

Section 04 20 00 - Unit Masonry**PART 1 - GENERAL****1.01 DESCRIPTION**

- A. Work Included:
 - 1. Labor and materials required to complete masonry work.
 - 2. Caulk joints between masonry and stone.

- B. Related Work Specified Elsewhere:
 - 1. Cut Stone Work - Section 04 43 00
 - 2. Gypsum Board Sheathing - Section 06 16 43
 - 3. Air Barrier Systems - Section 07 27 26
 - 4. Architectural Sheet Metal Work - Section 07 60 00
 - 5. Firestopping - Section 07 84 00
 - 6. Hollow Metal Doors and Frames - Section 08 11 00

1.02 QUALITY ASSURANCE

- A. Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

- B. Standards:

Masonry materials and masonry construction shall comply with the latest edition of:

 - 1. Brick Industry Association, "Technical Notes on Brick Construction".
 - 2. National Concrete Masonry Association (NCMA)
 - a. Specification for the design and construction of load-bearing concrete masonry.
 - b. Guide specifications for Cold Weather Masonry Construction, International Masonry Industry All-Weather Council, latest edition.
 - c. TEK 19-7 - Characteristics Of Concrete Masonry Units with Integral Water Repellent.
 - d. TEK 23A - Grouting for Concrete Masonry Walls.
 - e. TEK 59 - Reinforced Concrete Masonry Construction.
 - f. TEK 71 - Cold Weather Construction with Concrete Masonry.
 - 3. American Concrete Institute ACI 531 - Building code Requirements for Concrete Masonry Structures.

- C. Standards: latest revision.
 - ASTM C 150 - Standard Specification for Portland Cement.

 - ASTM C 33 - Standard Specification for Concrete Aggregates.

 - ASTM C 90 - Standard Specification for Hollow Load-Bearing Concrete Masonry Units.

 - ASTM C 144 - Standard Specification for Aggregate for Masonry Mortar.

 - ASTM C 270 - Standard Specification for Mortar for Unit Masonry.

ASTM C 207 - Standard Specification for Hydrated Lime for Masonry Purposes.

ASTM C 216-95a - Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).

ASTM C 331 - Standard Specification for Lightweight Aggregates for Concrete Masonry Units.

- D. The specified compressive strength f'_m of 2250 psi and a net area compressive strength of 3275 psi for concrete masonry units (CMU) shall be verified by the block supplier by prism tests in accordance with NCMA specification, ASTM C 39 and ASTM E 447.
- E. All masonry and grouting and reinforcing work shall be performed by masonry workers who have successfully completed the International Masonry Institute (1.800.464.0988) or (1.800.803-0295) training course for Grouting and Reinforced Masonry Construction, or equal. Installing contractor shall assign supervision of all grouting and reinforcing to personnel who have successfully completed the International Masonry Institute training course for Grouting and Reinforced Masonry Construction, or equal. The supervisor responsible for the placement of reinforced assemblies will be present at the time of each grout pour.
- F. Brickwork Panel: Erect sample panel at site for Architect's approval.
 - 1. Make each mock-up panel approximately 4'-0" high and 6'-0" long.
 - 2. Provide one mock-up panel for each combination of face brick, bond pattern, mortar color and joint type used in the work.
 - 3. Revise as necessary to secure Architect's approval.
 - 4. No brickwork shall be started until sample panel has been approved. All brickwork on project shall match approved panel.
 - 5. Remove panel when directed.

1.03 SUBMITTALS

- A. Materials list of items proposed to be provided under this Section.
- B. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
- C. Portland Cement: Submit name of product to Architect.
- D. Concrete masonry units: Submit manufacturer's certificate of compliance for concrete block density and strength upon request.
- E. Submit details of the method of mixing the mortar, including the manner in which the sand will be measured, before beginning work.

1.04 PRODUCT DELIVERY HANDLING AND STORAGE

- A. Deliver, handle and store materials so as to prevent inclusion of foreign materials and damage by water or breakage.
- B. Deliver packaged materials and store in original packages until ready for use. Packages or materials showing evidence of water or other damage will be rejected.

PART 2 - PRODUCTS**2.01 MATERIALS**

- A. Anchors, Ties, Etc.:
 - 1. Brick Veneer Anchors: No. 9 gauge galvanized hard wire anchors.
 - 2. Stone Veneer Anchors: Type 302 or 304 stainless steel anchors of type required for coursing.
 - 3. Partition Anchors: 1/8" thick galvanized steel rigid strap type partition anchors bent on both ends. For anchoring load bearing walls at intersections
 - 4. Approved Manufacturers:
 - Hohmann & Barnard, #344 - Rigid Partition Anchor
 - Wire Bond
 - Heckman Building Products
 - 5. Veneer anchors for use with steel stud/brick veneer system: Hot dipped galvanized steel wire and anchor plate with prong legs of sufficient length to bridge the sheathing and abut the metal stud providing positive anchorage to the stud should the sheathing deteriorate. Attach anchor plate to studs with polymer coated self tapping screws. Wire tie to be 3/16" hot dipped galvanized wire in "V" shape.
 - Hohmann & Barnard, Inc., "X-Seal Anchor" with "Vee Tie" and "X-Seal Tape"
 - Dur-O-Wal, Inc., "DA 210X" with "DA700" Ties.
- B. Masonry Horizontal Wall Reinforcing: electrically welded side and cross rods, ladder or truss type with galvanized side and cross rods. Hot Dip Galvanizing shall conform to ASTM A153, Class B-2 (1.5 oz. per square foot, average).
 - 1. Standard type with No. 9 gauge side and cross rods.
 - 2. Provide special fabricated units for all corners and wall intersections.
 - 3. Reinforcing for all faced or cavity walls shall be three (3) wire type with cross wires spaced 16" o/c. Cross wires for cavity walls shall have moisture drip.
 - 4. Approved Manufacturers:
 - Dur-O-Wal, Inc., "Dur-O-Wal"
 - Heckmann, "No. 1100" and "No. 1200"
 - Hohmann and Barnard, Inc., "Lox All"
- C. Reinforcing Steel: ASTM A 615, Grade 60.

- D. Expansion Joints: Clay masonry
Silicone pre-coated, preformed, pre-compressed, self-expanding, binary sealant system.
Seal shall combine factory-applied, 15 Shore-A hardness, low-modulus silicone, and alternating vertical laminations of impregnated expanding foam sealant and closed-cell (EVA) foam into a unified binary sealant system.
Expanding foam laminations to be compressed 4-times to approximately 25% of fully expanded dimension.
Silicone external color facing to be factory-applied to the foam while it is partially pre-compressed to a width greater than maximum joint extension and cured before final compression.
Coating width to be a minimum of 1.75 -1.85 times the designed, or field measured, joint gap width. When compressed to final supplied dimension, a bellows with distinct and uniform folds to handle movement shall be created in the silicone coating.
Silicone coating color as selected by Architect from manufacturer's standard colors.
- COLORSEAL from EMSEAL JOINT SYSTEMS, LTD, 23 Bridle Lane, Suite 3, Westborough, MA 01581-2603, PH: 508-836-0280, FX: 508-836-0281.
 - approved equal
- E. Control Joints: CMU
1. Compressible polyurethane foam, polyethylene foam or foamed polyvinyl chloride plastic. Joint filler of thickness and width as required by detail.
 - Hohmann & Barnard, Inc., "VS Series"
 - Dur-O-Wal, "Rapid Poly-Joint"
 - approved equal
 2. Closed Cell Neoprene Sponge for horizontal expansion joints and soft joints in masonry.
 - Hohmann & Barnard, Inc., "NS Closed Cell Neoprene Sponge"
 - Dur-O-Wal, "Rapid Expansion Joint D/A2015" and "Rapid Soft Joint D/A2010"
- F. Water shall be clean and free from deleterious material, suitable for drinking and range from 50 to 70 degrees F.
- G. Portland Cement to comply with Standard Specifications of the American Society for Testing Materials, C 150, Type I. Cement shall be standard product name of which shall be submitted to Architect for approval.
- H. Lime: Hydrated lime conforming to standard specifications of the ASTM C 207, Type S.
- I. Sand for Mortar: Clean, sharp, free from loam, silt, vegetable matter, salts and other injurious substances, conforming to ASTM C144, except that sand for mortar in 1/4 inch wide joints shall pass a No. 16 sieve. Sand is further subject to approval of the Architect, based on mortar color desired and use of readily available local sands. Sand shall be from one source.
- J. Calcium Chloride: Calcium chloride or admixtures containing chloride salts are not permitted.

K. Brick:

1. All brick shall conform to requirements of applicable codes as to absorption, compressive strength and grade use.
2. Building Brick (common brick) shall be of clay or shale, uniform in shade and size and free from cracks, warpage or other defects that would affect serviceability or strength.
3. Face brick shall be Type FBX, Utility size (3-5/8" x 3-5/8" x 11-5/8"), with faces free from defects, conforming to ASTM C 216, Grade SW. Allowable chippage shall conform to ASTM C216-95a, Table 3. No face cracks allowed. Provide all special shapes, as required.
4. Brick: Match existing

L. Concrete Block:

1. Concrete masonry block shall be of quality, make, weight, density and strength conforming to ASTM C 90.
2. Moisture in units shall not exceed 30 percent maximum absorption value of units when delivered and shall be free of any deleterious matter.
3. Aggregates:
 - Stone aggregate: Conform to ASTM C 33.
4. All block shall have stone aggregate, unless otherwise noted, and be of thickness necessary to achieve required fire rating.
5. Exposed block for room interiors shall be smooth faced, made with fine aggregate to produce an overall smooth, dense surface free from damaged faces and edges.
6. Exposed corners of concrete block shall be bullnose.
7. Ground Face Block: Conform to ASTM C90, Type I, Integrally colored, integrally waterproof concrete block with one or more faces ground to expose the variegated colors of the natural aggregates. Concrete mix shall have special additives to prevent efflorescence and to provide integral repellency. Units shall have factory applied heat treated acrylic finish. Units shall conform to requirements of ASTM C744 with respect to adhesion, abrasion, color change and resistance to crazing and ASTM C67 with respect to freezing and thawing. See Color and Material Schedule for color selection. Color and aggregate as selected by Architect from manufacturer's complete color range.
 - Trenwyth Industries, "Trendstone"
 - Premier Block Corporation, Eau Claire, WI, "Ultra"
8. Provide special units required for all lintels, bond beams, corners, jambs, caps sills, ornamental work, etc., and for proper bonding to adjoining work.
9. Where shown on drawings and as required, provide 100 percent solid blocks.
10. All blocks shall be to modular dimensions. Only two (2) cell block is allowed for reinforced masonry construction.
11. Unless otherwise noted in Structural Drawings, net area compressive strength of masonry unit shall equal 3275 psi.

M. Cast Stone (precast concrete accent, ledges, sills, etc.):

- Manmade stone comprised of a highly refined mixture of Portland cement and coarse and fine aggregates producing a fine grain textured product similar in appearance to select grade natural limestone. Conform to requirements of ASTM C 1364.
- Advance Cast Stone, Random Lake, WI
 - American Artstone Company, New Ulm, MN
 - Custom Cast Stone, Westfield, IN
 - Edwards Cast Stone Company, Dubuque, IA
 - MidCon Products, Inc., Hortonville, WI

- Stonecast Products, Germantown, WI
 - Wisconsin Pride Stone Mfg., Nekoosa, WI
 - approved equal
- N. Cavity Wall Insulation:
Extruded polystyrene insulation board, ASTM C578, Type X, 1.30 lb./cu.ft. density, 15 psi compressive strength, square edged.
- Dow Chemical "CavityMate"
 - DiversiFoam Products "CertiFoam 15"
 - Owens Corning "Foamular CW-15"
 - Pactiv Building Products, Atlanta, GA, "GreenGuard"
- O. Insulation Joint Sealing Tape: Pressure sensitive, self adhering, acrylic adhesive joint sealing tape, complying with AAMA 711, and, meeting the following criteria:
1. Recommended by its manufacturer for sealing the joints of extruded polystyrene insulation board in vertical cavity wall construction
 2. Peel Adhesion Strength: Compliant with ICC-ES AC 148 and AAMA 711
 3. Water Resistance and Joint Sealing: Compliant with ICC-ES AC 71
 4. Air Permeance: Air permeance less than or equal to 0.02 L/s/m², tested in accordance with ASTM E 2178
 5. Service Temperature: Service temperature range shall be at least 0°F to 120°F maximum
 6. Width: Minimum 3.5"
 7. Approved Manufacturers:
 - Owens Corning, "JointSealR Foam Joint Tape".
 - Dow, "Weathermate Construction Tape".
 - Pactiv Building Products, "GreenGuard Contractor Tape"
 - approved equal
- P. Air Barrier Systems: See Section 07 27 26
- Q. Through Wall Flashing:
40 mil thick consisting of 0.81 mm of highly adhesive rubberized asphalt compound or pressure sensitive clear adhesive completely and integrally bonded to 0.20 mm high density cross laminated polyethylene; or self-adhered EPDM. Provide termination mastic and other accessories required for a complete and proper installation.
- W.R. Grace, "Perm-A-Barrier"
 - SafSeal Innovations, Denver, CO "6634"
 - Mirafi, "MiraDRI TWF"
 - Carlisle, "CCW-705-TWF"
 - Tamko, "TW Thru-Wall Flashing"
 - Hohmann & Barnard, Inc., "Flex-Flash"
 - Polyguard Products, Inc., "Polygurd Thru Wall Flashing Membrane"
 - Firestone, "FlashGard Membrane"
 - approved equal
- R. Drip Edge: Stainless Steel, ASTM A167, Grade/Type 304, soft temper; 24 gauge; smooth finish.
- S. Partition Top Joint Filler:
1. Non-Fire Rated Partitions: Sponge neoprene or PVC, rectangular, 1" less than width of wall, 3/8" thick.
 2. Fire Rated Partitions: See Section 07 84 00 - Firestopping.

- T. Weep Hole Ventilators: 90% open-weave recycled polyester mesh with anti-microbial and flame retardant additives. Size: 2-5/8" x 3-1/2" x 1/2". Color to match mortar color.
- Mortar Net "Weep Vent"
- CavClear, Inc., "CavClear Weep Vents"
- U. Full Height Air Space Maintenance and Cavity Control: Full wall masonry drainage and ventilation mat designed to provide an unobstructed air space for drainage of liquid moisture and ventilation of masonry wall system. Product shall be made up of an extruded polymer matrix of entangled monofilaments and provide over 95% open airspace in the masonry cavity for optimum ventilation. Product shall have a non-woven, lightweight, breathable fabric heat-laminated on one side to prevent mortar from entering the cavity, clinging to wall ties, or blocking weep holes. Product shall be installed full height of masonry cavity and designed to rest between the brick ties. Masonry drainage mat thickness to allow no more than 3/8 inch tolerance between the masonry mat and masonry wythe.
- Keene Building Products, Mayfield Heights, Ohio 44124. Toll Free Tel: (877) 514-5336. Tel: (440) 605-1020. "CAV-AIR-ATOR"
- CavClear, Hudson, WI, (715) 381-5773 "CavClear Masonry Mat"
- V. Sealant: For sealing joints where partitions meet roof construction. Moisture cured polyurethane sealant or silicone construction sealant.
- Tremco "Dymonic"
- G.E. "Silpruf"
- W. Sealant: For sealing joints between masonry and stone. Multi-component polyurethane sealant meeting requirements of Federal Specification TT-S-00227E, Class A, Type II or One part low modulus polyurethane based non-sag elastomeric sealant meeting requirements of Federal Specification TT-S-00230C, Type II, Class A. Color as selected by Architect.
- Tremco, "Dymeric 240/240FC"
- Pecora, "Dynatrol II"
- Sika Corporation, "Sikaflex -15LM"
- X. Waterproofing (Brick): 3-5% (hardfired brick) or 7-9% (porous brick) Silicone Rubber capable of bridging cracks and structural defects up to 1/32 of an inch. Product shall dry to a clear, flat finish. Provide warranty that, when applied in accordance with manufacturer's application instructions, product will prevent water penetration for a period of ten (10) years from date of application.
- Professional Products of Kansas, Inc. 800-676-7346, "PWS-5" (hard fired brick) and "PWS-8" (porous brick)
- approved equal.

2.02 MIXES

- A. Mix mortar in accordance with the proportion requirements of Brick Industry Association Standard Specification for Portland Cements-Lime Mortar for Brick Masonry; M1-72.
- B. Method of measuring materials for mortar used in construction shall be by either volume or weight. The method used shall be such that the specified proportions of the mortar materials can be controlled and accurately maintained.

C. Mortar Types:

Type M - For use below grade.

1. One (1) part Portland Cement
2. One quarter (1/4) part Hydrated Lime
3. Sand: Not less than 2-1/4 and not more than 3 times the sum of the volumes of cement and lime used.

Type N - For non-structural walls and interior partitions. For use with stonework.

1. One (1) part Portland Cement
2. One (1) part Hydrated Lime
3. Sand: Not less than 2-1/4 and not more than 3 times the sum of the volumes of cement and lime used.

Type S - For use below grade. For use above grade for all load bearing walls, all exterior walls and all walls shown on structural drawings. For use with steel stud/brick veneer construction.

1. One (1) part Portland Cement
2. One Half (1/2) part Hydrated Lime
3. Sand: Not less than 2-1/4 and not more than 3 times the sum of the volumes of cement and lime used.

- D. At Contractor's option, an approved brand of masonry cement mortar, conforming to F.S. SS-C-181B and ASTM C 91 may be substituted for the above mortars.

E. Tuckpointing Mortar:

Use only prehydrated mortar.

Thoroughly mix all dry ingredients and then add only enough water to produce a damp, unworkable mix that retains its shape when pressed into a ball. After about two (2) hours, add enough water to bring it to the proper consistency, which is somewhat drier than conventional masonry mortars.

- F. Color additive for mortar: Use as require to match existing mortar color.

- Tamms Industries, Inc. "Concentrated Mortar Colors.
- Western Lime and Cement Company, "Colored Masons Blend"
- DCS Color & Supply Co., Inc., Milwaukee, WI
- approved equal

G. Grout:

1. For filling cores of concrete block:
 - a. One (1) part Portland Cement;
 - b. Two and one-half (2-1/2) parts sand;
 - c. Two (2) parts graded pea gravel passing 1/4" screen.
 - d. Slump: 9" + or - 1".
 - e. Compressive Strength: 3000 psi minimum at 28 days.
2. Mix as submitted by concrete supplier.
3. Non-Shrinking Mortar:
 - BASF, "Masterflow 713 Plus".
4. Mix shall be verified for strength by testing agency and adjusted as required.

H. Mixing:

1. All materials for mortars shall be measured by volume; sand and cement mixed dry, lime putty added and water added to bring to proper consistency for use.
2. Masonry cement mortars shall be mixed in strict accordance

- with manufacturer's instructions.
3. No mortars that have stood more than two (2) hours shall be used.
 4. Mortar that has stiffened within above time limit may be retempered.
 5. Colored mortar may not be retempered due to possible variations in color.

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Lay all work true to dimension, plumb, square and in bond accurately. All courses shall be level with joints of uniform width, except where otherwise specified.
2. No joints shall exceed size specified. Bond all brickwork every sixth (6th) course.
3. Block shall be cut accurately to fit around all pipes, ducts, openings, etc., and all voids slushed full.
4. Provide all scaffolds, staging, hoists, etc., required for proper execution of work.

B. Brick:

1. Except in freezing weather, all brick having an absorption of five percent (5%) or over shall be thoroughly and uniformly wetted down a few hours before laying.
2. All brickwork using modular brick is dimensioned three (3) courses equal 8".
3. Lay brick in bond to match existing brickwork, bonded with masonry reinforcing placed every 16" vertically.
4. Tool all joints to slight concave when mortar is thumbprint hard.
5. Provide expansion joints in brick masonry spaced 20' o/c.

C. Block:

1. Set blocks in full bed of mortar not over 3/8" thick and butter all vertical joints on walls and webs.
2. Lay block in running bond, unless otherwise noted.
3. Provide control joints spaced no greater than 30' o/c in interior CMU walls.
4. Tool all joints as directed by Architect.
5. Do all necessary cutting with masonry saw.
6. Where noted, provide 100 percent solid blocks.
7. Fill lintels, bond beams, etc., with concrete and reinforced with rods as required to carry superimposed loads.
8. Fill hollow metal frames with mortar as wall is laid up.
9. Where called for on drawings, fill cores of blocks with grout.
10. Bond intersections of block walls to concrete with partition anchors.
11. Bond beams shall be of special lintel blocks filled with concrete and reinforced.
12. Where fire doors occur, fill cores of block within 16" of opening with concrete.

D. Reinforced Masonry Walls:

1. Grouting Techniques: At contractor's option, use either low-lift or high-lift grouting techniques as per NCMA Tek 3-2A and Tek 14-2.

2. Low-Lift Grouting:
 - a. Lay CMU to maximum pour height. Do not exceed 5' height.
 - b. Place grout continuously; do not interrupt pouring of grout for more than one hour. Rod grout during placing. Terminate pours 1-1/2" below beam.
 - c. Under Concrete Beams: Stop grout in vertical cells 1-1/2" below beam.
 - d. Splice reinforcing bars.
 3. High Lift Grouting:
 - a. Do not use high-lift grouting technique for grouting unless minimum cavity dimension is 3" or larger.
 - b. Provide inspection holes in first course at all vertical cells to be filled.
 - c. Limit grout pours to heights recommended by NCMA for types of CMU and reinforcing used in the work, but in no case exceed 16' in height.
 - d. Splice reinforcing bars.
 4. Prior to grouting, inspect and clean grout spaces. After final inspection close inspection holes (if any).
- E. Air Barrier Preparation:
- This project will have fluid-applied Membrane Air Barrier material applied to the cavity side of the CMU. Special attention and care must be taken to provide a smooth, filled surface to receive the membrane. The care is necessary to ensure the design performance of the selected materials. Concrete masonry unit (CMU) wall shall be prepared as follows to accept the air & vapor barrier:
1. Surfaces shall be free of contaminants such as grease, oil and wax on surfaces to receive membrane
 2. The CMU surfaces shall be free from projections.
 3. Strike all mortar joints flush to the face of the concrete block.
 4. Fill all voids and holes greater than 1/4 inch across at any point with mortar, sealant or other approved fill material.
 5. Surface irregularities exceeding 1/4 inch in height or sharp to touch shall be ground flush or made smooth.
 6. Fill around all penetrations with mortar, sealant or other approved fill material and strike flush.
 7. If the surfaces cannot be made smooth to the satisfaction of the Architect, it will be the responsibility of the trade to alternatively apply a parge coat (typically one part cement to three parts sand) over the entire surface to receive Air & Vapor Barrier Membrane
 8. Remove mortar droppings on brick ties, shelf angles, brick shelves or other horizontal obstructions.
- F. Cavity Wall Construction:
1. Separate facing and backing masonry completely by continuous air space.
 2. Erect inner wythe of concrete block.
 3. Apply specified air barrier system following manufacturer's application requirements for type of substrate.
 4. Apply specified wall insulation with adhesive and construct outer facing of face brick, block or stone.
 5. Bond two (2) walls together with horizontal masonry wall reinforcement spaced 16" o/c vertically with first tie not over 8" below foundation and upper tie not over 8" below top of wall.

6. Keep air space between facing and backing walls clear and clean of mortar droppings. Use one of specified mortar control devices. Install in accordance with manufacturer's installation instructions.
 7. Place insulation as wall construction proceeds.
 8. Install weep hole ventilators in head joints of exterior facing wall spaced 24" o/c, unless otherwise noted. Locate at top of cavity, bottom of cavity just and above ledges, shelf angles, lintels, etc.
 9. Flashing: Install as shown on Drawings, as specified herein and in all locations where weep holes are specified. Provide termination bar at top edge of flashing. Place flashing at the following locations:
 - a. Above grade at base of walls
 - b. Under and behind all sills
 - c. Over all openings, except those completely protected by overhanging projections.
 - d. At spandrels
 - e. Exterior and interior wythes of parapet walls.
 - f. In mortar bed beneath coping.
 10. Provide minimum 1-1/2" high end dams at longitudinal ends of flashing and metal flashing edging over lintels, at column abutments, adjacent to building expansion joints and other flashing interruptions. Apply sealant to all end dam seams.
- G. Steel Stud/Brick Veneer Wall System:
1. Space specified veneer anchors a maximum of 16" o/c, each direction. Corrugated ties are not to be used.
 2. Embed all ties at least 2" into the bed joints of the brick veneer. Legs of ties must penetrate insulation and be in contact with steel studs. Securely attached to the metal studs through the sheathing and not to the sheathing alone.
 3. Flashings:
 - a. Where indicated on the drawings, build flashing into the wall. Install flashing at the base of all cavities, at all window and door heads and sills, and elsewhere as specified or as indicated on the drawings. Set all flashing on a beveled bed of mortar to turn out any water.
 - b. The exposed exterior edge of flashings should uniformly extend out a minimum of 3/4" with a minimum of 1/2" continuous hem and be turned downward with approximately a 45 degree bend to serve as a drip. Notch hem and taper-cut drip for the underlying piece at joints.
 - c. The concealed portion of flashings shall be turned up to form a back dam to contain water, with the interior top edge secured with termination bar.
 4. Provide weep holes at all flashing locations at intervals of 24" maximum, unless otherwise noted on drawings.
 5. Provide all vertical and horizontal expansion joints.
- H. Masonry Wall Reinforcing: Continuously reinforce all masonry walls with specified reinforcing of proper width for wall thickness and in accordance with manufacturer's recommendations.
1. Reinforce top course of all walls and first two (2) courses above and first course below all openings. Reinforcement shall extend 24" each side of opening.
 2. Reinforce balance of wall every second block course (16" o/c vertically).
 3. At corners and intersections, use special corners or "T"

assemblies.

- I. Where walls and partitions meet concrete slabs, beams, girders, tees and other precast construction, fill joint with specified compressible filler and seal with moisture cured urethane sealant.
- J. Lintels:
 - 1. Steel lintels will be furnished by Steel Contractor but set by Mason Contractor.
 - 2. All lintels, not otherwise shown, shall be reinforced precast of lightweight aggregate or special lintel blocks filled with concrete and reinforced as required.
- K. Chases, Recesses, Etc.,: This Contractor to construct all chases, recesses, etc., as may be required by work of other Contractors or as may be directed by Architect.
- L. Building Expansion and control Joints:
 - 1. Construct expansion joints in clay masonry, Install preformed, precompressed expansion joint material.
 - 2. Construct control joint in concrete masonry. Install premolded joint filler using adhesive recommended by manufacturer. Joints will be sealed under Section 07 90 00.
- M. Built-In Work:
 - 1. Consult other trades in advance and make provisions for installation of their work in order to avoid cutting and patching.
 - 2. Build in anchors as required.
 - 3. Set steel lintels in beds of mortar.
 - 4. Fill solid with mortar around metal door frames.
- N. Cutting and Patching:
 - 1. Do all cutting and patching of work in this section as per General Conditions and Division 01.
 - 2. Where new work connects with existing, this Contractor shall do all necessary cutting, fitting and patching, removing all work in his line, cutting all openings called for on Drawings or as required to make satisfactory connection with work to be performed under this specification.

3.03 TOLERANCES FOR CONSTRUCTION

- A. Variations from the plumb in the lines and surfaces of columns, walls and arrises shall not exceed 1/4 inch in 10 feet, 3/8 inch in a story height or 20 feet, maximum, or 1/2 inch in 40 feet or more. Variation from plumb for external corners, expansion joints and other conspicuous lines shall not exceed 1/4 inch in any story or 20 feet, maximum, or 1/2 inch in 40 feet or more.
- B. Variation from the level of the grades for exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines shall not exceed 1/4 inch in any bay or 20 feet, or 1/2 inch in 40 feet or more.
- C. Variation of the linear building line from an established position in plan and related portion of columns, walls and partitions shall not exceed 1/2 inch in any bay or 20 feet, maximum, or 3/4 inch in 40 feet or more.
- D. Variation in cross-sectional thickness of walls shall not exceed

plus or minus 1/8 inch from the dimensions indicated on the drawings.

3.04 COLD WEATHER REQUIREMENTS

- A. Construction Requirements (masonry being worked on), per NCMA Tek 3-1A and the Guide specifications for Cold Weather Masonry Construction, International Masonry Industry All-Weather Council, latest edition.
1. Air temperature 90 degrees F. to 40 degrees F.: Normal masonry procedures.
 2. Air temperature 40 degrees F. to 32 degrees F.: Heat mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F. Maintain mortar above freezing until placement.
 3. Air temperature 32 degrees F. to 25 degrees F.: Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F. Maintain mortar above freezing until placement.
 4. Air temperature 25 degrees F. to 20 degrees F.: Mortar on boards should be maintained above 40 degrees F. Maintain mortar above freezing until placement. Do not lay units having a temperature below 20 degrees F. Remove visible ice prior to laying units.
 5. Air temperature 20 degrees F. and below: Heat sand and mixing water to produce mortar temperatures between 40 degrees F and 120 degrees F. Maintain mortar above freezing until placement. Do not lay units having a temperature below 20 degrees F. Remove visible ice prior to laying units.
- B. Protection Requirements (completed masonry or sections not being worked on) per NCMA Tek 3-1A and the Guide specifications for Cold Weather Masonry Construction, International Masonry Industry All-Weather Council, latest edition.
1. Mean daily temperature 90 degrees F. to 40 degrees F.: Cover tops of walls at end of workday.
 2. Mean daily temperature of 40 degrees F. to 32 degrees F.: Cover tops of walls with weather-resistive membrane at end of workday for 24 hours.
 3. Mean daily temperature of 32 degrees F. to 25 degrees F.: Install wind breaks if wind exceeds 15 mph. Completely cover masonry with weather-resistive membrane at end of workday for 24 hours.
 4. Mean daily temperature of 25 degrees F. to 20 degrees F.: During workday, use heat sources both sides of masonry. Install wind breaks if wind exceeds 15 mph. At end of day, completely cover walls with insulated blankets or equal protection.
 5. Mean daily temperature of 20 degrees F. and below: During workday, use an enclosure for masonry under construction and use heat sources to maintain the temperature above 32 degrees F. Maintain masonry above 32 degrees for 24 hours after construction by enclosure with supplementary heat, by electric blankets, by infrared heat lamps, or other acceptable means.

3.05 PROTECTION

- A. Protect The tops of exterior walls at night and during delays in the work.
- B. Protect from damage all projections, sills, steps, etc.

- C. As soon as rainy, cold or freezing weather sets in, cover all materials as soon as delivered to job site.
- D. Build necessary water and weathertight sheds for storage of lime and cement before material is delivered.
- E. Contractor shall provide adequate bracing of walls during erection to prevent damage due to high winds or other lateral loads until permanent bracing is installed.

3.06 MASONRY CLEANING AND POINTING

- A. Do all work in as clean a manner as possible. Remove excess material and mortar droppings daily. Remove mortar droppings on connecting or adjoining work before final set. Clean CMU within 7 to 14 days after joints are tooled.
- B. Exposed Masonry: At completion of work, point holes in joints of exposed exterior masonry surfaces, completely fill with mortar, tool properly. After pointing has set and hardened, clean surfaces of all excess mortar with a detergent cleaner specifically designed for masonry surfaces.
 - 1. Diedrich Technologies, Inc.
7373 S. 6th Street
Oak Creek, WI 53154
Phone: 414-764-0058, 800-283-3888
Fax: 414-764-6993
Approved Products:
 - a. Diedrich 200 Lime Solv
 - b. Diedrich 202 New Masonry Detergent
 - c. Diedrich 202V Vana-Stop New Masonry Detergent
 - 2. Prosoco, Inc.
3741 Greenway Circle, Lawrence, KS 66046.
Phone: (800)255-4255; Fax: (785) 830-9797.
 - a. 600 Detergent
 - b. Concrete Brick Cleaner.
- C. Protect adjacent surfaces from contact with cleaner.
- D. Remove and replace defective materials and correct defective workmanship.
- E. Waterproofing:
When exterior brick has dried out sufficiently after cleaning and pointing, apply one (1) coat of a specified waterproofing sprayed on with low pressure equipment. Follow manufacturer's written application instructions.

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