



# Cherry Creek School District Technical Guidelines - 2020

## DIVISION 04 - MASONRY

### 04 05 13 – MORTAR AND MASONRY GROUT

#### PART 1 - GENERAL

- A. Summary - Section includes:
  - 1. Masonry mortar.
  - 2. Masonry grout.
  
- B. Referenced Standards/Minimum Criteria:
  - 1. Portland cement: ASTM C150-19a "Standard Specification for Portland Cement", Type 1
  - 2. Hydrated lime: ASTM C270-19 "Standard Specification for Mortar for Unit Masonry", Type S or Type N
  - 3. Aggregate for mortar: ASTM C144-18 "Standard Specification for Aggregate for Masonry Mortar".
  - 4. Aggregate for grout: ASTM C404-18 "Standard Specification for Aggregate for Masonry Grout".
  - 5. Ready mix grout: ASTM C476-19 "Standard Specification for Grout for Masonry", Grout tests will be conducted by a testing laboratory selected and paid by the School District. Testing in accordance with ASTM C1019-19 "Standard Test Method for Sampling and Testing Grout for Masonry".
    - a. Testing Requirements: Minimum of one (1) sample (3 specimens) for each 5,000 square feet of masonry wall area.
  
- C. Submittals Required:
  - 1. Mortar mix designs.
  - 2. Grout mix designs.
  - 3. Color options for mortar colors.
  
- D. Restrictions/Critical Criteria:
  - 1. Accelerators and Antifreeze Compounds: Not permitted.
  - 2. Other Admixtures: Only with permission of Architect.
  - 3. Verify with School District the use of colored mortar versus standard gray mortar.
  - 4. Coarse Grout: Coarse grout may be used only in grout spaces in brick masonry 2-inches or more in horizontal dimension and grout spaces in filled-cell construction 3-inches or more in both horizontal dimensions. Coarse grout shall be composed of one-part Portland cement with not more than one-tenth part hydrated lime or lime putty added, and two to three parts sand, and not more than two parts gravel.
  - 5. Fine Grout: Use fine grout in all locations where coarse grout may not be used. Fine grout shall be composed of one-part Portland cement, with not more than one-tenth part hydrated lime or lime putty added, and two and one-fourth to three parts sand.
  - 6. Grout shall attain a minimum strength at 28 days of 2,000 psi or as determined by structural consultant.
  - 7. Use water-repellant additive for mortar used in conjunction with CMU specified with water-repellant additives per manufacturer's recommendations.



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## PART 2 - PRODUCTS

- A. Acceptable Materials:
  - 1. Portland Cement: Type I. Masonry cement not allowed unless approved by the School District.
  - 2. Hydrated Lime: Type S or N.
  - 3. Aggregates for Mortar: Clean well washed sand. Sand shall be free from deleterious amounts of acids, alkalies, or organic materials.
  - 4. Aggregates for Grout: Clean well washed sand. Sand shall be free from deleterious amounts of acids, alkalies, or organic materials.
  - 5. Water: Potable.
  - 6. Colors: Standard color as selected by Architect.
  - 7. Mortar Color: As manufactured by one of the following:
    - a. Tamms Industries: [www.euclidchemical.com](http://www.euclidchemical.com).
    - b. Solomon Grind-Chem Service, Inc. [www.solomoncolors.com](http://www.solomoncolors.com).
    - c. Lafarge-Holcim Ltd. [www.lafarge-holcim.com](http://www.lafarge-holcim.com).
    - d. Approved substitute.
- B. Acceptable Mixing Methods:
  - 1. Site or ready-mixed grout for masonry.

## 04 05 19 – MASONRY ACCESSORIES

### PART 1 - GENERAL

- A. Summary - Section includes:
  - 1. Wall ties, anchors and reinforcing
  - 2. Weep materials
  - 3. Control joints
  - 4. Masonry flashing
  - 5. Column isolation material
  - 6. Glass block unit reinforcing
- B. Referenced Standards/Minimum Criteria:
  - 1. Wall ties and reinforcing:
    - a. ASTM A153-16a "Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware" - Class B2 at exterior/cavity walls.
    - b. ASTM A641-19 "Standard Specification for Zinc—Coated (Galvanized) Carbon Steel Wire", Class 1 for interior walls.
- C. Submittals Required:
  - 1. Product data for all component items.
- D. Restrictions/Critical:
  - 1. Install masonry accessories per standards of the Brick Institute of America and National Concrete Masonry Association.



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## PART 2 - PRODUCTS

- A. Acceptable Manufacturers - Wall Ties and Reinforcing:
  - 1. Hohmann & Barnard, Inc. [www.h-b.com](http://www.h-b.com).
  - 2. Approved substitute
  
- B. Acceptable Products: Provide products by Hohmann & Barnard as listed or approved substitute:
  - 1. Horizontal Reinforcing: Use prefabricated corners and tees. Type as follows:
    - a. Single Wythe Walls: "220 Ladder Mesh".
    - b. Cavity Walls: "270 Ladder Lox-All Adjustable Eye-Wire".
    - c. Composite Walls: "230 Ladder-Tri-Mesh".
  - 2. Dovetail Anchors: "315 Triangular Tie" or similar of other manufacturer. Provide 22-gauge dovetail anchor slots for anchors.
  - 3. Masonry Veneer Wall Ties:
    - a. At Stud Walls: "HB-200/DA-213 Adjustable Veneer Anchor" or similar of other manufacturer.
    - b. At Concrete or Concrete Masonry Walls: "2-Seal Concrete Seal Tie" or similar of other manufacturer.
  - 4. Ties at Structural Steel Beams and Columns: "359 Weld-On Tie" or "359-C Weld-On Tie".
  - 5. Weep Material: 3/8-inch o.d. clear plastic with insert screen, cotton rope or manufactured joint drain system.
  - 6. Control Joints: 3/8-inch thick non-asphaltic fiberboard.
  - 7. Masonry Flashing:
    - a. Self-adhesive, rubberized asphalt/polyethylene through-wall flashing for cavity wall applications "Textroflash Flashing" by Hohmann & Barnard, "Perm-A-Barrier" by Grace Construction Products Applied Technologies, or similar of other manufacturer.
    - b. Stainless Steel Flashing: Flexible stainless-steel fabric flashing, Class A material consisting of a layer of polymeric fabric with a single sheet of 304 stainless steel bonded to one side. "Mighty-Flash" by Hohmann & Barnard or "Multi-Flash SS" by York Flashings, or similar product by other manufacturer.
  - 8. Column Isolation: 1-inch thick, semi-rigid fiberglass.
  
- C. Acceptable Manufacturers of Glass Block Reinforcing and Materials: Pittsburgh Glass Block Co. [www.pittsburghglassblock.com](http://www.pittsburghglassblock.com), or approved substitute.
  - 1. Panel Reinforcing: Two parallel 9-gauge wires at two (2) inches on center with butt-welded cross-wires spaced at regular intervals, galvanized after welding.
  - 2. Expansion Strips: 3/8-inch thick fibrous glass or polyethylene foam.
  - 3. Panel Anchors: 20 gauge perforated steel strips 1-3/4-inch wide x 24-inches long, galvanized after perforation.



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## 04 20 00 – UNIT MASONRY

### PART 1 - GENERAL

- A. Summary - Section includes:
  - 1. Sample masonry panels.
  - 2. Brick veneer masonry.
  - 3. Concrete block masonry.
  - 4. Glass unit masonry.
  - 5. Acoustical block.
  - 6. Reinforced unit masonry.
  - 7. Sand filled block walls.
  - 8. Integrally colored regular face block masonry.
  - 9. Integrally colored split face block masonry.
  
- B. Referenced Standards/Minimum Criteria:
  - 1. Preconstruction masonry prisms (8) shall be constructed and tested by testing agency employed by School District in accordance with ASTM C1314-18 "Standard Test Method for Compressive Strength of Masonry Prisms".
  - 2. Masonry work: Strictly require compliance with requirements/standards/technical recommendations of the Brick Institute of America and the National Concrete Masonry Association.
  - 3. Masonry installer must have completed the masonry certification program of the Rocky Mountain Masonry Institute.
  - 4. Construction tolerances and quality/location of control and expansion joints shall, as a minimum, be per the standards of the Brick Institute of America and the National Concrete Masonry Association.
  - 5. Brick: Conform to ASTM C216-19 "Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale)", Type FSB, Grade SW.
  - 6. Lightweight hollow and load-bearing concrete block for interior locations: Conform to ASTM C90-16a "Standard Specification for Loadbearing Concrete Masonry Units", aggregate to ASTM C331-17 "Standard Specification for Lightweight Aggregates for Concrete Masonry Units".
  - 7. Medium weight integral colored split face, ground face, smooth face and regular block: Conform to ASTM C90-16a "Standard Specification for Loadbearing Concrete Masonry Units".
  - 8. Glass block units: Fire rating as required for location.
  
- C. Submittals Required:
  - 1. Samples required for different masonry units (including colors).
  - 2. Product data/specifications required for each type of masonry unit certifying that masonry unit meets ASTM requirements.
  - 3. Test reports of masonry prism tests.
  - 4. Fire test reports for glass block: Tests per ASTM and Underwriters Laboratories (UL).



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### D. Restrictions/Critical Criteria:

1. Split face or heavy textured masonry units not recommended for interior use due to safety and maintenance issues.
2. Unit masonry shall be covered with metal flashing or caps at the top of all parapet walls.
3. Reveals and recessed courses are not recommended due to safety issues (increased possible climbing activities).
4. Below grade transitions between masonry and other materials not recommended. Provide waterproofing and drainage when unavoidable and authorization by the School District.
5. Mock-Ups: Furnish materials specified in sufficient quantities to construct a minimum of two (2) 4' x 4' masonry sample wall panels. Make such modifications as necessary to achieve panels satisfactory to the Architect and School District. The panels shall be erected at a location on the site to be designated by the Architect and shall be maintained by the Contractor until project is completed. Sample panels shall be cleaned and sealed with water repellent coating prior to review by Architect.
6. Protection of Completed Work from Physical Damage: Protect projecting masonry susceptible to damage after setting by suitable planking well supported. Jambs and sill of openings used for passage shall be securely boxed. Replace masonry work showing damage or disfiguration during the progress of work in its entirety. No patching or hiding of defects will be permitted.
7. Provide horizontal flashings at critical exterior wall locations including, but not limited to, heads of openings, weep locations, bond beams, and penetrations. Provide end dams where flashings meet other wall systems or grouted vertical cells.
8. All exterior masonry to be sealed or coated with anti-graffiti coating - see Division 07.
9. Where cutting of units is necessary, make cuts with a mortar-driven masonry saw.
10. Brick/Block Veneer: Where brick or block veneer occurs over stud walls, bond to steel studs with brick veneer ties. Keep cavities behind brick or block veneer free of mortar droppings to facilitate drainage to the outside of the wall.
11. Steel Door Jambs: Steel door jambs set in masonry shall have jambs grouted full of mortar as wall is built.
12. Reinforced hollow unit masonry shall be built to preserve the unobstructed vertical continuity of the cells to be filled. Maintain a clear, unobstructed vertical opening area measuring not less than 2-inches x 3-inches. Hold vertical reinforcement in position at top and bottom and at intervals not exceeding 192 bar diameters. Fill cells containing reinforcement solidly with grout. Pour grout in 4-foot maximum lifts. Consolidate grout at time of pouring by mechanical vibration. Reconsolidate by mechanical vibration to minimize voids due to water loss.
13. Sand Filled Block Walls: Fill block cores without reinforcing in 4-foot lifts with washed dry sand as the wall is laid up except cores with reinforcing. Sand fill behind outlets, fire alarm horns, drinking fountains, and other built-in items.
14. Daily Cleaning of Masonry: Make every effort to keep masonry work as clean as possible during construction. At a minimum, dry brush masonry surfaces after mortar has set at end of each day's work and after final pointing.



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15. Final Cleaning of Masonry:
  - a. Clean mortar, dirt and construction film from masonry using stiff brush and water when mortar is at least 7 days and not more than 14 days old.
  - b. Remove efflorescence or other stain in accordance with masonry unit manufacturer's recommendations.
  - c. No high pressure or muriatic acid cleaning of brick or block will be permitted.
  - d. Deviations from the water cleaning process must be requested in writing and approved by the Architect and School District prior to the start of masonry work.

### PART 2 - PRODUCTS

- A. Acceptable Manufacturers:
  1. Face Brick:
    - a. Lakewood Brick & Tile Co. [www.summitbrick.com](http://www.summitbrick.com).
    - b. Summit Brick Company: [www.summitbrick.com](http://www.summitbrick.com).
    - c. Denver Brick Co. [www.denverbrick.com](http://www.denverbrick.com).
    - d. General Shale: [www.generalshale.com](http://www.generalshale.com).
    - e. Approved substitute.
  2. Lightweight Concrete Block:
    - a. Baselite Concrete Products: [www.basalite.com](http://www.basalite.com).
    - b. Best Block McKinney Concrete Products, Inc. (Pueblo, CO)
    - c. Valley Block Co. (Loveland, CO)
    - d. Colorado Best Block: [www.coloradobestblock.com](http://www.coloradobestblock.com).
    - e. Approved substitute.
  3. Integral Colored Face Block:
    - a. Baselite Concrete Products: [www.basalite.com](http://www.basalite.com).
    - b. Best Block McKinney Concrete Products, Inc. Pueblo, CO)
    - c. Colorado Best Block: [www.coloradobestblock.com](http://www.coloradobestblock.com).
    - d. Approved substitute.
  4. Non-rated and Fire-rated glass unit masonry: Pittsburgh Glass Block Co. [www.pittsburghglassblock.com](http://www.pittsburghglassblock.com), or approved substitute.
  5. Acoustical units: Standard size CMU with one (1) side slotted and core containing noncombustible fibrous sound-absorbing metal-backed batt material. "Soundblox" as manufactured by the Proudfoot Company, Inc. [www.theproudfootcompany.com](http://www.theproudfootcompany.com), or approved substitute.

**END OF SECTION**