

Division 4 – Masonry

04.1. Brick Selection

- a. During the Preliminary Design phase, in context with the surrounding buildings, the A/E shall select brick, mortar and joint tooling, to be approved by the University Architect. The University has final approval of all brick types, shapes, colors and mortar type and color.
- b. Refer to **CHAPTER TWO – CAMPUS DESIGN** for basis of brick used on campus.
- c. Brick and mortar selection for renovations and/or additions to buildings shall match the closest freshly cleaned adjacent existing wall unless otherwise approved by the University. Additions and/or renovations to existing buildings shall match the existing mortar and brick in size, color, texture and compressive strength unless otherwise approved by the University. The A/E is to clearly delineate an existing 4-foot square or greater wall area containing a minimum of 100 existing bricks to be matched and include that information in the bid documents. The wall area location selected by the A/E shall be approved by the University prior to bidding. Allowances for masonry materials to match existing are not permitted.
- d. Removal of existing brick for use on additions or renovations shall be carefully executed to prevent cracks, splits, spalls and damage to the surface integrity of the units.
- e. Refer to **DIVISION ONE – GENERAL CONDITIONS** for information regarding brick mock ups. The specifications shall require the contractor to erect at least one, but no more than three, sample wall panels size 4'-0" x 4'-0" minimum, for brick and mortar selection by the University Architect and the A/E. 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. The A/E shall advise the University prior to approving or not approving a mockup and prior to notifying the Contractor.
- f. If fewer than three brick manufacturers and/or mortars are selected, then performance specifications for size, type of brick, color, range, strength and permeability shall be used, citing as the basis of design one or more manufacturer's brick products. Mortar shall be selected and specified, likewise.
- g. Brick patterns/coursing must be approved during Preliminary Design.
- h. All control joints must be shown on elevation drawings in the Working Drawing Design Submittal. Reliance on specified location criteria is not desired.
- i. Any type of exterior masonry sealer, water repellent, or waterproofing coating is not allowed.
- j. Limit/reduce the use of horizontal mortar joints (Caps, parapets, etc.) brick caps are not allowed except for the university standard site walls.
- k. Flashing details (masonry flashings, weeps, parapets, wall caps, etc.), expansion joint and masonry opening detailing including end dams, shall be included in the Working Drawing Design Submittal for review by the University.
- l. The use of masonry cleaners shall not be scheduled without prior approval by the ODU Project Manager.

04.2. Sills

- a. All masonry veneer buildings shall use pre-cast, cast stone, brick, non-porous sills for all punched openings.
- b. Sills shall be one-piece when the opening is <8' in width. Where multiple piece sills are used, the vertical joints shall be located in line with window openings, flashing joints or other wall elements above.
- c. Precast sills shall extend a minimum of 4" in each direction beyond the width of the opening.

04.3. Miscellaneous Metals

- a. All steel lintels supporting exterior masonry shall be hot dipped galvanized. No field cutting is permitted.
- b. Hot dip galvanized factory primed lintel, the A/E shall confirm that the final paint is compatible with the factory primer.
- c. No exposed weld joints. If necessary, they must be ground smooth and hot galvanized.
- d. Miscellaneous steel lintels, shelf angles, attachments, etc. embedded or incorporated into masonry construction shall be hot-dipped galvanized or stainless steel. Exposed to view, e.g., window lintels, items are to be finished to match adjacent construction.

04.4. Mortar

- a. Masonry mortar shall not be mixed unless the outdoor air temperature is above 40 degrees F and rising without the specific approval of the A/E. Any cold-weather mortar mixing and applications shall comply with the most restrictive provisions of the current Masonry Standards Joint Committee (MSJC) code.
- b. All masonry shall have full bed and head joints.
- c. All joints shall be uniformly struck and the backsides shall not be parged. Exposed joints shall be struck in timely manner to produce an even coloration throughout the entire wall.
- d. Projecting courses shall not be set until mortar, in the joints below, is set enough to prevent extrusion. All projecting courses shall be durably supported until mortar has cured.
- e. Tooled joints shall be standard concave joints unless otherwise required to match adjacent existing joints.
- f. Mortar Pigments: Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes. Use only pigments with a record of satisfactory performance in masonry mortar.
- g. Mortars with color pigments shall be factory premixed.
- h. Mortar admixtures must have both A/E and University approval prior to specification and/or usage.
- i. Mortar shall not be re-tempered or used after it has begun to set.

04.5. Flashing & Weeps

- a. The use of a cavity drainage material or free-draining mesh, made from polymer strands that will not degrade within the wall cavity with insect barrier, is required. Cavity protection shall be provided throughout the entire installation to minimize backside mortar droppings. Every course of flashing and weeps shall be protected by a minimum of a 10" approved mortar net.
- b. Flashing courses and weeps shall be inspected by the Project Inspector before covering.
- c. Flashings shall be through-wall into the backing masonry joints and sealed with an elastomeric sealant.
- d. Clearly show locations and detailing of flashing in the Working Drawings. Show extent and alignment of flashing locations with other building elements and openings on elevations. Indicate end dam locations.
- e. Refer to **DIVISION 7 – THERMAL AND MOISTURE PROTECTION** for flashing materials.
- f. Weep holes or screeds shall not be damaged by masonry installation and shall aesthetically complement the surrounding area.
- g. Weeps shall be placed at a maximum 24" on center and shall extend into the cavity to at least the full cavity depth.
- h. Weeps shall be designed to allow air circulation through the entire cavity.
- i. Do not use open head joints.
- j. Weep and vent holes for brick veneer shall be manufactured cellular plastic vents; One piece, flexible extrusion made from UV-resistant polypropylene copolymer, full height and width of head joint and

- depth 1/8" (3 mm) less than depth of outer wythe, in color selected from manufacturer's standard. Install at heads and sills of all openings and top and bottom of wall.
- 04.6. Grout
- a. All metal door frame jambs and heads in masonry walls shall be solid grouted.
 - b. Grout mixtures shall be constantly monitored by an on-site 3rd party inspector.
- 04.7. Protect Stone and cast stone from masonry cleaners. Masonry cleaning shall be scheduled to be performed immediately following grout set.
- 04.8. Masonry Anchorage and Reinforcing
- a. Hot-dip galvanized, carbon-steel wire or steel sheet.
 - b. Wire, steel sheets, steel plates, shapes and bars.
 - c. Corrugated metal ties are prohibited.
 - d. Stainless steel bars and anchors for stone trim or pre-cast concrete trim are required.
 - e. Reinforcing Bar Positioners: Galvanized wire units designed to fit into mortar bed joints spanning masonry unit cells with eye hook loops for holding reinforcing bars in center of cells.
- 04.9. Masonry Accessories
- a. Concrete masonry control joints shall be built-in rubber type or grout keyed type, with face joint kept clear for installation of sealant.
 - b. Dovetail slots and anchors shall be used for masonry veneer over concrete walls.
 - c. Wire ties of pintle and eye-hook design shall be used for masonry veneer over concrete masonry or framed walls.
 - d. While 304 stainless steel masonry ties and other structural elements are preferred for the Hampton Roads environment and for the extended life of a building, standard weight, hot-dip galvanized is acceptable.
 - e. Specify molten zinc galvanizing repair if necessary for cut or abraded miscellaneous steel embedded in masonry. Paint-type repairs or non-galvanized miscellaneous steel items are not acceptable.
- 04.10. Masonry Restoration
- a. A/E shall review all restoration and cleaning specifications with the University.
 - b. A/E shall specify cleaning to be performed from the bottom up.
 - c. A/E shall specify pre-cleaning conference and test area.
 - d. The General Contractor shall schedule and coordinate testing of cleaning agents to be used prior to bidding.
 - e. Masonry Cleaning References
 - i. **BRICK INDUSTRY TECHNICAL NOTES ON BRICK CONSTRUCTION #20 - CLEANING BRICKWORK.**
 - ii. **CAST STONE INSTITUTE TECHNICAL BULLETIN #39 - CLEANING**
- 04.11. Parapet Walls
- a. Parapet walls up to 42 inches in height shall be flashed from underside of coping to roofing.
 - b. Roofing membrane to extend up and over parapet and to terminate to exterior face of wall.
- 04.12. Stone Masonry
- a. Limestone back and bonding faces shall be damp-proofed with a water barrier as approved by the Indiana Limestone Institute of America, Inc. Limestone shall not be installed lower than 4" above grade when adjacent to lawns or planted areas. Verify bonding capability.
 - b. Non-staining sealant or acrylic-based compounds shall be used for sealing stonework.
 - c. Silicon-based compounds are prohibited for limestone.

- d. Handling, protection and installation shall comply with the recommendations of the Indiana Limestone Institute of America, Inc.
- 04.13. Cast Stone Masonry
- a. All cast stone shall be minimum 6,500 psi concrete. All exposed corners shall be eased.
 - b. Embedded anchors and other inserts shall be fabricated from stainless steel.
 - c. A/E shall specify cleaner that is compatible with cast stone.
- 04.14. Calcium Silicate Masonry
- a. Calcium Silicate masonry shall not be placed in contact with grade, shall be a minimum of 4" above grade.
- 04.15. Masonry Coatings
- a. Refer to the **CAST STONE INSTITUTE TECHNICAL BULLETIN #35 – WATER REPELLENT COATINGS.**