Jefferson County School District, R-1
Support Services

TECHNICAL GUIDELINES

DIVISION 04 – MASONRY
November 1, 2006

DIVISION 04 – MASONRY

04 01 00 Maintenance of Unit Masonry – November 1, 2006

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Pointing and Repointing
  1. Comply with RMMI recommendations.
  2. Determine the minimum depth of the old mortar to be removed. This is usually 2.5 to 2 times the width of the joint.
  3. Clean out the joint using hand tools like chisels and mash hammers.
     a. Grinders and saws are prohibited.
  4. Clean mortar joints with a soft jet of water to prepare joints to receive mortar. All loose particles that might prevent a strong structural bond must be removed. The joints should be damp but no standing puddles of water should exist.
  5. The new mortar must be as soft as or softer than the masonry units and the old mortar.
  6. The mortar must have as great or greater vapor permeability to the original mortar and the surrounding masonry.
  7. Match existing mortar sand, color, and texture.
  8. Add mortar to joint in ¼ inch layers. Pack mortar to the back of the joint and wait until the mortar is hard enough to resist a thumbprint but just slightly. Tool to match existing.
  9. Take care to not over-apply mortar and widen the joint.
  10. Lightly mist the wall to promote slow curing and reduce shrinkage.
  11. Clean surround bricks of mortar.
- Repair/Restoration
  1. Align new masonry coursing with adjacent existing, to the greatest extent possible.
- Typical scope and sequence for masonry restoration and cleaning.
  1. Remove waterproofing, if any
  2. Remove and replace defective masonry units
  3. Repoint mortar joints
  4. Reconstruct surface grout separations and gaps
  5. Clear weep obstructions
  6. Retrofit inadequate or missing flashings.

END SECTION 04 01 00

04 05 00 Common Work Results for Masonry – November 1, 2006

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- In the absence of other information, the details, specifications, tolerances, and standards of the following organizations apply:
  1. Brick Institute of America (BIA)
  2. National Concrete Masonry Association (NCMA)
  3. Rocky Mountain Masonry Institute (RMMI).

- Coordination and Quality Control
  1. Modular dimensioning is critical for all Division 04 work.
  2. Coordinate modular masonry dimensions and tolerances with other trades before commencing masonry work.
  3. Coordinate architectural and structural details.
  4. Steel Lintel for masonry construction: Design for l / 600 maximum deflection.
  5. Minimize or eliminate the need for masonry shelf angles.
     a. When unavoidable, design shelf angle as a lintel.
  6. Coordinate horizontal flashings to occur at critical locations, including:
     a. Parapet
     b. Heads of openings
     c. Weep holes
     d. Penetrations
  7. Detail horizontal flashings per Division 07.
  8. Seal horizontal and vertical exterior masonry with penetrating sealer per Division 07.
  9. Slush fill HM frame with grout at masonry and concrete construction. See Division 08.
- Masonry Mortar for New Construction:
  1. Pre-mixed masonry cement, factory blended to design specification and delivered to jobsite in packages labeled with mortar design, is preferred over job-mixed mortar for new buildings, major additions, and other projects with more than 10,000 masonry units.
  2. Admixtures, additives, and colorings are prohibited without prior approval by Jefferson County School District
  3. Specify the <u>weakest</u> mortar that will meet project requirements.
     a. Type “N” is recommended.
  4. Blend mortar in a mechanical mixer.
  5. Tool exterior masonry head joints to one the following profiles:
     a. Concave
     b. V
     c. Weathered
- Masonry Grout:
  1. Maximum lifts are to be determined by the structural engineer
     a. 12-inch maximum lift where any dimension is less than 2 inches.
     b. Lifts over 48 inches are prohibited.
  2. Temporary cleanouts are not recommended.
     a. When used, must not be visible in finished construction.
- Masonry Anchorage and Reinforcement:
  1. Ties: Stainless steel 2-piece slotted or clip-and-loop only
     a. Single-piece flat stock, corrugated, wire ties, and ferrous materials are prohibited.
  2. Horizontal Joint Reinforcement:
     a. Continuous longitudinal wall reinforcement is mandatory. Interrupt at vertical joints.
     b. Truss type
     c. Galvanized or stainless steel per BIA or NCMA recommendations.
- Masonry Accessories:
  1. Embedded Flashing: Per 07 60 00
  2. Control Joint Materials: No requirements

3. Expansion Joint Materials: No requirements
4. Weeps:
   a. Louvered or plastic cellular venting type at head joints
   b. Prohibited:
      (1) Tube Weeps
      (2) Open Head Joints
      (3) Wicks
      (4) Nylon
   c. Minimum quantities and spacing per BIA, NCMA and mandatory at 32 inches o.c. maximum spacing at the following locations:
      (1) Lowest course or second lowest course; with flashing
      (2) Above lintels, shelf angles, and other intermediate flashings and supports
      (3) 12'-0" vertically
      (4) 24 inches above grade at north and lee sides of building (snowdrifts)
5. Mortar control: Mandatory for cavity wall construction; Mortar Net or equivalent
6. Inserts and anchors: Stainless steel
   a. Plastic is prohibited.
7. Ventilators: 10'-0" maximum vertical interval (or centerline of wall 11 feet to 20 feet tall)

END SECTION 04 05 00

04 20 00 Unit Masonry – November 1, 2006

- Work in this section is open to any product or material meeting the requirements of this Technical Guideline.
- Masonry is the preferred material for Jefferson County School District R-1 exterior building facades and interior public spaces.
- In the absence of other information, standards of the following organizations apply:
  1. Brick Institute of America (BIA)
  2. National Concrete Masonry Association (NCMA)
  3. Rocky Mountain Masonry Institute (RMMI).
  4. ASTM Standard Specification for Facing Brick
- Jefferson County School District, R-1 reserves the right to retain the services of RMMI for design reviews and construction inspections of unit masonry.
- Submittals
  1. Product Data: Preferred. Specify and enforce <u>exact</u> requirements and tolerances.
  2. Samples: Required for individual masonry units
  3. Field Sample
     a. One Field Sample is required for each masonry assembly or design over 500 square feet.
     b. 48 inches x 48 inches minimum size quality control sample panel (or section of the final installation) against which all subsequent work will be evaluated.
     c. The panel is to remain undisturbed until Final Acceptance of the project.
  4. Closeout: Record masonry manufacturer and unit specifications for future replication.

- Restrictions
  1. Split faced, ribbed, and heavy textured concrete masonry units:
     a. Not recommended for interior applications due to maintenance and safety issues.
     b. Not recommended below 8'-0" when adjacent to pedestrian areas.
  2. Exposed Unit masonry is prohibited for horizontal applications with upward exposure. (i.e. coping, caps, rowlock, sills, reveals)
  3. Parapet:
     a. Not recommended
     b. Face masonry is recommended on both sides.
     c. Increase reinforcing by at least 50% over wall design
  4. Below grade transitions between masonry and other materials are prohibited.
  5. Through-wall flashing is prohibited without wythe-connecting reinforcement above and below the flashing.
  6. Patented Masonry Systems and Proprietary multi-component assemblies that include masonry units are prohibited unless authorized by Jefferson County School District, R-1 Facilities Planning and Design.
- Standard/traditional masonry sizes, textures, and colors are strongly preferred.
- Delivery time and future availability are critical, often determining, specification criteria.
- Clay Unit Masonry (Brick)
  1. Type FBS or better, Grade SW
  2. Minimum compressing strength = 5000 PSI
  3. Specify unit size by width, weight and length, not product name
- Concrete Unit Masonry
  1. Grade N
  2. Face shell thickness = 1 3/8 inch minimum.
  3. Bullnose profile is required at exterior corners in the following locations:
     a. Corridors
     b. Kitchen
     c. Gym
     d. Inset door frames
  4. Pumice content: 25% maximum
  5. Acoustical units: Standard sized CMU with 1 side slotted and/or beveled containing noncombustible fibrous sound-absorbing metal-backed batt material.
     a. NRC = 65 (minimum)
- Glass Unit Masonry: Prohibited
- Adobe Unit Masonry: Prohibited
- Source Quality Control
  1. Face masonry: "No efflorescence" rated per ASTM C67
  2. Single kiln run units are preferred.
  3. Fabrication tolerances
     a. Clay Masonry Unit (Brick): ± 1/8 inch of specified dimensions
     b. Concrete Masonry Unit thickness/cross section: plus 1/2 inch; minus 1/4 inch
  4. Randomly blend Clay Masonry Units (Brick) from at least 3 loads/pallets at the brickyard.
- Maintain masonry units, especially concrete masonry units, in dry condition until final installation.

- Unit Masonry Construction
  1. Cavity Walls:
     a. Preferred: Brick/CMU cavity wall per RMMI. Construct brick face no sooner than 30 days after CMU back up wythe.
     b. Acceptable: Brick/Steel stud cavity wall per RMMI.
     c. Discouraged: CMU/Steel stud cavity wall
  2. Multiple Wythe Unit Masonry: Bond beam top course is mandatory
  3. Single Wythe Unit Masonry: Not recommended
     a. Bond beam top course is mandatory
  4. Surface Bonded Masonry: Prohibited
  5. Thin Brick Veneer: Prohibited
- Acceptable Installers:
  1. RMMI Certified Masonry Professionals (CMP), Contractors (CMC), and Specialists (CMS) are mandatory.
- Field Quality Control
  1. Hot/Cold weather masonry work: Strictly comply with BIA, NCMA guidelines
  2. Control and Expansion joints: BIA and NCMA guidelines are <u>minimum</u> requirements for Jefferson County School District R-1 buildings.
  3. Cavities: 2-inch minimum <u>clear</u> width with no more than 10% mortar obstruction.
  4. <u>Full</u> mortar joints are mandatory; include webs of CMU.
     a. Head Joints: 85%
  5. Testing: Prism test is usually sufficient.
  6. Soaps: Minimum 50% of original masonry unit thickness
  7. Corbel: Maximum 3/4 inch per course.
  8. Horizontal reinforcing:
     a. BIA and NCMA guidelines are <u>minimum</u> requirements for Jefferson County School District R-1 buildings.
     b. Continuity is required below fenestration (windows and other wall penetrations).
  9. Split Faced CMU:
     a. Exterior corner details require Owner approval.
     b. Abutting construction is prohibited
  10. Protect the top of masonry walls and veneers to prevent water infiltration, wicking, and efflorescence.
  11. Protect the base of masonry walls from mortar drippings and mud.
  12. Turn scaffolding on edge at the end of each work day to minimize rain backsplash.
  13. Weeps: Functional and adequate
  14. Flashing per Section 07 60 00
- Clean new masonry per RMMI recommendations 1 week minimum, 2 weeks maximum, after replacement.

END SECTION 04 20 00

04 21 00 Clay Unit Masonry – November 1, 2006

- See Section 04 20 00

END SECTION 04 21 00

04 22 00 Concrete Unit Masonry – November 1, 2006

- See Section 04 20 00

END SECTION 04 22 00

04 40 00 Stone Assemblies – November 1, 2006

- Submittals
  1. Samples: Required
  2. Closeout: Record source of stone materials
- Restrictions
  1. Stone is prohibited for large-scale applications in Jefferson County School District R-1 buildings.
  2. Limit stone to interior and exterior architectural highlight features and as required in retrofit projects to match existing.

END SECTION 04 40 00