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This MANU-SPEC® utilizes the Construction Specifications Institute (CSI) *Project Resource Manual* (PRM), including *MasterFormat*®, *SectionFormat*™ and *PageFormat*™. A MANU-SPEC is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification. Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This MANU-SPEC specifies face brick. This product is manufactured by The Belden Brick Company. Revise MANU-SPEC section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat*™ for other section numbers and titles.

SECTION 04 21 00
CLAY UNIT MASONRY

PART 1 GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Clay Masonry Units.
 - 2. Steel Reinforcement.
 - 3. Anchors and Ties.
 - 4. Expansion Joints.
 - 5. Accessories.
 - 6. Mortar.
- B. Products Installed But Not Furnished Under This Section:
 - 1. Concrete Masonry Units: Division 04 concrete unit masonry sections.
 - 2. Grout: Division 04 grout sections.
 - 3. Lintels and Shelf Angles: Division 05 metal fabrications sections.
 - 4. Flashing: Division 07 flashing sections.
- C. Related Sections:
 - 1. Insulation: Division 07 insulation sections.
 - 2. Sealants: Division 07 sealants sections.

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Section 01 42 19 - Reference Standards may establish the edition date of standards. This article does not require compliance with standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section.

1.02 REFERENCES

- A. ASTM International (ASTM):



1. ASTM A36 Standard Specification for Carbon Structural Steel.
 2. ASTM A82 Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
 3. ASTM A153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 4. ASTM A615 Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.
 5. ASTM A775 Standard Specification for Epoxy-Coated Steel Reinforcing Bars.
 6. ASTM A996 Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.
 7. ASTM A1008 Standard Specification for Steel Sheet, Cold-Rolled Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable.
 8. ASTM C67 Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
 9. ASTM C144 Standard Specification for Aggregate for Masonry Mortar.
 10. ASTM C150 Standard Specification for Portland Cement.
 11. ASTM C207 Standard Specification for Hydrated Lime for Masonry Purposes.
 12. ASTM C216 Standard Specification for Facing Brick (Solid Masonry Units Made from Clay or Shale).
 13. ASTM C270 Standard Specification for Mortar for Unit Masonry.
 14. ASTM C652 Standard Specification for Hollow Brick (Hollow Masonry Units Made from Clay or Shale).
 15. ASTM C1088 Standard Specification for Thin Veneer Brick Units Made from Clay or Shale.
 16. ASTM D1056 Standard Specification for Flexible Cellular Materials—Sponge or Expanded Rubber.
- B. The Brick Industry Association (BIA):
1. Technical Note 20, Cleaning Brickwork.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor, either before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Section [01 33 00 - Submittals Procedures] [_____].

1.03 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Section [01 33 00 - Submittal Procedures].
- B. Product Data: Submit product data for specified products.
- C. Samples: Submit brick samples showing range of color and texture to be expected.
- D. Test Reports: Submit reports of brick tests specified in Part 2.

Specifier Note: Article below should include prerequisites, standards, limitations and criteria, which establish an overall level of quality for products and workmanship for this section. Coordinate article below with Division 01 Quality Assurance Section.

1.04 QUALITY ASSURANCE

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section. General statements to comply with a particular code are typically addressed in Conditions of the Contract and Section 01 41 00 - Regulatory Requirements. Repetitive statements should be avoided.

- A. Regulatory Requirements: In accordance with Section [01 41 00 - Regulatory Requirements].
- B. Mock-Ups:

Specifier Note: If mock-up configuration is not indicated on the drawings, insert a description below.

1. Provide a mock-up panel for each type of brick specified and as indicated on the drawings.
2. Locate mock-up(s) as directed by the Architect; do not move, alter or destroy mock-up(s) until directed to do so by the Architect.
3. For each mock-up, provide brick of color and texture that represents the brick to be used in the work.

4. Do not begin installation of brickwork until the Architect accepts the mock-up(s). Build as many mock-ups as required to obtain the Architect's acceptance. Remove unacceptable mock-ups from the site.

1.05 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Section [01 61 00 - Common Product Requirements].
- B. Storage and Protection:
 1. Store materials to prevent damage due to moisture, humidity, contaminants, breakage, chipping or other causes.
 2. Store materials on wood skids or pallets. Cover with a non-staining waterproof membrane allowing for airflow around brick while protecting it from airborne contaminants and wind-borne dirt.
 3. Store different types of materials separately.

Specifier Note: Coordinate article below with Conditions of the Contract and with Section 01 78 36 - Warranties.

PART 2 PRODUCTS

Specifier Note: Retain article below for proprietary method specification. Add product attributes, performance characteristics, material standards and descriptions as applicable. Use of such phrases as "or equal", "or approved equal" or similar phrases may cause ambiguity in specifications. Such phrases require verification (procedural, legal and regulatory) and assignment of responsibility for determining "or equal" products.

2.01 CLAY MASONRY UNITS

Specifier Note: Paragraph below is an addition to CSI *SectionFormat* and a supplement to MANU-SPEC. Retain or delete paragraph below per project requirements and specifier's practice.

- A. Manufacturer: The Belden Brick Company.
 1. Contact: 700 W. Tuscarawas Street, Canton, OH 44702; Telephone: (330) 456-0031; Fax: (330) 456-2694; E-mail: info@beldenbrick.com; website: www.beldenbrick.com.
- B. Brick:

Specifier Note: Insert text below to describe physical characteristics of brick. The range of sizes available is indicated on the manufacturer's website.

1. Size: [Standard Modular, 3 5/8 inches x 2 1/4 inches x 7 5/8 inches (92 x 57 x 194 mm)].

Specifier Note: Range of colors available is indicated on the manufacturer's website.

2. Color: [As indicated on drawings] [Match samples on display in Architect's office] [_____].

Specifier Note: Compressive strengths and initial rates of absorption (IRA) vary by product. Brick products are identified by color; retain below only if color is specified and compressive strength and IRA are critical.

3. Compressive Strength: [_____] lb per square inch, minimum.
4. Initial Rate of Absorption (IRA): [_____] grams per minute per 30 square inches, maximum.
5. Special Shapes: As indicated on the drawings.
6. Provide brick that has been blended by the manufacturer.

2.02 MATERIALS

Specifier Note: Select brick(s) and brick type(s) below.

- A. Face Brick: ASTM C216, Grade SW, Type [FBS] [FBX] [FBA].
- B. Hollow Brick: ASTM C652, Grade SW, Type [HBS] [HBX] [HBA].
- C. Thin Veneer Brick: ASTM C1088, Grade [Exterior] [Interior], Type [FBS] [FBX] [FBA].
- D. Steel Reinforcement:

Specifier Note: Retain type(s) below to conform to project requirements.

1. Billet Steel Deformed Bars: ASTM A615.
2. Rail Steel Deformed Bars: ASTM A996.
3. Axle Steel Deformed Bars: ASTM A996.
4. Epoxy Coated Steel Bars: ASTM A775.

Specifier Note: Retain anchors and ties to conform to project requirements. Insert sizes if not indicated on the drawings.

E. Anchors and Ties:

Specifier Note: Corrugated ties are recommended on 1 - 3 story residential or commercial buildings. If size(s) of ties and/or joint reinforcement is not indicated on drawings, insert below.

1. Corrugated Ties: ASTM A1008, 20 gauge, [width and length as indicated on drawings], galvanized in accordance with ASTM A153, Class B-2.
 2. Joint Reinforcement: ASTM A82, [size as indicated on drawings], galvanized in accordance with ASTM A153, Class B-2.
 3. Wire Wall Ties, ASTM A82:
 - a. Wire Size: [As indicated on drawings].
 - b. Shape: [As indicated on drawings].
 - c. Length: [As indicated on drawings].
 - d. Galvanized in accordance with ASTM A153, Class B-2.
 4. Dovetail Anchors, ASTM A1008:
 - a. Gauge: [As indicated on drawings].
 - b. Length: [As indicated on drawings].
 - c. Galvanized in accordance with ASTM A153, Class B-2.
 5. Plate [Header] [Bent] Bar Anchors, ASTM A36:
 - a. Diameter: [As indicated on drawings].
 - b. Length: [As indicated on drawings].
 - c. Galvanized in accordance with ASTM A153, Class B-2.
- F. Expansion Joints: [Premolded Foam: ASTM D1056, Type 2, Class A, Grade 1] [Neoprene: ASTM D1056, Type 2, Class A, Grade 1].
- G. Mortar:
1. Portland Cement: ASTM C150, Type I.
 2. Hydrated Lime: ASTM C207, Type S.
 3. Sand: ASTM C144.
 4. Water: Potable.

2.03 ACCESSORIES

Specifier Note: Select type of weep below to conform to project requirements.

- A. Weeps: [Cotton sash cord, 12 inches (305 mm) long with end laid in cavity] [Plastic tube, 1/4 inch (6.4 mm) diameter, minimum, x 4 inches (102 mm) long] [Plastic vent] [Aluminum vent].

2.04 MIXES

Specifier Note: Revise mortar type below if required to conform to project requirements.

- A. Proportions: ASTM C270, Type N.
- B. Procedure: Mix in as stiff a consistency as can be worked into joints.

2.05 SOURCE QUALITY CONTROL

- A. Brick: Sample and test brick in accordance with ASTM C67.
 - 1. Testing will be paid for by [Owner] [Contractor].
 - 2. Test for:
 - a. Compressive strength.
 - b. 24-hour cold water absorption.
 - c. 5-hour boil absorption.
 - d. Saturation coefficient.
 - e. Initial rate of absorption.
 - f. Efflorescence.

2.06 PRODUCT SUBSTITUTIONS

- A. Substitutions: Substitutions in accordance with Section [01 25 13 - Product Substitution Procedures] [No substitutions permitted].

PART 3 EXECUTION

Specifier Note: Paragraph below is an addition to CSI *SectionFormat* and a supplement to MANU-SPEC. Retain or delete paragraph below per project requirements and specifier's practice.

3.01 MANUFACTURER'S INSTRUCTIONS

- A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions and product carton instructions for installation.

3.02 EXAMINATION

- A. Site Verification of Conditions: Verify that substrate conditions, for substrates that have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

3.03 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- B. Remove mud, loose rust, ice and other coatings that would interfere with bond from reinforcement.

3.04 INSTALLATION

Specifier Note: Insert bond pattern requirements below. See BIA Technical Note 30 for information on bond patterns.

- A. Bond: Lay masonry in [1/2 bond] [1/3 bond] [Flemish Bond] [_____] pattern.
- B. Laying Masonry:
 - 1. Lay masonry with full head and bed joints.
 - 2. Lay masonry units plumb and true to line.
 - 3. Where fresh mortar joins partially set mortar, remove loose brick and mortar and lightly wet the exposed surface of set masonry.
 - 4. Lay masonry in proper sequence to avoid toothing. Rack walls back in each course at the end of the workday.
 - 5. When adjustment must be made after mortar begins to harden, remove hardened mortar and replace it with fresh mortar.
- C. Tooling and Pointing:

Specifier Note: Select joint tooling requirements to conform to project requirements.

1. Tool mortar joints to a [Concave] [V-shaped] [Grapevine] appearance.
 2. Tool exposed joints when thumbprint hard.
 3. Flush-cut all joints not tooled.
 4. When re-pointing, rake mortar joints to a depth of not less than 1/2 inch (12.7 mm). Fill solidly with pointing mortar. Tool joints.
- D. Flashing:
1. Remove projections that might puncture flashing from masonry surface.
 2. Place through-wall flashing on bed of mortar so that flashing projects 1/4 inch (6.4 mm) from wall face to form a drip. Lap flashing a minimum of 6 inches (152 mm).
 3. Cover flashing with mortar.
- E. Weeps:
1. Provide weeps in head joints of the first brick course immediately above flashing. Place weeps at not more than 24 inches (610 mm) on center horizontally.
 2. Keep cavity free of mortar.
- F. Expansion Joints:
1. Locate joints as indicated on drawings.
 2. Keep joints free of mortar and debris.
 3. Install expansion joint material.
- G. Cold Weather Procedures:
1. Preparation:
 - a. If ice or snow has formed on masonry bed, remove by carefully applying heat not to exceed 120 degrees F (49 degrees C) until surface is dry to the touch.
 - b. Remove masonry that is frozen or damaged.
 - c. When clay masonry unit suction exceeds 30 grams per minute per 30 square inches, sprinkle with heated water as follows:
 - 1) When units are 32 degrees F (0 degrees C) or above, heat water to 70 degrees F (21 degrees C) or above.
 - 2) When units are below 32 degrees F (0 degrees C), heat water to 130 degrees F (54 degrees C) or above.
 2. Work in Progress:
 - a. Air temperature 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C):
 - 1) Heat sand or mixing water to produce mortar temperatures between 40 degrees F (4 degrees C) and 32 degrees F (0 degrees C).
 - b. Air temperature 32 degrees F (0 degrees C) to 25 degrees F (-4 degrees C):
 - 1) Heat sand and mixing water to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).
 - 2) Maintain temperature of mortar on boards above freezing.
 - c. Air temperature 25 degrees F (-4 degrees C) to 20 degrees F (-7 degrees C):
 - 1) Heat sand and mixing water to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).
 - 2) Maintain temperature of mortar on boards above freezing.
 - 3) Use salamanders or other heat sources on both sides of walls.
 - 4) Use windbreaks when wind exceeds 15 miles per hour (6.7 meters per second).
 - d. Air temperature below 20 degrees F (-7 degrees C):
 - 1) Heat sand and mixing water to produce mortar temperatures between 40 degrees F (4 degrees C) and 120 degrees F (49 degrees C).

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- 2) Provide enclosures and auxiliary heat to maintain air temperature above 32 degrees F (0 degrees C).
 - 3) Lay units with a minimum temperature of 20 degrees F (-7 degrees C).
3. Completed Work and Work Not in Progress:
- a. Mean daily air temperature of 40 degrees F (4 degrees C) to 32 degrees F (0 degrees C): Protect masonry from rain and snow for 24 hours by covering with a weather-resistive membrane.
 - b. Mean daily air temperature of 32 degrees F (0 degrees C) to 25 degrees F (-4 degrees C): Cover masonry with a weather-resistive membrane for 24 hours.
 - c. Mean daily air temperature of 25 degrees F (-4 degrees C) to 20 degrees F (-7 degrees C): Cover masonry with insulating blankets for 24 hours.
 - d. Mean daily air temperature below 20 degrees F (-7 degrees C): Maintain masonry temperature above 32 degrees F (0 degrees C) by enclosure and supplementary heat, or electric heating blankets or infrared lamps.
- H. Hot Weather Procedures:
- 1. When ambient temperature exceeds 90 degrees F (32 degrees C) and wind exceeds 8 miles per hour (3.6 meters per second):
 - a. Maintain temperature of mortar and grout between 70 degrees F (21 degrees C) and 120 degrees F (49 degrees C).
 - b. Limit spread of mortar bed to 4 feet (1.2 m) and place units within 1 minute of spreading mortar.
 - c. Control moisture evaporation in partially or newly completed walls by fog spraying, covering with opaque plastic or canvas or both.
- I. Protection of Work in Progress:
- 1. Covering:
 - a. Cover tops of walls with a strong waterproof membrane at the end of each day or shutdown.
 - b. Extend cover a minimum of 24 inches (610 mm) down each side of wall.
 - c. Hold cover securely in place.
 - 2. Load Application:
 - a. Do not apply uniform floor or roof loading for at least 12 hours after completing columns and walls.
 - b. Do not apply concentrated loads for at least 3 days after completing columns and walls.
 - 3. Staining:
 - a. Prevent grout and mortar from staining the face of masonry.
 - b. Remove grout and mortar that comes in contact with masonry units immediately.
 - c. Protect sills, ledges and projections from mortar droppings.
 - d. Protect base of wall from rain-splashed mud and mortar splatter.
 - e. Turn scaffold boards on edge when work is not in progress.
- 3.05 CLEANING
- A. Cut out defective mortar joints and holes in exposed masonry and re-point with mortar.
 - B. Clean a sample wall area. Do not proceed with cleaning without Architect's approval.
 - C. Clean brick in accordance with BIA Technical Note Number 20 and the cleaning agent manufacturer's recommendations.

END OF SECTION