 percent blend of Chilton colors of gray to charcoal and occasional mauve and 50 percent Fond du Lac colors gray to white. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- GG. Cabin Creek River Rock: Material shall be furnished in lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 8 inches (50 to 204 mm) and a nominal depth of 4 inches to 5 inches (102 to 127 mm) plus or minus $\frac{1}{2}$ inch (12.5 mm). This blend exposes 65 percent splitface material with a full color range of gray to charcoal and occasional mauve and 25 percent weathered edge material shall provide a full range browns to reds and 10 percent bedface with full range of lavenders, browns and grays. The product is then tumbled. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- HH. Cream City River Rock: Material shall be 100 percent machine split and is furnished in random lengths up to 40 inches (up to 1016 mm), a

random rise from 2 to 8 inches (50 to 204 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). The product is then tumbled and the splitface is to be exposed. Color shall be a full range of gray to white. Material shall conform to ASTM C568 with the following properties:

1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

II. Colonial Gray River Rock: Material shall be 100 percent machine split and is furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 6 inches (50 to 152 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). The product is then tumbled and the splitface is to be exposed. Color shall range from gray to charcoal and occasional mauve. Material shall conform to ASTM C568 with the following properties:

1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

JJ. Byron River Rock: Material shall be furnished in random irregular sizes ranging from 1 to 4 SF (.09 to .37 sm). The depth of this material shall be 4 inches to 5 inches (102 to 127 mm) plus or minus 1/2 inch (12.5 mm). The product is then tumbled. Material shall be installed as exposing 100 percent bedface and color shall range from light gray to buff. Material shall conform when tested in accordance with ASTM C568 with the following properties:

1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- KK. Blue Ridge River Rock: Material shall be furnished in random irregular sizes from 1 to 4 SF (.09 to .37 sm) The depth of this material shall be 4 inches to 5 inches (102 to 127 mm) plus or minus ½ inch (12.5 mm). The product is then tumbled. Material shall expose 100 percent bedface and range from lavenders, browns, and grays. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- LL. Mountain River Jax: Material shall be furnished in random disc-like shapes ranging from 4 to 7 inches (102 mm to 178 mm) or 7 to 12 inches (178 mm to 306 mm). The depth of the material is approx. 1 to 2 inches (26 mm to 52 mm). The finish is smooth. Expect a full color range of reds, blues, blacks and grays. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 12 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2690 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 143 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 10.2 Mpa when tested in accordance with ASTM C880.
- MM. Chilton Woodlake Blend: Material shall be furnished in a mix of random irregular and random ashlar stones. 70 percent shall be 100 percent machine split and is furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 6 inches (50 to 152 mm) and a nominal depth of 4 inches (102 mm) plus or minus ¾ inch (19 mm). The splitface is to be exposed. Color shall range from gray to charcoal and occasional mauve. 30 percent shall be furnished in random irregular sizes from 1 to 4 SF (.09 to .37 sm) The depth of this material shall be 4 inches to 5 inches (102 to 127 mm) plus or minus ½ inch (12.5 mm). Material shall be installed as exposing 100 percent bedface and range from lavenders, browns, and grays. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- NN. Fond du Lac Woodlake Blend: Material shall be furnished in a mix of random irregular and random ashlar stones. 70 percent shall be 100 percent machine split and is furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 8 inches (50 to 204 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). The splitface is to be exposed. Color shall be a full range of gray to white. 30 percent shall be furnished in random irregular sizes ranging from 1 to 4 SF (.09 to .37 sm). The depth of this material shall be 4 inches to 5 inches (102 to 127 mm) plus or minus 1/2 inch (12.5 mm). Material shall be installed as exposing 100 percent bedface and color shall range from light gray to buff. Material shall conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- OO. Mill Creek Castle Rock: Material shall be machine split four edges in heights of 6, 8, 12 and 18 inches (152, 203, 304 and 457 mm) and is furnished in random lengths up to 40 inches (up to 1016 mm) to and a nominal depth of 4 to 5 inches (102 mm to 127 mm) plus or minus 1/2 inch (12.5 mm). The bedface is to be exposed. A change of color in one piece is acceptable. Color shall be brown to buff. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- PP. Mill Creek Tailored Blend: Material shall be furnished in lengths of 6 inches to 48 inches (152 mm to 1216 mm) and in 4 separate rises of 20 percent - 2 1/4 inches (56 mm); 40 percent - 5 inches (127 mm); 30 percent - 7 3/4 inches (197 mm); 10 percent - 10 1/2 inches (267 mm). All beds are sawn, the ends are split, and the bedface is to be exposed. Color range from brown to buff. Material to conform when tested in accordance with ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

- QQ. Mill Creek Country Squire: Material shall be 100 percent machine split and is furnished in random lengths up to 40 inches (up to 1016 mm), a random rise from 2 to 6 inches (50 to 152 mm) and a nominal depth of 4 inches (102 mm) plus or minus 3/4 inch (19 mm). The splitface is to be exposed. Color shall range from gray to buff. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.

2.3 Special Shapes

- A. Provide special shapes as indicated on the Drawings and as follows:
1. Quoins.
 2. Keystones.
 3. Edgestones.
 4. Cornerstones.
 5. Sills.
 6. Ledges.
 7. Medallions
 8. Other _____.
- B. Material shall be furnished in sizes indicated plus or minus 1/2 inch. Material shall conform to ASTM C568 with the following properties:
1. Maximum absorption rate of 3 percent when tested in accordance with ASTM C97.
 2. Minimum density of 2560 kg/m³ when tested in accordance with ASTM C97.
 3. Minimum compressive strength of 55 Mpa when tested in accordance with ASTM C170.
 4. Minimum flexural strength of 8.27 Mpa when tested in accordance with ASTM C880.
- C. Color shall be:
1. Match the veneer stone.
 2. _____.

2.4 Accessories

- A. Joint Reinforcement: As specified in Section _____.
- B. Wall Ties: Formed steel wire, 22 gage (___ mm) diameter, hot-dip galvanized to A 153, B2 finish:
1. Eye and pintle type.
 2. Wall strap for bolted attachment to studs.
 3. Wire loop for embedment in back-up masonry.
 4. With provision for vertical adjustment after attachment.
- C. Wall Ties: Formed steel wire, 22 gage (___ mm) diameter, stainless steel conforming to ASTM A580:
5. Eye and pintle type.

6. Wall strap for bolted attachment to studs.
 7. Wire loop for embedment in back-up masonry.
 8. With provision for vertical adjustment after attachment.
- D. Other Anchors in Direct Contact with Stone: ASTM A666, Type 304, stainless steel of sizes and configurations required for support of stone and applicable superimposed loads.
 - E. Weephole Vent Devices: Buechel Stone EMC3639 Weep System w/WOW Weeps
 - F. Setting Buttons and Shims: Plastic.

2.5 Mortar

- A. Masonry Cement: Complying with ASTM C91:
 1. Type S.
 2. Color, gray is recommend
 3. Color, white is optional
 4. Color _____.
- B. Portland Cement: Complying with ASTM C150:
 1. Type I.
 2. Type __.
 3. Color, gray is recommended
 4. Color, white is optional
 5. Color _____.
- C. Mortar Aggregate: Complying with ASTM C144, standard masonry type.
- D. Hydrated Lime: Complying with ASTM C207:
 1. Type S.
 2. Type SA.
- E. Water: Clean and potable.

2.6 Mixes

- A. Mortar Mixes:
 1. Mortar for Structural Masonry: Complying with ASTM C270, using Proportion Specification.
 - a. Type S.
- B. Mortar Mixing:
 1. Mix mortar ingredients in accordance with ASTM C270. Mix only in quantities needed for immediate use.
 2. Do not use anti-freeze compounds to lower freezing point of mortar.

PART 3 EXECUTION

3.1 Examination

- A. Do not begin installation until backing structure is plumb, bearing surfaces are level and substrates are clean and properly prepared.
- B. Verify that built-in items are in proper location, and ready for roughing into masonry.
- C. Notify architect of unsatisfactory preparation before proceeding.

3.2 Preparation

- A. Stone must be water saturated, surface-dry when placed. Water down the stone 24 hours prior to placement until saturated. Reapply water to keep stone saturated as required by weather conditions.
- B. Coordinate placement of reinforcement, anchors and accessories, flashings and weep holes and other moisture control products supplied by other sections.
- C. Clean all built-in items of loose rust, ice, mud, or other foreign matter before incorporating into the wall. All ferrous metal built into the wall shall be primed or galvanized.
- D. If required, provide temporary bracing during installation of masonry work. Maintain bracing in place until building structure provides permanent support.

3.3 Installation

- A. Install masonry and mortar in accordance with ACI 530.1/ASCE 6/TMS 602 Specifications for Masonry Structures.
- B. Maintain masonry courses to uniform dimension(s). Form vertical and horizontal joints of uniform thickness.
- C. Pattern Bond:
 - 1. Lay stone with the bedface, splitface or weather edge exposed, as described in stone veneer section 2.2. Take care to avoid a concentration of any one color to any one wall surface.
 - 2. Maintain an approximate 1/2 inch joint, as stone allows. If a “drystack” installation is desired, stone is to be laid tight to one another, as the stone will naturally allow.
 - 3. Do not use stacked vertical joints.
 - 4. Lay out work in advance and distribute color range of stone uniformly over total work area.
- D. Anchoring: Tie stone to backing as required by the applicable Building Code. As a minimum tie stone to backing with metal ties as follows:
 - 1. Provide minimum one tie per 2 square feet of wall surface area.
 - 2. Maximum spacing between adjacent ties shall be 16 inches vertically and 32 inches o.c. horizontally.
 - 3. Ties shall be imbedded in horizontal joints to a 2 inch minimum depth.
 - 4. Provide additional ties at openings within 12 inches of opening.
- E. Joining Work: Where fresh masonry joints partially set masonry.
 - 1. Remove loose stone and mortar.
 - 2. Clean and lightly wet surface of set masonry.
 - 3. To avoid a horizontal run of masonry rack back 1/2 the length of stone in each course.
 - 4. Tothing is not permitted.
- F. Joints:
 - 1. Lay stone with an approximate 1/2 inch mortar joint, as stone allows.
 - 2. Tool joints when "thumb-print" hard with a round jointer slightly larger than the width of the joint.
 - 3. Trowel-point or concave tool exterior joints below grade.

4. Flush cut joints to be finished with a soft brush only.
 5. Re-tempering or mortar is not permitted.
 6. Use non-corrosive stone shims as required to maintain uniform joint thickness.
- G. Flashing:
1. Clean surface of masonry smooth and remove any projections, which could damage flashings.
 2. Place flashing on a bed of mortar.
 3. Cover flashing with mortar.
 4. Provide Buechel Stone EMC3639 Weep System behind the stone veneer and provide WOW weeps at bottom of wall, spaced 16" apart.
- H. Control and Expansion Joints: Keep joints open and free of debris. Coordinate control joint in accordance with Section 07900 for sealant performance.
- I. Sealant Recesses: Provide open joint 3/4 inch deep and 1/4 inch wide, where masonry meets doors, windows and other exterior openings. Coordinate sealant joints in accordance with Section 07900 for sealant performance.
- J. Cutting And Fitting: Cut and fit for chases, pipes, conduit, sleeves, grounds, and other penetrations and adjacent materials. Coordinate with other sections of work to provide correct size, shape, and location.

3.4 Field Quality Control

- A. Test mortar and grout in accordance with Section 01110.
- B. Testing of Mortar Mix: In accordance with ASTM C780, Annex A4, for mortar aggregate ratio and ASTM C780, Annex A5, for mortar water content.

3.5 Protection

- A. Protect installed products until completion of project.
- B. Cover the top of unfinished stone masonry work to protect it from the weather.
- C. Touch-up, repair or replace damaged products before substantial completion.

3.6 Cleaning

Promptly remove excess wet mortar from the face of the stone as work progresses. Clean stone masonry with a stiff nylon brush and clean water only. If it is necessary to clean stonework with chemicals please go to www.buechelstone.com for cleaning details and recommendations.

END OF SECTION