SECTION 042219

INSULATED CONCRETE UNIT MASONRY

[Specifier Notes] – Insulated Concrete Masonry Units (ICMUs) are pre-assembled masonry units consisting of a structural CMU and non-structural thin veneer components that are separated by an insulation thermal break and held together as a single unit.

* 1. GENERAL
  2. SUMMARY
     1. Section Includes: The section includes the installation of the following:

[Specifier Notes] – Retain the subparagraph immediately below if both structural CMU and non-structural thin veneer components of ICMU are made of typical CMU material.

* + - 1. Insulated concrete masonry units (ICMU).

[Specifier Notes] – Retain the subparagraph immediately below if either or both the structural CMU and non-structural thin veneer is made of a decorative CMU, or a polymer glazed CMU.

* 1. REFERENCES
     1. Definitions:
        1. CMU: Concrete masonry unit(s).
        2. ICMU(s): Insulated concrete masonry unit(s) without pigments added.
        3. Decorative ICMU(s): Insulated concrete masonry unit(s) with one or more components are of decorative masonry units with integral color, textured finish (ground, polished, filled and polished, shot blasted, smooth face).
        4. Reinforced Masonry: As defined by NCMA TEK 1-4 “Glossary of Concrete Masonry Terms:”
           1. “Masonry containing reinforcement in the mortar joints or grouted cores used to resist stresses. Unit masonry in which reinforcement is embedded in such a manner that the component materials act together to resist applied forces.”
        5. Non-Structural Thin Veneer: Thin, decorative concrete units of various shapes, colors, and finishes.
        6. Structural CMU: Concrete masonry units (CMU) with open cells complying with ASTM C90 “Standard Specification for Loadbearing Concrete Masonry Units” used in either load bearing or non-load bearing conditions.
        7. Dimensions: All unit sizes are shown as Nominal Dimensions.
  2. ADMINISTRATIVE REQUIREMENTS

[Specifier Notes] – Coordinate information in Preinstallation Meetings paragraph below with Section 013100 “Project Management and Coordination;” Section 013119 “Project Meeting;” and Section 013119.33 “Preinstallation Meetings.”

Only retain the “Preinstallation Meetings” paragraph below for large or complex projects. Otherwise, delete this paragraph.

* + 1. Preinstallation Meetings: Conduct Preinstallation Meeting at [**job** **site**] <**insert** **location**>.

[Specifier Notes] – Provide list of required meeting topics if necessary.

* + - 1. <Insert topic>
  1. ACTION SUBMITTALS
     1. Product Data: Provide Manufacturer’s Product Data for [**each** **type** **of** **product** **specified**.] [**the** **following** **items:**]

[Specifier Notes] – Retain only those items listed below that require product data be submitted and delete those items specified in other sections.

* + - 1. ICMU, including structural CMU and non-structural thin veneer components with insulation as a complete unit, including integral water repellant.
      2. Decorative ICMU, including structural CMU and non-structural thin veneer components with insulation as a complete unit, including integral water repellant.
      3. Mortar, including integral water repellant.
      4. Grout.
      5. Prefabricated Flashing.
      6. Flashing.
      7. Weeps.
    1. Shop Drawings: Provide Shop Drawings indicating installation details, including the following:
       1. Special [**Decorative**] ICMU Shapes: Provide drawings indicating sizes, configuration, and locations of special shapes.
       2. Reinforcing: Provide drawings indicating reinforcing that complies with ACI 315 “Details and Detailing of Concrete Reinforcement”[**.**][**and** **includes** **the** **following:**]
          1. Provide elevations indicating steel reinforcing bar placement.
          2. Provide details indicating steel reinforcing bar sizes, placement, bends, and laps dimensions.

[Specifier Notes] – If only one submission of samples is required, retain the Samples paragraph immediately below and delete the “Samples, Selection Set” and “Samples, Confirmation Set” paragraphs that follow.

* + 1. Samples: Submit samples [for each type of product specified.] [as follows:]
       1. ICMU, including structural CMU and non-structural thin veneer components with insulation as a complete unit.
       2. Decorative ICMU, including structural CMU and non-structural thin veneer components with insulation as a complete unit.

[Specifier Notes] – If a two stage submission is process is required for selection of colors and finishes, delete the Samples paragraph immediately above and retain the “Samples, Selection Set” and “Samples, Confirmation Set” paragraphs immediately below.

* + 1. Samples, Selection Set: Submit complete series of manufacturer’s standard colors and finishes, in manufacturer's standard size, for [**the** **following:**] <**insert** **product**>[**.**]
       1. Decorative ICMU, including structural CMU and non-structural thin veneer components with insulation as a complete unit.
       2. Non-Structural Thin Veneer

[Specifier Notes] – Only include mortar if they are specified in this section. Otherwise coordinate mortar sample requirements with Sections 042000 “Unit Masonry,” 042200 “Concrete Unit Masonry.”

* + - 1. Colored Mortar with integral water repellant.
    1. Samples, Confirmation Set: For each product color and finish selection to be made by the Architect from the Selection Set of Samples, provide manufacturer's standard size, for [**the** **following:**] <**insert** **product**>[**.**]
       1. Decorative ICMU, including structural CMU and non-structural thin veneer components with insulation as a complete unit.
       2. Non-Structural Thin Veneer.

[Specifier Notes] – Only include mortar if they are specified in this section. Otherwise coordinate mortar sample requirements with Sections 042000 “Unit Masonry” and 042200 “Concrete Unit Masonry.”

* + - 1. Colored Mortar with integral water repellant.
    1. Sustainable Design Submittals: For each product, submit the following item to the Project Sustainable Design Coordinator:
       1. Environmental Product Declaration (EPD).
  1. INFORMATIONAL SUBMITTALS

[Specifier Notes] – According to TMS 402-11/ACI 530-11/ASCE 5-11: “Building Code Requirements and Specification for Masonry Structures and Related Commentaries,” material certificates are required for all masonry construction.

* + 1. Certificates: For each of the following materials, submit documentation, on product manufacturer’s letterhead, stating that materials comply with requirements of the Contract Documents.

[Specifier Notes] – Retain only those products specified in this section and only those items with require a certificate.

Retain test reports option in subparagraph below if required by authorities having jurisdiction.

* + - 1. CMUs, General: Submit certifications stating material properties of materials[**,** **including** **test** **reports** **verifying** **properties** **stated**].

[Specifier Notes] – Retain the Structural CMUs subparagraph below if using either the “Specifications for Masonry Structures” (ACI 530.1/ ASCE 6/TMS 602) or ASTM C1314 “Standard Test Method for Compressive Strength of Masonry Prisms” method for determining the net area compressive strength of masonry in Performance Criteria article in Part 2 below.

* + - 1. Structural CMUs: Submit data and calculations demonstrating average net area compressive strength of CMUs.
      2. ICMU, including structural CMU and non-structural thin veneer components with insulation as a complete unit.
      3. Decorative ICMU, including structural CMU and non-structural thin veneer components with insulation as a complete unit.
      4. Non-Structural Thin Veneer.
      5. Insulation.
      6. Mortar with integral water repellant.
      7. Grout.
      8. Steel reinforcing.

[Specifier Notes] – Do not review or stamp the delegated design submission without consulting your attorney or errors and omissions carrier.

* + 1. Delegated Design Submittals: Provide engineering design calculations.
    2. Test and Evaluation Reports:

[Specifier Notes] – Retain the Compressive Strength subparagraph below if using “Specifications for Masonry Structures” (ACI 530.1/ ASCE 6/TMS 602) method for determining the net area compressive strength of masonry in Performance Criteria article in Part 2 below. Otherwise delete this subparagraph.

* + - 1. Compressive Strength Report: Submit report of the following properties for each combination of masonry unit type and mortar type to be incorporated in the Work calculated according to the standards of “Specifications for Masonry Structures” (ACI 530.1/ ASCE 6/TMS 602):

[Specifier Notes] – Retain only those properties listed below which are required for the project. Verify with structural consultant before editing.

* + - * 1. Average net area compressive strength of masonry units.
        2. Average net area compressive strength of mortar types.
        3. Resulting net area compressive strength of masonry construction.
  1. QUALITY ASSURANCE

[Specifier Notes] – Coordinate the requirements of this Article with those of Section 014000 “Quality Requirements.”

Retain the requirements for a licensed engineer if masonry walls will bear structural loads and the Contractor will be required to hire a structural engineer to design these walls. Otherwise, delete requirements for a licensed professional as well as the Structural Performance Requirements in Part 2 below.

* + 1. Licensed Professionals:
       1. Owner to retain an experienced, professional, structural engineer who is legally qualified to practice in the jurisdiction where the project is located to calculate design of masonry reinforcing requirements and to prepare construction documents for installation of reinforced masonry.

[Specifier Notes] – Drawing Coordination: Clearly identify on the drawings which portion (or portions) of exterior wall construction is be included in the mockup.

* + 1. Mockups: Construct mockup of typical exterior wall, as indicated on the Drawings, to exhibit aesthetic effects, to confirm product selections and placement, and to establish construction quality standards.
  1. DELIVERY, STORAGE, AND HANDLING
     1. Delivery and Acceptance Requirements: Deliver CMUs and other cementitious materials neatly stacked on pallets.
     2. Storage and Handling Requirements: Store CMUs and other cementitious materials on elevated platforms in a dry, sheltered location.
        1. If sheltered location is not available, completely cover tops and side of stored CMUs and other cementitious materials with a waterproof tarp that is securely restrained from exposing covered materials to precipitation.
  2. FIELD CONDITIONS
     1. Protection During Construction:
        1. Comply with protection recommendations of NCMA TEK 8-4A “Cleaning Concrete Masonry.”
        2. At the end of each day’s work, cover top of masonry construction with a waterproof tarp that is securely restrained from exposing covered work to precipitation.
           1. Extend protective covering a minimum of 24 inches down each side of masonry construction.
        3. Spread protective covering over ground and wall surfaces to protect in place masonry work from mud splatter.
        4. Protect work adjacent to and below masonry work from grout and mortar droppings, including the following surfaces:
           1. Sills
           2. Ledges
           3. Projections
           4. Window and door frames.
        5. Immediately remove grout, mortar, and soil that comes in contact with exposed masonry work.
     2. Weather Conditions:
        1. Ambient Conditions: Comply with working recommendations of the International Masonry Industry All Weather Council (IMIAWC) regarding weather conditions.
        2. Cold Weather and Hot Weather Construction: Comply with recommendations of ACI 530 “Building Code Requirements and Specification for Masonry Structures” and IMIAWC “Recommended Practices and Guide Specifications for Cold Weather and Hot Weather Masonry Construction.”

1. PRODUCTS
   1. MANUFACTURERS
      1. Manufacturer: Subject to compliance with requirements, provide Insultech™ products by Echelon™, a member of the Oldcastle Company.
      2. Source Limitations: Obtain [**ICMUs**] [**and**] [**decorative ICMUs**] from a single manufacturer.
   2. PERFORMANCE CRITERIA

[Specifier Notes] – Retain the Structural Performance Requirement paragraph below if masonry walls will bear structural loads and the Contractor will be required to hire a structural engineer to design these walls. Otherwise delete the Structural Performance Requirement paragraph below.

* + 1. Structural Performance Requirements: Provide reinforced masonry construction designed to comply with the following requirements:

[Specifier Notes] – Retain the first subparagraph below and delete the remaining subparagraphs if reinforced masonry requirements are specified in another section. Otherwise delete the first subparagraph and retain the remaining subparagraphs.

* + - 1. Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Masonry”] <Insert Section Number and Section Title of appropriate Section>.
      2. Design Standards: Comply with the design recommendations of the following:
         1. ACI 530/530.1-13, “Building Code Requirements and Specification for Masonry Structures and Companion Commentaries.”
         2. NCMA TEK 12-4D “Steel Reinforcement for Concrete Masonry.”
         3. NCMA TEK 14-19A “Allowable Stress Design Tables for Reinforced Concrete Masonry Walls.”

[Specifier Notes] – Retain TEK 16-3B reference only if there will be reinforced composite walls.

* + - * 1. NCMA TEK 16-3B “Reinforced Composite Concrete Masonry Walls.”
      1. Dead Loads: [As indicated on the Drawings] <insert load>.
      2. Live Loads: [As indicated on the Drawings] <insert load>.
      3. Wind Loads: [As indicated on the Drawings] <insert load>.
      4. Seismic Loads: [As indicated on the Drawings] <insert load>.
         1. Importance Factor: [**1.0**] [**1.5**].
    1. Thermal Resistive Performance Requirements:

[Specifier Notes] – The R-Value below is based on ICMUs with a standard 8” thick structural CMU component. For the R-value of ICMU of different thickness, consult with an Oldcastle representative.

* + - 1. R-Value: 16.0 at 75 degrees F.

[Specifier Notes] – A 4-hour rated assembly can be achieved based on fully assembled ICMUs with structural CMU components that are a minimum 8” thick.

* + 1. Fire Resistive Performance Requirements: [As indicated on Drawings] [Provide ICMU as required to comply with [1] [1-1/2] [2] [3] [and] [4] <insert hourly rating>-hour fire rated assemblies where indicated on the Drawings].
       1. Determine fire resistant rating [according to testing complying with ASTM E 119 testing methods] [by equivalent concrete masonry thickness] [or by other means, as acceptable to authorities having jurisdiction].

[Specifier Notes] – Retain the subparagraph below if the local authority having jurisdiction requires that only listed and labeled products be used in fire rated assemblies. Otherwise, delete this subparagraph.

* + - 1. For ICMU within fire rated assemblies, provide units which have been listed and labeled by a qualified testing agency which is acceptable to the local authority having jurisdiction.

[Specifier Notes] – Always retain the Water Penetration Resistance paragraph below for exterior masonry construction. Coordinate this Performance Criteria with the Integral Water Repellant product specified in Insulated Concrete Masonry Units, General article below.

* + 1. Water Penetration Resistance: CMU shows no visible water or leaks on back of test specimen after 24 hours when tested according to ASTM E514 / E514M “Standard Test Method for Water Penetration and Leakage Through Masonry.”
  1. CONCRETE MASONRY UNITS, GENERAL
     1. Masonry Standard: Provide concrete masonry complying with ASTM C90 “Standard Specification for Loadbearing Concrete Masonry Units.”

[Specifier Notes] – Delete the Compressive Strength subparagraph below if retaining the Structural Performance Requirements paragraph in the Performance Criteria article above.

Typical minimum compressive strength values specified are 2150 psi, 2800 psi, and 3050 psi, depending on structural requirements. However, Oldcastle is able to produce ICMU to other compressive strength requirements as well. Consult with a licensed structural engineer to determine compressive strength requirements and with an Oldcastle representative to verify other compressive strengths available.

* + - 1. Compressive Strength: Provide [**ICMUs**] [**and**] [**decorative ICMUs**] with a minimum average net area compressive strength of <**Insert compress strength required**>.
      2. Density: Provide ICMU of the following density:

[Specifier Notes] – Retain one of the following CMU density classifications and delete the remainder. If retaining more than one, clearly indicate on the Drawings where each weight is used. Lightweight CMU is quicker and easier to lay. Contractors will typically charge less for installing lightweight CMU since they can lay more units per hour. Verify availability of density categories required with Oldcastle representative before editing.

* + - * 1. Lightweight CMU: Less than 105 lb/cu. ft..
        2. Medium weight CMU: At least 105 lb/cu. ft. but less than 125 lb/cu. ft..
        3. Normal weight CMU: 125 lb/cu. ft. or more.
    1. Pigments: ASTM C979 “Standard Specification for Pigments for Integrally Colored Concrete,” inorganic iron oxide pigments.

[Specifier Notes] – Base course ICMUs of exterior walls should always include integral water repellant. The integral water repellant helps protect the ICMU from staining from mud splatter during construction.

* + 1. Integral Water Repellant: Liquid polymeric, admixture that does not reduce flexural bond strength.
       1. Integral Water Repellant Product: Subject to compliance with requirements, provide product recommended [**the following**] [**one of the following products**] or by manufacturer’s recommendation:
          1. RainBloc® Water Repellent Masonry Unit admixture, manufactured by ACM Chemistries, Inc.
    2. Integral Water Repellent. Certified by ICMU manufacturer to have been tested and
  1. INSULATED CONCRETE MASONRY UNITS
     1. ICMU: Preassembled, structural ICMU, with no added pigment and no applied texture or finish, consisting of a structural CMU and a thin, non-structural CMU veneer separated by a graphite polystyrene (GPS) molded insulation thermal break and held together as a single unit.
        1. Components:
           1. Structural CMU: Nominal [**6 inches**] [**8 inches**] [**10 inches**] [**12 inches**] thick CMU with unfinished exposed interior face and dovetailed slots on the opposite face.
           2. Insulation: Nominal 3 inches thick Molded GPS insulation.
           3. Non-Structural Thin Veneer: Nominal 1-5/8 inches thick CMU with unfinished exposed exterior face and dovetailed slots on the opposite face.
        2. Unit Size[**s**]: Nominal dimensions and actual dimensions of complete preassembled unit[**s**]:

[Specifier Notes] – Retain only those sizes actually used on the project. If more than one size of unit is used on a project, be sure to indicate locations of each size unit on the Drawings clearly.

* + - * 1. Nominal Dimensions: 12 inches deep by 8 inches high by 16 inches long.

Actual Dimensions: 12-1/4 inches deep by 7-5/8 inches high by 15-5/8 inches long.

* + - * 1. Nominal Dimensions: 10 inches deep by 8 inches high by 16 inches long.

Actual Dimensions: 10-1/4 inches deep by 7-5/8 inches high by 15-5/8 inches long.

* + - * 1. Nominal Dimensions: 8 inches deep by 8 inches high by 16 inches long.

Actual Dimensions: 8-1/4 inches deep by 7-5/8 inches high by 15-5/8 inches long.

* + - * 1. Nominal Dimensions: 6 inches deep by 8 inches high by 16 inches long.

Actual Dimensions: 6-1/4 inches deep by 7-5/8 inches high by 15-5/8 inches long.

* + - * 1. Nominal Dimensions: 12 inches deep by 4 inches high by 16 inches long.

Actual Dimensions: 12-1/4 inches deep by 3-5/8 inches high by 15-5/8 inches long.

Decorative ICMUs can be made up of any combination of standard CMU, decorative CMU, or polymer glazed CMU. The paragraphs below define the typical combinations Echelon™ has available. Revise the one or more of the Decorative ICMU Type paragraphs below to achieve the desired combination. However, be sure to contact an Echelon™ costs and availability.

Copy and paste the Decorative ICMU paragraph below for each combination of structural CMU and a decorative non-structural thin veneers used on the project. Provide each combination with a different alpha or numeric designation and clearly indicate on the Drawings with each type is located.

* + 1. Decorative ICMU, Type <Insert Designation>: Pre-assembled, structural ICMU consisting of a structural CMU and a decorative non-structural thin veneer separated by a graphite polystyrene (GPS) molded insulation thermal break and held together as a single unit.

[Specifier Notes] – The following decorative finishes are available on the non-structural thin veneer as well as the structural CMU backup unit. Select one non-structural thin veneer CMU and one structural CMU backup for each Decorative ICMU type used on the project. Copy and paste this Decorative ICMU paragraph for each combination of structural CMU and a decorative non-structural thin veneers selected.

Contact an Oldcastle representative to determine availability.

* + - 1. Non-Structural Thin Veneer CMU:
         1. Thin Veneer, with added pigment and with no applied texture.
         2. Thin Veneer [Trenwyth Trendstone®] [Trenwyth Trendstone Plus®]

Color: [As select by the Architect from masonry manufacturer’s full range of standard colors] [As indicated on Drawings] <insert color>.

Retain the Polished option if specifying Trenwyth Trendstone® or retain the Polished and Filled option if specifying Trenwyth Trendstone Plus®.

Finish: [Polished] [Polished and Filled].

* + - * 1. Thin Veneer [Trenwyth Verastone®] [Trenwyth Verastone Plus®].

Color: [As select by the Architect from masonry manufacturer’s full range of standard colors] [As indicated on Drawings] <insert color>.

Retain the Polished option if specifying Trenwyth Verastone® or retain the Polished and Filled option if specifying Trenwyth Verastone Plus®.

Finish: [Polished] [Polished and Filled].

* + - * 1. Thin Veneer Trenwyth Mesastone®

Color: [As select by the Architect from masonry manufacturer’s full range of standard colors] [As indicated on Drawings] <insert color>.

Finish: [Textured] [As select by the Architect from masonry manufacturer’s full range of standard finishes] [As indicated on Drawings] <insert finish>.

Finish: [Smooth] [Textured] [As select by the Architect from masonry manufacturer’s full range of standard finishes] [As indicated on Drawings] <insert finish>.

* + - 1. Insulation: Nominal 3 inches thick Molded GPS insulation.
      2. Structural CMU Backup:
         1. Structural CMU, with added pigment and with no applied texture.
         2. Structural CMU [Trenwyth Trendstone®] [Trenwyth Trendstone Plus®].

Color: [As select by the Architect from masonry manufacturer’s full range of standard colors] [As indicated on Drawings] <insert color>.

Retain the Polished option if specifying Trenwyth Trendstone® or retain the Polished and Filled option if specifying Trenwyth Trendstone Plus®.

Finish: [Polished] [Polished and Filled].

* + - * 1. Structural CMU [Trenwyth Verastone®] [Trenwyth Verastone Plus®].

Color: [As select by the Architect from masonry manufacturer’s full range of standard colors] [As indicated on Drawings] <insert color>.

Retain the Polished option if specifying Trenwyth Versastone® or retain the Polished and Filled option if specifying Trenwyth Versastone Plus®.

Finish: [Polished] [Polished and Filled].

* + - * 1. Structural CMU Trenwyth Mesastone®

Color: [As select by the Architect from masonry manufacturer’s full range of standard colors] [As indicated on Drawings] <insert color>.

Finish: Textured.

Finish: [Smooth] [Textured] [As select by the Architect from masonry manufacturer’s full range of standard finishes] [As indicated on Drawings] <insert finish>.

* + - 1. Unit Size[**s**]: Nominal dimensions and actual dimensions of complete preassembled unit[**s**]:

[Specifier Notes] – Retain only those sizes actually used on the project. If more than one size of unit is used on a project, be sure to indicate locations of each size unit on the Drawings clearly.

* + - * 1. Nominal Dimensions: 12 inches deep by 8 inches high by 16 inches long.

Actual Dimensions: 12-1/4 inches deep by 7-5/8 inches high by 15-5/8 inches long.

* + - * 1. Nominal Dimensions: 10 inches deep by 8 inches high by 16 inches long.

Actual Dimensions: 10-1/4 inches deep by 7-5/8 inches high by 15-5/8 inches long.

* + - * 1. Nominal Dimensions: 8 inches deep by 8 inches high by 16 inches long.

Actual Dimensions: 8-1/4 inches deep by 7-5/8 inches high by 15-5/8 inches long.

* + - * 1. Nominal Dimensions: 6 inches deep by 8 inches high by 16 inches long.

Actual Dimensions: 6-1/4 inches deep by 7-5/8 inches high by 15-5/8 inches long.

* + - * 1. Nominal Dimensions: 12 inches deep by 4 inches high by 16 inches long.

Actual Dimensions: 12-1/4 inches deep by 3-5/8 inches high by 15-5/8 inches long.

* 1. INSULATION
     1. Product: Subject to compliance with requirements, provide Neopor® by BASF.

[Specifier Notes] – Always retain the “Graphite polystyrene (GPS)” paragraph below.

* + 1. Graphite polystyrene (GPS): Closed cell, GPS insulation complying with ASTM C578 “Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation” Type II insulation, molded to interlock with the structural CMU and non-structural thin veneer components of ICMU and with male and female connections to interlock with adjacent ICMU units.
       1. Density: 1.35 lb/cu. ft..
       2. Compressive Strength (Resistance): 15.0 psi.
  1. SPECIAL SHAPES
     1. Provide special shapes as required to complete the masonry work as indicated on the Drawings without requiring field cutting[**.**][**,** **including** **the** **following:**]
        1. Left and right hand corners units.
        2. Left and right hand corner continuation units.
        3. Open end stretcher units.
        4. Closed end stretcher units.
        5. Double sash units.
        6. Left and right hand half sash units.
        7. Veneer stretcher units.
        8. Veneer left and right hand corners units.
        9. Left and right hand 4-inch return jamb block units.
  2. CONCRETE MASONRY LINTELS

[Specifier Notes] – Retain the paragraph immediately below if masonry lintels are specified in another section. Otherwise, delete this paragraph.

* + 1. Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Masonry”] <Insert Section Number and Section Title of appropriate Section>.

[Specifier Notes] – Retain the paragraph immediately below if bond beam units are used to form lintels and are specified in this section. Otherwise, delete this paragraph.

* + 1. Bond Beam Units: Provide closed bottom CMU bond beams matching properties and dimension of ICMU structural CMU component, including color and finish of exposed ICMU faces.
       1. Provide Veneer stretcher units where required to match ICMU non-structural thin veneer.
  1. CONCRETE LINTELS

[Specifier Notes] – Retain this article if precast concrete lintels are used.

Retain the paragraph immediately below if precast concrete lintels are specified in another section. Otherwise, delete this paragraph.

* + 1. Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Masonry”] [033000 "Cast-in-Place Concrete"] <Insert Section Number and Section Title of appropriate Section>.

[Specifier Notes] – Retain the paragraph immediately below if precast concrete lintels are specified in this section. Otherwise, delete this paragraph.

* + 1. Precast Concrete Lintel: Provide steel reinforced, precast concrete lintels complying with ASTM C1623 “Standard Specification for Manufactured Concrete Masonry Lintels” with [**color, texture, and**] density matching ICMU.
  1. STEEL LINTELS

[Specifier Notes] – Retain this article if steel lintels are used.

Retain the paragraph immediately below if steel lintels are specified in another section. Otherwise, delete this paragraph.

* + 1. Comply with requirements of Section [042000 “Unit Masonry”] [055000 “Metal Fabrications”] <Insert Section Number and Section Title of appropriate Section>.

[Specifier Notes] – Retain the paragraph immediately below if steel lintels are specified in this section. Otherwise, delete this paragraph.

Retain the galvanized option in paragraph immediately below for interior openings in wet areas or for exterior openings. The factory primed option may be retained with or without galvanizing.

* + 1. Provide [**galvanized**] [**and**] [**factory primed**] steel angles and shapes as indicated on the Drawings.
       1. Size steel lintels to support dead loads over openings but not less than sizes indicated on the Drawings.
       2. Provide minimum of 8 inches of bearing on each side of opening but not less than required based on masonry’s bearing capacity.
  1. MORTAR AND GROUT MATERIALS

[Specifier Notes] – Retain the paragraph immediately below if mortars and grouts are specified in another section and delete the remaining paragraphs of the Mortar and Grout Materials article. Otherwise, delete this paragraph and retain the remaining paragraphs.

* + 1. Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Masonry”] <Insert Section Number and Section Title of appropriate Section>.
    2. General: Comply with recommendations of the following:
       1. NCMA TEK 9-1A Mortars for Concrete Masonry.
       2. NCMA TEK 9-4A Grout for Concrete Masonry.
    3. Portland Cement: Comply with ASTM C150 “Standard Specification for Portland Cement” using [**one** **of**] the following portland cement [**Type**] [**Types**]:
       1. Type I, normal.
       2. Type II, moderate sulfate resistance.
       3. Type III, high early strength, maybe used for cold weather conditions.
    4. Hydrated Lime: Comply with ASTM C207 “Standard Specification for Hydrated Lime for Masonry Purposes,” Type S (special).
    5. Aggregates:
       1. Aggregates for Mortar: Comply with ASTM C144 “Standard Specification for Aggregate for Masonry Mortar.”
       2. Aggregates for Grout: Comply with ASTM C404 “Standard Specification for Aggregates for Masonry Grout.”
    6. Packaged Cement Mix: Packaged, factory blended mix of portland cement and hydrated lime with no other components included.
    7. Mortar Cement: Comply with ASTM C1329 “Standard Specification for Mortar Cement.”
    8. Pigments: Comply with ASTM C979 “Standard Specification for Pigments for Integrally Colored Concrete.”
       1. Comply with quantity limitation specified ASTM C1384 “Standard Specification for Admixtures for Masonry Mortars” when adding to mortar.
    9. Admixtures: Comply with quantity limitation specified ASTM C1384 “Standard Specification for Admixtures for Masonry Mortars” when adding to mortar.
       1. Cold Weather: Comply with ASTM C494 “Standard Specification for Chemical Admixtures for Concrete.”
       2. Integral Water Repellant: Liquid polymeric, admixture that does not reduce flexural bond strength.
          1. Integral Water Repellant Product: Subject to compliance with requirements, provide one of the following products:

RainBloc® Water Repellent Masonry Unit admixture, manufactured by ACM Chemistries, Inc.

* + 1. Water: Clean and drinkable.
  1. REINFORCEMENT

[Specifier Notes] – Retain the paragraph immediately below if reinforcing is specified in another section and delete the remaining paragraphs of the Reinforcement article. Otherwise, delete this paragraph.

* + 1. Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Masonry”] <Insert Section Number and Section Title of appropriate Section>.

[Specifier Notes] – Retain the Reinforcing Bars paragraph immediately below if steel reinforcing bars are used in the masonry walls or bond beams. Otherwise deleted this paragraph and the Reinforcing Bar Positioners paragraph below.

* + 1. Reinforcing Bars: Uncoated, deformed, steel reinforcing bars.
       1. Provide bars complying with either of the following standards:
          1. ASTM A615 “Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement.”
          2. ASTM A996 “Standard Specification for Rail-Steel and Axle-Steel Deformed Bars for Concrete Reinforcement.”
       2. Minimum Yield Strength: [**60,000**] <**Insert** **Strength**> psi.
       3. Grade: [**60**] <**Insert** **Grade**>,
       4. Sizes: [As indicated on [structural] Drawings][As determined by Delegated Design Engineer].

[Specifier Notes] – Retain the Reinforcing Bar Positioners paragraph immediately below if steel reinforcing bars are used in the masonry walls or bond beams. Otherwise deleted this paragraph. The purpose of the reinforcing bar positioners is to hold the reinforcing bars in place when block cells or bond beams are being filled with grout.

* + 1. Reinforcing Bar Positioners: Prefabricated wire elements configured to span masonry unit cells and hold reinforcing bars in position when cells are filled with grout. Provide reinforcing bar positioners configured to accommodate the masonry and reinforcing requirements indicated on the Drawings.
       1. Wire Material: Provide wire made of [**one** **of**] the following [**material**] [**materials**]:
          1. Cold-drawn steel wire conforming to ASTM A106 “Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.”

[Specifier Notes] – Typically delete the stainless steel subparagraph below unless potential corrosion of galvanized steel is a concern. Type 316 stainless steel has a higher resistance to corrosion than Type 304. Type 316 stainless steel is typically used in environments that are highly corrosive to steel, such as coastal shorelines where the atmosphere has a high salt content.

* + - * 1. Stainless steel wire conforming to ASTM A580 “Standard Specification for Stainless Steel Wire,” - AISI Type [**304**] [**316**].
      1. Wire Diameter: 0.148 inch minimum.

[Specifier Notes] – Delete the wire finish subparagraph below if only stainless steel reinforcing bar positioners are allowed.

* + - 1. Wire Finish: Galvanized according to [**one** **of**] the following [**method**] [**methods**]:
         1. Mill Galvanized: ASTM A641 “Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire” 0.1 ounces per square foot minimum thickness.
         2. Hot Dipped Galvanized after Fabrication: ASTM A153-B2 “Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware” 1.5 ounces per square foot minimum thickness.

[Specifier Notes] – Ladder type joint reinforcement is set within the horizontal joints of the structural CMU components of the ICMU.

* + 1. Joint Reinforcement, Ladder or Truss Type: Prefabricated wire ladder type joint reinforcement consisting of [**2**] [**3**] [**4**] longitudinal rods with cross rods equally spaced, at a maximum of 16 inches on center, to avoid obstructing masonry unit cells.
       1. Ladder Width: [Depth of structural CMU backup component of ICMU] <insert dimension>.
       2. Wire Material: Provide wire made of [**one** **of**] the following [**material**] [**materials**]:
          1. Cold-drawn steel wire conforming to ASTM A106 “Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.”

[Specifier Notes] – Typically delete the stainless steel subparagraph below unless potential corrosion of galvanized steel is a concern. Type 316 stainless steel has a higher resistance to corrosion than Type 304. Type 316 stainless steel is typically used in environments that are highly corrosive to steel, such as coastal shorelines where the atmosphere has a high salt content.

* + - * 1. Stainless steel wire conforming to ASTM A580 “Standard Specification for Stainless Steel Wire,” - AISI Type [**304**] [**316**].

[Specifier Notes] – Ladders composed of 0.148 inch longitudinal rod and cross rods are considered standard. Combine 0.187 inch longitudinal rods with 0.148 inch cross rods for heavy duty reinforcement and 0.187 inch longitudinal rod and cross rods for extra heavy duty reinforcement.

* + - 1. Longitudinal Rod Diameter: [**0.148 inch**] [**0.187 inch**] minimum.

[Specifier Notes] – Cross rods can be the same diameter as the longitudinal rods, but ladders are typically made with cross rods that are thicker than the longitudinal rods. Confirm configuration availability with joint reinforcement manufacture.

* + - 1. Cross Rod Diameter: [**0.148 inch**] [**0.187 inch**] minimum.

[Specifier Notes] – Delete the wire finish subparagraph below if only stainless steel reinforcing bar positioners are allowed.

* + - 1. Wire Finish: Galvanized according to [**one** **of**] the following [**method**] [**methods**]:
         1. Mill Galvanized: ASTM A641 “Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire” 0.1 ounces per square foot minimum thickness.
         2. Hot Dipped Galvanized after Fabrication: ASTM A153-B2 “Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware” 1.5 ounces per square foot minimum thickness.

[Specifier Notes] – Single wire type joint reinforcement is set within the horizontal joints of the non-structural thin veneer components of the ICMU.

* + 1. Joint Reinforcement, Single Wire (Pencil Wire) Type:
       1. Wire Material: Provide wire made of [**one** **of**] the following [**material**] [**materials**]:
          1. Cold-drawn steel wire conforming to ASTM A106 “Standard Specification for Seamless Carbon Steel Pipe for High-Temperature Service.”

[Specifier Notes] – Typically delete the stainless steel subparagraph below unless potential corrosion of galvanized steel is a concern. Type 316 stainless steel has a higher resistance to corrosion than Type 304. Type 316 stainless steel is typically used in environments that are highly corrosive to steel, such as coastal shorelines where the atmosphere has a high salt content.

* + - * 1. Stainless steel wire conforming to ASTM A580 “Standard Specification for Stainless Steel Wire,” - AISI Type [**304**] [**316**].
      1. Wire Diameter: [**0.148 inch**] [**0.187 inch**] minimum.

[Specifier Notes] – Delete the wire finish subparagraph below if only stainless steel reinforcing bar positioners are allowed.

* + - 1. Wire Finish: Galvanized according to [**one** **of**] the following [**method**] [**methods**]:
         1. Mill Galvanized: ASTM A641 “Standard Specification for Zinc–Coated (Galvanized) Carbon Steel Wire” 0.1 ounces per square foot minimum thickness.
         2. Hot Dipped Galvanized after Fabrication: ASTM A153-B2 “Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware” 1.5 ounces per square foot minimum thickness.
  1. ACCESSORIES
     1. Field Applied, Water Repellant: Clear, [**water-based,**] [**solvent-based,**] penetrating water repellent for concrete and masonry.

[Specifier Notes] – Retain the Product subparagraph below if specific water repellant products are required. Otherwise, delete this subparagraph to allow the Contractor to select the waterproofing product.

If retaining the Product subparagraph below, consult with an Oldcastle representative to determine list of recommended and compatible water repellant products.

* + - 1. Product: Subject to compliance with requirements and approval of the ICMU manufacturer, provide one of the following products:
         1. <Insert name of waterproofing product and name of manufacturer>.

[Specifier Notes] – Retain the Flashing paragraph immediately below even when other flashing materials are specified elsewhere. Flexible flashing or metal flashing in addition to the flashing and weeps specified below will be required to provide a complete flashing system.

* + 1. Prefabricated Flashing and Weeps:
       1. Product: Subject to compliance with requirements, provide “BlockFlash™” as manufactured by Mortar Net Solutions™.
       2. Flashing Material: Provide prefabricated flashing pans made from recycled polypropylene, chemically stabilized to inhibit degradation by ultraviolet radiation.
       3. Flashing Configuration: Embeddable flashing device for exterior CMU construction with built-in slope to direct moisture to integrated weeps and prefabricated flashing manufacturer’s attached drainage mats and 1 inch extended insect guards.
       4. Coordinate the flashing and weeps specified in the section with other flashing specified in Section [**042000** **“Unit** **Masonry”**] [**042200** **“Concrete** **Unit** **Masonry”**] [**042613** “**Masonry** **Veneer”**] [**076200** **“Sheet** **Metal** **Flashing** **and** **Trim”**] <**Insert** **Section** **Number** **and** **Section** **Title** **of** **appropriate** **Section**>.

[Specifier Notes] – Retain the Flashing paragraph immediately below if flashing is specified in another section and delete the Flexible Flashing paragraph below. Otherwise, delete this paragraph. Typically metal flashings are specified in 076200 “Sheet Metal Flashing and Trim” rather than a masonry section.

* + 1. Flashing: Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Masonry”] [042613 “Masonry Veneer”] [076200 “Sheet Metal Flashing and Trim”] <Insert Section Number and Section Title of appropriate Section>.

[Specifier Notes] – Retain the Flexible Flashing paragraph immediately below if flashing is specified in this section. Otherwise, delete this paragraph.

* + 1. Flexible Flashing: Provide [**one** **of**] the following flashing [**material**] [**materials**]:

[Specifier Notes] – Retain one or more of the following flexible flashing materials.

* + - 1. Butyl Rubber Flashing: [**0.030 inch**] [**0.040 inch**] thick membrane consisting of a flexible, rubberized asphalt adhesive bonded to a high-density, cross-laminated polyethylene film.
      2. Copper Foil Flashing: [5-oz./sq. ft.] [7-oz./sq. ft.] copper foil [laminated between 2 layers of fiber glass cloth] [coated with flexible asphalt].
      3. EPDM Flashing: EPDM membrane, complying with ASTM D4637 “Standard Specification for EPDM Sheet Used In Single-Ply Roof Membrane,”, 0.045 inch thick.
      4. Rubberized Asphalt Flashing: 0.040 inch thick membrane consisting of a 0.032 inch thick self-adhered rubberized asphalt laminated to an 0.008 inch thick, high density, polyethylene film with release liner to prevent product from sticking to itself.
      5. Thermoplastic Vinyl Flashing: 0.040 inch thick thermoplastic vinyl membrane with UV stabilizers, self-adhered rubberized asphalt, and release liner to prevent product from sticking to itself.
    1. Weeps: Free-draining [UV stabilized, open weave, polyester mesh] [UV stabilized, corrugated plastic vent] inserts for open head joints of masonry walls.
       1. Do not install cotton chord drainage.
       2. Color: As indicated on the Drawings As selected by the Architect from the manufacturer’s full range of standard colors
    2. Joint Sealants: Non-staining silicone sealant as specified in Section 079200 “Joint Sealants.”
    3. Sealant Backer Rods: As specified in Section 079200 “Joint Sealants.”
       1. Width and Thickness: As indicated on Drawings.

[Specifier Notes] – Retain the paragraph immediately below if there are any control joints in the masonry work. Otherwise, delete this paragraph.

* + 1. Masonry Control Joint Gasket: Provide preformed gasket strips designed to fit standard sash block and to maintain lateral stability in masonry walls, made of [**one** **of**] the following [**material**] [**materials**]:
       1. Styrene-butadiene rubber compound, complying with ASTM D 2000 “Standard Classification System for Rubber Products in Automotive Applications”, Designation M2AA-805.
       2. PVC, complying with ASTM D 2287 “Standard Specification for Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds”, Type PVC-65406.
  1. MASONRY CLEANER
     1. Proprietary Acidic Cleaner: Standard strength cleaner designed to remove mortar and grout stains, efflorescence, and other construction related stains without discoloring and without damaging masonry and mortar surfaces and as approved by ICMU manufacturer.
        1. Acidic Cleaner Product per Manufacturers Recommendation: Subject to compliance with requirements, provide one of the following [**or** **comparable** **product** **by** **another** **manufacturer**]:

[Specifier Notes] – Contact Oldcastle representative for specific product recommendations.

* + - * 1. <Insert name of product and manufacturer>.

1. EXECUTION
   1. EXAMINATION
      1. Verification of Conditions: Examine in place construction, with mason present, to evaluate and verify the following:
         1. That substrates to receive masonry work are within specified dimensional tolerances.
         2. That substrates to receive masonry work are clean and have no conditions that would weaken bonding of mortar.
         3. That steel reinforcing is the specified size and in the required location.
      2. Correct unacceptable conditions before beginning installation.
   2. PREPARATION
      1. Prepare masonry and set reinforcement prior to grouting according to the recommendations of NCMA TEK 3-2A, “Grouting Concrete Masonry Walls.”
   3. INSTALLATION OF [DECORATIVE] ICMUs
      1. General:
         1. Comply with written recommendation of ICMU manufacturer.
         2. Do not install wet ICMUs.
         3. Brace walls under construction according to the recommendations of NCMA TEK 3-4B, “Bracing Masonry Walls During Construction.”
      2. Layout: Comply with requirements of NCMA TEK 3-8A, “Concrete Masonry Construction.”

[Specifier Notes] – Delete the subparagraph below if all ICMU have integral water repellant.

* + - 1. Set first course of [**decorative**] ICMU using units with integral water repellant.
    1. Bond Pattern: Lay ICMUs in [a running bond pattern] [a stacked bond pattern] [[a pattern] [the patterns] indicated on Drawings] <insert bond pattern>.
    2. Tolerances: Comply with requirements of NCMA TEK 3-8A, “Concrete Masonry Construction.”
    3. Setting in Mortar: Comply with recommendations of NCMA TEK 3-1C through TEK 3-14 as applicable to the type of masonry construction and project conditions.

[Specifier Notes] – Insultech’s stainless steel “Bridge tool” is an essential device required to set ICMUs accurately, cleanly, and properly. Consult Oldcastle representative for additional information about this tool and its use.

* + - 1. ICMU manufacturer’s stainless-steel “Bridge tool” is mandatory to install mortar at a uniform 3/4 inch joint thickness with an inside mortar cant to prevent interior mortar roll in during mortar compression as part of the unit installation and to maintain the drainage channels.
      2. Take measures to minimize mortar droppings.
    1. Grouting of Cores: Place grout in cells of [**decorative**] ICMUs according to the recommendation of NCMA TEK 3-2A “Grouting Concrete Masonry Walls.”
    2. Control and Expansion Joints: Unless otherwise indicated on Drawings, locate and install control and expansion joints according to one of the following standards:
       1. NCMA TEK 10-2C “Control Joints for Concrete Masonry Walls - Empirical Method.”
       2. NCMA TEK 10-3 “Control Joints for Concrete Masonry Walls - Alternative Engineered Method.”

[Specifier Notes] – Base course ICMUs of exterior walls should always include the application of water repellant to protect ICMU from stains due to mud splatter during construction.

* + 1. Application of Water Repellant: Apply water repellant over [**exterior surface ICMU base course**] [**entire exterior ICMU surface**] according to water repellant manufacturer’s written recommendations.
  1. INSTALLATION OF LINTELS

[Specifier Notes] – Retain the paragraph immediately below if lintel installation is specified in another section and delete the remaining paragraphs of the Installation of Lintels article. Otherwise, delete this paragraph.

* + 1. Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Masonry”] <Insert Section Number and Section Title of appropriate Section>.
    2. Concrete Masonry Lintels: Install CMU lintels where indicated on Drawings.
       1. Provide a minimum of [**8 inches**] <**Insert** **Section** **length**> of bearing on each side of masonry opening, unless otherwise indicated on Drawings.
       2. Temporary Bracing: Provide temporary bracing until grout has cured sufficiently to support applied loads, but not less than 7 days.
       3. Reinforcing: Install reinforcing as indicated on Drawings, but not less than recommended in NCMA TEK 17-1D “ASD of CM Lintels Based on 2012 IBC/2011MSJC.”
    3. Steel Angle Lintels: Install steel angle lintels where indicated on Drawings.
       1. Provide a minimum of [**8 inches**] <**Insert** **Section** **length**> of bearing on each side of masonry opening, unless otherwise indicated on Drawings.
       2. Coordinate with Section 055000 “Metal Fabrications.”
  1. INSTALLATION OF FLASHING
     1. Prefabricated Flashing and Weeps: Install prefabricated flashing and weep units at base course, at bond beams, at lintels, and other horizontal locations where ICMU cores are grouted solid.
        1. Install prefabricated flashing and weep units according to manufacturer’s written instructions.
        2. Coordinate installation of prefabricated flashing and weep units with installation of other flashing work.

[Specifier Notes] – Retain the paragraph immediately below if flashing and flashing installation is specified in another section and delete the Flexible Flashing article below. Otherwise, delete this paragraph.

* + 1. Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Masonry”] [042613 “Masonry Veneer”] [076200 “Sheet Metal Flashing and Trim”] <Insert Section Number and Section Title of appropriate Section>.

[Specifier Notes] – Only retain the paragraph immediately below if flashing is not specified in another section. Otherwise delete this paragraph.

* + 1. Flexible Flashing: Locate and install flexible flashing according to the recommendations of the following standards:
       1. NCMA TEK 19-4A “Flashing Strategies for Concrete Masonry Walls.”
       2. NCMA TEK 19-5A “Flashing Details for Concrete Masonry Walls.”
    2. Weeps: Install weeps at the head joints of the non-structural thin veneer of the [**decorative**] ICMUs directly above flashing.
       1. Space weeps no more than 16 inches o.c. horizontally.
  1. REINFORCED [DECORATIVE] ICMUs

[Specifier Notes] – Retain the paragraph immediately below if steel reinforcing of masonry is specified in another section and delete the remaining paragraphs of the Reinforced ICMUs article. Otherwise, delete this paragraph.

* + 1. Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Comply with requirements of Section [042000 “Unit Masonry”] [042200 “Concrete Unit Masonry”] <Insert Section Number and Section Title of appropriate Section>.
    2. Install reinforcing in masonry construction according to the following standards:
       1. NCMA TEK 12-1B “Anchors and Ties for Masonry.”
       2. NCMA TEK 12-2B “Joint Reinforcement for Concrete Masonry.”
       3. NCMA TEK 12-3C “Design of Anchor Bolts Embedded in Conc. Masonry.”
       4. NCMA TEK 12-4D “Steel Reinforcement for Concrete Masonry.”
       5. NCMA TEK 12-5 “Fasteners for Concrete Masonry.”
       6. NCMA TEK 12-6 “Splices, Development & Standard Hooks for CM.”
       7. NCMA TEK 12-6A “Splices, Development and Standard Hooks for CM Based on the 2009 & 2012 IBC.”
    3. Ladder Type Joint Reinforcement: Set within the horizontal joints of the structural CMU components of the ICMU at a minimum of 16 inches on center vertical, unless otherwise indicated.
    4. Single Wire (Pencil Wire) Type Joint Reinforcement: Set within the horizontal joints of the non-structural thin veneer components of the ICMU at a minimum of 16 inches on center vertical, unless otherwise indicated.
  1. CLEANING
     1. Progress Cleaning: Comply with cleaning during construction recommendations of NCMA TEK 8-4A “Cleaning Concrete Masonry.”
        1. Remove mortar droppings which adhere to exposed faces of masonry units with a trowel or chisel after mortar has hardened.
        2. Remove remaining mortar with stiff fiber or bristle brush.
        3. Remove grout spills immediately by washing and brushing.
     2. Final Cleaning: Perform final cleaning according to ICMU manufacturer’s recommendations.

END OF SECTION