

MORTAR**SECTION 04100****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Mortar for masonry.
- B. Grout for reinforced masonry, bond beams, lintels, etc.

1.02 RELATED SECTIONS

- A. Section 04200 - Unit Masonry: Installation of mortar and grout.
- B. Section 08112 - Standard Steel Frames: Grouting steel door frames.

1.03 REFERENCES

- A. ASTM C5 - Quicklime for Structural Purposes.
- B. ASTM C144 - Aggregate for Masonry Mortar.
- C. ASTM C150 - Portland Cement.
- D. ASTM C207 - Hydrated Lime for Masonry Purposes.
- E. ASTM C270 - Mortar for Unit Masonry.
- F. ASTM C404 - Aggregates for Masonry Grout.
- G. ASTM C476 - Grout for Masonry.
- H. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

1.04 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Include design mix, indicate method used, required environmental conditions, and admixture limitations.
- C. Certificates: Submit certificates attesting to compliance with applicable specifications for grades, types, classes, etc. reports on mortar indicating conformance to ASTM C270.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store protect and handle products to site under provisions of Section 01600.
- B. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.06 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Portland Cement: ASTM C150, Type I, except Type III may be used in cold weather.
- B. Mortar Aggregate: ASTM C144, standard masonry type.
- C. Hydrated Lime: ASTM C207, Type S.
- D. Water: Clean and potable.
- E. Grout Aggregate: ASTM C404.

2.02 MORTAR MIXES

- A. Mortar: ASTM C270, Type N to achieve 750 psi at interior partitions.
 - 1. No chlorides or masonry cements permitted.
 - 2. Limit cementitious materials in mortar to portland cement-lime.

2.03 MORTAR MIXING

- A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270 and written instructions of the manufacturer of prepackaged cement/lime mix.
- B. Do not use anti-freeze compounds to lower the freezing point of mortar.
- C. If water is lost by evaporation, re-temper only within two hours of mixing.
- D. Use mortar within two hours after mixing at temperatures of 80 degrees F, or two-and-one-half hours at temperatures under 50 degrees F.

2.04 MORTAR MIX TESTS

- A. Testing of Mortar Mix: In accordance with ASTM C780 for compressive strength, consistency, mortar aggregate ratio, and water content and slump.

2.05 GROUT MIXES

- A. Bond Beams and Lintels: 3000 psi strength at 28 days; 7-8 inches slump; mixed in accordance with ASTM C476 Course grout.

2.06 GROUT MIXING

- A. Thoroughly mix ingredients in quantities needed for immediate use in accordance with ASTM C476 and of consistency (fine or coarse) at time of placement which will completely fill all spaces to receive grout.
 - 1. Use fine grout in grout spaces less than 2" in horizontal direction, unless otherwise indicated.
 - 2. Use coarse grout in grout spaces 2" or more in least horizontal dimension, unless otherwise indicated.
- B. Add admixtures in accordance with manufacturer's instructions. Provide uniformity of mix.
- C. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install mortar in accordance with ASTM C780 and to the requirements of the specific masonry section.
- B. Brace masonry for wet grout pressure.
- C. Work grout into masonry cores and cavities to eliminate voids.
- D. Do not displace reinforcement while placing grout.
- E. Remove grout spaces of excess mortar.

END OF SECTION

UNIT MASONRY**SECTION 04200****PART 1 - GENERAL****1.01 SECTION INCLUDES**

- A. Concrete masonry units.
- B. Reinforcement, anchorage, and accessories.
- C. Foamed insulation in masonry walls (cells of CMU).
- D. Through-wall flashing where indicated on the drawings.

1.02 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- A. Section 05500 - Metal Fabrications: Placement of loose steel lintels.

1.03 RELATED SECTIONS

- A. Section 04100 - Mortar: Mortar and grouts.
- B. Section 05500 - Metal Fabrication: Loose steel lintels.
- C. Section 07900 - Joint Sealers: Rod and sealant at control and expansion joints.

1.04 REFERENCES

- A. ANSI/ASTM A82 - Cold-Drawn Steel Wire for Concrete Reinforcement.
- B. ASTM C90 - Hollow - Load Bearing Concrete Masonry Units.
- C. ASTM C129 - Non-Load Bearing Concrete Masonry Units.
- D. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Construction.
- E. UL - Underwriters' Laboratories.

1.05 SUBMITTALS

- A. Submit product data provisions of Section 01300.
- B. Submit product data for fabricated wire reinforcement, and ties.
- C. Submit drawings in sufficient detail to show fabrication, installation, anchorage, and interface of the work of this Section with the work of adjacent trades.
 - 1. Provide setting drawings, templates and directions for the installation of dove tail slots and other anchorages installed as a unit of work under other sections.

D. Quality Control Submittals

1. Mix Designs: Submit mix design for each mortar and grout mix, for indicated strength.
2. Field Test Reports: Submit certification that materials conform to requirements of Contract Documents.
3. Certificates: Submit copies for each type of product indicated, submit manufacturer's specifications and other data needed to prove compliance with the specified requirements.

1.06 QUALIFICATIONS

- A. Installer: Company specializing in performing the work of this Section with minimum 5 years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Section 01600.
- B. Store and protect products under provisions of Section 01600.
- C. Store and handle masonry units to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion or other causes.

1.08 ENVIRONMENTAL REQUIREMENTS

- A. Cold Weather Requirements: Comply with IMIAC - Recommended Practices and Specifications for Cold Weather Masonry Construction.
- B. Protection of Work: During erection, cover top of walls with waterproof sheeting at end of each day's work. Cover partially completed structures when work is not in progress.

1.9 SEQUENCING AND SCHEDULING

- A. Coordinate the masonry work with installation of window anchors.

1.10 QUALITY ASSURANCE

- A. Fire-Rated Masonry: Wherever a fire-resistance classification is shown or scheduled for unit masonry construction (4-hour, 3-hour, and similar designations), comply with the requirements for materials and installation established by the American Insurance Association and other governing authorities for the construction shown.
- B. Single Source Responsibility: Obtain exposed masonry units of uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one manufacturer for each different product required for each continuous surface or visually related surfaces. Also obtain all mortar materials from a single source.

PART 2 - PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Hollow and Solid Load Bearing Block Units: ASTM C90, Grade N, Type I - Moisture Controlled; light weight classification.
- B. Masonry Units Size: Nominal modular size with face dimension of 8 x 16 inches. Provide special units for 90° corners, bond beams and lintels.

2.02 REINFORCEMENT AND ANCHORAGE

- A. Single Wythe Joint Reinforcement: ladder type; hot dip galvanized after fabrication, cold-drawn steel conforming to ANSI/ASTM A82, 3/16 inch side rods with No. 9 cross ties.
- B. Reinforcing Steel: ASTM A615, 60 ksi yield grade, deformed billet bars, galvanized finish.
- C. Strap Anchors: Bent steel shape, 1-1/4" wide, not less than 16 gage thick, galvanized to ASTM A123 G90 finish.
- D. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
 - 1. AA Wire Products Co.
 - 2. Dur-O-Wall, Inc.
 - 3. Heckman Building Products, Inc.
 - 4. Hohmann & Barnard, Inc.
 - 5. National Wire Products Corp.

2.03 ACCESSORIES

- A. Premolded Control Joint Strips: Material as follows, designed to fit standard sash block and to maintain lateral stability in concrete masonry wall; size and configuration as indicated.
 - 1. Styrene-butadiene rubber compound complying with ASTM D 2000, Designation 2AA-805.
- B. Cleaning Solutions: Non-acidic, not harmful to masonry work or adjacent materials as recommended by the masonry manufacturers.
- C. Rubberized Asphalt Sheet Flashing: Manufacturer's standard composite flashing product consisting of a pliable and highly adhesive rubberized asphalt compound 32 mils (0.8mm) thick, bonded completely and integrally to a high-density, cross-laminated polyethylene film, 8 mils (0.2 mm thick, to produce an overall thickness of 40 mils (1.0 mm) equal to Perm-A Barrier by W.R. Grace and equal product by Sandal.
 - 1. Primer: Flashing manufacturer's standard product or product recommended by flashing manufacturer for bonding flashing sheets to masonry and concrete

2.04 INSULATION

- A. Amino plast foam insulation complying with ASTM D1622 for density of .770 lbs./cu.ft., R-value of 4.7 per inch, and flame spread of less than 25 and smoke developed of less than 100 per ASTM E84; "Thermco Foam Insulatoin" by Thermco, "Core-Fill 500" by Tailored Chemical Co or equal

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Verify items provided by other Sections of work are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.
- D. Beginning of installation means installer accepts existing conditions.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other Sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
 - 1. Use dry cutting saws to cut concrete masonry units.

3.03 COURSING AND INSULATION

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Lay concrete masonry units in bond to match existing. Course one unit and one mortar joint to equal 8 inches. Form concave mortar joints in all joints except provide cut joints flush in concrete masonry back-up on the cavity side to provide a even surface for application of cavity insulation.
- D. Drill holes in mortar joints into all cells on concrete masonry units at exterior walls and install foamed-in-place insulation to totally fill all cells in strict compliance with manufacturers printed instructions. Patch the joint with mortar and tool.

3.04 PLACING AND BONDING

- A. Do not wet concrete masonry units.
- B. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- C. Lay hollow masonry units with face shell bedding on head and bed joints.

- D. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- E. Remove excess mortar as Work progresses.
- F. Interlock intersections and external corners except on stack bond.
- G. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- H. Perform jobsite cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- I. Stopping and Resuming Work: Rack back 1/2-unit length in each course; do not tooth. Clean exposed surfaces of set masonry, wet units lightly (if required) and remove loose masonry units and mortar prior to laying fresh masonry.

3.05 REINFORCEMENT AND ANCHORAGES - GENERAL

- A. General: Provide anchor devices of type indicated.
- B. Anchor masonry to structural members where masonry abuts or faces structural members to comply with the following:
 - 1. Anchor masonry to structural members with flexible anchors embedded in masonry joints and attached to structure or embedded in structure.
 - 2. Space anchors as indicated, but not more than 16" o.c. vertically and 16" o.c. horizontally.
- C. Provide continuity at corners and wall intersections by use of prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, pipe enclosures and other special conditions.

3.06 REINFORCEMENT AND ANCHORAGES - SINGLE WYTHE MASONRY

- A. Install horizontal joint reinforcement 16 inches oc.
- B. Place masonry joint reinforcement in first and second horizontal joints above and below openings. Extend minimum 16 inches each side of opening.
- C. Place joint reinforcement continuous in first and second joint below top of walls.
- D. Lap joint reinforcement ends minimum 6 inches. Extend minimum 16 inches each side of openings.

3.07 LINTELS

- A. Install loose steel and poured U-block lintels over openings as indicated on Drawings.
- B. Do not place mortar within 1/2 inch of either side of steel lintels to allow for expansion.
- C. Maintain minimum 8 inch bearing on each side of opening.

3.08 EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control and expansion joints.
- B. Install preformed control joint filler in continuous lengths. Seal butt and corner joints in accordance with manufacturer's instructions.
- C. Joint Spacing: If location of joints is not shown, place vertical joints spaced not to exceed 35'-0" o.c. for concrete masonry wythes if reinforced. Locate joints at point of natural weakness in the masonry work.

3.09 BUILT-IN WORK

- A. As work progresses, build in metal door and glazed frames window frames and other items furnished by other Sections.
- B. Build in items plumb and level.
- C. Bed anchors of metal door and glazed frames in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores with grout minimum 12 inches from framed openings.
- D. Do not build in organic materials subject to deterioration.
- E. Provide concealed flashing in masonry work where indicated on the drawings above, to the downward flow of water in the wall so as to divert such water away from the interior. Prepare masonry surfaces smooth and free from projections which could puncture flashing. Place through-wall flashing in a bed of mastic and cover with mortar. Seal penetrations in flashing with mastic before covering with mortar. Extend flashings through exterior face of masonry and cut off flush with face of masonry after completion of work

3.10 TOLERANCES

- A. Maximum Variation From Unit to Adjacent Unit: 1/32 inch.
- B. Maximum Variation From Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
- C. Maximum Variation From Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- D. Maximum Variation From Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.
- E. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.
- F. Maximum Variation From Cross Sectional Thickness of Walls: 1/4inch.

3.11 CUTTING AND FITTING

- A. Obtain Architect approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.12 CLEANING

- A. Clean exposed CMU masonry by dry brushing at the end of each day's work and after final pointing to remove mortar spots and droppings.
- B. Remove excess mortar and mortar smears.
- C. Replace defective mortar. Match adjacent work.
- D. Clean soiled surfaces with cleaning solution.
- E. Use non-metallic tools in cleaning operations.

3.13 PROTECTION OF FINISHED WORK

- A. Protect finished installation under provisions of Section 01500.
- B. Without damaging completed work, provide protective boards at exposed external corners which may be damaged by construction activities.

END OF SECTION

