

**R.G. KREUSLER PARK RESTROOM BUILDING  
AND ENTRY DRIVE MODIFICATIONS - #14204**

**Specifications**

**SECTION 04100  
MORTAR**

**PART 1 - GENERAL**

**1.01 SECTION INCLUDES**

- A. Mortar and grout for masonry.

**1.02 REFERENCED**

- A. ASTM C5 - Quicklime for Structural Purposes.
- B. ASTM C91 - Masonry Cement.
- C. ASTM C94 - Ready-Mixed Concrete.
- D. ASTM C144 - Aggregate for Masonry Mortar.
- E. ASTM C150 - Portland Cement.
- F. ASTM C207 - Hydrated Lime for Masonry Purposes.
- G. ASTM C270 - Mortar for Unit Masonry.
- H. ASTM C387 - Packaged, Dry, Combined Materials, for Mortar and Concrete.
- I. ASTM C404 - Aggregate for Masonry Grout.
- J. ASTM C476 - Grout for Masonry.
- K. ASTM C595 - Blended Hydraulic Cement.
- L. ASTM C780 - Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
- M. ASTM C1019 - Method of Sampling and Testing Grout.

**1.03 SUBMITTALS**

- A. Submit product data under provisions of Section 01300.
- B. Include design mix, indicate Proportion or Property method used, required environmental conditions, and admixture limitations.

**1.04 DELIVERY, STORAGE, AND HANDLING**

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

**1.05 ENVIRONMENTAL REQUIREMENTS**

- A. Maintain materials and surrounding air temperatures to minimum 50 degrees F prior to, during, and 48 hours after completion of masonry work.

**1.06 MIX TESTS**

- A. Test mortar and grout in accordance with Section 01410.
- B. Testing of Mortar Mix: in accordance with ASTM C780.
- C. Testing of Grout Mix: in accordance with ASTM C1019.
- D. Test mortar mix for compressive strength.

**PART 2 - PRODUCT**

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**2.01 MATERIALS**

- A. Portland Cement: ASTM C150, Type I, gray color.
- B. Hydrated Lime: ASTM C207, Type S.
- C. Grout Fine Aggregate: sand.
- D. Water: Clean and potable.

**2.02 MORTAR MIXES**

- A. Mortar for Load Bearing Walls and Partitions: ASTM C270, Type S utilizing the Proportion Method to achieve 1800 psi strength.
- B. Mortar for Non-load Bearing Walls and Partitions: ASTM C270, Type S utilizing the Proportion Method to achieve 1800 psi strength.
- C. Mortar for Reinforced Masonry: ASTM C270, TYPE S utilizing the Proportion Method to achieve 1800 psi strength.

**2.03 MORTAR MIXING**

- A. Thoroughly mix mortar ingredients in quantities needed for immediate use in accordance with ASTM C270.
- B. Add admixtures in accordance with manufacturer's instructions. Provide uniformity of mix and coloration.
- C. If water is lost by evaporation, retemper 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 GROUT MIXES**

- A. Bond Beams and Lintels: 3000 psi strength at 28 days; 7-8 inches slump; mixed in accordance with ASTM C476 Fine.
- B. Engineered Masonry: 3000 psi strength at 28 days; 7-8 inches slump; premixed type in accordance with ASTM C94.

**2.05 GROUT MIXING**

- A. Mix concrete in accordance with ASTM C94 for transit mix.
- B. Add admixtures in accordance with manufacturer's instructions. Provide uniformity of mix.

**PART 3 - EXECUTION**

**3.01 EXAMINATION**

- A. Request inspection of spaces to be grouted.

**3.02 PREPARATION**

- A. Plug cleanout holes with masonry units to prevent leakage of grout materials. Brace masonry for wet grout pressure.

**3.03 INSTALLATION**

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- A. Work grout into masonry cores and cavities to eliminate voids.
- B. Do not displace reinforcement while placing grout.
- C. Remove grout spaces of excess mortar.

END OF SECTION 04100

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**SECTION 04340  
REINFORCED UNIT MASONRY SYSTEM**

**PART 1 - GENERAL**

**1.01 GENERAL**

A. Related Sections: General Provisions of the Contract, including General, Special and Supplementary Conditions and Division One General Requirements, apply to work specified in this section.

1. 03200 - Concrete Reinforcement

B. Work Includes: Structural load bearing concrete masonry units, defined as all concrete masonry walls shown on the structural drawings. Mortar. Jointing and cleaning.

**1.02 QUALITY ASSURANCE**

A. Codes and Standards

1. ANSI/ASTM A82 - Cold-Drawn Steel Wire for Concrete Reinforcement
2. ANSI/ASTM C55 - Concrete Building Brick
3. ASTM A123 - Zinc (Hot-Dipped Galvanized) Coatings on Iron and Steel Products
4. ASTM A525 - Steel Sheet, Zinc Coated, (Galvanized) by the Hot-Dip Process
5. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement
6. ASTM C90 - Hollow Load Bearing Concrete Masonry Units
7. IMIAC - International Masonry Industry All-Weather Council; Recommended Practices and Guide Specifications for Cold Weather Masonry Construction
8. ACI 531 - Building Code Requirements for Concrete Masonry Structures.

**1.03 SUBMITTALS**

A. Submit shop drawings and product data in accordance with General Conditions of the Contract for Construction. Submit shop drawings indicating bars sizes, spacings, locations, quantities of reinforcement, bending and cutting schedules, supporting and spacing devices.

B. Submit product data for masonry units and fabricated wire reinforcement. Submit samples under provisions of Section 01300. Submit manufacturer's certification that products meet or exceed specified requirements.

**1.04 DELIVERY, STORAGE AND HANDLING**

A. Masonry units delivered to the site must comply with acceptable moisture content limitations. Store units above ground. Store on platform, which permits air circulation. Cover and protect units against moisture.

**1.05 ENVIRONMENTAL REQUIREMENTS**

A. Maintain materials and surrounding air temperature to minimum 50 degrees F (10 degrees C) prior to, during, and 48 hours after completion of masonry work.

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**PART 2 - PRODUCT**

**2.01 MASONRY UNITS**

- A. Hollow load bearing masonry conforming to ASTM C-90-90, Grade N of standard sizes as shown on drawings. No broken or chipped block permitted. Moisture content should not exceed 50% of total absorption. Net cross sectional area - 50% of gross.
- B. Standard masonry unit shall be square ended block such that cores align vertically for unobstructed grouting. The only exception is listed below. At the columns defined as concrete columns cast after masonry is erected (i.e., tie columns) use "one end plain" masonry unit that has one square end and one end indented between face shells. Place the indented end in contact with the tie column. Maintain vertical alignment of head joints.
- C. Masonry units: Nominal modular size as shown on the drawings. Provide special units for 90-degree corners, bond beams, lintels, coved base, and bullnosed corners. Provide Fire Rated Masonry Units as required by the Life Safety Drawings and Architectural floor plans.

**2.02 MORTAR**

- A. Conform to "Tentative Specifications for Mortar for Unit Masonry" ASTM C-270, Type S, property specifications. All ingredients shall meet appropriate ASTM Specifications. Water: Potable.
- B. Mixing: All mortar shall be thoroughly mixed for a period of at least five minutes after all materials are in mixer designed for this purpose. These requirements shall not be waived except for minor jobs and then only upon the written approval of the Owner's Representative.
- C. Time Limit: All mortar to be used and placed in final position within 2-1/2 hours after mixing with air temperature is 80 degrees F or higher and within 3-1/2 hours when air temperatures is less than 80 degrees F. Mortar not used within these time limits shall be discarded.
- D. Retempering: Mortar that has stiffened within the allowable time limit because of evaporation of moisture may be retempered to restore workability by adding water.

**2.03 REINFORCEMENT AND ANCHORAGE**

- A. Joint Reinforcement: Ladder type; hot-dip galvanized after fabrication cold-drawn steel conforming to ANSI/ASTM A82, 3/18 inch side rods with 9 gage cross ties. Finish to be galvanized with 0.4 ounces of zinc Class 1. Use 3 wire Type (tripod) in cavity walls and 2 wire in single width walls. Provide prefabricated corner and tee units.
- B. Acceptable Manufacturers: Hohmann & Barnard, Duro-Wall, Masonry Reinforcing Corporation of America, TY-Wall, AA Wire Products Company.

**2.04 PREPARATION**

- A. Direct and coordinate placement of metal anchors supplied to other Sections. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

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**2.05 COURSING**

- A. Establish lines, levels, and coursing indicated. Protect from displacement. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness. Lay concrete masonry units in running bond. Course one unit and one mortar joint to equal 8 inches. Form concave mortar joints.

**2.06 PLACING AND BONDING**

- A. Lay all masonry units in a "full" bed of mortar. Buttering corners of joints or excessive furrowing of mortar joints are not permitted. Remove excess mortar as work progresses. Interlock intersections and external corners.
- B. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace. Perform jobsite cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges. Cut mortar joints flush where ceramic or quarry wall tile is scheduled, cement parging is required.

**2.07 REINFORCEMENT AND ANCHORAGES - REINFORCED UNIT MASONRY**

- A. Install horizontal joint reinforcement at a maximum spacing inches o.c. Place masonry joint reinforcement in first horizontal joints above and below openings. Extend minimum 16 inches each side of opening. Lap joint reinforcement ends minimum 12 inches.
- B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position. Embed anchors embedded in concrete. Embed anchorages in every second block joint.
- C. Reinforce joint corners and intersections with a vertical #4 bar grouted in the cell at the intersection and one cell each side of the intersection.

**2.08 REINFORCEMENT AND GROUTING**

- A. Lay masonry units with core cells vertically aligned and cavities between wythes clear of mortar and unobstructed. Place mortar in masonry unit bed joints back 1/4 inch (6 mm) from edge of unit grout spaces, bevel back and upward. Reinforce masonry unit cores with reinforcement bars and grout.
- B. Retain vertical reinforcement in position at top and bottom and at intervals not exceeding 192 bar diameters. Lap splices in deformed reinforcing bars shall be 48 bar diameters minimum. Grout spaces less than 2 inches in width with fine grout using low lift grouting techniques. Grout space 2 inches or greater in width with course grout using high or low lift grouting techniques.
- C. When grouting is stopped for more than one hour, terminate grout 1-1/2 inches below top of upper masonry unit to form a positive key for subsequent grout placements.
- D. Low Lift Grouting: Place first lift of grout to a height of 16 inches and rod for grout consolidation with a 1 inch by 2 inch wood stick or a mechanical vibrator. Place subsequent lifts in 8-inch increments and rod for grout consolidation.

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- E. High Lift Grouting: Provide clean out opening no less than 4 inches high and 12 square inches in area at the bottom of each cell to be grouted by cutting one face shell of masonry unit below the top of floor slab so that repair is not visible in the finished construction. Do not use high lift grouting until masonry units have been in place 72 hours. Remove mortar fins protruding more than 1/2 inch into the grout space by dislodging the projections with a rod or stick as the work progresses or by washing the grout space at least twice a day during erection using a high-pressure stream of water.
- F. Clean masonry cells or mortar droppings and other foreign materials. Request the Inspector to inspect the cells. Allow 3 days advance notice of inspection. After cleaning and cell inspection, seal openings. Pump grout into spaces. Maintain water content in grout to intended slump without aggregate segregation.
- G. Limit grout lift to 60 inches and rod for grout consolidation. Wait a minimum of 30 minutes and a maximum of 60 minutes before placing next lift. The first lift shall be consolidated using mechanical vibrators. After the required waiting period, place the second lift and consolidated with the vibrator extending 12 to 18 inches into the previous lift. Do not insert vibrators into lower pours that are in a semi-solidified state. Repeat the waiting, pouring, and consolidating process until the top of the grout pour is reached. Reconsolidate the top pour after the required waiting period.

2.09 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control and expansion joints. Form control joint with a sheet building paper bond breaker, fitted to one side of the hollow contour end of the block unit. Fill the resultant elliptical core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant. Size control joint in accordance with Section 07900 for sealant performance. Form expansion joint as detailed.

2.10 CUTTING AND FITTING

- A. Cut and fit for chases, pipes, conduit, sleeves, and grounds. Coordinate with other Sections of work to provide correct size, shape and location. Obtain Architect/Engineer approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired. Cutting may only be done with a power saw.

2.11 CLEANING

- A. Clean work under provisions of Section 01700. Remove excess mortar and mortar smears. Replace defective mortar. Match adjacent work. Clean soiled surfaces with cleaning solution. Use non-metallic tools in cleaning operations.

2.12 PROTECTION OF FINISHED WORK

- A. Protect finish installation. Without damaging completed work, provide protective boards at exposed external corners, which may be damaged by construction activities.

END OF SECTION 04340