# PART 1 - GENERAL

## 1.1 SUMMARY

A. The Work of this Section Includes:
   1. Concrete block masonry.
   2. Grouting of masonry.
   3. Installing reinforcing steel bars in masonry.

B. Related Work Specified Elsewhere includes:
   1. Division 3 Section “Concrete Reinforcement” for furnishing steel bar reinforcing for masonry.
   2. Division 3 Section “Concrete Reinforcement” for dowels in concrete for masonry.
   3. Division 9 Section “Painting” for water repellent sealer.

## 1.2 REFERENCES

A. 2013 California Building Code (CBC-2013)

B. ASTM International (ASTM):
   1. A153/A153M - Standard Specification for Zinc-Coating (Hot Dip) on Iron and Steel Hardware.
   2. A615/A615M - Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   3. A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.
   4. A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
   5. A951 - Standard Specification for Masonry Joint Reinforcement.
   6. C90 - Standard Specification for Hollow Loadbearing Concrete Masonry Units.
   7. C129 - Standard Specification for Hollow Nonloadbearing Concrete Masonry Units.
   8. C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Concrete.
   9. C1019 - Standard Test Method for Sampling and Testing Grout.

C. The Masonry Society (TMS):
   1. 402 - Building Code for Masonry Structures.
   2. 602 - Specification for Masonry Structures.

## 1.3 SUBMITTALS

A. Samples: Submit the following:
   1. Two Samples of each type of masonry unit to show full range of color and texture, for selection and approval.
   2. Samples of cured dry mortar showing finish color.
   3. Cured sealant colors for control joints.
   4. Control joint filler, 12" pieces of each size and type.

B. Sample Panels: Prepare as many of following Sample panels at the site as are required for approval. Conform installed masonry to the approved panels. Approved panels may be a part of the permanent construction if so approved and conforming to all other requirements indicated and specified.
   1. Minimum 6-foot long by 4-foot high panel of each type and pattern of vertical masonry, with a minimum 2-foot return, utilizing the approved block and mortar.

C. Mix Designs: Submit for mortar and grout.

D. Product Data: Provide product data, including verification of recycled content of masonry units.

E. General: Comply with division 1 Section “Shop Drawings, Product Data, & Samples.”

1.4 JOB CONDITIONS

A. Inspect and verify surfaces to receive Work of this Section. Report all conditions that prevent correct installation of masonry.

1.5 QUALITY ASSURANCE

A. Standards: Conform to 2013 CBC, Chapter 21 and to standards referenced herein. In case of a conflict between standards, the most stringent requirements govern.

B. Split coursing: Only full coursing will be permitted at the head of any type of opening.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Portland cement: ASTM C150, Type I or II, low alkali; mortar cement or plastic cement not permitted. Use one brand.

B. Hydrated lime: ASTM C207, Type S.

C. Mortar sand: ASTM C144, minimum 4% passing No. 100 sieve, uniformly graded fine to coarse.

D. Grout aggregates: Pea Gravel ASTM C30.

E. Mortar admix: None without prior approval of University’s Representative.

F. Grout admix: None without prior approval of University’s Representative.

G. Color pigment: Pure ground mineral oxides, non-fading, alkali and lime proof, factory packaged, not more than 3 pounds per sack of cement.

H. Water: From domestic potable source.

I. Control joint filler: Dur-O-Wal "Rapid Control Joint", or equal, wide flange unless regular flange is shown, approved sizes.

2.2 CONCRETE BLOCK MATERIALS

A. General: Masonry units shall conform to ASTM C90, Grade N-1, standard precision type normal weight units, steam-cured or yard air cured for 28 days, meeting Quality Control Standards of Concrete Masonry Association. Include matching jamb, lintel, control joint, bond beam, and other special shape, type, or size units as required.

2.3 MORTAR AND GROUT PROPORTIONS AND MIXING

A. Strengths: Minimum compressive strengths, 1,800 psi for mortar and 2,000 psi for grout at 28 days.

B. Mixing: Place half of the required water and sand in an operating machine mixer; then add Portland cement, remainder of sand and water, and then hydrated lime. Machine mix not less than 5 minutes after all ingredients are charged.

D. Retempering: Retemper mortar within one hour after leaving the mixer and maintain high plasticity. Add water in a basin formed in the mortar and rework mortar into water. Discard all mortar that is not used within one hour or that has begun to initially set.

2.4 ANCHORS

A. Adjustable Anchors for Connecting to Structure: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall. Anchor Section for Welding to Steel Frame: Crimped 1/4-inch- diameter, hot-dip galvanized steel wire Tie Section: Triangular-shaped wire tie, sized to extend within 1 inch of masonry face, made from 0.188-inch- diameter, hot-dip galvanized steel wire Connector Section for Concrete: Dovetail tabs for inserting into dovetail slots in concrete and attached to tie section; formed from 0.053-inch- thick, steel sheet, galvanized after fabrication.

B. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins, unless otherwise indicated.
   1. Corrosion Protection: Hot-dip galvanized to comply with ASTM A 153/A 153M

2.5 EMBEDDED FLASHING MATERIALS

A. Metal Flashing: Provide metal flashing, where flashing is exposed or partly exposed and where indicated, complying with SMACNA's "Architectural Sheet Metal Manual and as follows:
   1. Stainless Steel: ASTM A 240/A 240M, Type 304, 0.016 inch thick.
   2. Fabricate continuous flashings in sections 96 inches long minimum, but not exceeding 12 feet.
   3. Provide splice plates at joints of formed, smooth metal flashing. Fabricate through-wall flashing with snaplock receiver built into CMU back-up to receive flashing.

B. Flexible Flashing: For flashing not exposed to the exterior, use the following, unless otherwise indicated:

C. Copper-Laminated Flashing: 5-oz./sq. ft. copper sheet bonded with asphalt between 2 layers of glass-fiber cloth. Use only where flashing is fully concealed in masonry. Provide one of the following products, or equal:

Advanced Building Products Inc.; Copper Fabric Flashing.
AFCO Products Inc.; Copper Fabric.
Hohmann & Barnard, Inc.; H & B C-Fab Flashing.
Phoenix Building Products; Type FCC-Fabric Covered Copper.
Polytite Manufacturing Corp.; Copper Fabric Flashing.

Sandell Manufacturing Co., Inc.; Copper Fabric Flashing.
York Manufacturing, Inc.; York Copper Fabric Flashing.

2.6 MISCELLANEOUS ACCESSORIES

A. Compressible Filler: Premolded filler strips complying with ASTM D 1056, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene.

B. Preformed Control-Joint Gaskets: Made from styrene-butadiene-rubber compound, complying with ASTM D 2000, Designation M2AA-805 and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells. Units are formed from 0.142-inch (3.6-mm) steel wire, hot-dip galvanized after fabrication. Provide units with either two loops or four loops as needed for number of bars indicated.

Products:
Hohmann & Barnard, Inc.; #RB or #RB-Twin Rebar Positioner.
Or equal

PART 3 - EXECUTION

3.1 INSTALLATION OF CONCRETE BLOCK MASONRY

A. General: Lay out unit masonry to minimize cutting of units and use of odd joint sizes or bond. Construct all masonry in accordance with Applicable Building Code and Concrete Masonry Association standards for reinforced masonry. Place and embed in masonry anchors, bolts, reglets, sleeves, conduits, and all other items furnished under other Sections, fully grouted in place. Work out details and be responsible for size, position, and arrangement of embedded items and necessary openings. Cut units by machine saw. Install only clean uncracked units.

B. Setting: Install masonry to preserve unobstructed vertical continuity of block cells. Full bed face shells and cross webs in mortar. Fill header or end joints solid with mortar to a depth from face of wall or unit not less than the thickness of the longitudinal face shells. Provide corner bond by lapping units in successive vertical courses.

C. Cleanout Openings: Provide openings at the bottom of cells containing bar reinforcing, and at each lift or pour of grout exceeding 48" height. Remove all overhanging mortar and other obstructions or debris from the interior of block cells. Seal cleanouts with matching whole units and mortar joints.

D. Reinforcing: Use deep-cut bond beam units at horizontal reinforcing bars. Install open end units for vertical bars unless otherwise shown. Hold vertical reinforcing bars in correct position at top, bottom, and intervals not over 160 bar diameters between, and secure in place with wood frames or similar devices as required for proper alignment. Install horizontal reinforcement as erection progresses, laps wire tied. Maintain a minimum 3/4" clear space between masonry and bars. Make laps and splices in bars not less than 40 bar diameters unless otherwise indicated.

E. Grouting: Fill all cells containing reinforcement with grout except where grout filling of all cells is shown. Pour in 4-foot lifts, waiting about 1-hour between lifts. Pour full height in each section of

the wall in one work shift. Consolidate grout by puddling or internal vibration, then reconsolidate about 10 minutes later before plasticity is lost. Form horizontal construction joints by stopping the grout pour 1-1/2" below the top of masonry units. High lift grout placement may be used at Contractor's option as approved by the University's Representative and according to Applicable Building Code.

F. Bond and Joints: Lay units with stacked bond. Make joints uniformly 3/8" size, concealed joints. All joints shall be raked.

G. Weep Holes: Provide 1/4" diameter weep holes at bottom of ungrouted cells of exterior walls, or provide weep holes at maximum 32" centers with drain slots under webs of intervening units.

H. Openings in Walls: Provide masonry cap at bottom of openings. Special anchorage required for attachment of bottom masonry cap.

I. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath, wire mesh, or plastic mesh in the joint below and rod mortar or grout into core.

J. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

K. Build non-load-bearing interior partitions full height of story to underside of solid floor or roof structure above, unless otherwise indicated.

L. Install compressible filler in joint between top of partition and underside of structure above.

M. Fasten partition top anchors to structure above and build into top of partition. Grout cells of CMUs solidly around plastic tubes of anchors and push tubes down into grout to provide 1/2-inch clearance between end of anchor rod and end of tube. Space anchors 48 inches o.c., unless otherwise indicated.

N. At fire-rated partitions, treat joint between top of partition and underside of structure above to comply with Division 7 Section "Through-Penetration Firestop Systems."

## 3.2 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 (406 mm) o.c.
   2. Space reinforcement not more than 8 inches o.c. in foundation walls and parapet walls.
   3. Provide reinforcement not more than 8 inches above and below wall openings and extending 12 inches beyond openings.

   Reinforcement above is in addition to continuous reinforcement.

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

## 3.3 EMBEDDED FLASHING

A. Install single-wythe CMU flashing system in bed joints of CMU walls where indicated to comply with manufacturer's written instructions. Install CMU cell pans with upturned edges located below face shells and webs of CMUs above and with weep spouts aligned with face of wall. Install CMU web covers so that they cover upturned edges of CMU cell pans at CMU webs and extend from face shell to face shell.

3. 4 PARGING

A. Parge walls wherever required to assure smooth surfaces to receive waterproofing.

B. Clean wall surfaces thoroughly. Apply Larson Products Co. Weldcrete bonding agent or equal, to surfaces of wall in accordance with manufacturer's instructions.

C. Apply parge coat of Type S mortar with Laticrete or equal, latex admix added per admix manufacturer's directions. Apply in 2 uniform coats to a total thickness of 3/4 inch. Scarify first parging coat to ensure full bond to subsequent coat.

D. Use a steel-trowel finish to produce a smooth, flat, dense surface with a maximum surface variation of 1/8 inch per foot. Form a wash at top of parging and a cove at bottom. Damp cure parging for at least 24 hours and protect until cured. Provide nailers if required for attachment of membrane.

3.5 CURING

A. Keep newly constructed masonry damp for 3 days with regulated fog spray of water sufficient only to moisten faces of masonry but not in an amount as to cause water to flow down over masonry. Do not saturate masonry with water for curing or any other purposes and protect from rain or flooding during curing period.

3.6 CLEANING

A. Clean mortar and grout off exposed surfaces immediately and as the Work progresses. Acceptably repair imperfect joints, holes, defaced units, chipped edges or corners, and all other defects, or replace the defective units as required for approval. Mortar or grout staining on exposed masonry surfaces is subject to sandblast cleaning of the entire surface involved to obtain clean uniform approved appearance, as directed and at no additional contract cost.

3.7 FIELD QUALITY CONTROL

A. Testing: Testing Laboratory shall test mortar and grout to extent shown, directed, or required by Applicable Building Code.

B. Continuous Inspection: Required if indicated, and for high lift grouting operations.

END OF SECTION