

PERMANENT FORMS 03130
ECO-Block, LLC

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This Architectural Specification utilizes the Construction Specifications Institute (CSI) *Manual of Practice*, including *MasterFormat*®, *Section Format*® and *Page Format*®. This Architectural Specification is a manufacturer-specific proprietary product specification using the proprietary method of specifying applicable to project specifications and master guide specifications. Optional text is indicated by brackets []; delete optional text in final copy of specification. Specifier Notes typically precede specification text; delete notes in final copy of specification.

Trade/brand names with appropriate symbols typically are used in Specifier Notes; symbols are not used in specification text. Metric conversion, where used, is soft metric conversion.

This Architectural Specification specifies the ECO-Block® Insulating Concrete Forming System. This system is manufactured by ECO-Block, LLC. Revise the Architectural Specification section number and title below to suit project requirements, specification practices and section content. Refer to CSI *MasterFormat* for other section numbers and titles.

SECTION 03130
PERMANENT FORMS
(PERMANENT INSULATING CONCRETE FORMING SYSTEM)

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Permanent Insulating Concrete Forming System.

Specifier Note: Revise paragraph below to suit project requirements. If a reader of this section could reasonably expect to find a product or component specified in this section, but it is actually specified elsewhere, then the related section number(s) should be listed in the paragraph below. Add section numbers and titles per CSI *MasterFormat* and specifiers practice. In the absence of related sections, delete paragraph below.

B. Related Sections:

1. Division 3 Sections: Cast-In-Place Concrete.
2. Division 3 Sections: Precast Concrete.
3. Division 3 Sections: Tilt-Up Precast Concrete.

Specifier Note: Article below may be omitted when specifying manufacturer's proprietary products and recommended installation. Retain Reference Article when specifying products and installation by an industry reference standard. If retained, list standard(s) referenced in this section. Indicate issuing authority name, acronym, standard designation and title. Establish policy for indicating edition date of standard referenced. Conditions of the Contract or Division 1 References Section may establish the edition date of standards. This article does not require compliance with standard, but is merely a listing of references used. Article below should list only those industry standards referenced in this section.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):

1. ASTM C203 Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.
2. ASTM C272 Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.
3. ASTM C303 Standard Test Method for Density of Preformed Block-Type Thermal Insulation.
4. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.

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5. ASTM D635 Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
6. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
7. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
8. ASTM D1761 Standard Test Method for Mechanical Fasteners in Wood
9. ASTM D1929 Standard Test Method for Determining Ignition Temperature of Plastics.
10. ASTM D2126 Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
11. ASTM E90 Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
12. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials.
13. ASTM E283 Standard Test Method for Determining Rate of Air Leakage through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
14. ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.

B. National Standards Of Canada (CAN_):

1. ULC S101 Fire Endurance Tests of Building Construction and Materials.
2. ULC S102.2 Standard Test Method for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials and Assemblies.
3. ULC S701 Standard for Thermal Insulation, Polystyrene Boards and Pipe Covering
4. CSA A23.3 Design of Concrete Structures
5. CSA A23.1 Concrete Materials and Methods of Concrete Construction

C. National Building Code of Canada (NBCC 1995):

1. Canadian Construction Materials Center (CCMC): Report #12966-R
2. Ontario Building Code (OBC 1997):
 - a. Ontario Ministers Ruling #04-12-116
 - b. Building Code Commission (BCC): BCC Ruling #04-51-1006 for Compliance To OBC 1997 Section 3.2.3.7.(1):
3. New Brunswick Fire Marshal: Fire Prevention Act Regulation 82-20: File #3955

D. Intertek Testing Services/Warnock Hersey (ITS)

1. Fire Resistance Ratings - Intertek Directory of Listed Products: Design #ECO/WA 240-01

Specifier Note: Article below should be restricted to statements describing design or performance requirements and functional (not dimensional) tolerances of a complete system. Omit descriptions to composite and operational properties to extent necessary to link multiple components of a system and to interface with other systems.

1.03 SYSTEM DESCRIPTION

A. Design Requirements: [Specify design requirements.].

B. Performance Requirements: Provide a Permanent Insulating Concrete Forming System which has been manufactured, fabricated and installed accordance with the following criteria:

1. Fire Endurance Tests of Building Construction & Materials (CAN/ULC S101):
 - a. ECO-Block ICF Concrete Wall; ITS Directory Listing Design #ECO/WA 240-01
2. Air Penetration (ASTM E283): < 0.01 cfm/ft² ((<0.003 m²/min)/m²)
3. Water Penetration (ASTM E331): no leakage visible with 8" (200 mm) rain per hour for 2 hour duration and a Water Transmission Pressure differential of 15 psf (715 Pa)
4. Sound Transmission Classification (ASTM E90): 51 when ½" gypsum applied to one side only and a 6" concrete core utilized.

Specifier Note: Article below includes submittal of relevant data to be furnished by Contractor either before, during or after construction. Coordinate this article with Architect's and Contractor's duties and responsibilities in Conditions of the Contract and Division 1 Submittal Procedures Section.

1.04 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures Section.

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- B. Product Data: Submit manufacturer's product data and installation instructions.
- C. Shop Drawings: Show locations of form types and applicable structural details.
- D. Samples: Provide selection and verification samples.
- E. Quality Assurance/Control Submittals: Submit the following:
 - 1. Test Reports: When requested, provide test data in support of performance and product requirements specified.
 - 2. Certificates: Submit certifications specified in this section.

Specifier Note: Article below should include prerequisites, standards, limitations and criteria which establish an overall level of quality for products and workmanship for this section. Coordinate article below with Division 1 Quality Assurance Section.

1.05 QUALITY ASSURANCE

Specifier Note: Paragraph below should list obligations for compliance with specific code requirements particular to this section.

General statements to comply with a particular code are typically addressed in Conditions of the Contract and Division 1 Regulatory Requirements Section. Repetitive statements should be avoided.

- A. Installer Qualifications: Installer having demonstrated experience with work of scope and scale comparable to the project.
- B. Regulatory Requirements and Approvals: Comply with the requirements of the following code criteria:
 - 1. [National Building Code of Canada] [Specify code body]
 - a. CCMC Report #12966-R [Specify code report number]
 - b. Ontario Ministers Ruling#04-12-116 [Specify ruling number]
 - c. BCC Ruling #04-51-1006 – Compliance To OBC Section 3.2.3.7. (1) [Specify ruling number]
 - d. New Brunswick Fire Marshal: Fire Prevention Act Regulation 82-20: File #3955 [Specify file number]
 - e. Intertek Directory of Listed Products: Design #ECO/WA 240-01 [Specify design number]

C. Certifications: Manufacturer's signed certification that product complies with the requirements of this section.

Specifier Note: Retain paragraph below if a pre-installation meeting is required.

D. Pre-installation Meetings: [Specify requirements.].

Specifier Note: Article below should include special and unique requirements. Coordinate article below with Division 1 Product Requirements Section.

1.06 DELIVERY, STORAGE & HANDLING

- A. General: Comply with Division 1 Product Requirement Section.
- B. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Storage and Protection: Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
 - 1. Do not store bagged blocks or accessories in direct contact with the ground.
 - 2. Materials stored on site shall be wrapped in minimum 6 month UV protected packaging.

Specifier Note: Retain, edit or delete article below to suit project and specifier practice.

1.07 PROJECT/SITE CONDITIONS

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A. Environmental Requirements: [Specify environmental requirements.].

B. Existing Conditions: [Specify requirements due to existing conditions.].

Specifier Note: Coordinate article below with Conditions of the Contract and with Division 1 Closeout Submittals (Warranty) Section.

1.08 WARRANTY

A. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.

PART 2 PRODUCTS

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

2.01 PERMANENT INSULATING CONCRETE FORMING SYSTEM

Specifier Note: Paragraph below is an addition to CSI *Section Format* and a supplement to this Architectural Specification. Retain or delete paragraph below per project requirements and specifiers practice.

A. Manufacturer: ECO-Block, LLC.

1. Contact: 10 Pacific Court, Suite #6, London, Ontario, Canada N5V 3K4
Phone: (800) 479-1066 Phone: (519) 659-2000 Fax: (519) 659-2220
E-mail: info@eco-block.com; website: www.eco-block.com.

B. Proprietary Products/Systems. Permanent Insulating Concrete Forming System, including the following:

Specifier Note: Connector size determines wall thickness, available sizes include [4" (102 mm)] [6" (152 mm)] [8" (203 mm)] [10" (254 mm)], Greater core thicknesses are achieved by using the connector splice to connect 2 or more connectors together.

1. ECO-Block Insulating Concrete Form Standard Panels:

- a. Material: Expanded Polystyrene (EPS).
- b. Dimensions (Straight Panel): 48" x 16" x 2.5" (1219 x 406 x 63.5 mm).
- c. Thermal Resistance {R/inch} (ASTM C518): 4.193 ft²•hr•°F/Btu•in ; (0.605 K•m/W).
- d. Flame Spread Index (CAN/ULC S102.2): 200
- e. Smoke Development Index (CAN/ULC S102.2): +500
- f. Dimensional Stability (ASTM D2126): -0.40%.
- g. Flexural Strength (ASTM C203): 40.0 psi minimum (276 kPa).
- h. Compressive Strength (ASTM D1621): 15.0 psi (104 kPa).
- i. Density (ASTM C1622): 1.45 to 1.60 pcf (23.2 to 25.6 kg/m³).
- j. Water Vapor Permeance (ASTM E96) [Full Thickness]: 0.36 perms (20.7 ng/(Pa•s•m²)).
- K. Water Absorption (ASTM C272): 2.1%.
- l. Self-Ignition Temperature (ASTM D1929): 860°F (460°C).

2. ECO-Block Insulating Concrete Form Web Material:

- a. Material: Polypropylene (PP)
- b. Self-Ignition Temperature (ASTM D1929): 644°F (340°C).
- c. Rate of Burning (ASTM D635): 0.56"/min (1.43 cm/min)
- d. Fastener Shear (ASTM D1761):
[Fastener installed into Web must penetrate minimum ¼" (6 mm) through Web]
- i. #10 Wood Screw - Ultimate Lateral Shear Strength: 359.5 lbs (1.6 kN)
- Design Lateral Shear Strength: 112.3 lbs (0.5 kN)
- ii. #6 Drywall Screw - Ultimate Lateral Shear Strength: 191.3 lbs (0.85 kN)
- Design Lateral Shear Strength: 71.2 lbs (0.317 kN)
- e. Fastener Withdrawal (ASTM D1761):
[Fastener installed into Web must penetrate minimum ¼" (6 mm) through Web]
- i. #10 Wood Screw - Ultimate Withdrawal Strength: 199 lbs (0.885 kN)

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- ii. #6 Drywall Screw
 - Design Withdrawal Strength: 39.8 lbs (0.177 kN)
 - Ultimate Withdrawal Strength: 155.8 lbs (0.693 kN)
 - Design Withdrawal Strength: 31.2 lbs (0.139 kN)

Specifier Note: Edit Article below to suit project requirements. If substitutions are permitted, edit text below. Add text to refer to Division 1 Project Requirements (Product Substitutions Procedures) Section.

2.02 PRODUCT SUBSTITUTIONS

A. Substitutions:

1. Only materials meeting the requirements of Part 2.01 B. are permitted.
2. Only materials meeting the requirements of Part 1.06 C. (2) are permitted.
3. Only materials meeting the requirements of Part 1.03 B. are permitted.

2.03 ACCESSORY MATERIALS

A. Accessory Materials: Refer to other sections for related materials.

2.04 COMPONENTS

A. Proprietary Products/System Components, including:

1. ECO-Block ICF Corner Block:
 - a. Material: Expanded Polystyrene (EPS).

Specifier Note: Connector size determines wall thickness. Coordinate with connector(s) selection. Corner Blocks are made from an outside corner panel and an inside corner panel. Inside corner panel dimensions vary depending on core thickness. Corner blocks are manufactured for 4", 6" and 8" (102, 152 and 203 mm) cores. Greater cores thicknesses require the use of 90 degree panel connectors and straight panels.

- b. Size: [4" (102 mm)] [6" (152 mm)] [8" (203 mm)]
- c. Dimensions: 32" (813 mm) (long side) x 16" (406 mm) (short side) x 16" (406 mm) (high) x 2.5" (64 mm) (thick).

2. ECO-Block ICF 45 Degree Corner Block:
 - a. Material: Expanded Polystyrene (EPS).

Specifier Note: 45 Degree Corner Blocks are made from an outside corner panel and an inside corner panel. 45 Degree corner blocks are manufactured for 6" (152 mm) core. Greater cores thicknesses require the of 45 degree panel connectors and straight panels.

- b. Size: [6" (152 mm)].
- c. Dimensions: 32" (813 mm) (long side) x 16" (406 mm) (short side) x 16" (406 mm) (high) x 2.5" (64 mm) (thick).

3. ECO-Block ICF Brick Ledge Panel:
 - a. Material: Expanded Polystyrene (EPS).

Specifier Note: Connector size determines wall thickness. Coordinate with connector(s) selection. Brick ledge panels come in straight panels only; corners require mitering.

- b. Size: [4" (102 mm)] [6" (152 mm)] [8" (203 mm)] [10" (254 mm)].
- c. Dimensions: 48" x 16" x 7.5" (1219 x 406 x 191 mm) (EPS thickness is 2.5" (64 mm)).

4. ECO-Block Connectors:
 - a. Material: Acrylonitrile Butadiene Styrene (ABS).

Specifier Note: Connector size determines wall thickness. Select and specify appropriate connector(s) below. Coordinate with appropriate corner block(s) selection. Connectors greater than 10" (254 mm) can be made using the connector splice to connect 2 or more connectors together.

- b. Size: [4" (102 mm)] [6" (152 mm)] [8" (203 mm)] [10" (254 mm)].

5. ECO-Block Connector Splice:
 - a. Material: Polypropylene.

6. ECO-Block Brick Ledge Rail:
 - a. Material: Polycarbonate.
 - b. Dimensions: 44" (1118 mm).

7. ECO-Block Tie Anchors:
 - a. Material: Acrylonitrile Butadiene Styrene (ABS).

8. 90 Degree and 45 Degree Panel Connector Extrusion:

Specifier Note: Panel connectors are used to form 90 degree or 45 degree corners with standard panels.

- a. Material: PVC.
- b. Size: 47" x 2 ½" (1194 mm x 64 mm).

PART 3 EXECUTION

Specifier Note: Article below is an addition to the CSI *Section Format* and a supplement to this Architectural Specification. Revise article below to suit project requirements and specifiers practice.

3.01 MANUFACTURER'S INSTRUCTIONS

A. Comply with the instructions and recommendations of the Permanent Insulating Concrete Forming System manufacturer.

3.02 EXAMINATION

A. Site Verification of Conditions: Verify layout matches drawings at all locations and that site conditions are appropriate for installation of ECO-Block forming and placement of concrete.

B. Do not proceed with work until unsatisfactory conditions have been corrected.

Specifier Note: Coordinate article below with manufacturer's recommended construction details and requirements.

3.03 CONSTRUCTION

A. Special Techniques for Wall Installation:

1. Erect wall forms plumb, square and level.
2. Plumb, square, diagonally brace against racking and securely attach to forms, wood bucks for doors, windows and other openings.
3. Properly reinforce all cuts and weak spots in forming blocks.
4. Install sleeves for penetrations and anchors for interior walls into formwork before placing concrete.
5. Install and securely tie reinforcing bars so that concrete, when placed, will fully surround all bars.
6. Make lintels over door and window openings integral with wall by installing required reinforcing bars as shown on structural drawings.
7. Place horizontal reinforcing bars in notches in panel connectors, staggering bars side to side, or as recommended by the engineer of record.
8. Install vertical bars near center of wall forms.
9. Place anchor bolts and straps at top of wall as shown on drawings.
10. Conform to CAN/CSA A23.1 (or ACI 318) for concrete mixes and placement.
11. Cold weather concrete placement shall be in accordance with PCA - R&D Serial No. 2615
12. Consolidate concrete during placement in accordance with ACI 309R-96 and/or ACI 309.3R-92 with ¾" (19.1 mm) diameter steel head internal vibrator or external equivalent.
13. Do not add additional water to concrete during placement.
14. Cut chases for electrical cable and plumbing into the blocks using a router or hot knife after concrete has been placed and cured.

Specifier Note: Retain, edit or delete paragraph below to suit project. Consult with manufacturer to obtain more information on the tilt-up method best suited to project, and specify requirements below.

B. Special Techniques for Wall Installation - Insulated Tilt-Up Precast Applications: Form insulated tilt-up concrete walls with ECO-Block panels using one of the 3 different methodologies recommended by manufacturer:

1. Method 1: Place ECO-Block panels on the casting bed prior to placing reinforced concrete.
2. Method 2: Wet-set ECO-Block panels on top of freshly placed concrete.
3. Method 3: Combine both methods to form a 2-sided, insulated tilt-up wall.

C. Interface with Other Work:

1. Where point loads from beams, girders or trusses are to be supported, increase wall width as shown on structural drawings.

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2. Make connections to floor joists, roof trusses, concrete block walls and wood walls using industry standard hardware and methods shown on drawings.
3. Use brick ledge forms and 90 degree corner forms where shown on drawings.

3.04 FIELD QUALITY CONTROL

- A. Site Tests: [Specify required site tests.].
- B. Inspection: [Specify required inspections.].

Specifier Note: Coordinate article below with Division 1 Execution Requirements Section.

3.05 PROTECTION

- A. Protect completed work from damage during subsequent construction activities on the site.

END OF SECTION