

ReadyBrick™ Product Guide Specification

Specifier Notes: All the information contained herein is offered as guidance for proper construction of masonry assemblies and is intended to comply with appropriate industry standards and practices. Use of any or all of this information is the sole responsibility of the Owner and their agents. The actual project specifications must take into account specific requirements for the project and local construction practices.

SECTION 04220 READYBRICK

PART I - GENERAL

I.01. SUMMARY

- A. Section Includes:
 - 1. Custom concrete masonry units (CMU), ReadyBrick
 - 2. Reinforcement, anchorages, and accessories
 - 3. Masonry fill insulation
- B. Related Work Installed and Furnished Under Other Sections, including, but not limited to:
 - 1. Masonry Accessories.
 - 2. Flashing.
 - 3. Insulation.
 - 4. Structural Steel.
 - 5. Concrete.
 - 6. Caulking and Sealants.
- C. Related Sections, including, but not limited to:
 - 1. Section 04060 - Masonry Mortar.
 - 2. Section 04070 - Masonry Grout.
 - 3. Section 04220 - Concrete Masonry Units.
 - 4. Section 05120 - Structural Steel: Support plates and angles with anchor studs, expansion bolts, sleeve anchors, adhesive anchors, and anchor bolts embedded in masonry for supporting structural members.
 - 5. Section 05500 - Metal Fabrications: Loose steel lintels and other metal components embedded in masonry.
 - 6. Section 7200 – Masonry Fill Insulation.
 - 7. Section 07900 - Joint Sealer: Rod and sealant at control joints.

I.02. REFERENCES AND STANDARDS

- A. American Concrete Institute (ACI):
 - 1. ACI 117-90 - Standard Specifications for Tolerances for Concrete Construction and Materials.
 - 2. ACI 530-05 - Building Code Requirements for Masonry Structures.
 - 3. ACI 530.1-05 - Specification for Masonry Structures.
- B. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 82 - Specification for Steel Wire, Plain, for Concrete Reinforcement.
 - 2. ASTM A 153 - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 3. ASTM A 307 - Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength.
 - 4. ASTM A 615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
 - 5. ASTM A 951 - Specification for Masonry Joint Reinforcement.
 - 6. ASTM C 90 - Specification for Loadbearing Concrete Masonry Units.
 - 7. ASTM C 129 - Specification for Non-Load-Bearing Concrete Masonry Units.
 - 8. ASTM C 140 - Methods of Sampling and Testing Concrete Masonry Units.
 - 9. ASTM C 516 - Specification for Vermiculite Loose Fill Thermal Insulation.
 - 10. ASTM C 549 - Specification for Perlite Loose Fill Insulation.
 - 11. ASTM C 920 - Specification for Elastomeric Joint Sealants.
 - 12. ASTM D 994 - Specification for Preformed Expansion Joint Filler for Concrete (Bituminous).
 - 13. ASTM D 1056 - Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.
 - 14. ASTM D 2000 - Classification System for Rubber Products in Automotive Applications.
 - 15. ASTM D 2287 - Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds.
- C. National Concrete Masonry Association (NCMA):
 - 1. TEK Notes and published typical masonry standards.

I.03. SUBMITTALS

- A. Product Data: Submission of manufacturer's product data for each product of each masonry type, accessory, and other manufacturer products.
- B. Compliance: Submission of certification for each type that complies with specified requirements.
- C. Test Reports: Third party reports for each masonry type certifying compliance under the testing methodology ASTM C-140.
- D. Color Selections:
 - a. Unit masonry samples showing the full extent of colors and textures available for each type of masonry unit.
- E. Samples:
 - a. Unit masonry samples for each type of exposed masonry units including a full range of colors and textures available to be completed in the project.

I.04. QUALITY ASSURANCE

- A. Construction: Construct masonry in accordance with requirements of ACI 530 and 530.1.
- B. Mock-up: Construct a masonry wall panel to represent the exterior masonry wall.
 - 1. Minimum sample panel size is 4 ft. square.
 - 2. Locate where directed by Architect/Owner's Representative.
 - 3. Include reinforcing, minimum of one control joint, one outside corner, joint profile, and mortar color.
 - 4. Erect entire mock-up with methods representative of daily construction and in-progress cleaning practices.
 - 5. Clean one-half of mock-up to represent final clean down using methods and materials in accordance with the cleaning requirements herein and leave remainder without final cleaning for comparison purposes.
 - 6. Receive acceptance of mock-up by Architect/Owner's Representative before proceeding with masonry installation.
 - 7. The acceptable standard for the Work is established by the accepted panel.
 - 8. Retain sample panels at job site until Work has been accepted.
 - 9. Mock-up may not remain as part of the Work.
- C. Special Inspection and Testing: Provide inspection and testing in accordance with the Building Code and as noted on Drawings and will be performed under provisions of Section 01450, of the Project Specifications.

I.05. PRODUCT HANDLING AND STORAGE

- A. Delivery of materials to project shall be undamaged. Handle units in a careful manner to avoid breakage and damage to units.
 - 1. Do not use damaged masonry units
 - 2. Do not use damaged components of structure
 - 3. Do not use damaged packaged materials.
 - 4. Do not use masonry units that are contaminated.
- B. Storage:
 - 1. Store and handle materials to prevent their deterioration due to moisture, temperature changes, contaminates, corrosion or other causes.
 - 2. Store cementitious materials off the ground, under cover, and in a dry location.
 - 3. Store different aggregates separately.
 - 4. Protect reinforcement, ties, and metal accessories from permanent distortions, and store them off the ground.
- C. Cleaning Reinforcement: Before being placed, remove loose rust, ice, and other deleterious coatings from reinforcement.

I.06. PROJECT CONDITIONS

- A. Environmental Requirements (Cold Weather): Follow the requirements of ACI 530.1-05. Include the following construction requirements for cold weather procedures:
 - 1. When ambient air temperatures are above 40F, cover tops of walls and masonry elements with waterproof materials at end of workday to prevent water from entering masonry.
 - 2. When ambient air temperatures are below 40F and above 32F, or temperature of masonry units is below 40F:
 - a. Remove visible ice or snow on masonry units before units are placed in the wall.
 - b. Do not lay masonry units having a temperature below 20F.

- c. Heat sand and mixing water to produce mortar temperatures between 40F and 120F at the time of mixing.
 - d. Maintain mortar and grout temperatures above freezing until used in masonry.
 - e. Cover tops of walls and masonry elements with weather resistive membrane at end of workday to prevent water from entering masonry.
 - 3. When ambient air temperatures are below 32F and above 25F, or temperature of masonry units is below 40F:
 - a. Adhere to procedures provided in 1.06.A.2 above, and the following:
 - b. Heat grout aggregates and mixing water to produce grout temperatures between 70F and 120F at the time of mixing. Maintain grout temperature above 70F at time of grout placement.
 - c. Completely cover walls and masonry elements with weather resistive membrane at end of work day and keep covers in place for 24 hours.
 - 4. When ambient air temperature is below 25F and above 20F:
 - a. Adhere to procedures provided in 1.06.A.3 above, and the following:
 - b. Use heat source on both sides of masonry under construction, heat masonry surfaces to 40F.
 - c. Install wind breaks when wind velocity is in excess of 15 mph.
 - d. Completely cover walls and masonry elements with insulated blankets or equivalent protection at end of workday and keep covers in place for 24 hours.
 - 5. When ambient temperature is below 20F:
 - a. Adhere to procedures provided in 1.06.A.4 above.
 - b. Provide an enclosure for the masonry under construction.
 - c. Use heat sources to maintain temperatures above 32F within the enclosure.
 - d. Maintain masonry temperature above 32F for 24 hours after construction by enclosure with supplementary heat, electric heating blankets, infrared heat lamps, or other acceptable methods.
- B. Environmental Requirements (Hot Weather): Follow the requirements of ACI 530.1-05. Include the following construction requirements for hot weather procedures:
 - 1. When ambient temperature is above 100F, or ambient air temperature is above 90F and wind velocity exceeds 8 mph:
 - a. Maintain sand piles in damp, loose condition.
 - b. Provide necessary conditions and equipment to produce and maintain mortar and grout having temperatures below 120F.
 - c. Maintain mortar and grout temperatures below 120F.
 - d. Flush mixer, mortar and grout transport container, and mortarboards with cool water before they come in contact with mortar or grout.
 - e. Maintain mortar consistency by re-tempering with cool water.
 - f. Use mortar within 2 hours of initial mixing.
 - g. Fog spray newly constructed masonry until damp, at least three times a day until the masonry is three days old.
 - 2. When ambient temperature is above 115F, or ambient air temperature is above 105F and wind velocity exceeds 8 mph:
 - a. Implement the requirements of 1.06.B.1 above, and the following:
 - b. Shade materials and mixing equipment from direct sunlight.
 - c. Use cool mixing water for mortar and grout. Ice is permitted in mixing water prior to use, but not at time when mixing water added to other mortar or grout materials.

1.07. WARRANTY

- A. Concrete Masonry Units: Submit manufacturer's standard warranty.

PART 2 - PRODUCTS

2.01. READYBRICK CONCRETE MASONRY UNITS

- A. Integrally Pigmented Loadbearing Units: ASTM C 90.
 - I. Manufacturers and Suppliers:
 - a. ReadyBrick by Reading Rock, Inc.
 - b. Colors:
 - i. Pearl Street
 - ii. Coral
 - iii. Walnut
 - iv. Brownstone
 - v. Beachwood
 - vi. Rosewood
 - vii. Slate

2. Stretcher unit dimensions:
 - a. Nominal 4 inch high.
 - b. Nominal 16 inch long.
 - c. Nominal 4, 8, or 12 inches wide.
 3. Normal weight
 4. Integral metallic oxide pigments.
 5. Integral water repellent.
 6. Substitutions: Not permitted.
- B. Unit Design: Modular units sized as indicated and scheduled. Provide special units for bond beams, control and expansion joints.

2.02 REINFORCEMENT AND ANCHORAGES

- A. Horizontal Joint Reinforcement: ASTM A 951.
1. Minimum wire size W1.7 (9 gage) and maximum wire size W2.8 (3/16 inch wire).
 2. Width 1-1/2 to 2 inches less than wall thickness.
 3. Hot-dipped galvanized, 1.5 oz. ASTM A 153, Class B2.
 4. Contractor's option to use truss or ladder type.
- B. Masonry Veneer Anchors: ASTM A 82.
1. Rectangular adjustable tie system with wall eyelet sections welded to horizontal joint reinforcement 16 inches on center maximum.
 2. Minimum wire size W2.8 (3/16 inch wire).
 3. Hot dipped galvanized, 1.5 oz. ASTM A 153, Class B2.
 4. Provide wall tie pintle sections, at least two, that fit into eyelet sections with maximum clearance of 1/16 inch.
 5. Maximum offset for pintle anchors 1-1/4 inch.
 6. Provide pintle anchors of sufficient length to extend a distance at least 1/2 inch onto the outer face shell of the masonry unit.
- C. Deformed Bars: ASTM A 615, Grade 60.
- D. Anchor Bolts and Threaded Rods: ASTM A 307. Embed in masonry as shown in Structural Drawings.
- E. Bar Positioners for Vertical Wall Reinforcing Bars:
1. Minimum W1.7 (9 gage) galvanized wire.

2.03. ACCESSORIES

- A. Joint Filler: Use the size and shape of joint fillers specified.
- B. Through Wall Flashing: As specified.
- C. Adhesive: As specified or as recommended by flashing material manufacturer.
- D. Weeps: Plastic tubes or galvanized steel.

2.04. MASONRY FILL INSULATION

- A. See Section 7200

PART 3 - EXECUTION

3.01. INSPECTION

- A. Verification: Prior to the start of masonry construction the Contractor shall verify:
1. Foundations are constructed with tolerances conforming to ACI 117.
 2. Reinforcing dowels are positioned in accordance with Project Drawings.
 3. Verify items provided by other Sections of the Work are properly sized and located.
- B. Notification: If conditions are not met notify the Architect/Owners Representative.

3.02. PREPARATION

- A. Establish Lines, Levels, and Coursing:

1. Protect lines from disturbance.
 2. Use non-corrosive materials in contact with masonry.
- B. Surface Preparation: Prior to placing ReadyBrick remove laitance, loose aggregate or other materials that would prevent mortar from bonding to the foundation.

3.03. COURSING

- A. Placement: Place ReadyBrick to lines and levels indicated.
- B. Uniformity: Maintain masonry courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.
- C. Bond Patterns: Place ReadyBrick in 1/2 running bond unless otherwise noted.
- D. Course Height: Course one ReadyBrick and one mortar joint equal to 4 inches.

3.04. PLACING AND BONDING

- A. Bed and Head Joints:
1. Joint Thickness:
 - a. Construct 3/8-inch bed and head joints unless otherwise indicated.
 - b. Construct bed joint at starting course on foundation not less than 1/4 inch and not more than 3/4 inch.
 2. Fill holes not specified in exposed and below grade masonry with mortar.
 3. Tool head and bed joints concave unless below grade or above ceiling height and to be concealed.
 - a. Use tool with large enough radius that joint is not raked free of mortar.
 4. Remove masonry protrusions extending 1/2 inch or more into cells or cavities to be grouted.
- B. Unit Placement:
1. ReadyBrick: Lay units with bed and head joints filled from the faces of the units to a distance in not less than the thickness of the face shell.
 - a. Webs are fully mortared in all courses of piers, columns, pilasters, starting course on footings or foundations, and where adjacent to cells or cavities to be reinforced or filled with concrete or grout.
 - b. Spread out full mortar bed, including areas under cells, for starting course on footings where cells are not to be grouted.
 - c. Vertical cells to be grouted are aligned and unobstructed openings for grout are provided in accordance with drawings.
 2. Keep cavity airspace and weep holes clean or mortar, clean out promptly if mortar falls into cavity airspace or plugs weep holes.
 3. In-Progress Cleaning:
 - a. Remove excess mortar.
 - b. Dry brush exposed masonry prior to the end of each workday.
 - c. Protect wall from mud splatter and mortar droppings.
 - i. Set scaffolds and scaffold boards so that mortar is not deflected onto masonry.
 - ii. At end of each workday turn scaffold boards so that rainwater is not deflected onto masonry.
 - d. Place ReadyBrick such that mortar does not run down the face of the wall or smear the masonry face.
 4. Adjustments:
 - a. Do not shift or tap ReadyBrick after mortar has taken initial set.
 - b. Remove unit and mortar and replace.
 5. After joints are tooled, cut off mortar tailings with trowel and dry brush excess mortar burrs and dust from the face of the masonry.
 6. Fully bond external and internal corners and properly anchor intersecting walls.
 7. Termination of Wall Height:
 - a. For fire-rated walls, construct walls to finish against bottom of roof or floor deck and fill voids with fire stopping.
 - b. For other than fire-rated walls, cut units to match the slope of the roof deck and finish construction to within 2-inches of an parallel to roof deck.
 8. Isolate masonry partitions from vertical structural framing members with a control joint.

3.05. TOLERANCES: Erect masonry within the following tolerances from specified dimensions:

- A. Dimension of Elements:
1. In cross-section or elevation: -1/4 inch, + 1/2 inch.

2. Mortar joint thickness:
 - a. Bed: plus or minus 1/8 inch
 - b. Head: plus 3/8 inch or minus 1/4 inch.
 - c. Collar: plus 3/8 inch or minus 1/4 inch.
 3. Grout space or cavity airspace except where passing framed construction: plus 3/8 inch or minus 1/4 inch.
- B. Elements:
1. Variation from level:
 - a. Bed joints: plus or minus 1/4 inch in 10 feet; plus or minus 1/2 inch maximum.
 - b. Top of bearing walls: plus or minus 1/4 inch in 10 feet; plus or minus 1/2 inch maximum.
 2. Variation from plumb: plus or minus 1/4 inch in 10 feet; plus or minus 3/8 inch in 20 feet; plus or minus 1/2 inch maximum.
 3. True to line: plus or minus 1/4 inch in 10 feet; plus or minus 3/8 inch in 20 feet; plus or minus 1/2 inch maximum.
 4. Alignment of columns and walls (bottom versus top):
 - a. Bearing: plus or minus 1/2 inch.
 - b. Non-bearing: plus or minus 3/4 inch.
- C. Location of Elements:
1. Indicated in plan: plus or minus 1/2 inch in 20 feet; plus or minus 3/4 inch maximum.
 2. Indicated in elevation: plus or minus 1/4 inch in story height; plus or minus 3/4 inch maximum.
- D. Notification: If the above conditions cannot be met due to previous construction notify Architect/Owner's Representative/Engineer.

3.06. REINFORCEMENT AND ANCHORAGES

- A. Basic Requirements:
1. Place reinforcement and anchorages in accordance with the sizes, types, and locations indicated on the Project Drawings, and as specified.
 2. Do not place dissimilar metals in contact with each other.
- B. Details of Reinforcement:
1. Completely embed reinforcement in grout in accordance with Article 3.08.
 2. Maintain clear distance between reinforcing bars and any face of masonry unit or formed surface:
 - a. Not less than 1/4 inch for fine grout.
 - b. Not less than 1/2 inch for coarse grout.
 3. Splice only where indicated on Drawings, unless otherwise specified.
 4. Do not bend reinforcing bars after embedded in grout.
 5. Place vertical reinforcing bars supported and secured against displacement by means of bar positioners.
 6. Support bars other than vertical bars and tie to prevent displacement.
 7. Placement tolerances:
 - a. Tolerances for the placement of reinforcing bars:
 - i. +/- 1/2 inch when the distance from the centerline of the reinforcing bar to the opposite outside face of the masonry, d, is 8 inches or less.
 - ii. +/- 1 inch when the distance from the centerline of the reinforcing bar to the opposite outside face of the masonry, d, is 24 inches or less but more than 8 inches.
 - iii. +/- 1-1/4 inch when the distance from the centerline of the reinforcing bar to the opposite outside face of the masonry is more than 24 inches.
 - b. Place vertical reinforcing bars within 2 inches of required location along the length of the wall.
 - c. If it is necessary to move bars more than one bar diameter or a distance exceeding the tolerances provided in Section 3.07.B.7.a. to avoid interference with other reinforcing bars, conduit, or embedded items, notify the Architect/Owner's Representative for the acceptance of the resulting arrangement of bars.
- C. Joint Reinforcement:
1. Placement:
 - a. Install joint reinforcement at 16 inches on center vertically, except space at 8 inches on center in parapet walls and below finished floor unless otherwise indicated on Drawings.
 - b. Place joint reinforcement continuous in first bed joints below top of masonry wall and bed joint 8 inches below first bed joint below top of wall.
 - c. Place joint reinforcement so that longitudinal wire are embedded in mortar:
 - i. Minimum cover of 1/2 inch when not exposed to weather.
 - ii. Minimum cover of 5/8 inch when exposed to weather or earth.
 - d. Lap joint reinforcement ends minimum 6 inches.
 - e. Do not extend joint reinforcement through control joints.

- D. Wall Ties:
1. Embed ends of wall ties in mortar joints at least 1/2 inch into outer face shell of hollow masonry construction.
 2. Unless otherwise required, install adjustable wall ties in accordance with the following:
 - a. One tie for each 1.77 sq. ft. of wall area.
 - b. Do not exceed 16 in. on center horizontally or vertically.
 3. Install wire ties perpendicular to a vertical line on the face of the wythe from which they protrude.
 4. Unless otherwise provided, install additional unit ties around all openings larger than 16 inches in either dimension. Space ties around the opening at a maximum of 3 feet on center and place ties within 12 inches of the opening.

3.07. GROUT PLACEMENT

- A. Placement:
1. Place grout within 1-1/2 hours of introducing mixing water and prior to initial set.
 2. Prevent grout from flowing onto or otherwise staining faces of CMU intended to be exposed.
- B. Confinement: Confine grout to the areas indicated on the Drawings.
- C. Grout Pour Height: Use fine or coarse grout in accordance with requirements in Section 04070.
- D. Grout Lift Height: Do not exceed the max. grout pour height as discussed in 3.5C and 3.5D of ACI 530.1-05.
- E. Consolidation: Consolidate grout at the time of placement.
1. Consolidate grout pours 12 inches or less in height by mechanical vibration or puddling.
 2. Consolidate grout pours exceeding 12 inches in height by mechanical vibration and reconsolidate by mechanical vibration after initial water loss and settlement has occurred.

3.08. BRACING

- A. Design and Installation: Design, provide and install bracing for walls, lintels, and other masonry work that will assure stability of masonry during construction.
- B. Duration: Maintain bracing in place until roof or other structural elements are complete and provide permanent support.

3.09. LINTELS

- A. Steel Lintels:
1. Install loose steel lintels as scheduled.
 2. Provide 9 gage Z-ties at each vertical joint of soap units covering steel lintels. Weld Z-ties to web of steel lintel.
- B. Concrete Masonry Lintels:
1. Install reinforced unit masonry lintels over openings where steel lintels are not scheduled.
 2. Construct lintels using grout fill and reinforcing.
 - a. Maintain minimum 8 inch bearing on each side of opening unless otherwise noted on Drawings.
 - b. Use reinforcing bars of one-piece lengths only.
 - c. Place and consolidate grout without disturbing reinforcing.
 3. Allow lintels to reach strength before removing temporary supports.

3.10. MOVEMENT JOINTS

- A. Control Joints:
1. Do not continue bond beams or joint reinforcing across control joints.
 2. Install preformed control joint filler at locations indicated on Drawings and in accordance with NCMA recommendations.
 3. Use proper size material to create sealant joint space.
 4. Backer rod and sealant installed in accordance with Section 07900.
- B. Seismic Joints:
1. As specified and recommended per Project Drawings and specifications.

3.11. CLEANING

- A. In-Progress Cleaning: Clean unit masonry as Work progresses by dry brushing to remove mortar fins and smears before tooling joints as described in Article 3.03.B.1.

- B. Final Cleaning:
1. After mortar has set, reached initial curing; within 7 days of completion of work for custom masonry units, clean exposed masonry as follows:
 2. Remove large mortar particles by hand with wooden paddles and non-metallic scrape hoes or chisels.
 3. Cut out any defective mortar joints and holes and re-point with mortar.
 4. Protect non-masonry surfaces from contact with cleaning solution by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 5. Clean ReadyBrick with proprietary masonry cleaner.
 - a. Materials:
 - i. Sure Klean 600 Detergent, by Prosoco, Kansas City, Missouri (800) 255-4255, diluted as recommended by masonry cleaner manufacturer.
 - ii. Sure Klean Custom Masonry Cleaner, by Prosoco, Kansas City, Missouri (800) 255-4255, diluted as recommended by masonry cleaner manufacturer.
 - b. Thoroughly wet surface of masonry.
 - c. Scrub using non-metallic brushes:
 - d. Immediately rinse with water.
 - e. Do small sections at a time.
 - f. Work from top to bottom.
 6. Do not use high pressure cleaning methods.
 - a. Do not exceed nozzle pressure of 500 psi.
 - b. Use water flow of at least 4 gallons per minute.
 - c. Use at least 40° fan nozzle.
 - d. Keep nozzle at least 18-inches from face ReadyBrick.
 7. Cleaned surfaces shall appear as represented by mockup wall panel.

3.12. SEALING

- I. Seal ReadyBrick with proprietary masonry cleaner
 - a. Materials
 - i. Custom Masonry Sealer, by Prosoco, Kansas City, Missouri (800) 255-4255, follow manufacturer's recommendations for applying

3.13. PROTECTIONS

- A. External Corners: Maintain protective boards at exposed external corners that may be damaged by construction activities.
 - I. Provide protection without damaging work.
- B. Base of Walls: Protect the base of walls from rain-splashed mud and mortar droppings.
- C. Environmental: At end of day, cover completed masonry to prevent moisture infiltration. Use the following provisions unless otherwise required for environmental conditions, Section 106:
- D. Load Application:
 1. Do not apply uniform floor or roof loading for at least 12 hours after building masonry columns or walls
 2. Do not apply concentrated loads for at least three days after building masonry columns or walls

3.14. FIELD QUALITY CONTROL

- A. Masonry: Required testing will be in accordance with Section 01450, of the Project Specifications.