SECTION 042113 - BRICK MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Face brick.
2. Mortar.
3. Ties and anchors.
4. Embedded flashing.
5. Miscellaneous masonry accessories.

B. Related Sections:

1. Section 042000 "Concrete Unit Masonry" for coordination of cavity wall mock-up, cavity wall construction and cavity wall insulation.
2. Section 055000 "Metal Fabrications" for furnishing steel lintels and for brick masonry.
3. Section 076200 "Sheet Metal Flashing and Trim" for exposed sheet metal flashing.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For the following:

1. Masonry Units: Show sizes, profiles, coursing, and locations of special shapes.
2. Fabricated Flashing: Detail corner units, end-dam units, and other special applications.

C. Samples for Verification: For each type and color of the following:

1. Face brick, in the form of straps of five or more bricks.
2. Weep holes and vents.
3. Accessories embedded in masonry.

D. List of Materials Used in Constructing Mockups: List generic product names together with manufacturers, manufacturers' product names, model numbers, lot numbers, batch numbers, source of supply, and other information as required to identify materials used. Include mix proportions for mortar and grout and source of aggregates.

8. Approval of sample panels is for color, texture, and blending of masonry 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 Architect in writing.

    a. Approval of sample panels does not constitute approval of deviations from the Contract Documents contained in sample panels unless such deviations are specifically approved by Architect in writing. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
    b. If sample panel is not approved, the Contractor shall provide up to a total of 3 sample panels (mock-ups) for Architect's review.

9. Clean exposed faces of mockups with masonry cleaner as indicated.
10. Protect accepted mockups from the elements with weather-resistant membrane.
11. Approved mockups may not become part of the completed Work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

B. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Deliver preblended, dry mortar mix in moisture-resistant containers designed for use with dispensing silos. Store preblended, dry mortar mix in delivery containers on elevated platforms, under cover, and in a dry location or in covered weatherproof dispensing silos.

E. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 PROJECT CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.

1. Extend cover a minimum of 24 inches down both sides of walls and hold cover securely in place.
2. Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

1. Products: Subject to compliance with requirements, provide the following:

    a. Redland Brick, Cushwa, #170 Camden Blend.
    b. Another brick approved by the process indicated in specification Section 001210 – Substitution Request Form, or by Section 016000 - Product Requirements.
2. Initial Rate of Absorption: Less than 30 g/30 sq. in. per minute when tested per ASTM C 67.
3. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
4. Size (Actual Dimensions): 3-3/4 inches wide by 2-1/4 inches high by 7-5/8 inches long.

2.3 MORTAR MATERIALS

A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction. Provide natural color as required to produce mortar color to match existing.

B. Hydrated Lime: ASTM C 207, Type S.

C. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes and complying with ASTM C 979. Use only pigments with a record of satisfactory performance in masonry mortar. Mortar is to match existing courthouse in color and texture.

1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

    a. Davis Colors; True Tone Mortar Colors.
    b. Lanxess Corporation; Bayferrox Iron Oxide Pigments.
    c. Solomon Colors, Inc.; SGS Mortar Colors.

D. Colored Cement Product: Packaged blend made from portland cement and hydrated lime and mortar pigments, all complying with specified requirements, and containing no other ingredients.

1. Colored Portland Cement-Lime Mix:

    a. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:

        1) Capital Materials Corporation; Riverton Portland Cement Lime Custom Color.
        2) Holcim (US) Inc.; Rainbow Mortamix Custom Color Cement/Lime.
        3) Lafarge North America Inc.; Eaglebond Portland & Lime.
        4) Lehigh Cement Company; Lehigh Custom Color Portland/Lime Cement.

2. Formulate blend as required to produce color indicated or, if not indicated, as selected from manufacturer's standard colors.
3. Pigments shall not exceed 10 percent of portland cement by weight.

a. Products: Subject to compliance with requirements, provide one of the following:

1) Cheney Flashing Company; Cheney Flashing (Dovetail)] [or] [Cheney 3-Way Flashing (Sawtooth).
2) Keystone Flashing Company, Inc.; Keystone 3-Way Interlocking Thruwall Flashing.

5. Fabricate through-wall flashing with drip edge unless otherwise indicated. Fabricate by extending flashing 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
6. Fabricate metal drip edges for ribbed metal flashing from plain metal flashing of same metal as ribbed flashing and extending at least 3 inches into wall with hemmed inner edge to receive ribbed flashing and form a hooked seam. Form hem on upper surface of metal so that completed seam will shed water.
7. Metal Drip Edge: Fabricate from stainless steel. Extend at least 3 inches into wall and 1/2 inch out from wall, with outer edge bent down 30 degrees and hemmed.
8. Metal Expansion-Joint Strips: Fabricate from stainless steel to shapes indicated.

B. Flexible Flashing: Use one of the following unless otherwise indicated:

1. Copper-Laminated Flashing: 5-oz./sq. ft. copper sheet bonded between 2 layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry.

a. Products: Subject to compliance with requirements, provide one of the following:

1) Advanced Building Products Inc.; Copper Fabric Flashing or Copper Sealtite 2000.
2) Dayton Superior Corporation, Dur-O-Wal Division; Copper Fabric Thru-Wall Flashing.
3) Hohmann & Barnard, Inc.; H & B C-Fab Flashing.
4) Phoenix Building Products; Type FCC-Fabric Covered Copper.
5) Sandell Manufacturing Co., Inc.; Copper Fabric Flashing.
6) York Manufacturing, Inc.; Multi-Flash 500.

2. Asphalt-Coated Copper Flashing: 5-oz./sq. ft. copper sheet coated with flexible asphalt. Use only where flashing is fully concealed in masonry.

a. Products: Subject to compliance with requirements, provide one of the following:

1) Advanced Building Products Inc.; Cop-R-Cote.
2) Dayton Superior Corporation, Dur-O-Wal Division; Copper Coated Thru-Wall Flashing.
3) Hohmann & Barnard, Inc.; H & B C-Coat Flashing.
4) Phoenix Building Products; Type ACC-Asphalt Bituminous Coated.
5) Sandell Manufacturing Co., Inc.; Coated Copper Flashing.

C. Application: Unless otherwise indicated, use the following:

a. Strips, full-depth of cavity and 10 inches high, with dovetail shaped notches 7 inches deep that prevent clogging with mortar droppings.
b. Strips, not less than 1-1/2 inches thick and 10 inches high, with dimpled surface designed to catch mortar droppings and prevent weep holes from clogging with mortar.

## 2.7 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

a. Diedrich Technologies, Inc.
b. EaCo Chem, Inc.
c. ProSoCo, Inc.

## 2.8 MORTAR MIXES

A. General: Do not use admixtures, including pigments, air-entraining agents, accelerators, retarders, water-repellent agents, antifreeze compounds, or other admixtures unless otherwise indicated.

1. Do not use calcium chloride in mortar.
2. Use portland cement-lime mortar unless otherwise indicated.
3. No cold-weather admixtures allowed.

B. Preblended, Dry Mortar Mix: Furnish dry mortar ingredients in form of a preblended mix. Measure quantities by weight to ensure accurate proportions, and thoroughly blend ingredients before delivering to Project site. Color and texture to match existing Courthouse mortar.

C. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specification. Provide Type S for exterior Brick construction.

1. Pigments shall not exceed 5 percent of masonry cement or mortar cement by weight.
2. Application: Use pigmented mortar for exposed mortar joints with face brick.

3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet or 1/2 inch maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
7. For faces of adjacent exposed masonry units, do not vary from flush alignment by more than 1/16 inch except due to warpage of masonry units within tolerances specified for warpage of units.

C. Joints:

1. For bed joints, do not vary from thickness indicated by more than plus or minus 1/8 inch with a maximum thickness limited to 1/2 inch. Do not vary from bed-joint thickness of adjacent courses by more than 1/8 inch.
2. For exposed head joints, do not vary from thickness indicated by more than plus or minus 1/8 inch. Do not vary from adjacent bed-joint and head-joint thicknesses by more than 1/8 inch.

## 3.4 LAYING MASONRY WALLS

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Bond Pattern for Exposed Masonry: Unless otherwise indicated, lay exposed masonry in running bond with rowlock (header) and soldier bands, as indicated on Drawings; do not use units with less than nominal 4-inch horizontal face dimensions at corners or jambs. Soldier corners are a special shape.

C. Stopping and Resuming Work: Stop work by racking back units in each course from those in course below; do not tooth. When resuming work, clean masonry surfaces that are to receive mortar, remove loose masonry units and mortar, and wet brick if required before laying fresh masonry.

D. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.

E. Fill space between steel frames and masonry solidly with mortar unless otherwise indicated.

## 3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow brick as follows:

B. Provide minimum bearing of 8 inches at each jamb unless otherwise indicated.

3.9 FLASHING, WEEP HOLES, CAVITY DRAINAGE, AND VENTS

A. General: Install embedded flashing and weep holes in masonry at shelf angles, lintels, ledges, other obstructions to downward flow of water in wall, and where indicated.

B. Install flashing as follows unless otherwise indicated:

1. Prepare masonry surfaces so they are smooth and free from projections that could puncture flashing. Where flashing is within mortar joint, place through-wall flashing on sloping bed of mortar and cover with mortar. Before covering with mortar, seal penetrations in flashing with adhesive, sealant, or tape as recommended by flashing manufacturer.
2. At multiwythe masonry walls, including cavity walls, extend flashing through outer wythe, turned up a minimum of 8 inches (200 mm), and through inner wythe to within 1/2 inch (13 mm) of the interior face of wall in exposed masonry. Where interior face of wall is to receive furring or framing, carry flashing completely through inner wythe and turn flashing up approximately 2 inches (50 mm) on interior face.
3. At masonry-veneer walls, extend flashing through veneer, across air space behind veneer, and up face of sheathing at least 8 inches, with upper edge tucked under building paper or building wrap, lapping at least 4 inches.
4. At lintels and shelf angles, extend flashing a minimum of 6 inches to masonry at each end. At heads and sills, extend flashing 6 inches at ends and turn up not less than 2 inches to form end dams.
5. Interlock end joints of ribbed sheet metal flashing by overlapping ribs not less than 1-1/2 inches or as recommended by flashing manufacturer, and seal lap with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
6. Install metal drip edges with ribbed sheet metal flashing by interlocking hemmed edges to form hooked seam. Seal seam with elastomeric sealant complying with requirements in Section 079200 "Joint Sealants" for application indicated.
7. Install metal drip edges beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal drip edge.
8. Install metal flashing termination beneath flexible flashing at exterior face of wall. Stop flexible flashing 1/2 inch back from outside face of wall and adhere flexible flashing to top of metal flashing termination.

C. Install reglets and nailers for flashing and other related construction where they are shown to be built into masonry.

D. Install weep holes in head joints in exterior wythes of first course of masonry immediately above embedded flashing and as follows:

1. Use specified weep/vent products to form weep holes.
2. Space weep holes 24 inches unless otherwise indicated.

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SECTION 042200 – CONCRETE UNIT MASONRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Concrete masonry units.
2. Concrete building brick.
3. Mortar and grout.
4. Steel reinforcing bars.
5. Masonry joint reinforcement.
6. Ties and anchors.
7. Miscellaneous masonry accessories.

B. Related Sections:

1. Section 042113 "Brick Masonry" for furnishing brick masonry construction and flashing.
2. Section 055000 "Metal Fabrications" for furnishing galvanized steel lintels for unit masonry.

1.3 DEFINITIONS

A. CMU(s): Concrete masonry unit(s).

B. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 PERFORMANCE REQUIREMENTS

A. Provide concrete unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to Tables 1 and 2 in ACI 530.1/ASCE 6/TMS 602.

D. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

E. Minutes from Preinstallation Conference.

1.7 QUALITY ASSURANCE

A. Testing Agency Qualifications: Qualified according to ASTM C 1093 for testing indicated.

B. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

C. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

D. Masonry Standard: Comply with ACI 530.1/ASCE 6/TMS 602 unless modified by requirements in the Contract Documents.

E. Mockups: Build mockup of cavity wall to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.

1. Build mockup of typical wall area as required by Section 042113 "Brick Masonry".
2. Approval of mockups is for color, texture, and blending of masonry units; relationship of mortar and sealant colors to masonry unit colors; tooling of joints; and aesthetic qualities of workmanship.
    a. Approval of mockups is also for other material and construction qualities specifically approved by Architect in writing.
    b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless such deviations are specifically approved by Architect in writing.
    c. If sample panel is not approved, the Contractor shall provide up to a total of 3 sample panels (mock-ups) for Architect's review.
3. Approved mockups may not become part of the completed Work.

F. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination."

1.8 DELIVERY, STORAGE, AND HANDLING

A. Store masonry units on elevated platforms in a dry location. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from single source from single manufacturer for each product required.

B. Source Limitations for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from single manufacturer for each cementitious component and from single source or producer for each aggregate.

2.2 PERFORMANCE REQUIREMENTS

A. Provide structural unit masonry that develops indicated net-area compressive strengths at 28 days.

1. Determine net-area compressive strength of masonry from average net-area compressive strengths of masonry units and mortar types (unit-strength method) according to TMS 602/ACI 530.1/ASCE 6.

2.3 MASONRY UNITS, GENERAL

A. Defective Units: Referenced masonry unit standards may allow a certain percentage of units to contain chips, cracks, or other defects exceeding limits stated in the standard. Do not use units where such defects will be exposed in the completed Work.

2.4 CONCRETE MASONRY UNITS

A. Shapes: Provide shapes indicated and as follows, with exposed surfaces matching exposed faces of adjacent units unless otherwise indicated.

1. Provide special shapes for lintels, corners, jambs, and other special conditions.
2. Provide bullnose units for outside corners and jambs, unless otherwise indicated.

B. CMUs: ASTM C 90.

1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength of 2800 psi.
2. Density Classification: Normal weight.
3. Size (Width): Manufactured to dimensions 3/8 inch less than nominal dimensions.

3. Steel Plates, Shapes, and Bars: ASTM A 36.

## 2.9 MISCELLANEOUS ANCHORS

A. Postinstalled Anchors: Provide chemical or torque-controlled expansion anchors, with capability to sustain, without failure, a load equal to six times the load imposed when installed in solid or grouted unit masonry and equal to four times the load imposed when installed in concrete, as determined by testing per ASTM E 488 conducted by a qualified independent testing agency.

1. Manufacturers:

   a. HILTI.
   b. Simpson Strong-Tie.
   c. Redhead.

2. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 for Class SC 1 service condition (mild).
3. Where postinstalled anchors are indicated in Drawings, provide type indicated. If not indicated provide either chemical or torque-controlled expansion as required above.

## 2.10 MISCELLANEOUS MASONRY ACCESSORIES

A. Preformed Control-Joint Gaskets: Made from PVC, complying with ASTM D 2287, Type PVC-65406 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells and hold reinforcing bars in center of cells. Units are formed from 0.148-inch steel wire, hot-dip galvanized after fabrication. Provide units designed for number of bars indicated.

1. Products: Subject to compliance with requirements, provide one of the following:

   a. Dayton Superior Corporation, Dur-O-Wal Division; D/A 810, D/A 812 or D/A 817.
   b. Heckmann Building Products Inc.; No. 376 Rebar Positioner.
   c. Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
   d. Wire-Bond; O-Ring or Double O-Ring Rebar Positioner.

## 2.11 MASONRY CLEANERS

A. Proprietary Acidic Cleaner: Manufacturer's standard-strength cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from new masonry without discoloring or damaging masonry surfaces. Use product expressly approved for intended use by cleaner manufacturer and manufacturer of masonry units being cleaned.

3.2 INSTALLATION, GENERAL

A. Thickness: Build cavity and composite walls and other masonry construction to full thickness shown. Build single-wythe walls to actual widths of masonry units, using units of widths indicated.

B. Build chases and recesses to accommodate items specified in this and other Sections.

C. Leave openings for equipment to be installed before completing masonry. After installing equipment, complete masonry to match the construction immediately adjacent to opening.

D. Use full-size units without cutting if possible. If cutting is required to provide a continuous pattern or to fit adjoining construction, cut units with motor-driven saws; provide clean, sharp, unchipped edges. Allow units to dry before laying unless wetting of units is specified. Install cut units with cut surfaces and, where possible, cut edges concealed.

E. Select and arrange units for exposed unit masonry to produce a uniform blend of colors and textures.

1. Mix units from several pallets or cubes as they are placed.

3.3 TOLERANCES

A. Dimensions and Locations of Elements:

1. For dimensions in cross section or elevation do not vary by more than plus 1/2 inch or minus 1/4 inch.
2. For location of elements in plan do not vary from that indicated by more than plus or minus 1/2 inch.
3. For location of elements in elevation do not vary from that indicated by more than plus or minus 1/4 inch in a story height or 1/2 inch total.

B. Lines and Levels:

1. For bed joints and top surfaces of bearing walls do not vary from level by more than 1/4 inch in 10 feet, or 1/2 inch maximum.
2. For conspicuous horizontal lines, such as lintels, sills, parapets, and reveals, do not vary from level by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
3. For vertical lines and surfaces do not vary from plumb by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
4. For conspicuous vertical lines, such as external corners, door jambs, reveals, and expansion and control joints, do not vary from plumb by more than 1/8 inch in 10 feet, 1/4 inch in 20 feet, or 1/2 inch maximum.
5. For lines and surfaces do not vary from straight by more than 1/4 inch in 10 feet, 3/8 inch in 20 feet, or 1/2 inch maximum.
6. For vertical alignment of exposed head joints, do not vary from plumb by more than 1/4 inch in 10 feet, or 1/2 inch maximum.

3.5 MORTAR BEDDING AND JOINTING

A. Lay hollow CMUs as follows:

1. Bed face shells in mortar and make head joints of depth equal to bed joints.
2. Bed webs in mortar in all courses of piers, columns, and pilasters.
3. Bed webs in mortar in grouted masonry, including starting course on footings.
4. Fully bed entire units, including areas under cells, at starting course on footings where cells are not grouted.

B. Lay solid CMUs with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not deeply furrow bed joints or slush head joints.

C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness unless otherwise indicated.

D. Cut joints flush for masonry walls to receive plaster or other direct-applied finishes (other than paint) unless otherwise indicated.

3.6 COMPOSITE MASONRY

A. Corners: Provide interlocking masonry unit bond in each wythe and course at corners unless otherwise indicated.

1. Provide continuity with masonry joint reinforcement at corners by using prefabricated L-shaped units as well as masonry bonding.

3.7 MASONRY JOINT REINFORCEMENT

A. General: Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch on exterior side of walls, 1/2 inch elsewhere. Lap reinforcement a minimum of 6 inches.

1. Space reinforcement not more than 16 inches o.c. (Unless noted otherwise).
2. Space reinforcement not more than 8 inches o.c. in parapet walls.
3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings in addition to continuous reinforcement.

B. Interrupt joint reinforcement at control and expansion joints unless otherwise indicated.

C. Provide continuity at wall intersections by using prefabricated T-shaped units.

D. Provide continuity at corners by using prefabricated L-shaped units.

E. Cut and bend reinforcing units as directed by manufacturer for continuity at corners, returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

D. Concrete Masonry Unit Test: For each type of unit provided, according to ASTM C 140 for compressive strength.

E. Mortar Test (Property Specification): For each mix provided, according to ASTM C 780. Test mortar for compressive strength.

F. Grout Test (Compressive Strength): For each mix provided, according to ASTM C 1019.

G. Prism Test: For each type of construction provided, according to ASTM C 1314 at 7 days and at 28 days.

H. Test results shall be reported in writing to Architect and Contractor within 48 hours of testing. Reports shall contain Project identification name, date of testing and inspecting agency and location of test.

## 3.11 REPAIRING, POINTING, AND CLEANING

A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or that do not match adjoining units. Install new units to match adjoining units; install in fresh mortar, pointed to eliminate evidence of replacement.

B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for sealant application, where indicated.

C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears before tooling joints.

D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:

1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
3. Protect adjacent stone and nonmasonry surfaces from contact with cleaner by covering them with liquid strippable masking agent or polyethylene film and waterproof masking tape.
4. Wet wall surfaces with water before applying cleaners; remove cleaners promptly by rinsing surfaces thoroughly with clear water.
5. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2A applicable to type of stain on exposed surfaces.

CLEMSON UNIVERSITY
THE BISHOP MATERIALS LABORATORY

# TEST REPORT
## THE BISHOP MATERIALS LABORATORY

100 Clemson Research Blvd.
Anderson, SC 29625
(864) 656-1094
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www.bishopmaterialslab.com

AASHTO R18 ACCREDITED LABORATORY

*Results of Tests on Brick conducted in accordance with ASTM C67-13 Standard Method for Sampling and Testing Brick and Structural Clay Tile*

04/03/2014

| | | | | | |
|---|---|---|---|---|---|
| Name: | Redland Brick Inc<br>P. O. Box 160<br>Williamsport , MD 21795 | Plant: | Cushwa | *Temperature: 70 - 77F | |
| | | Report Number: | 5567.10177 | *Humidity: 45% - 55% | |
| Phone: | | Received Date: | 03/24/2014 | | |
| Fax: | | Sampled Date: | 03/24/2014 | | |
| | | Lot: | | | |
| | | Product Code: | | | |

Sample Description: **Cushwa Machine Made Face Brick**

| | | | | | | | Test Date |
|---|---|---|---|---|---|---|---|
| **Absorption** | 1 | 2 | 3 | 4 | 5 | Average | |
| *24 Hour Submersion In Cold Water (%)* | 6.85 | 6.70 | 8.08 | 7.07 | 8.09 | 7.36 | 03/25/2014 |
| *5 Hour Submersion In Boiling Water (%)* | 11.20 | 10.73 | 12.18 | 11.36 | 12.17 | 11.53 | |
| *Saturation Coefficient (Ratio of 24H to 6H)* | 0.61 | 0.62 | 0.66 | 0.62 | 0.67 | 0.64 | |

*Measurement Uncertainty ± 0.55 %

*The 1 and 2 hour boiled water absorption tests are not required by the customer

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Compressive Strength** | 1 | 2 | 3 | 4 | 5 | Average | |
| *psi* | 5,428 | 6,836 | 5,804 | 5,774 | 5,397 | 5,848 | 03/25/2014 |
| *MPa* | 37.4 | 47.1 | 40.0 | 39.8 | 37.2 | 40.3 | |

*Measurement Uncertainty ± 231 psi

| | | | | | | |
|---|---|---|---|---|---|---|
| **Efflorescence** | 11 | 12 | 13 | 14 | 15 | |
| | Not Effloresced | Not Effloresced | Not Effloresced | Not Effloresced | Not Effloresced | 04/03/2014 |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **IRA (Oven Dried Method)** | 6 | 7 | 8 | 9 | 10 | Average | |
| *g/min/30 in.²* | 53.9 | 44.8 | 52.1 | 44.5 | 59.3 | 50.9 | 03/25/2014 |

*Measurement Uncertainty ± 1.5 g/min/30 in.²

***The brick represented by the test results shown here comply with the physical property requirements of the standards listed below:***

ASTM C 216 - 13 Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale)
Grade: SW, MW

John Sanders, Ph.D., PE, Director

Gary W. Parker, Laboratory Supervisor

**This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2*

**The temperature and humidity of the Bishop Materials Laboratory is constantly kept between 70 -77F, and 45-55%*

*The results shown above apply only to the samples tested, which are provided by the customer.*

*This test report shall not be reproduced except in full, without written approval of the laboratory.*



Lab Reference: 5567.10177

Redland BRICK
An ISO 9001 Compliant Quality System

# SAFETY DATA SHEET

Latest Revision: 05-15-2015

## SECTION 1 - IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND THE COMPANY/UNDERTAKING

Product Identifier:

| | |
|---|---|
| Material Name: | Brick |
| Trade Name: | Clay and/or Shale Brick; Face Brick; Pavers; Red Shale/Fireclay Chemical Resistant Brick |
| Chemical Family: | Predominately Aluminum Silicates |
| Formula: | Mixture |

Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Intended Use: Building material used for structural support.

Details of the Supplier of the Safety Data Sheet


Redland Brick Inc.
15718 Clear Spring Road, P O Box 160
Williamsport, MD 21795

Product Support/ Technical Services Phone: 301-223-7700
Emergency Phone number: (24 hrs.): 301-223-7700
Contact E-Mail: info@redlandbrick.com


## SECTION 2 - HAZARD(S) IDENTIFICATION

Appearance: Granular brick-shaped solid; comes in wide range of colors

Hazard Classification of the Substance or Mixture:

| | | | |
|---|---|---|---|
| Skin Irritation | 2 | Carcinogenicity | 1A |
| Eye Irritation | 2A | Specific target organ toxicity-Single exposure | 3 |
| Skin sensitization | 1B | Specific target organ toxicity-Repeated exposure | 1 |

Signal Word: DANGER

Hazard Statement: Brick dust may contain crystalline silica, a chemical that has been determined by certain agencies to cause cancer. See Section 11 for more information on health hazards.

Pictograms:

Precautionary Statement: Limit inhalation of clay dust. Do not eat, drink, or smoke when using this product. Wash hands thoroughly after handling. Contaminated work clothing must not be allowed out of the workplace Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Wear protective gloves/protective clothing/eye protection/ face protection. Use only outdoors or in well ventilated area.

Response: If exposed or concerned: Get medical advice/attention. If skin rash occurs: Get medical advice/ attention. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If brick dust is inhaled: Remove person to fresh air and keep comfortable for breathing. Call poison center/doctor if you feel unwell.

Storage: Not Applicable

Disposal: Dispose of unused or unwanted brick products in accordance with all local, regional, national and international regulations.

## SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

| INGREDIENTS | CAS NO. | % WEIGHT | ADDITIONAL INFORMATION: |
|---|---|---|---|
| Aluminum Silicates | Various | 75-85 | The listed chemistries are provided for industrial hygiene and environmental purposes and are not intended to represent product specification. This information has been compiled from data believed to be reliable. Elements such as aluminum, arsenic, boron, barium, chromium, cobalt, copper, lead, nickel, molybdenum, tin, titanium, vanadium and zirconium may be present in trace amounts. Brick products as shipped to not present an exposure hazard. |
| Quartz | 14808-60-7 | Varies | |
| Iron Compounds | Various | 0-5 | |
| Calcium Compounds | Various | 0-12 | |
| Manganese Compounds | Various | 0-3 | |
| Magnesium Compounds | Various | 0-3 | |
| Zinc Compounds | 1314-13-2 | 0-10 | |
| Iron Chromite | 1308-31-2 | 0-3 | |

## SECTION 4 - FIRST AID MEASURES

Description of First Aid Measures

Eye Contact: Flush with running water. Obtain medical assistance if irritation continues.

Skin Contact: Wash with soap and water. If allergic reaction causes a rash that does not heal within a few days consult a physician. Treat abrasions as any other scrape or cut with disinfectants and bandages.

## SECTION 4 - FIRST AID MEASURES

| | |
|---|---|
| Ingestion: | None (no known acute effects). |
| Inhalation: | Remove from exposure to airborne particulates. Consult a physician if breathing does not return to normal. |

Most Important Symptoms and Effects, Both Acute and Delayed

| | |
|---|---|
| Symptoms and Effects of Exposure: | For information on potential signs and symptoms of exposure. See Section 2 - Hazards Identification and/or Section 11 - Toxicological Information. |
| Medical Conditions: | Excessive dust exposure may aggravate any existing respiratory disorders or diseases. |
| Aggravated by Exposure: | Possible complications or allergies resulting in irritation to skin, eyes, and respiratory tract may occur from excessive exposure to dusts. |

Recommendations for Immediate Medical Attention and Special Treatment Needed

| | |
|---|---|
| Notes to Physician: | Symptoms may not appear immediately. |

## SECTION 5 - FIRE-FIGHTING MEASURES

Extinguishing Media: Not Applicable

Special Hazards Arising from the Substance or Mixture

Hazardous Combustion Products: No Data Available

Fire/Explosion Hazards: Bricks as shipped do not pose a fire or explosion hazard. Advice for Fire-Fighters: None

## SECTION 6 - ACCIDENTAL RELEASE MEASURES

| | |
|---|---|
| Personal Precautions and Protective Equipment: | Use personal protection recommended in Section 8 |
| Emergency Procedures: | Not Applicable |
| Methods and Materials for Containment and Cleaning Up: | Not Applicable |
| Cleanup Procedure: | Not Applicable |

## SECTION 7 - HANDLING AND STORAGE

| | |
|---|---|
| Precautions for Safe Handling: | Minimize dust generation and accumulation. Avoid breathing dust. |
| Conditions for Safe Storage, Including any Incompatibilities: | Always stack and store bricks in a stable manner to avoid falling hazards. |

## SECTION 8 - EXPOSURE CONTROLS/PERSONAL PROTECTION

| | EXPOSURE LIMITS | | | EXPOSURE LIMITS | |
|---|---|---|---|---|---|
| | OSHA PEL | ACGIH TLV | | OSHA PEL | ACGIH TLV |
| Aluminum Silicates | 15 mg/m$^3$ | 10 mg/m$^3$ | Manganese Compounds | not available | not available |
| Quartz | 10/%$SiO_2$+2mg/m3 | .025 mg/m$^3$ | Calcium Compounds | not available | not available |
| Chromium Compounds | not available | not available | Iron Compounds as granular body additives | not available | not available |

Exposure Controls:

| | |
|---|---|
| Engineering Controls: | Provide adequate ventilation to maintain exposures below the OSHA PEL and ACGIH TLV for quartz and other substances. |
| Personal Protective Equipment: | Refer to applicable national standards and regulations in the selection and use of person protective equipment (PPE). |
| Feet: | Use of steel toe shoes is recommended when handling brick. |
| Eyes and Face: | Face shields should be used when sawing brick. |
| Skin: | Use gloves and or protective clothing if abrasions or allergic reactions are experienced. |
| Respiratory Protection: | For airborne concentration exceeding the OSHA PEL or ACGIH TLV use a NIOSH and/or MSHA approved respirator. |
| OTHER: | Use of wet sawing methods is recommended anytime that bricks must be cut. |

## SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

| | | | |
|---|---|---|---|
| Physical State: | Granular Solid | Color: | Bricks come in a wide range of colors |
| Odor: | Essentially odorless | Odor Threshold: | No data available |
| Molecular Formula: | Mixture | Molecular Weight: | Mixture |

| | | | |
|---|---|---|---|
| Solvent Solubility: | No data available | Decomposition Temperature (°C) | No data available |
| Water Solubility: | Negligible | Evaporation Rate (Gram/s): | No data available |
| pH: | No data available | Vapor Pressure (kPa): | No data available |
| Melting/Freezing Point (°C) | No data available | Vapor Density (g/ml): | No data available |
| Boiling Point (°C) | No data available | Relativity Density: | No data available |
| Partition Coefficient: Method, pH, Endpoint, Value) | No data available | Viscosity: | No data available |

Flammability:

| | | | |
|---|---|---|---|
| Autoignition Temperature (Solid) (°C) | No data available | Upper Explosive Limits (Liquid) (% by Vol.): | No data available |
| Flammability (Solids): | No data available | Lower Explosive Limits (Liquid) (% by Vol.): | No data available |
| Flash Point (Liquid) (°C) | No data available | | |

## SECTION 10 - STABILITY AND REACTIVITY

| | | | |
|---|---|---|---|
| Reactivity: | Brick as shipped are not reactive | Chemical Stability: | Stable under normal conditions of use |
| Possibility of Hazardous Reactions: | | | |
| Oxidizing Properties: | No data available | Incompatible Materials: | No data available |
| Hazardous Decomposition Products: | No data available | | |

## SECTION 11 - TOXICOLOGICAL INFORMATION

**Effects of Short Term Exposure:**

Bricks as shipped do not present an inhalation, ingestion or contact hazard. However operations such as sawing and grinding may result in the following effects.

| | |
|---|---|
| Eyes: | May cause irritation by abrasion with dust chips. |
| Skin: | Brick dust or chips may cause allergic reactions in hypersensitive individuals; may cause cuts and skin abrasions. |
| Inhalation: | Brick dust or chips may cause congestion and irritation in nasal and respiratory passages |
| Ingestion: | No known acute effects. |

**Effects of Long Term Exposure:**

Excessive exposures to reparable particulates (dust) over an extended period of time may result in the development of pulmonary diseases such as silicosis.

**Information on Toxicological Effects:**

General Information: Toxicological properties of the formulation have not been investigated. The information in this section describes the potential hazards of crystalline silica. Brick dust may contain crystalline silica, a chemical that has been determined by certain agencies to cause cancer and other chemicals known to cause cancer, birth defects and other reproductive harm. Inhalation of brick dust above established or recommended exposure levels should be avoided by use of wet sawing or shaping and/or use of a NIOSH and/or MSHA approved respirator.

Carcinogen Status: The following carcinogenicity classifications for crystalline silica have been established by the following agencies:

| | | | |
|---|---|---|---|
| OSHA: | Not regulated as a carcinogen | NIOSH: | Carcinogen, with no further categorization |
| IARC: | Group 1 carcinogen in humans | NTP: | Known carcinogen |

## SECTION 12 - ECOLOGICAL INFORMATION

**There are no known environmental impacts.**

## SECTION 13 - DISPOSAL CONSIDERATIONS

**Waste Treatment Methods:** Dispose of waste in accordance with all applicable laws and regulations. State specific and community specific provisions must be considered. It is recommended that waste minimization be practiced.

## SECTION 14 - TRANSPORT INFORMATION

**This material is not regulated for transportation as a hazardous material/dangerous good.**

DOT: Bricks as shipped are not hazardous materials per DOT regulations.

## SECTION 15 - REGULATORY INFORMATION

**Safety, Health and Environmental Regulations/Legislation Specific for Substance or Mixture:**

| | |
|---|---|
| RCRA: | Brick in its solid form is typically considered a non-hazardous waste for disposal, but local regulation may vary, therefore all waste must be disposed/recycled/reclaimed in accordance with federal, state, and local environmental control regulations. Water containing brick solids, such as from wet sawing operations, should also be disposed of in accordance with federal, state and local environmental regulation. Brick waste should not used as a blasting agent. |
| EPCRA Section 311/312: | Bricks as shipped are not a Section 311/312 reportable product. |
| EPCRA Section 313: | Bricks as shipped are not subject to the Section 313, Toxic Chemical Release Inventory reporting requirements. |
| DOT: | Bricks as shipped are not hazardous materials per DOT regulations. |

## SECTION 16 - OTHER INFORMATION

Redland Brick Inc. considers our product an "article" as defined in 29 CFR 1910.1200 (b)(6)(v) and 40 CFR 372.38. As an article, an SDS is not required and the product is exempt from all other requirements for the hazard communication standard. OSHA requires an SDS for brick because it is occasionally dry sawed. We recommend only wet sawing of brick.

| | | | |
|---|---|---|---|
| Data Sources: | The data contained in this SDS may have been gathered from confidential internal sources, raw material suppliers, or from the published literature. | | |
| **Reasons for Revision:** | **Converted MSDS to SDS.** | **Prepared by:** | **Redland Brick Inc.** |

This SDS was prepared with information believed accurate at the time of preparation and was prepared and provided in good faith. However, Redland Brick, Inc. assumes no responsibility as to the accuracy or suitability of such information an no warranty expressed or implied is made.

# TECHNICAL ADVISORY 99A rev.5

## *INITIAL CLEANING GUIDE FOR ALL REDLAND BRICK*

*THE #1 RULE* – THE CLEANING METHOD IS JUST AS IMPORTANT AS THE CLEANING AGENT!

NOTE: ALWAYS CONTACT THE MORTAR MANUFACTURER FOR CLEANING RECOMMENDATIONS TO AVOID DISCOLORATION OF MORTAR JOINTS.

Redland Brick, Inc
Technical Services Dept
15718 Clear Spring Road
P.O. Box 160
Williamsport, MD 21795
(301) 223-7700
(301) 223-8775

*CATEGORY A: Surface treated brick including*

1. CUSHWA AND ROCKY RIDGE MOULDED FACE BRICK
2. HARMAR, KF AND LAWRENCEVILLE SAND FACED AND SURFACE TREATED BRICK
3. KF TUMBLED BRICK

METHODS: FOLLOW REDLAND TECHNICAL ADVISORY #94A4 "CLEANING MOULDED BRICKWORK"
NOTE: HIGH PRESSURE (OVER 300 psi) IS NOT ALLOWED

INITIAL CLEAN DOWN AGENTS:

>WE RECOMMEND EACOCHEM NMD80.

>GOOD RESULTS HAVE BEEN OBTAINED WITH CAREFUL USE OF SUREKLEAN VANATROL, OR DIEDRICH VANA-STOP.

>RED ONLY BRICK HAVE BEEN CLEANED SUCCESSFULLY WITH SUREKLEAN #600 OR DIEDRICH #202, BUT THESE CAN EASILY DAMAGE MORTAR AND CAUSE EFFLORESCENCE – AND SHOULD NEVER BE USED ON WHITE, BROWN OR BLACK BRICK

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*CATEGORY B: "Through-body" brick*
HARMAR, KF AND LAWRENCEVILLE FACE BRICK – NOT SANDED OR COATED

METHODS: FOLLOW BIA TECH NOTE 20.
"BUCKET AND BRUSH" METHOD RECOMMENDED.
HIGH PRESSURE ALLOWED IF APPROPRIATE PRECAUTIONS USED.

INITIAL CLEAN DOWN AGENTS:

>WE RECOMMEND EACOCHEM NMD80.

>GOOD RESULTS HAVE BEEN OBTAINED WITH CAREFUL USE OF SUREKLEAN VANATROL, OR DIEDRICH VANA-STOP.

>RED ONLY BRICK HAVE BEEN CLEANED SUCCESSFULLY WITH SUREKLEAN #600 OR DIEDRICH #202, BUT THESE CAN EASILY DAMAGE MORTAR AND CAUSE EFFLORESCENCE – AND SHOULD NEVER BE USED ON WHITE, BROWN OR BLACK BRICK OR ANY HARMAR BRICK MADE WITH FIRECLAY (#800 SERIES)

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*CATEGORY C:* HARMAR FIRECLAY PRODUCTS (#800 SERIES)

INITIAL CLEAN DOWN AGENTS:

>WE RECOMMEND EACOCHEM NMD80.

>GOOD RESULTS HAVE BEEN OBTAINED WITH CAREFUL USE OF SUREKLEAN VANATROL, OR DIEDRICH VANA-STOP.

---

*CATEGORY D:* CUSHWA AND ROCKY RIDGE MOULDED PAVERS

METHODS: CLEANING MORTAR IS NOT RECOMMENDED – ABSORBANT PAVERS MAY HOLD WATER AND CLEANING ACIDS WHICH CAN CREATE EFFLORECSCENCE FROM NEW MORTAR IN JOINTS AND SETTING BED. CONTACT YOUR LOCAL DISTRIBUTOR FOR SITE INSPECTION AND ADVICE.

CLEANING AGENTS: SITE INSPECTION BY LOCAL DISTRIBUTOR REQUIRED.

---

*CATEGORY E:* HARMAR, LAWRENCEVILLE AND KF PAVERS

METHODS: CLEANING MORTAR IS NOT RECOMMENDED.
CONTACT YOUR LOCAL DISTRIBUTOR FOR SITE INSPECTION AND ADVICE.

CLEANING AGENTS: SITE INSPECTION BY LOCAL DISTRIBUTOR REQUIRED.

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# TECHNICAL ADVISORY NOTE #94A4

# Cleaning Moulded Brickwork

## Including Sand-Finished and Coated Extruded Brick

Revised June 2012

Redland Brick, Inc
Technical Services Dept
15716 Clear Spring Road
P.O. Box 160
Williamsport, MD 21795
(301) 223-7700
(301) 223-6575 Fax

New brickwork is usually cleaned to remove excess mortar from brick faces. The cleaning agents designed to do this are sometimes called "detergents", but they are ALL some type of buffered acids. Only acid will dissolve the cement in mortar to release it from the brick faces. All of the cleaning agents, even the mildest ones, have the potential to damage masonry. This is why the method of cleaning is critically important. (Muriatic acid is NEVER recommended for cleaning any masonry.)

There are three methods approved by Redland Brick for cleaning new brickwork constructed with Cushwa moulded face brick, Rocky Ridge moulded face brick, and all Harmar, Lawrenceville and KF sand-finished or surface treated face brick.

**METHOD 1. No Cleaning** (Building Clean Walls).

If certain precautions are taken, objectionable amounts of excess mortar on the brick can be completely avoided, or, at least minimized, so that water and chemicals are not required. This is by far the best approach to clean, beautiful brickwork. Careful work is not much slower, nor much more expensive, than haphazard work. And, any extra cost is far less than the cost of chemical cleaning; and far, far less expensive than solving problems later caused by poor chemical cleaning.

**Specify and follow these steps:**

a. All brick received on the jobsite should never touch the ground or concrete. Store on wood pallets. Cover with plastic or tarps.

b. Scaffolding should be erected away from the wall to prevent mortar droppings from splattering onto the wall.

c. When not in use, scaffold boards should be removed or turned up, away from the wall, so that mortar splatter or rain splatter will not hit the wall.

d. As brick are laid, masons should cut excess mortar with the edge of the trowel such that mortar is not smeared onto the brick.

e. After tooling joints, mortar tailings (tags) should be cut off with the edge of a clean trowel. DO NOT BRUSH at this time, because mortar could still be absorbed into the brick faces.

f. The day AFTER brick are laid, the brickwork may be brushed, or scraped with a wood paddle, to remove tailings or burrs missed the previous day. Do not use metal brushes, metal scrapers or other brick.

g. Protect ledges, such as sills and watertables, from mortar droppings, by covering them with plastic.

h. At the wall base, cover the ground with straw or plastic to prevent mud splatter.

i. Cover all wall openings daily to prevent precipitation from entering the wall behind the brick. This will help limit efflorescence and staining.

## METHOD 2. Chemical Cleaning with Bucket and Brush.

If the brickwork must be cleaned of excess mortar, beyond what was accomplished with Method 1, the next best method is the use of proprietary cleaning agents (acids), applied by brush or low-pressure spray (such as a "garden" sprayer), not by high pressure-spray equipment.

**Specify and follow these steps:**

Start by following Method 1, above, building the masonry as clean as possible.

a. Remove all large mortar droppings within 24 hours of laying, with a bristle brush or wood. Do not use metal or other brick.

b. Wait at least 4 days after laying, preferably 7 days, before starting, in order to avoid chemical damage to mortar joints.

c. Test the chemicals and method at least two weeks prior to starting. This can be done on a specially erected "field panel", or an approved area of the wall.

d. Follow the cleaning agent manufacturer recommendations COMPLETELY.

e. Remove any older mortar droppings with a wood paddle before starting. Chemicals will only remove thin smears. Attempting to remove thick clumps of mortar with chemicals and a brush will be frustrating, at best, and could lead to problems later caused by misuse of the chemicals.

f. Pre-wet the wall area with clean water by low pressure hose (40 psi). The bricks' absorption must be satisfied by clean water so that chemicals and dissolved mortar will not be absorbed. If the wall begins to become surface dry, re-wet with clean water until final rinsing of the area is complete.

g. Start at the top of the wall by working 20-40 square feet areas.

h. Keep areas below the cleaning area saturated with clean water.

i. Do not allow the area being cleaned to dry out until final rinsing is complete.

j. Apply cleaning solution from a bucket with a medium stiff bristle brush and scrub with the brush in accordance with the timing specified by the instructions with the cleaning agent. Avoid scrubbing the joints.

k. Rinse thoroughly with plenty of clean water by low pressure hose.

l. Avoid cleaning in direct sun. Try to clean "ahead" of the sun, so that drying after rinsing is enhanced.

m. Rinse thoroughly with clean water from a low-pressure hose. Be certain all "dirty" water is flushed all the way to the ground and does not stay on any masonry.

n. IMPORTANT: EacoChem NMD-80 is <u>recommended</u> for new cleaning of all Redland brick. SureKlean VanaTrol and Diedrich Vana-Stop (#202V) are not recommended, but have been used successfully for cleaning all Redland brick. SureKlean #600 and Diedrich #202 Detergent can be safe for <u>red brick</u> but may damage mortar and are more likely to contribute to efflorescence than NMD-80. Improper application of any material may cause efflorescence or other staining.

**REMEMBER; CONTROLLING THE METHOD OF CLEANING IS MUCH MORE IMPORTANT THAN WHICH CLEANING ACID YOU USE. IMPROPER CLEANING METHODS OFTEN CAUSE EFFLORESCENCE, AND CAN CAUSE MANY OTHER TYPES OF DAMAGE TO MASONRY.**

## METHOD 3. "High Pressure" Cleaning with Chemicals.

**Extreme caution, and a limited definition of "high" pressure**, are required with this method. Pressure spray equipment has become popular because of ease of use, speed, and economy. Pressure spray equipment has also ruined many brick projects.

The success of high pressure cleaning relies not only on limiting the pressure, but, also, the nozzle type, distance from wall, angle to wall, and operator technique. Experience and good judgment are critical. **Planning, testing and control are essential.**

**Specify and follow these steps:**

Always start by following Method 1, above, building the masonry as clean as possible.

a. . DO NOT APPLY CHEMICALS AT MORE THAN THIRTY (30) PSI AT ONE (1) GALLON PER MINUTE. It may be practical to apply the cleaning chemicals by garden hose or sprayer, or by bucket-and-brush. Then, use the "high pressure" spray for rinsing.

b. Maximum water pressure allowed is three hundred (300) psi. (Be aware that, even at this pressure, moulded, sanded, and surface treated brick can be damaged beyond repair if appropriate cautions are not followed.) Always test the method and allow the test to dry before judging.

c. Water flow must be less than four (4) gallons per minute.

d. Use only cone shape nozzle, not fan or stream.

e. Always pre-wet the brickwork with clean water prior to applying chemicals. With our recommended Eacochem NMd-80, less water is required. Keep masonry below the work area wet – never allow cleaning solution to get onto dry brickwork.

f. Do not clean sections large enough to begin to surface dry before complete rinsing is possible. The size of this area is dependent on weather conditions.

g. Work top to bottom.

h. Test the chemicals and method. This can be done on a specially erected "field panel", or an approved area of the wall. Allow the test area to dry before determining the results.

I. The operator of the pressure equipment intended to clean the wall must be the same operator as performed the test. If this is not possible, **another test** must be performed by the appropriate operator, and this test must also be approved by the owner prior to starting.

j. IMPORTANT: EacoChem NMD-80 is **recommended** for new cleaning of all Redland brick. SureKlean VanaTrol and Diedrich Vana-Stop (#202V) are not recommended, but have been used successfully for cleaning all Redland brick. SureKlean #600 and Diedrich #202 Detergent are not recommended but can be safe for red brick, but may damage mortar and are more likely to contribute to efflorescence than NMD-80. Improper application of any material may cause efflorescence or other staining.

**REMEMBER; CONTROLLING THE METHOD OF CLEANING IS MUCH MORE IMPORTANT THAN WHICH CLEANING ACID YOU USE. DAMAGE TO MASONRY IS TYPICALLY CAUSED BY THE CLEANING PERSONNEL, NOT THE CLEANING CHEMICALS.**

August 17, 2015

Edgewood Building Supply
430 West Carmel Drive
Carmel, In 46032

**Redland Brick Inc.**
15718 Clear Spring Road
P O Box 160
Williamsport, MD 21795
(301) 223-7700
(301) 223-6675 Fax

Redland BRICK
An ISO 9001 Compliant Quality System

JOB: Montgomery County Courthouse
Montgomery Co., IN

[redacted]

G.C.:

[redacted]

To whom it may concern:

Please be advised that the Cushwa #170 Camden Blend modular size face brick that we propose to furnish on the above job will meet ASTM Specification C216, Grade SW, Type FBS.

Regards,

[redacted]

[redacted]

Enclosed: SDS, Test Report