

Section 04 21 13 Brick Veneer

Specifications

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PART 1 GENERAL

- 1.01 SECTION INCLUDES
- A. Facebrick units on new construction.
 - B. Reinforcement, anchorage, and accessories (at both brick veneer and CMU single wythe walls).
- 1.02 REFERENCE
- A. ACI 530.1 - Specifications for Masonry.
- 1.03 SUBMITTALS
- A. Samples: Submit brick units, to illustrate color, texture and color range.
- 1.04 QUALITY ASSURANCE
- A. Perform work in accordance with ACI 530 and ACI 530.1.
 - B. Brick shall comply with or exceed ASTM C-216 Grade SW Type FBX.
- 1.05 QUALIFICATIONS
- A. Installer: Mason with minimum three years documented experience.
 - B. Manufacturer: NOTE – THIS SPECIFICATION REQUIRES THAT ALL MANUFACTURERS SPECIFIED AND REQUESTING PRIOR APPROVAL MUST SUBMIT A SAMPLE SELECTION PROPOSED TO MEET THE AESTHETIC REQUIREMENTS OF COLOR AND FINISH OF THIS SPECIFICATION; THIS SUBMITTAL SHALL BE AT LEAST 10 (TEN) DAYS PRIOR TO BID. Only approved manufacturer and it's approved product/model shall be noted in the Prior Approval of the Addenda; manufacturer's and products not specifically listed in the Addenda shall not be approved nor acceptable. Furthermore, failure of manufacturers (listed in this Section' original specification) to be listed in the addenda shall be considered to be revoked from the specification of this Section.
- 1.06 ENVIRONMENTAL REQUIREMENTS
- A. Maintain materials and surroundings air temperature to minimum 50 degrees F prior to, during, and 48 hours after completion of masonry work.
 - B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of work.
- 1.07 MOCKUP
- A. Install 4 foot high by 6 foot wide panel illustrating pattern, bond, and blend of colors for Architect's approval of masonry materials prior to ordering all materials. Mock-up should accurately portray the color, blend, and size of brick that will be sent to the jobsite.
 - B. After all brick has been sent to the jobsite, construct a second mock-up wall size as necessary to incorporate examples of ALL conditions pertinent to the project; include bonding patterns, colored mortars, finished joint tooling, back-up construction, expansion joints & control joints (with sealant & backer rod), corners, headers, sills, horizontal reinforcing, anchorage to back-up construction, thru-wall flashing, cavity insulation, weeps, and any other special conditions for the project into masonry panel. The purpose of the sample panel is for the Contractor to show his understanding of all aesthetic and technical criteria related to masonry work for the Architect's approval prior to initiating actual work on the project. Masonry Work should not commence until the Architect and Owner have issued approval of the mock-up. Mock-up may remain as part of work if accepted.

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PART 2 PRODUCTS

2.01 BRICK UNITS

- A. Face Brick: Size, texture, and color **as selected by Architect to match existing.**
- B. Size and Shape: Nominal modular size.
- C. Special shapes as required. Use solid units where cores (frogs) would otherwise be exposed to view.
- D. Manufacturer:
 - 1. Acme
 - 2. Tri-State
 - 3. Boral

2.02 REINFORCEMENT AND ANCHORAGE

- A. Coating: Hot dipped galvanized; 1.50 oz. psf
- B. Wire Gage: Standard weight.
- C. Type:
 - 1. Truss type; with pintle extensions at brick veneer assemblies - extension length of pintles to accommodate 2" board insulation and air space (re: drawings).
 - a. Manufacturer:
 - 1. Hohmann & Barnard: LoxAll Adjustable Eye-Wire; adjustable wall ties.
 - 2. Dur-O-Wal.
 - 2. Dovetail, slotted; extension length to accommodate air space (re: drawings).
 - a. Manufacturer:
 - 1. Hohmann & Barnard: LoxAll; adjustable wall ties.
 - 2. Dur-O-Wal: D/A 210 with D/A 701.

2.03 MORTAR AND GROUT

- A. Colored Mortar/Grout: Type N; color to be selected from manufacturer's full range.

2.04 FLASHINGS

- A. Copper 10 oz./ sq. ft. (corrugated) or 5 oz./sq. ft. laminated between glass fabrics (vinyl or rubber materials are not acceptable).
- B. Set flashing flush to face of exterior wythe, extend through cavity, rising no less than 8" and terminate at depth of 4" into bed joint of interior wythe. Neatly trim excess from exterior wythe joint after architect has approved installation.
- C. Extend flashing minimum 8" beyond each side of opening; form end dams by turning up material minimum 2" each end.
- D. End laps: minimum 6 inches, sealed with flashing adhesive
- E. Install mortar break diagonally on top of flashing to ensure that the mortar droppings are broken up and deflected away from the weep holes

2.05 ACCESSORIES

- A. Joint Filler: Closed cell rubber oversized 50 percent to joint width; self-expanding.
- B. Weeps: preformed corrugated plastic, typical; plastic tube-type at sill weeps.
- C. Mortarnets at bottom of masonry shelf.

PART 3 EXECUTION

3.01 COURSING

- A. Brick Units:
 - 1. Bond: Running; bond deviations where shown on drawings
 - 2. Pattern: See elevations of drawings for pattern requirements
 - 3. Mortar Joints: Tooled slightly concave; sled runners on horizontal joints

3.02 WEEPS

- A. Install weeps at dampcourse, sills, and lintels at a minimum of 24" o.c.

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- 3.03 CONTROL AND EXPANSION JOINTS
- A. Install control and expansion joints where indicated on plans; keep joint free of mortar and foreign matter.
 - B. If size is not indicated in the drawings, bring to the attention of the Architect.
 - C. Do not span expansion joints with reinforcement or anchorage.
- 3.04 REINFORCEMENT AND ANCHORAGE (INCLUDING SINGLE WYTHE CMU WALLS)
- A. Install horizontal joint reinforcement 16" o.c.; vertical reinforcement 16" o.c.
 - 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.
 - E. Install 2" wide by 30" metal lath strips (at 16" o.c.) at CMU intersections and control joints; also provide same to span at brick veneer control joints.
 - F. Provide 1 1/2" wide by 30" long by 1/4" thick metal strap anchors at 48" o.c vertically at CMU control joints and intersections; bend last 2" of each end of anchor 90° and set in grouted cells.
- 3.05 MASONRY FLASHINGS
- A. Extend flashings horizontally at foundation walls, above ledge or shelf angles and lintels, at bottom of walls.
 - B. Turn flashing up (under insulation or sheathing board) minimum 8 inches and bed into mortar joint of masonry.
 - C. Lap end joints minimum 6 inches and seal watertight.
 - D. Turn flashing, fold, and seal at corners, bends, and interruptions.
 - E. Provide end dams at sill and head flashings.
 - F. Install gravel or mortarnets at cavity at to top of second course above dampcourse flashing to prevent mortar spillage from clogging weepholes.
- 3.06 SURFACE TREATMENT
- A. Tool joints to match those of existing brick veneer at existing building.
- 3.07 TOLERANCES
- A. Maximum Variation from Unit to Adjacent Unit: 1/32 inch.
 - B. Maximum Variation from Plumb: 1/4 inch, total.
 - C. Maximum Variation from Level Coursing: 1/8 inch in 3 ft. and 1/4 inch in 10 ft.
 - D. Maximum Variation of Joint Thickness: 1/8 inch in 3 ft.
- 3.08 CLEANING
- A. Remove excess mortar and mortar smears.
 - B. Clean soiled surfaces with cleaning solution.
- 3.09 PROTECTION
- A. Secure 24" wide plastic and/ or mulch at base of building to protect brickwork from mud staining and other construction splatters; protection to remain until hardscape/ landscape is established.

END OF SECTION

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PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Block filler and finishes are included in Section 09 90 00.

1.02 SUMMARY

- A. This Section includes the following:
 - 1. Concrete masonry unit for load bearing and non-load bearing walls.
 - 2. Through-wall flashing
- B. Products installed but not furnished under this Section include the following:
 - 1. Sheet Metal Flashing and Trim is included in Section 07 60 00.
 - 2. Steel Doors and Frames are included in Section 08 11 13.
- C. Provide concrete masonry units that develop installed compressive strength of 1500 psi, min.

1.03 SUBMITTALS

- A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
 - 1. Product data for each different masonry unit, accessory, and other manufactured product indicated.
 - 2. Shop drawings for reinforcing detailing fabrication, bending, and placement of unit masonry reinforcing bars. Comply with ACI 315 "Details and Detailing of Concrete Reinforcing" showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of masonry reinforcement.
 - 3. Samples for verification purposes of the following:
 - a. Full-size units for each different masonry unit required showing full range of exposed color, texture, and dimensions to be expected in completed construction.
 - b. Material certificates, signed by manufacturer and Contractor certifying that each material complies with requirements for:
 - 1. Mortar, including name of manufacturer, brand, type, and weight slips at time of delivery.
 - 2. Reinforcing bars.
 - 3. Anchors, ties, and metal accessories.
 - 4. Cold-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.
 - 5. Hot-weather construction procedures evidencing compliance with requirements specified in referenced unit masonry standard.
 - 6. Qualification data for firms to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, telephone numbers, names of Architects and Owners, and other information specified.

1.04 QUALITY ASSURANCE

- A. Unit Masonry Standard: Comply with ACI 530.1/ASCE 6 "Specifications for Masonry Structures," except as otherwise indicated.
 - 1. Revise ACI 530.1/ASCE 6 to exclude Sections 1.4 and 1.7; Parts 2.1.2, 3.1.2, and 4.1.2; and Articles 1.5.1.2, 1.5.1.3, 2.1.1.1, 2.1.1.2, and 2.3.3.9 and to modify Article 2.1.1.4 by deleting requirement for installing vent pipes and conduits built into masonry.
- B. Single-Source Responsibility for Masonry Units: Obtain concrete 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.
- C. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of uniform quality and color, from one manufacturer for each cementitious component and from one source and producer for each aggregate.
- D. Field-Constructed Mock-Ups: Prior to installation of concrete masonry, erect sample wall panels to further verify selections made under sample submittals and to demonstrate aesthetic effects as well as qualities of materials and execution. Build mock-ups to comply with the following requirements, using materials indicated for final unit of Work:
 - 1. Locate mock-ups on site as directed by Architect.

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2. Build mock-ups in sizes of approximately 4 feet long by 4 feet high by full thickness, including face and backup wythes as well as accessories.
 3. Notify Architect (1) week prior to dates and times when mock-ups will be erected.
 4. Protect mock-ups from the elements with weather-resistant membrane.
 5. Retain and maintain mock-ups during construction in undisturbed condition as standard for judging completed unit masonry construction.
 6. When directed, demolish and remove mock-ups from Project site.
- E. Pre-installation Conference: Conduct conference at Project site, to comply with requirements of Division 1 Section "Project Meetings."
- 1.05 DELIVERY, STORAGE, AND HANDLING
- A. Deliver masonry materials to project in undamaged condition.
 - B. Store and handle masonry units off the ground, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not place until units are in an air-dried condition.
 - C. Store cementitious materials off the ground, under cover, and in dry location.
 - D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
 - E. Store masonry accessories including metal items to prevent corrosion and accumulation of dirt and oil.
- 1.06 PROJECT CONDITIONS
- A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - B. Extend cover a minimum of 24 inches down both sides and hold cover securely in place.
 - C. Do not apply uniform roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
 - D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Remove immediately any grout, mortar, and soil that come in contact with such masonry.
 - E. Protect base of walls from rain-splashed mud and mortar splatter by means of coverings spread on ground and over wall surface.
 - F. Protect sills, ledges, and projections from mortar droppings.
 - G. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes from mortar droppings.
 - H. Cold-Weather Construction: Comply with referenced unit masonry standard for cold-weather construction and the following:
 1. Do not lay masonry units that are wet or frozen.
 2. Remove masonry damaged by freezing conditions.
 - I. Hot-Weather Construction: Comply with referenced unit masonry standard.
- 1.07 COORDINATION
- A. Coordinate installation of other sections (conduit, plumbing, F.E. cabinets, board insulation).

PART 2 - PRODUCTS

- 2.01 MATERIALS, GENERAL
- A. Comply with referenced unit masonry standard and other requirements specified in this Section applicable to each material indicated.
 - B. CONCRETE MASONRY UNITS
 1. General: Comply with requirements indicated below applicable to each form of concrete masonry unit required.
 - a. Provide special shapes and finishes where indicated and as follows:
 1. For lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
 2. At all instructional spaces and corridors for students, use radius-edged units for outside corners (including at window sills); use special corner pieces to accommodate transition from where radius edge vertical pieces meet horizontal radius edge pieces.
 3. **First course to have square corners to accommodate applied rubber base.**

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- b Size: Provide concrete masonry units complying with requirements indicated below (or as specifically shown on plan) for nominal sizes, manufactured to specified face dimensions within tolerances specified in the applicable referenced ASTM specification for concrete masonry units.
 - 1. Hollow Load-Bearing Concrete Masonry Units: ASTM C 90, Grade N and as follows:
 - a. 8 inch x 8 inch x 16 inch (8 inch x 12 inch x 16 inch at elevator shaft enclosure) stretcher block with regular or plain ends as required by conditions.
 - b. 8 inch x 8 inch x 16 inch U-block at lintels and bond beams.
 - c. 16 inch x 8 inch x 8 inch U-block cut to match roof pitch at locations indicated.
 - d. 6 inch x 8 inch x 16 inch stretcher blocks where shown on plan.
 - e. Use 4 inch, 10 inch, and 12 inch units where so indicated in drawings.
- c Unit Compressive Strength: Provide units with minimum average net area compressive strength of 1,900 psi.
- d Weight Classification: Light weight.

2.02 MORTAR

- A. General: Provide field mixed or proprietary mason's mix conforming to the same requirements as field mixed mortar conforming to ASTM C270, Type N.
 - 1. Portland Cement shall conform to ASTM C150, gray color.
 - 2. Masonry Cement: ASTM C91, Type N, "Magnolia Mason's Mix", "Atlas Masonry Cement", or "Lone Star Masonry Cement"
 - 3. Hydrated Lime shall conform to ASTM C207, Type S.
 - 4. Aggregate shall be fine masonry sand conforming to ASTM C144.
 - 5. Quicklime: ASTM C5, non-hydraulic type, slacked in accordance with manufacturer's directions.
 - 6. Non-staining Portland Cement: ASTM C150, Type I, containing not more than .03 percent of water soluble alkali, and shall not stain other materials and surfaces with which it is in contact. Cement shall be gray unless otherwise hereinafter specified.
 - 7. Water shall be clean and drinkable.
- B. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified, combined with set-controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142, Type RS.
- C. Mortar Color: Standard Gray
- D. Mortar Mixes
 - 1. Mortar for load-bearing walls and partitions: ASTM C270, Type S utilizing the Proportion Method comprised of one (1) part Portland Cement, 1/4 part hydrated lime or lime putty, and three (3) parts sand; or one (1) part Portland Cement, one (1) part Type II masonry cement and six (6) parts sand.

2.03 REINFORCING STEEL

- A. General: Provide reinforcing steel complying with requirements of referenced unit masonry standard and this Section.
- B. Reinforcing Bars: Deformed billet steel complying with ASTM A 615, Grade 60.
- C. Interior Partitions – Single Wythe Joint Reinforcement: Truss type hot-dipped galvanized after fabrication, cold drawn steel conforming to ASTM A82. No. 9 side rods with No. 9 inch cross ties; truss single width manufactured by Dur-O-Wall
- D. Reinforcing Steel: ASTM A615, 60 ksi yield grade, deformed bars, unprotected finish. Corner ties and strap anchors: No. 4 hooked ties at each course with vertical bars in grouted cells

2.04 MASONRY CLEANERS

- A. Job-Mixed Detergent Solution: Solution of trisodium phosphate (1/2-cup dry measure) and laundry detergent (1/2-cup dry measure) dissolved in one gallon of water.

2.05 ACCESSORIES

- A. Single Wythe Joint Reinforcement: ASTM A951/A951M; truss type; steel; 0.188 inch diameter side rods with 0.148 inch diameter cross ties; hot dip galvanized.

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- B. Multiple Wythe Joint Reinforcement: ASTM A951/A951M; truss type; steel 0.188 inch diameter side rods with 0.148 inch diameter cross ties; hot dip galvanized.
 - C. Reinforcing Steel: specified in Section 03 20 00
 - D. Strap Anchors: equal to Dur-O-Wall DA301Z hot dip galvanized.
 - E. Wall Ties: equal to Dur-O-Wall DA990 hot dip galvanized.
 - F. Triangular Ties: equal to Dur-O-Wall DA700 (with appropriate anchor) hot dip galvanized
 - G. Dovetail Anchors: Bent steel strap, ASTM A153/A153M hot dip galvanized.
 - H. Anchor Rods: ASTM A307; Grade C; J-shaped or L-shaped; complete with washers and heavy hex nuts; sized for minimum 15 inch embedment; galvanized finish.
 - 1. Hot-Dipped Galvanizing: ASTM A153/A153M.
 - 2. Mechanical Galvanizing: ASTM B695; Class 55.
 - I. Drip Edge Flashings: equal to Dur-O-Wall DA1525
 - J. Thru Wall Flashings: 40 mil (32 mil rubberized asphalt plus 8 mil polyethylene film; equal to Dur-O-Wall DA1540.
 - K. Preformed Control Joints: Rubber; Furnish with corner and tee accessories, heat fused joints.
 - L. Joint Filler: Closed cell rubber; oversized 50 percent to joint width; self expanding
 - M. Cavity Drain Material: Open polyethylene mesh thickness required to fill cavity space, and shaped to ensure moisture drainage to cavity weeps. Equal to Dur-O-Wall Mortar Net™
 - N. Cavity Vents: equal to Dur-O-Wall 1006
 - O. Steel Lintels: size as indicated on Drawings, hot-dip galvanized.
 - P. Masonry Wall Stabilizing Anchor: equal to Heckmann No. 138 channel slot flat anchor, with No. 130 welded channel slot and No. 422 plastic rectangular tube.
- 2.06 SOURCE QUALITY CONTROL
- A. Concrete Masonry Units will be tested by qualified independent testing laboratory for strength, absorption, and moisture content per ASTM C 140.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other specific conditions, and other conditions affecting performance of unit masonry.
- B. Do not proceed until unsatisfactory conditions have been corrected.

3.02 INSTALLATION, GENERAL

- A. Comply with referenced unit masonry standard and other requirements indicated applicable to each type of installation included in Project.
- B. Thickness: Build cavity walls to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of nominal thickness indicated.
- C. Leave openings for equipment to be installed before completion of masonry. After installation of equipment, complete masonry to match construction immediately adjacent to the opening.
- D. Cut masonry units with motor-driven saws to provide clean, sharp, unchipped edges. Cut units as required to provide continuous pattern and to fit adjoining construction. Use full-size units without cutting where possible.
- E. Integrate joint reinforcement and brick masonry veneer ties.
- F. Where SGFT is required at the base course, coordinate joints, ties, and any other items that will affect the structural integrity and aesthetical appearance of the finished assembly.

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3.03 REQUIREMENTS FOR MASONRY CONSTRUCTION IN HOT AND COLD WEATHER

	Temperature	Preparation Requirements (Prior to Work)	Construction Requirements (Work in Progress)	Protection Requirements (After Masonry Is Placed)
Hot Weather	Above 115 °F or 105 °F with a wind velocity over 8 mph (46.1 °C or 40.6 °C with a 12.9 km/hr wind)	Shade materials and mixing equipment from direct sunlight. Comply with hot weather requirements below.	Use cool mixing water for mortar and grout. Ice must be melted or removed before water is added to other mortar or grout materials. Comply with hot weather requirements below.	Comply with hot weather requirements below.
	Above 100 °F or 90 °F with 8 mph wind (above 37.8 °C or 32.2 °C with a 12.9 km/hr wind)	Provide necessary conditions and equipment to produce mortar having a temperature below 120 °F (48.9 °C). Maintain sand piles in a damp, loose condition.	Maintain mortar and grout at a temperature below 120 °F (48.9 °C). Flush mixer, mortar transport container, and mortar boards with cool water before they come into contact with mortar ingredients or mortar. Maintain mortar consistency by retempering with cool water. Use mortar within 2 hr of initial mixing.	Fog spray newly constructed masonry until damp, at least three times a day until the masonry is three days old.
Normal Weather	100 °F to 40 °F (37.8 °C to 4.4 °C)	Normal Procedures.	Normal Procedures.	Normal Procedures.
Cold Weather	40 °F to 32 °F (4.4 °C to 0 °C)	Do not lay masonry units having either a temperature below 20°F (-6.7°C) or containing frozen moisture, visible ice, or snow on their surface. Remove visible ice and snow from the top surface of existing foundations and masonry to receive new construction. Heat these surfaces above freezing, using methods that do not result in damage.	Heat mixing water or sand to produce mortar between 40 °F (4.4 °C) and 120 °F (48.9 °C). Do not heat water or aggregates used in mortar or grout above 140 °F (60 °C). Heat grout materials when their temperature is below 32 °F (0 °C).	Completely cover newly constructed masonry with a weather-resistive membrane for 24 hr after construction.
	32 °F to 25 °F (0 °C to -3.9 °C)	Comply with cold weather requirements above.	Comply with cold weather requirements above. Maintain mortar temperature above freezing until used in masonry. Heat grout materials so grout is at a temperature between 70 °F (21.1 °C) and 120 °F (48.9 °C) during mixing and placed at a temperature above 70 °F (21.1 °C).	Comply with cold weather requirements above.
	25 °F to 20 °F (-3.9 °C to -6.7 °C)	Comply with cold weather requirements above.	Comply with cold weather requirements above. Heat masonry surfaces under construction to 40°F (4.4°C) and use wind breaks or enclosures when the wind velocity exceeds 15 mph (24 km/h). Heat masonry to a minimum of 40°F (4.4°C) prior to grouting.	Completely cover newly constructed masonry with weather-resistive insulating blankets or equal protection for 24 hr after completion of work. Extend time period to 48 hr for grouted masonry, unless the only cement in the grout is Type III portland cement.
	20 °F and Below (-6.7 °C and Below)	Comply with cold weather requirements above.	Comply with cold weather requirements above. Provide enclosure and heat to maintain air temperatures above 32 °F (0 °C) within the enclosure.	Maintain newly constructed masonry temperature above 32°F (0°C) for at least 24 hr after being completed by using heated enclosures, electric heating blankets, infrared lamps, or other acceptable methods. Extend time period to 48 hr for grouted masonry, unless the only cement in the grout is Type III portland cement.

Preparation and Construction requirements are based on ambient temperatures. **Protection** requirements, after masonry is placed, are based on mean daily temperatures.

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3.04 CONSTRUCTION TOLERANCES

- A. Comply with construction tolerances of referenced unit masonry standard.

3.05 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement-type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- B. Lay up walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
- C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do not use units with less than nominal 8-inch horizontal face dimensions at corners or jambs.
 - 1. One-half running bond with vertical joint in each course centered on units in courses above and below.
- D. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond. Do not tooth. Clean exposed surfaces of set masonry and remove loose masonry units and mortar prior to laying fresh masonry.
- E. Built-In Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.

3.06 MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar in starting course on footings, in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with concrete.
 - 3. For starting course on footings where cells are not filled with concrete, spread out full mortar bed including areas under cells.
- B. Intersecting and Abutting Walls: Unless vertical expansion or control joints are shown at juncture, provide same type of bonding specified for structural bonding between wythes and space as follows:
 - 1. Provide continuity with horizontal joint reinforcement using prefabricated "T" units.
 - 2. Nonbearing Interior Partitions: Build full height of story to underside of or roof structure, unless indicated otherwise.

3.06 CONTROL AND EXPANSION JOINTS

- A. Install control and expansion joints where indicated on plans; keep joint free of mortar and foreign matter.
- B. If size is not indicated in the drawings, bring to the attention of the Architect.
- C. Do not span expansion joints with reinforcement or anchorage.
- D. Provide control joints every 25'-0" regardless if not shown in drawings; bring to the attention of the Architect prior to installation at pre-installation conference.
- E. Control joint placement shall follow guidelines of the *Masonry Institute of America Design Manuel – 4th Addition*.

3.07 CAVITIES/AIR SPACES

- A. Keep cavities/air spaces clean of mortar droppings and other materials during construction. Strike joints facing cavities/air spaces flush.

3.08 LINTELS

- A. Install steel lintels where indicated.
- B. Coordinate bedding of masonry flashings as is indicated in drawings and is industry standard.
- C. Provide masonry lintels where shown and wherever openings of more than 2'-0" for block size units are shown.
 - 1. Provide formed-in-place masonry lintels.
 - 2. Provide temporary support for formed-in-place lintels.
 - 3. Use specially formed bond beam units with reinforcement bars placed as indicated and filled with coarse grout.
 - a. Reinforce units with 2 #4 deformed bars, minimum, unless otherwise indicated.
 - b. Provide minimum bearing of 8 inches at each jamb, unless otherwise indicated.
 - c. Fill block with concrete to full depth of 8 inch high block, unless otherwise

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- indicated to be filled to 16 inches.
- D. Where expansion and control joints are required, provide joints each side of wall with sealant specified in Section 07 92 00, offset control joint to align with end of lintels and continue up to termination of CMU.
- 3.09 JAMBS
- A. Provide concrete in jamb cells at all masonry openings; reinforcement continuous from concrete slab, through jamb, and up into lintel piece.
1. Provide (1) #4 rebar in each jamb, unless noted otherwise.
 2. Hook into concrete slab 12"; lap slab rebar and jamb rebar 12", minimum.
- 3.10 FIELD QUALITY CONTROL
- A. Testing Frequency: Tests and evaluations listed in this article will be performed during construction for each 5000 sq. ft. of wall area or portion thereof.
- B. Mortar properties will be tested per property specification of ASTM C 270.
- C. Evaluation of Quality Control Tests: In absence of other indications of noncompliance with requirements, masonry will be considered satisfactory if results from construction quality control tests comply with minimum requirements indicated.
- 3.11 REPAIRING, POINTING, AND CLEANING
- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units in fresh mortar, pointed to eliminate evidence of replacement.
- B. Pointing: Joints shall have tooling to match existing on campus. During the tooling of joints, enlarge any voids or holes and completely fill with mortar. Point-up all joints including corners, openings, and adjacent construction to provide a neat, uniform appearance, prepared for application of sealants.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 2. Test cleaning methods on sample wall panel; leave 1/2 panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - a. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
- E. Protection: Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION

Section 05 50 00 Metal Fabrications

Specifications

05 50 00-1

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. The work required under this section consists of metal fabrications made of steel shapes, sheets, plates, pipes as required for miscellaneous supports and railings.

1.02 WORK INCLUDES

- A. Miscellaneous steel that may be required for brick lintels, pipe supports, etc.

PART 2 PRODUCTS

2.01 MISCELLANEOUS MATERIALS

A. Ferrous Metals:

1. Metal Surfaces, General: For fabrication of miscellaneous metal work which will be exposed to view, use only materials which are smooth and free of surface blemishes including pitting, seam marks, roller marks, rolled trade names and roughness.
2. Steel Angles, Plates, Shapes and Bars: ASTM A 36.
3. Steel Pipe: ASTM A 53; Type and grade as selected by fabricator and as required for design loading; black finish unless galvanizing is indicated; standard weight (sched. 40), unless otherwise indicated.
4. Brackets, Flanges and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.
5. Concrete Inserts: Threaded or wedge type; galvanized ferrous castings, either malleable iron, ASTM A 47, or cast steel, ASTM A 27. Provide bolts, washers and shims as required, hot-dip galvanized, ASTM A 153.

B. Grout:

1. Non-Shrink Non-Metallic Grout: Pre-mixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with CE CRD-C621. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

C. Fasteners:

1. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade and class required.
2. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.
3. Lag Bolts: Square head type, FS FF-B-561.
4. Machine Screws: Cadmium plated steel, FS FF-S-92.
5. Wood Screws: Flat head carbon steel, FS FF-S-111.
6. Plain Washers: Round, carbon steel, FS FF-W-92.
7. Masonry Anchorage Devices: Expansion shields, FS FF-S-325.
8. Toggle Bolts: Tumble-wing type, FS FF-B-588, type and style as required.
9. Lock washers: Helical spring type carbon steel, FS FF-W-84.

D. Paint:

1. Shop Primer for Ferrous Metal: Manufacturer's or Fabricator's standard, fast-curing, lead-free, "universal" primer; selected for good resistance to normal atmospheric corrosion, for compatibility with finish paint systems indicated and for capability to provide a sound foundation for field-applied topcoats despite prolonged exposure; complying with performance requirements of FS TT-P-645.
2. Galvanizing Repair Paint: High zinc dust content paint for regalvanizing welds in galvanized steel, complying with the Military Specifications MIL-P-21035 (Ships) or SSPC-Paint-20.

E. Galvanizing: Provide a zinc coating for those items indicated or specified to be galvanized, as follows:

1. ASTM A 153 for galvanizing iron and steel hardware.
2. ASTM A 123 for galvanized rolled, pressed and forged steel shapes, plates, bars and strip 1/8" thick and heavier.
3. ASTM A 386 for galvanizing assembled steel products.

F. Shop Painting:

Specifications