

Briar Hill Stone Company

Specification Guide

This Guide is intended to assist with the specification of Briar Hill Sandstone. The options shall be selected that pertain to a specific project being specified. BHSC is a stone quarrier and fabricator only; all other assemblies and materials are the responsibility of others. Recommendations included are based on satisfactory historic performance, and current related data Project specific engineering and appropriate related assemblies, shall be specified by a licensed professional. The BHSC will be glad to assist in design and detailing review, and specification assistance.

Section 0440 00 – STONE ASSEMBLIES

DIMENSION STONE VENEER - AND - SPLIT FACE STONE VENEER

Part 1 - GENERAL

1.1. SUMMARY

- A. This section includes cut stone veneer anchored to Metal Strut System, Masonry Backup and Metal Studs.
- B. Related Sections: Examine contract documents for requirements that affect work of this section.
 - 1. Cast-In-Place Concrete; Concrete backup. Section 03300
 - 2. Masonry Assemblies; Concrete masonry unit backup. Section 04800
 - 3. Metal Fabrications Section 05500
 - 4. Flashing and Sheet Metal; through wall flashings. Section 07600
 - 5. Joint Sealers; Sealants and backer rods for sealing joints Section 07900
 - 6. Cavity Wall Masonry; Section 04 27 23
 - 7. Metal Fastenings; Section 05 05 23

1.2. SUBMITTALS

- A. Submit product data for each type of stone, accessory, and other manufactured products required. [Technical Note # 1]
- B. Submit shop drawings detailing fabrication and installation of stone veneer. Include cutting and setting drawings indicating sizes, dimensions, sections, and profiles of stone; arrangement and provisions for jointing, supporting, anchoring, and bonding stonework; and details showing relationship with, attachment to, and reception of related work.
- C. Submit sample sets of stone *showing* color range, grade, finish, and type of stone required.
Include five or more stones in each set of samples showing the full range of variations in Appearance and characteristics to be expected in completed work.
 - 1. Pointing mortar and grout samples for color specified showing full range of color and texture to be expected in the completed work.
 - 2. Sealant samples for each type and color of joint sealant required.
- D. Submit qualification data specified in "Quality Assurance". Include list of completed projects with project names, addresses and Architect.

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1.3. QUALITY ASSURANCE

- A. Installer Qualifications: A company specializing in performing the work of this section with a minimum of 10 years documented experience.
- B. Fabricator Qualifications: A company specializing in fabricating cut stone with a minimum of 10 years of documented experience.
- C. Single-Source Responsibility for stone: Obtain stone from a single quarry with resources to provide materials of consistent quality in physical properties and appearance.
- D. Single-Source Responsibility for Mortar and Grout Materials: Obtain mortar ingredients of uniform quality and from one manufacture for each cement and admixture component, and from one source or producer for each aggregate.
- E. Single-Source Responsibility for Other Materials: Obtain each type of stone accessory, sealant, and other materials from one manufacture for each product.
- F. Sample Wall Panel: Before start of work, construct a sample wall panel to comply with the Following requirements, using materials indicated for final unit work.
 - 1. Installation of sample panels shall allow sufficient time for construction of the panel, to let stone and mortar dry to its final color; before presentation to the Architect for approval. Rebuild rejected sample panel wall until accepted by the Architect.
 - 2. Stone sample panels and masonry sample required as part of Section 04200 work will be joined together as directed by the Architect. Locate combination sample panels on site where directed by the Architect.
 - 3. Build one sample panel, minimum feet long x feet high x full wall thickness of typical wall area including one type of stone veneer, back-up wythes, through wall flashing, and other masonry accessories. Include one vertical control joint in each sample panel Clean exposed surfaces of sample panel with specified cleaning solution.
 - 4. Notify architect one week in advance of the construction of the sample panel.
 - 5. Protect accepted sample panels from the elements with water resistant membrane.
 - 6. Retain and maintain accepted sample panel during construction in an undisturbed condition as a criteria for judging the acceptance of the work being preformed.

- a. Acceptance of the sample panel for color. Texture, and blending of stone units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; aesthetic qualities of workmanship; and other material and construction qualities specifically approved by the Architect in writing.
 - b. Incorporate patching methods proposed for chips and dutchman repair in the sample panel for review and approval by the Architect. Approved patching methods in the mock-up shall be the basis for acceptance in the final constructed wall.
 - c. Acceptance of sample panels, does not constitute approval of deviations from the contract documents unless the deviations are specifically approved by the Architect in writing.
 - d. When directed by the Architect, demolish and remove the sample panels from the project site.
- G. Pre-Construction Conference: Before start of stone veneer construction and associated work, meet at the project site or other mutually agreed location with the installer, and installers of related work, and other entities concerned with masonry performance; including (where applicable) the Architect and Owner. Record discussions and furnish copies to each participant. Provide at least 72 hours advance notice to participants before scheduling of pre-construction conference.

1.4. DELIVERY, STORAGE, AND HANDLING

- A. Deliver stone to the project site on pallets in undamaged condition. Store and handle stone to prevent damage from contaminants, corrosion, breakage, and chipping. Do not use pinch or wrecking bars without protection edges of stone with wood or other rigid material. Lift with wide-belt slings wherever possible. Do not use wire rope.
- B. Protect stored stone from weather with waterproof non-staining covers or enclosures, but allow air to circulate around stone. Place pallets of stone to distribute weight evenly to prevent breakage or cracking of stone.
- C. Store cementitious materials off the ground, under waterproof covering, and in a dry location.
- D. Deliver sealants to project in undamaged condition. Sealants shall be in original unopened Containers with labels specifying manufacture, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.

PROJECT CONDITIONS

- A. During installation, cover tops of walls, projections, and sills with waterproof sheeting at the end of each days work in such a way to prevent infiltration of water into the wall cavity. Cover partially completed stone masonry veneer when construction is not in progress. Covering should be weighted down not less than 18 inches apart to insure the covering remains in place.
- B. Immediately remove grout, mortar, and soil to prevent them from staining the face of the stone veneer.
 - 1. Protect base of walls from rain splashed mud and mortar splatter by coverings spread on the ground and over the wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and doorframes, as well as similar products with painted finishes, from mortar droppings.
 - 4. Turn scaffold boards nearest to the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on the completed new stone masonry.
- C. Cold Weather Protection: Comply with the following requirements;
 - 1. Remove ice or snow formed on the beds of the stone to be installed by carefully applying heat to the stone until those surfaces are dry to the touch.
 - 2. Remove stone veneer work damaged by freezing conditions.
 - 3. Perform the following construction procedures while stone veneer work is progressing.
 - a. Temperature ranges indicated apply to ambient air temperatures existing at the time of installations.
 - b. When heating mortar materials, maintain mixing temperatures selected within 10 degrees F; do not heat water for mortar to above 160 degrees F.
 - c. Mortar: at 40 degrees F and below, produce mortar temperature between 40 degrees F and 120 degrees F by heating mixing water, and at temperatures of 32 degrees F and below, heat sand as well. Always maintain temperature on mortarboards above 40 degrees F.
 - d. At 25 degrees F to 20 degrees F, heat both sides of walls under construction and use windbreaks or enclosures when wind is in excess of 15 mph. At 20 degrees F and below, maintain mortar and stone veneer work at temperatures above 40 degrees F for a minimum of 72 hours after the last stone is set.
- D. Do not proceed with installation of sealants when ambient and substrate temperatures are outside the limits permitted by sealant manufacture, or ambient temperature below 40 degrees F for 72 hours preceding application; or when substrates are wet due to rain, frost, condensation, or other causes unless approved in writing by the sealant manufacture and reviewed by the Architect.

PART 2. PRODUCTS

2.1 MATERIALS- GENERAL

- A. Comply with referenced standards and other requirements indicated applicable to each type of Material required. [Technical Note # 2]
- B. Provide blocks from a single quarry. Extract blocks from single quarry specially selected for the project; unless randomly selected blocks are acceptable to the Architect for aesthetic affect.
- C. Quarry stone in a manner to ensure block orientations yield finished stone with required Characteristics.
- D. Make quarried blocks available for inspection by architect.

2.2 SANDSTONE

- A. Sandstone: The Briar Hill Stone Company sandstone complying with ASTM C 616.
Classification 1- Sandstone
 - 1. Color: [choice of: Pleasant Hill Buff, Copper Variegated, Orchard Buff, Sunset Blush, and, Burgundy Brownstone]
 - 2. Finish: [choice of: Chat sawn, Diamond sawn, Split face, Rocked Face, or other specified special finish]
 - 3. Provide special shapes required on drawings.

2.3 MORTAR

- A. Prepared mortar shall be used throughout. Job mixed mortar shall not be used. Prepared mortar For all masonry shall be: Lafarge Corp., Kosmos Cement Co. Inc., Lehigh Portland Cement Co. or Medusa Cement Co.
 - 1. Type N Natural Color
- B. Water: Clean, non-alkaline, and potable.

2.4 ANCHORS AND ACCESSORIES

- A. Anchors and other components in contact with stone: Stainless steel Type 302/304 Sizes and configurations as required for Vertical and Horizontal support of stone and applicable Loads. All other support steel shall be hot dip galvanized conforming to ASTM A 123 or A 153 as applicable.
 - 1. Stone on Engineered Metal Strut System: Hohmann & Barnard, Inc. www.h-b.com
 - 2. Stone on Masonry Backup: Hohmann & Barnard, Inc., Dur-O-Wal, Inc.
 - 3. Stone on Metal Studs: Hohmann & Barnard, Inc., Dur-O-Wal, Inc. www.dur-o-wal.com
- B. Dovetail slots: Fabricate from not less than 24 gauge stainless steel. Provide filler strips, use Heckman No. 100, 1 in. wide by 1 in. deep or equal.
- C. Dowels, Anchor Bolts, Nuts, Washers, and Shims: Fabricate from AISI Type 302/304 stainless steel.
- D. Stone Anchors: Type and size required to securely anchor and fasten stonework in place. Fabricate anchors and dowels from type 302/304 stainless steel. Anchors shall be Hohman & Barnard Inc. (HB) No. ITV-HVR-195V Anchor System, or approved equal.
- E. Setting Buttons: [when required] Malleable lead buttons [Hohmann & Barnard, Inc.] non-staining to stone, *sized to suit Joint* thickness and bed depth of stonework.
- F. Sheet Metal Flashing: A verity of premium grade non-staining metal flashings are acceptable depending on application. Let flashing protrude from the facade face 1/2" minimum to 1" maximum only recommended.
- G. Weeps and Vents: [see weep and vent material]
- H. Stone Cleaner: As recommended by stone quarrier and/or fabricator, [technical note 4]

2.5 FABRICATION

- A. General: Fabricate stone veneer work in sizes and shapes required to comply with requirements indicated on project drawings and approved shop drawings.
- B. Cut stone to produce pieces of size and shape as indicated on approved shop drawings, complying with fabrication tolerances [Technical Note # 3] in compliance with ILL, and BSI standards
 - 1. Control bed depth of stone: as indicated on approved shop drawings or average bed width of rubble stone veneer.
 - 2. Maintain joint width as specified. Set with overlapping head corners
 - 3. Provide individual anchor slots at quarter points along the top and bottom of each stone as indicated on approved shop drawings
 - 4. Cut stones to produce joints as specified on approved shop drawings.
 - 5. Clean stone setting beds of any loose sand or dirt that will prevent proper bonding.
- C. Finish exposed faces of stones to comply with requirements indicated for finish under each type and application of stone required and to match approved samples and field constructed mock-up.
- D. Carefully inspect finished stone at fabrication plant for compliance with color range and requirements of approved shop drawings
 - 1. Natural variations in appearance are acceptable if installed stones match range of colors and other appearance characteristics represented in approved samples and field constructed mock-up.

2.6 MORTAR AND GROUT MIXES

- A. Do not use admixtures including air-entraining agents, accelerators, retardants, water repellent agents, antifreeze compounds, or other admixtures unless approved in writing by the Architect.
 - 1. Do not use calcium chloride in the mortar.
- B. Mortar types: Type N

Part 3 - EXECUTION

3.1 EXAMINATION

- A. Examine with the installer all surfaces to receive stone. Review conditions for stone veneer installation for compliance with requirements for installation tolerances and other conditions affecting the performance of the stone work. Do not proceed with installation until any unsatisfactory conditions have been corrected.
 - 1. Examine substrates to verify inserts, reinforcement; ties, flashing, and other items to be installed in unit masonry are present.
 - 2. Examine wall framing and sheathing to verify stud locations are suitable for proper spacing of veneer anchors and installation will result in a waterproof covering.
 - 3. For the record prepare a written report, endorsed by the installer, listing conditions detrimental to the proper performance of the stone veneer work

3.2 PREPERATION

- A. Advise installers of other work about specific requirements relating to placement of reinforcement, anchors, flashing, and similar items to be built into stone work. If necessary, furnish installers of other work with drawings or templates showing size and locations of these items.
- B. Accurately mark stud centerlines on the face of the substrate before start of stone installation.

3.3 INSTALLATION

- A. Install stone work using skilled masons, and employ skilled stone cutters at the site to do any required field cutting as stone is set.
 - 1. Exposed edges should be set in such a manor to provide a minimum of face deviation from stone to stone unless otherwise specified.
- B. Set stone to comply with requirements indicated on drawings, approved shop drawings, and approved sample panel.
 - 1. Install anchors, supports, fasteners, and other attachments necessary to secure stone veneer in place. Shim or adjust anchors, and accessories to set stone accurately with uniform joints of specified width so edges and faces align according to specified tolerances.
 - 2. Install flashing with end dams at lintels, ledges, shelf angles, and similar interruptions in the cavity wall to divert water to the exterior of the facade.
- C. Construction Tolerances: Set stone work to comply with the following tolerance
 - 1. Variation from plum: For lines and surfaces of columns, walls and arises, do not exceed 1/4 inch in 10 feet, 3/8 inch in a story height or 20 feet maximum or 1/2 inch in 40 feet or more.
 - 2. Variation from level: For height established for exposed water tables, sills, lintels, belt courses, parapets, and other conspicuous horizontal lines, do not exceed 1/2 inch in any bay or 20 feet maximum, or 3/4 inch in 40 feet or more.
 - 3. Variation of linear Building Line: For position shown in plan and related portions of columns, walls, and partitions do not exceed 1/2 inch in any bay or 20 feet maximum, or 3/4 inch in 40 feet or more.
 - 4. Variation in Mortar Joint Thickness: Do not vary from joint size specified and approved in sample panel.
 - 5. Variation in plane Between Adjacent Stones: Do not exceed one half of tolerance specified for thickness of stone.
- D. Provide expansion joints, of specified width at all locations indicated.
 - 1. Do not fill with mortar
 - 2. Sealing of expansion joints is specified in section 07900.
- E. Weep Holes: Place weep holes where moisture may accumulate, including but not limited to the following.
 - 1. At the base of cavity walls, shelf angles, and flashing. Locate weep holes directly above flashing at intervals of 16 to 24 inches Trim wicking material flush with outside face of wall after mortar has set.
 - 2. Vents: The cavity should always be vented at the top of the wall at 24 to 36 inch intervals. Air circulation is important so any moisture present can evaporate.
- F. Prepare joints and apply sealants of specified type at locations indicated complying with Section 07900 requirements.

3.4 ADJUSTING AND CLEANING

- A. Remove and replace or repair stone work of the following description.
 - 1. Broken, chipped, stained, or otherwise damaged stone. Stones of this type may be repaired providing the methods and results are the same as demonstrated on the approved field constructed sample panel.
 - 2. Defective Joints must be removed to a minimum depth of 1 inch and replaced matching the color of adjacent joint material.
 - 3. Stone and joints not matching approved field constructed sample panel.
- B. Replacement of stone and joints must blend with the overall appearance of the building; and must be approved by the Architect.
- C. **Daily Cleaning:** Clean off excess mortar as work progresses. Tool joints when mortar is set enough to allow proper working of the joint. Let mortar crumbs hang until dry and brush off with a with a semi-stiff natural bristle brush.

Cleaning Briar Hill Sandstone: [Refer To Technical Note 4]

- D. **Final Cleaning:** Only proprietary cleaners shall be used. After mortar is thoroughly set and cured but not longer than 14 days, clean stone veneer as recommended by the stone quarrier and fabricator.
 - 1. Large mortar smears and droppings should have been removed as part of the daily in progress cleaning; only dust and light staining should remain for the final cleaning.
 - 2. Test cleaning method on an inconspicuous area of the building wall. The panel should be a minimum of 16 SF. and be representative of the type of staining that occurs on the building. Obtain Architect's approval of sample cleaning before proceeding.
 - 3. Protect adjacent surfaces from contact with cleaning solution by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 4. Wet wall surfaces with water before application of cleaners. Clean stone by bucket and brush hand cleaning method described in BIA Technical Note No. 20 revision II using job-mixed detergent solution. After appropriate "dwell time", remove cleaning agent by rinsing thoroughly with clean water.
 - 5. The use of **muritic acid** is prohibited.

3.4 PROTECTION

- A. Post Installation: **Provide protection to finished stone work**; especially at main entrances to the building that other trades must use to enter with materials and equipment.
 - 1. Construct shields of plywood to protect areas where damaged could occur to ensure the stone work will not be damaged prior to project completion.
 - 2. Remove shields when potential for construction damage no longer exist

END OF SECTION.....