

## **DIVISION 4 - MASONRY (SUBJECT TO DIVISION 1)**

### **GENERAL**

This section covers all work, labor, materials, accessories, scaffolding and appliances necessary for the completion of all brick, block, anchoring, reinforcing and miscellaneous masonry work.

Repair: includes replacement of loose, missing or deteriorated elements, as identified by area in the Bid Document.

Install: includes all work necessary to provide complete masonry wall or veneer as identified by area or detail in the Work write-up.

### **4.A. PRODUCT DELIVERY, STORAGE AND HANDLING**

Store materials under cover in a dry place and in a manner to prevent damage or intrusion of foreign matter. During freezing weather, protect all masonry units with tarpaulins or other suitable materials. Store concrete masonry units under covers that will permit circulation of air and prevent excessive moisture absorption. Concrete masonry units shall be protected against wetting prior to use.

### **4.B. JOB CONDITIONS**

Masonry shall be kept to temperatures above freezing until mortar has attained sufficient strength and set so that it will not be damaged by freezing. Warm all materials in freezing weather to a minimum of 40° F and protect work by appropriate covering to prevent damage from freezing. The ambient temperature in the sheltered area shall not be less than 40° F for a minimum of 48 hours.

Protect walls against staining and keep top of walls covered when work is not in progress. Use non-staining, waterproofed covers, overhanging walls at least two feet.

### **4.C. MATERIALS**

Masonry Mortar - ASTM C-270 Types S and N components a) Portland Cement - Type I ASTM C-150, b) Masonry Cement ASTM C-91, c) Quicklime ASTM C-5, d) Hydrated Lime ASTM C-207, e) Water shall be clean and potable, and f) Sand shall conform to ASTM C-144.

Concrete Masonry Units, ASTM C-90-64 T (Load bearing). ASTM C-129 (Non-Load bearing) - Grade A, to be modular in size as set forth in the Bid Document.

Brick, Common: ASTM C62, grade MW.

Brick, Face: ASTM C216, grade SW, Type FBX, size and color and texture to match existing.

All stored materials at the job site will be under cover and in a dry place. All concrete masonry units shall be covered at all times. During erection, all walls shall be kept dry by covering at the end of each day or shut down period with a strong water-proof membrane, and the membrane will be securely anchored so that it will remain in place during high winds or inclement weather.

Masonry Wall Reinforcing - Wall reinforcing shall be standard grade of truss design, galvanized and shall be one of the following at the Contractor's option: "Dur-O-Wal," "Blok-Mesh," or "Wal-Truss." Cement block walls shall have reinforcing every sixteen inches (16") in height. Anchors and ties shall be zinc coated cold drawn steel, consisting of two or more nine gauge longitudinal and cross wires, meeting ASTM A-153 or A-116 and installed at 24" o.c., each way.

#### **4.D. CONCRETE BLOCK (PORCH SUPPORTS)**

1. Use standard weight 8" x 16" face size, with wall thickness as required by Code. Use concave ends for all block within the length of the wall, and either square ends or corner block for all corners. Lay running bond in full joints of mortar. Strike all joints and rod slightly concave on exterior to form a tight seal of mortar to block.
2. Reinforcing shall be as required in the Building Code.
3. Provide for proper ventilation.

#### **4.E. BRICK (BRICK VENEER OVER FRAME CONSTRUCTION)**

1. Face brick shall be of size and texture to match existing surface or as designated in the Bid Document. Duplicate the existing pattern or construct as designated in the Bid Document.
2. Provide a corrosion resistant metal base flashing. Extend over the top of foundation wall from approximate outside of the wall and not less than six (6) inches up on sheathing. Provide weep holes 2'0" on center.
3. Provide water resistant building paper over sheathing.
4. Provide one (1) inch air space between veneer and sheathing. Galvanized metal ties shall be installed in every sixth course (vertical distance not to exceed 24 inches) and at every third brick (horizontal distance not to exceed 26 inches). There shall be one metal tie for not more than 4½ square feet of wall area. Ties shall be vertically staggered. The ends of ties shall be bent to 90 degree angles to provide hooks not less than two (2) inches long. Additional ties shall be provided at all opening spaces, not more than three (3) feet apart around such opening and within 12 inches of the opening.

#### **4.F. MORTAR**

1. Mortar to be type S mortar of an approximate mixture of one part Portland Cement, one-half part lime, and five parts sand, maximum. Vary as required by the Building Code.
2. Tint mortar to match existing if required.

#### **4.G. TUCKPOINTING**

1. Remove and replace all deteriorated masonry or stone units which are no longer securely held with mortar. See Exhibit 2 (Secretary of the Interior's Standards for Rehabilitation).
2. Remove all deteriorated mortar from stone/block/brick surfaces back to a depth of at least 3/4-inch. Brush out joints free from dust and moisten slightly. Force mortar into joint, strike or rake and tool to match existing conditions. Tint mortar, if required, to match existing. Parge, if required, as set forth in Bid Document.
3. Do not apply to frozen or frost filled masonry or when temperatures are below 40° Fahrenheit.

#### **4.H. ANCHOR BOLTS**

1. Set sill plate anchor bolts ½" x 8"; space not more than six feet on center. Fit anchor bolt with washer or hook and anchor into grout.

#### **4.I. LINTELS**

1. All concrete lintels shall be reinforced with a minimum of two rods, sized as loading and Code requires.

#### **4.J. TEMPERATURE**

1. When the air temperature is expected to be below 40° Fahrenheit during the placing of concrete, or within 24 hours thereafter, the temperature of the concrete as placed shall be not lower than 50° Fahrenheit, and protected after placement during freezing or near freezing weather.
2. Do not work below 40° Fahrenheit unless special precautions are provided.
3. Use of anti-freeze agents or calcium chloride in mortar and concrete is allowed as per manufacturer's instructions.

#### **4.K. CONCRETE BLOCK WALL**

1. Remove existing deteriorated wall.
2. Replace with 8" concrete blocks with ½" vertical rebar at 4'0" on center. Set rebar in concrete footings.
3. Set new wall on 8" x 16" concrete footings. Fill void between new wall and existing foundation wall or firm soil with rubbish free dirt or sand. Tamp firm and level.
4. Place a minimum two-inch concrete cap, reinforced with four-inch/20 gauge wire mesh on top of wall.

#### **4.L. PARGE COAT FOUNDATION - INTERIOR - EXTERIOR**

1. Parging (Foundation repairs) - Remove loose mortar, dust, loose finishes, loose cementitious coatings and all other loose materials to expose sound portions of walls. Fill and point all obvious cracks, holes, and sources of water seepage. Prior to parging, clean areas with a commercial cleaning agent such as Thoro Clean, or approved equal. Apply a liquid bonding agent, such as Thorobond, or approved equal on all repair areas prior to refacing. Parge all repair areas using a mix of one (1) part cement to three (3) parts sand, and apply smooth finish to blend in with existing surfaces. Patching mortar coatings to be applied to a maximum thickness of ½", and allow 24 hours curing time between coats in bringing wall surfaces to required level plane. Parging shall be started a minimum six inches (6") below grade, and excavation shall extend approximately eight inches (8") below grade minimum.

#### **4.M. STUCCO**

1. Stucco mixes shall conform to Chapter 47 of the Uniform Building Code.
2. Expanded metal lath shall weigh not less than 1.8 pounds per square yard.

#### **4.N. CHIMNEY**

##### **1. Chimney Removal:**

- A. Remove brick to 18 inches below the roof, cover stack with three (3) layers of roofing paper and cap with a tight fitting 26 gauge galvanized cover. Use caulking to seal tight.
- B. Fit support framing so as to provide a solid support for 1/2-inch exterior plywood sheathing. Use 15 lb. asphalt-saturated felt. Piece in new roofing material to match as closely as possible.
- C. Shingles used for the repair shall match as closely as possible the color, style and quality of the existing roof.
- D. The Contractor shall be responsible for any repair due to damage resulting from the removal of materials, and labor involved in the removal and/or restoration of the chimney.

##### **2. Repair Chimney:**

- A. Tear down and remove deteriorated masonry units to solid and sound material.
- B. Rebuild chimney using all new material. New chimney shall match as closely as possible the color, size, and style of previous chimney.
- C. The Contractor shall be responsible for any repair due to damage resulting from the removal of materials and labor involved in the removal and/or restoration of the chimney.

##### **3. New Chimney:**

New Chimney (Block or brick [see Bid Document]) - Rebuild chimney from foundation to at least two feet (2') above any roof ridge within ten feet (10') of new work. Chimney is to be built of (16" x 16" chimney block) (2¼" x 4" x 8" brick) (select one) and lined with vitreous clay flue liner of minimum 64 square inches cross sectional areas, linear to extend at least four inches (4") above chimney cap. All masonry work to be level and plumb with all masonry embedded in full mortar joints. Place and set chimney cap on top of chimney and set joints. Set with slope of surface to drain water away from flue liner. Saddle to be installed at slope side of roof, and chimney to be flashed at roof line with approved flashing. Flashing shall be carried up the chimney a minimum of eight inches (8"), and a minimum of four inches (4") on the roof under the roofing. All flashing to be embedded one inch (1") into chimney masonry and adequately held with mortar and lead wool. All wood framing and sheathing around chimney to be adequately secured, and defective pieces replaced prior to flashing. New chimney to have 8" x 8" clean out door installed at its base. Clean out to be of heavy gauge iron or steel and of manufacturer's standard design.

##### **4. Clean Out Chimney:**

Furnish and install all labor and materials necessary to clean out chimney. Contractor to ensure premises are kept clean at all times. Any damage that may be caused will be the responsibility of the Contractor.

#### **4.O. CHIMNEY CAP**

1. Remove old cap and check all masonry units for tightness. If loose, restore to a sound condition.
2. Lay a mortar wash of Portland cement from outer most edge of brick to within two inches of the flue liner top.
3. Use a steel trowel at a 45° angle to assure fast runoff. Make sure there is a watertight seal between the flue liner and the mortar.

#### **4.P. FOUNDATION WALLS**

1. Foundation Walls (new) - Install new (8", 12" brick, concrete masonry unit or stone wall) to configuration as described under attached Bid Document. Walls to be laid up plumb and true, with courses level and accurately spaced. Coordinate with other work that may be needed and incorporated into the wall such as pipe sleeves, chases, and anchoring to other work. All joints to be approximately 3/8", and block and brick to be laid in running bond pattern unless otherwise indicated. If necessary to stop off a horizontal run of masonry, rack back at each course. Tothing will not be permitted. New masonry to be keyed into existing masonry walls a minimum half unit length every third course vertically. New masonry walls are to be bonded with continuous wire joint reinforcement spaced not more than sixteen inches (16") vertically. Joint reinforcing shall also be used eight inches (8") above and eight inches (8") below wall openings, extending twenty-four inches (24") beyond opening on both sides of wall. All necessary ancillary materials such as flashing, anchors, and reglets shall be installed according to manufacturer's instructions and the standard practices of the trade. All joints to be tooled, except where walls are to be stuccoed or parged, and shall be cut flush. Exterior foundation walls are to be waterproofed below grade with an appropriate asphalt base sealant. See Division 7. All masonry work is to be executed in a workmanlike manner and in conformance with the standards of the trade and local Building Code.
2. Foundation Wall Repair - Remove deteriorated and disintegrated (brick, block, stone) as specified in Bid Document from adjacent sound surfaces of wall and lay new matching (brick, block, stone) in wall. Prior to repairing wall, clean area with water under pressure. All new repair work to run true and level with coursing pattern and with existing sound surfaces of the wall and to match existing work as nearly as possible.

#### **4.Q. REINFORCED CONCRETE BLOCK FOUNDATION**

##### 1. Footings

Unless otherwise specified the existing footings shall be used. Contractor shall verify condition of existing footings when the old wall has been removed.

##### 2. Walls

Walls shall consist of standard 8"x8"x16" two cell concrete blocks. The walls shall be laid plumb and true with courses level and accurately spaced. All joints shall be cell shall have a #5 steel rebar extending to the full height of the wall and the cell filled with grout. Rebar shall be tied to the footing with dowels set into the footing a minimum of 6". When shorter lengths of rebar are used all overlaps shall be a minimum of 16".

Every second horizontal mortar joint (16" o.c.) shall be reinforced with standard truss steel reinforcing such as dur-a-wall or equivalent.

A horizontal bond beam shall be installed at approximately the horizontal centerline of the wall. The bond beam shall have one #5 rebar top and bottom and be filled with grout. The vertical rebar shall run through the center bond beam and extend into the top course of block. 1/2" anchor bolts shall be placed in the grouted cells of the top course of block and extend through the sill plate of the house.

The exterior of the wall shall be backplastered with mortar and waterproofed with an approved material. (See division 7.G.)

The exterior shall be tiled in an approved manner. (See division 10.H.)

#### **4.R MASONRY PIERS**

1. Construct new piers for porch. If footings do not extend below frost line, excavate and pour new footings at required depth. All work shall conform to Code.

#### **4.S. STONE STEP REPAIR**

1. Stone Step Repairs - Existing stone stairs are to be raised and reset to proper lines and levels. Where required, install new foundations to prevent movement to stairs. Exercise care in disassembling stairs to prevent damage to existing parts. Reset using stone settings mortar with latex additive.

Repair Stone Work - Repair spalls in existing stone work as required using matching stone materials, and appropriate mortars and cement. Use special cement commercially prepared for that purpose. If repair calls for build-up of missing parts or mortar patching, provide aggregate in mortar to produce matching color of existing stone as nearly as possible. Use stainless steel anchors and non-staining bonding agents in repairing stone work.