

SECTION 03460

BRICK FACED ARCHITECTURAL PRECAST CONCRETE

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Site Cast (Tilt-Up) Brick Faced Concrete Panels.
- B. Plant Cast (Precast) Brick Faced Concrete Panels.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Concrete, reinforcing, anchors, etc.
- B. Section 05120 - Structural Steel: Building structural frame.
- C. Section 07600 - Flashings and Sheet Metal: Supply of metal flashing reglets for placement by this Section.
- D. Section 07900 - Joint Sealers: Caulking of perimeter joint with sealant and backing.
- E. Division 08000 - Doors, Windows and Glass: Windows and door frames installed in precast and/or site cast units.

1.3 REFERENCES

- A. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
- B. ACI 318 - Building Code Requirements for Structural Concrete.
- C. ASTM C 67 - Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile.
- D. ASTM C 1088 - Standard Specification for Thin Veneer Brick Units Made From Clay or Shale.
- E. ASTM D 256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics
- F. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics
- G. AWS D1.1 - Structural Welding Code - Steel.
- H. AWS D1.4 - Structural Welding Code - Reinforcing Steel.
- I. PCI Guide to Thin Brick, published 2006, revised 2007.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

- A. Design units to withstand design loads in accordance with applicable code, and erection forces. Calculate structural properties of units in accordance with ACI 318.
- B. Design units to accommodate construction tolerances, deflection of building structural members and clearances of intended openings.

- C. Design and size components to withstand seismic loads and sway displacement as calculated in accordance with the applicable code.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Indicate layout and sizes, panel locations, configuration, joint locations, brick color and texture, brick coursing, brick coursing alignment across panel joints, reveal and false joint locations and dimensions, panel identification marks, reinforcement, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent components.
- D. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
 - 1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
 - 2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
- E. Selection Samples: For each brick product specified, two complete sets of color samples representing manufacturer's full range of available colors and patterns.
- F. Verification Samples: For each brick product specified, two samples, actual size, representing actual product, color, and patterns. Include form liner sample and bond breaker sample on brick sample representing bond breaker which will be used.
- G. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

1.6 QUALITY ASSURANCE

- A. Fabricator: Qualifications: Company specializing in performing Work of this section with minimum five years documented experience.
- B. Design: Design units under direct supervision of Professional Engineer experienced in design of this Work and licensed at Project location.
- C. Mock-Up: Provide a minimum 4 foot by 4 foot mock-up for evaluation of surface finish and application workmanship.
 - 1. Locate in areas designated by Architect.
 - 2. Do not proceed with remaining work until workmanship and color are approved by Architect.
 - 3. Rebuild mock-up as required to produce acceptable work.
 - 4. Accepted mock-up shall be comparison standard for remaining Work

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store form liner in manufacturer's unopened packaging until ready for installation. Form liner should not have prolonged exposure to direct sunlight that may damage the liner product. Avoid top loading or crushing liners in their packages.

- B. Store thin brick in manufacturer's unopened packaging until ready for installation. Protect the brick from extreme heat, over 120 degrees F, until it is installed and cast. Do not expose brick to excessive dust and dirt which may affect the brick's ability to bond to the concrete properly. Keep brick dry, covered and protected from the sun and rain prior to its installation.
- C. Handling Tilt-up and Precast Units: Lift units to position, consistent with their shape and design. Lift and support only from support points.
- D. Blocking and Lateral Support During Erection: Clean and non-staining, without causing harm to exposed surfaces.
- E. Protect panels from staining, chipping, or spalling.
- F. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.

1.8 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer/Supplier: United Wall Systems, which is located at: 8927 Augusta Road, Pelzer, South Carolina 29669; Toll Free Tel: 877-258-9800; Tel: 864-243-3220; Fax: 864-243-3321; Email: info@unitedwallsystems.com
- 1. Thin Brick: Manufacturers must meet specifications for and comply with designated requirements (Feldhaus, Summitville, Endicott)
- B. Substitutions: Not permitted.
- C. Liners or other embedding systems that employs individual brick connections leaving visible separation in the molds and subsequent joints will not be considered.

2.2 MATERIALS

- A. Cast-In Place Concrete: Forms, concrete, reinforcement, admixtures as specified in Section 03300 - Cast-In-Place Concrete.
- B. Brick Form Liner Sheets: UWS PPP single-use form liner sheets with a seamless joint design that provides a realistic coved and textured joint and fully embeds the thin brick into concrete walls for superior bonding, durability and weatherproofing. Each liner is designed with a universal overlap to ease speed panel set-up. UWS PPP Liner is a vacuum formed high impact polystyrene (HIPS) recyclable material.
 - 1. Physical properties:
 - a. Thickness: .02 inches
 - b. Weight: .112 pounds per square foot
 - c. Tensile 5000 psi at yield when tested in accordance with ASTM D 638.
 - d. Izod Impact 2.0-6.0 @73 degrees F when tested in accordance with ASTM D 256.
 - e. Coefficient of Thermal Expansion: .000003 inches per inch per degree Fahrenheit
 - f. Color: White (color can vary)

2. Liner Sheet Size: Liners are provided in nominal 40 inch by 48 inch panels and are manufactured with a universal overlap allowing for random brick spacing in accordance with the varied head joint feature for a superior architectural result and seamless panel construction.
 3. Patterns and Sizes: (Generally available; Custom patterns made on order)
 - a. Modular, Brick size: 2-1/4 inches by 7-5/8 inches. Sizes do not include overlap dimensions.
 - b. Closure Brick size (often called Economy), 3-5/8 inches by 7-5/8 inches:
 - c. Utility Brick size (often called Jumbo), 3-5/8 inches by 11-5/8 inches.
 - d. Norman Brick size, 2-1/4 inch by 11-5/8 inch.
- C. Thin Brick: Minimum thin brick requirements are ASTM C 1088, Type TBX, tested in accordance with ASTM C 67; certain precast applications require more stringent PCI tolerances (PCI Guide to Thin Brick 2007)
1. Size: Modular 2-1/4 inches (57.2 mm) high, 7-5/8 inches (193.7 mm) long, nominal 1/2 inch (12.7 mm) thick.
 2. Size: Closure 3-5/8 inches (92.1 mm) high, 7-5/8 inches (193.7 mm) long, nominal 1/2 inch (12.7 mm) thick.
 3. Size: Jumbo Norman 2-13/16 inches (71.4 mm) high, 11-5/8 inches (295.3 mm) long, nominal 1/2 inch (12.7 mm) thick.
 4. Size: Utility 3-5/8 inches (92.1 mm) high, 11-5/8 inches (295.3 mm) long, nominal 1/2 inch (12.7 mm) thick.
 5. Size-Norman 2-1/4 inches (57.2 mm) high, 12 inches long (305.1mm) long, nominal 1/2 inch (12.7 mm) thick.
 6. Trim Units: Matching thin brick.
 7. Tolerance: ASTM C1088; PCI Guide
 - a. Length: range of acceptability is +5/32 inch (4.0 mm) to -5/32 inch (4.0 mm); +0" (0mm) to -1/16 inch (1.6 mm) from specified dimension for thin brick unit nominal dimensions less than 8 inches.
 - b. Height: range of acceptability is +5/32 inch (4.0 mm) to -5/32 inch (4.0 mm); +0" (0mm) to -1/16 inch (1.6 mm) from specified dimension for thin brick unit nominal dimensions less than 8 inches.
 - c. Thickness: range of acceptability is +5/32 inch (4.0 mm) to -5/32 inch (4.0 mm); +0" (0mm) to -1/16 inch (1.6 mm) from specified dimension for thin brick unit nominal dimensions less than 8 inches.
 - d. Cold Water Absorption 24-hours: maximum 6% by ASTM C67
 - e. Modulus of Rupture: minimum 250 psi (1.7 MPa) by ASTM C67
 - f. Chippage: maximum 1/8" (3.2 mm)
 - g. Warpage: maximum 1/16" (1.6 mm)
 - h. Variation of Shape from Specified Angle: plus or minus 1 degree
 - i. Tensile bond Strength: minimum 150 psi (1.0 MPa) by modified ASTM E488
 - j. Efflorescence: Non effloresced by ASTM C67
 - k. Chemical Resistance: rated "not affected" by ASTM C650
 - l. Surface Coloring: shall withstand minimum 50 cycles of freeze-thaw by ASTM C67 with no observable difference in applied finish when viewed from 20 feet (6 m).
 8. Texture: (Select according to thin brick manufacturer's designation) Smooth, Wirecut, Velour, Creased, Sanded, etc.
 9. Color: (Select according to thin brick manufacturer's designation).
 10. Acceptable Manufacturers: Feldhaus Thin Brick, Endicott, Clay Products, Summitville Tile.
 11. Brick Coating: Wax, Face Off or NoxCrete brick coating shall be pre-applied to each brick face to facilitate the cleaning of the cast brick surface. Brick faces shall be coated with wax an approved bond breaker to prevent grout

staining.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify building structure, anchors, devices, and openings are ready to receive work of this Section.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Clean form thoroughly prior to installation.
- B. Provide for erection procedures and induced loads during erection. Maintain temporary bracing in place until final support is provided.
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 PANEL FABRICATION AND INSTALATION

- A. Maintain environmental records and quality control program during production of tilt-up or precast units. Make records available upon request.
- B. Use rigid forms constructed to maintain precast units uniform in shape, size and finish.
- C. Utilize form liners specified.
- D. Prepare, install, and finish form liners in accordance with current release of manufacturer's Technical Design and Installation Guide.
- E. Trim liner sheets as necessary prior to installation into the form.
- F. Mark the side of the form approximately every 2 feet (610 mm) with course reference points for coursing control purposes.
- G. Begin placing liner sheets in the form in accordance with the shop drawings. Note: Place only one tier of sheets prior to placing the bricks, face down, in to the liner. Adjust coursing as needed while installation progresses.
- H. Place Bricks face side down into the liner. Once fully bricked, check panel to ensure all bricks are fully nested and flat in the liner.
- I. Install reinforcement and necessary devices to support reinforcement and proceed with the pour as specified in Section 03300.
- J. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items as indicated on Drawings.
- K. Place recessed flashing reglets provided by Section 07800 continuous and straight.

- L. Locate hoisting devices to permit removal after erection.
- M. Cure units to develop concrete quality, and to minimize appearance blemishes including non-uniformity, staining, or surface cracking.
- N. Remove liner sheets by peeling them off the cured panel.
- O. Cleanup: Spray panel to remove wax and latent concrete leakage from brick faces with a pressure washer delivering a minimum of 1000 PSI of water pressure and using hot (180 degrees F) water. Non-waxed bricks do not require hot water rinse
- P. Erect units without damage to shape or finish. Replace or repair damaged panels.
- Q. Set units level and plumb within allowable tolerances.
- R. Maintain uniform horizontal and vertical joint, alignment and spacing across construction joints as erection progresses.
- S. When members require adjustment beyond design or tolerance criteria, discontinue affected work; advise Architect/Engineer.
- T. Fasten units in place. Perform welding, including tack welds, in accordance with AWS D1.1 and AWS D1.4.
- U. Seal perimeter and intermediate joints in accordance with Section 07900.

3.4 ERECTION TOLERANCES

- A. Dimensions of the finished panel, at the time of erection in the structure, shall conform to the tolerances for precast, non-prestressed elements in ACI 117, unless otherwise specified by the Architect.

3.5 FIELD QUALITY CONTROL

- A. Section 01400 - Quality Requirements: Testing and Inspection Services.
- B. Field inspection and testing will be performed by Owner's testing laboratory in accordance with applicable code.

3.6 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.7 SCHEDULES

- A. :
- B. :

END OF SECTION