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## **SECTION 03130**

### **INSULATING CONCRETE FORMS**

#### **PART 1 GENERAL**

##### **1.01 OVERVIEW**

- A. Work shall be conducted in accordance with Division 1 and requirements of this section.
- B. Installation of Celblox<sup>®</sup> Insulated Concrete Forms for cast-in-place concrete walls and installation of steel reinforcing bars and the placement of concrete into the forms.
- C. Adequate bracing and work shall be provided by the installing Contractor to comply with all applicable codes.

##### **1.02 SCOPE OF WORK**

- A. Qualified installer to provide labor, materials, tools, and temporary bracing to accomplish the installation of the Celblox<sup>®</sup> insulating concrete forms manufactured by Celblox, LLC 1405 Laukant St., Reedsburg, WI 53959

##### **1.03 ITEMS INSTALLED PER SPECIFICATION**

- 1. Utility penetration
- 2. Door and window bucks
- 3. Concrete
- 4. Hold-downs
- 5. Rebar
- 6. Hangers, insert devices, sleeves, bolts
- 7. Drainage system
- 8. Footings
- 9. Water proofing
- 10. Post pads
- 11. Beam pockets
- 12. Bracing

##### **1.04 RELATED SECTIONS**

- 1. Section 01500 Temporary Facility and Controls
- 2. Section 03050 Basic Concrete Materials and Methods
- 3. Section 03100 Concrete Forming and Accessories
- 4. Section 03200 Concrete Reinforcement
- 5. Section 03300 Cast-in-Place Concrete
- 6. Section 03400 Pre-Cast Concrete
- 7. Section 04000 Masonry

8. Section 05000 Metals
9. Section 06000 Woods and Plastics
10. Section 07100 Damp-proofing and Waterproofing
11. Section 07130 Modified Bituminous Sheet Waterproofing
12. Section 07240 Exterior Insulation and Finish System
13. Section 07460 Siding
14. Section 07600 Flashing and Sheet Metal
15. Section 08000 Doors and Windows
16. Section 09200 Plaster and Gypsum Board
17. Section 09700 Wall Finishes

## 1.05 APPLICABLE SPECIFICATIONS, CODES AND STANDARDS

### A. ASTM Standards

1. **ASTM C578** Standard Specification for Preformed Cellular Thermal Insulation.
2. **ASTM C203** Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
3. **ASTM C272** Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.
4. **ASTM C303** Standard Test Method for Density of Preformed Block-Type Thermal Insulation.
5. **ASTM C518** Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
6. **ASTM D1037-99** Test Method for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
7. **ASTM D1621** Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
8. **ASTM E84** Standard Test Method for Surface Burning Characteristics of Building Materials.
9. **ASTM E90** Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
10. **ASTM E96** Standard Test Methods for Water Vapor Transmission of Materials.
11. **ASTM E119** Standard Test Methods for Fire Tests of Building Construction and Materials.
12. **NFPA 251** Standard Methods of Tests of Fire Resistance of Building Construction and Material.
13. **ISO 9000** Quality System: Plastic Ties and Webs

### B. Uniform Building Code

1. **UBC 26-3** Standard Room Fire Test.

### C. International Code Council

1. International Building Code 2005 **ICCES ESR #1525** for Celblox<sup>®</sup> Insulating Concrete Forms.

- D. Wisconsin Safety and Buildings Division  
1. Wisconsin Building Product Evaluation **200710-I**.

#### 1.06 DEFINITIONS

1. EPS- Acronym for “Expanded Polystyrene” when referencing the insulating foam component of the Celblox® Insulated Concrete Form.
2. ICF- Acronym for “Insulated Concrete Form”
3. Celblox® Trained Installer- An installation contractor, who has received instructional training in the installation of Celblox ICF® Administered by the manufacturer Celblox, LLC.
4. Technical Associate- A technical representative, usually a staff member of a distribution firm, who has received instructional training in the installation of Celblox ICF’S (as administered by Celbox, LLC) and is in the capacity of supervising an installation crew on site.
5. Window or Door Opening Buck- a pre-manufactured or site constructed frame assembly consisting of wood or plastic material (or combination thereof) used to frame a rough opening within the forming system which will retain concrete around the opening. The frame can also provide for subsequent anchorage of doors and windows within the wall assembly.

#### 1.07 SYSTEM DESCRIPTION

1. Celblox® Insulated Concrete Forms consist of two opposing foam panels, each 16” high x 48” length x 2 ½” thick made of EPS (expanded polystyrene). The panels are connected by plastic “ties” so as to maintain an open cavity within which to pour the concrete.
2. The foam panels are pre-assembled at the factory in standard cavity widths to accommodate a poured wall thickness of 4” through 12”, in 2” increments.
3. Plastic webs, 1 ½” wide, embedded vertically in the walls of the foam provide full coverage the width of the blox every 8 inches on center for interior and exterior treatments.
4. All form units shall be capable of being shipped to site in folded condition to minimize shipping cost and site storage space requirements and be capable of being opened to installation ready condition.
5. Wall system to provide accurate positioning of steel within form cavity to conform to reinforcing requirements of ACI 318.
6. EPS foam panels with concrete to provide minimum insulation level of R23 across full line of form unit cavity widths.
7. EPS foam to provide maximum vapor permeation of 3.5 Perm-in.

#### 1.08 QUALITY ASSURANCE

1. Installer Qualifications: Minimum of three (3) years experience with general concrete forming.
2. Manufacturer Qualifications: Twenty (20) years experience manufacturing ICF's.
3. Pre-installation Meeting: Minimum one week prior to start of work as described in this document; attendees to include the manufacturer's representative, and the general contractor and foreman. Discuss following issues:
  - a) Scheduling and coordination of work and trades.
  - b) Environmental condition and site readiness.
  - c) Site access issues.
  - d) Trained Installer/Technical Associate shall furnish proof of training.
  - e) Documentation to Contractor prior to commencement of work under this section.
  - f) Site Mock-up: If required, construct sample wall mock-up panel to include full wall system and details located where directed by Consultant. Panel may form part of finished work if approved by Consultant.

#### 1.06 PRODUCT DELIVERY, STORAGE and HANDLING

1. Product delivered in factory packaging, unopened, undamaged, with identification labels intact.
2. Trained installer shall furnish product labeling to the General Contractor as required to maintain traceability of the product throughout the duration of the warranty.
3. Store and handle product in a specific location to prevent damage, impact damage or soiling.

#### 1.07 Submittals

1. Manufacture's literature describing products.
2. Installation manual.
3. When requested, provide manufacture's ICC report.
4. Steel Reinforcement per Architect's drawings
5. Concrete mix and specifications per Architect's drawings.
6. Engineering calculations per Architect's drawings.
7. Window and door schedule per engineer's specifications.

**PART 2 PRODUCTS**

**2.01 MANUFACTURE OF FORMS**

CelBlox, LLC  
1405 Laukant S t.  
Reedsburg, WI 53959  
Tel. 608-630-2205  
Fax 608-524-2362  
[www.celblox.com](http://www.celblox.com)

**2.02 MATERIALS**

A. Permanent Insulating Concrete Forming System made of Expanded Polystyrene (EPS) to comply with ASTM C-578 specifications:

- 1. Thermal Resistance ASTM C518-91
- 2. Compressive Resistance ASTM D1621
- 3. Water Vapor Permeability ASTM E96
- 4. Water Absorption ASTM C272
- 5. Flame Spread and Smoke Development ASTM E84
- 6. Flexural Strength ASTM C203-99
- 7. Fire Resistance rating of 4" wall finished: 2 Hours
- 8. Fire Resistance rating of 6" wall finished: 2 Hours
- 9. Fire Resistance rating of 8" wall finished: 4 hours
- 10. Test Method for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials (Screw withdrawal and lateral resistance tests) ASTM D1037-99

Distance from Edge of Sample (inches)	Section 61 Screw Withdrawals (Mean lbf)	Section 41 Lateral Resistance Test (Mean lbf)	
		Pulled Parallel to Axis Of Web	Pulled Perpendicular to Axis of Web
.25	177	231	169
.375	191	297	221
.5	212	353	289
.75	236	438	349

**2.03 MANUFACTURED COMPONENTS**

A. Proprietary System Components of Expanded Polystyrene (EPS).

- 1. Standard Block ,
  - a. Size: 4", 6", 8", 10", 12" cavity width for concrete.
  - b. 16" height x 48" length x 2 1/2" thick

<b>Standard CELBLOX®</b>	<b>4” Cavity</b>	<b>6” Cavity</b>	<b>8” Cavity</b>	<b>10” Cavity</b>	<b>12” Cavity</b>
<b>Concrete Thickness</b>	4”	6”	8”	10”	12”
<b>Concrete Volume</b>	.066 yd <sup>3</sup>	.099 yd <sup>3</sup>	.132 yd <sup>3</sup>	.165 yd <sup>3</sup>	.198 yd <sup>3</sup>
<b>EPS thickness (total)</b>	5 inches	5 inches	5 inches	5 inches	5 inches
<b>Wall Surface Area</b>	5.3 ft <sup>2</sup>	5.3 ft <sup>2</sup>	5.3 ft <sup>2</sup>	5.3 ft <sup>2</sup>	5.3 ft <sup>2</sup>

2. 45 Degree Corner Block
  - a. Size: 4”, 6”, 8”, 10”, 12” cavity width for concrete.
3. Brick Ledge Panel
  - a. Size: 4”, 6”, 8”, 10”, 12”
  - b. 16” height x 48” length x 2 ½” thick
4. 90 Degree Corner Block
  - a. Size: 4”, 6”, 8”, 10”, 12” cavity width for concrete.
5. Taper Top
  - a. Size: 4”, 6”, 8”, 10”, 12” cavity width for concrete.
  - b. 16” height x 48” length x 2 ½” thick

### **PART 3 EXECUTION / INSTALLATION**

#### **3.01 MANUFACTURER’S INSTRUCTIONS**

- A. Install the EPS forms in accordance with instructions and recommendations from CELBLOX, LLC.

#### **3.02 INSPECTION**

- A. Verification of Conditions at the site: Verify layout matches all locations indicated on the plans.
- B. Verify footing layout conform to final drawings and are within ¼” of level and square.
- C. Walls below and above grade shall maintain a tolerance of ¼” plumb and ¼” square to plan layout.
- D. Contractor shall verify that any anchorages or inserts are within tolerance and are correct.
- E. All window and door bucks are within ¼” of square of the rough opening requirements.
- F. Wall bracing systems shall be spaced no less than 4’ and no more than 5’ while using Celblox ICF’S.

#### **3.03 CONSTRUCTION**

- A. General
  1. Erect EPS forms plumb, square and level.
  2. Install windows and door bucks as specified.
  3. Install shoring and bracing to achieve design requirements.
  4. Properly reinforce all cuts and weak spots.

5. Install vertical and horizontal reinforcing bars as specified.
6. Install and tie all reinforcing bars such that concrete will fully surround all bars during the pour.
7. Place all anchor bolts and straps as specified.
8. Install sleeve penetrations as specified (e.g. – conduit, water pipes, air supplies, exhaust ducts, etc.)
9. Cut chases for plumbing and electrical indicated by the appropriate trade.
10. Penetrations exceeding 12" by 12" shall be reinforced.
11. Within the 30 minute period after the pour, adjust all bracing turnbuckles to bring the walls into plumb.

B. Interface with other work.

1. Create point load areas for girders, beams and trusses as indicated on the structural plans.
2. Install connections for floor joists and/or rim joists as specified.
3. Create transitions for brick facing with EPS Brickledge forms.

C. Protection.

1. Deliver product in the original factory packaging, bearing the product identification numbers and the manufacturer.
2. All materials and work shall be adequately protected by the erector at all times.
3. Provide temporary cover for insulating forms so as to prevent exposure to UV light if the application of surface finish will be delayed beyond 45 days.
4. Any material in contact with the ICF forms must be compatible with the expanded polystyrene.

3.04 CLEANING

- A. Clean formed cavities of debris prior to pouring concrete.

**END OF SECTION**