SECTION 072100.00

CONTINUOUS INSULATION SPECIFICATION

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PART 1 – GENERAL

1.01 RELATED DOCUMENTS

1. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this section.

1.02 SUMMARY

1. Definitions:
	1. Continuous Insulation (CI) is defined by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) as insulation that is uncompressed and continuous across all structural members without thermal bridges other than fasteners and service openings and is installed on the interior or exterior or is integral to any opaque surface of the building envelope.

Note that Laminators Inc. CI consists of Omega CI rigid insulation panels.

1. Section Includes:
	1. Exterior installation and performance of CI rigid insulation panels.
2. Related Sections:

Delete any of the following divisions that do not apply.

* 1. Division 03 – Concrete: Cast-In-Place Concrete
	2. Division 04 – Masonry: Unit Masonry
	3. Division 05 – Metals: Cold-Formed Metal Framing
	4. Division 06 – Wood, Plastics, and Composites: Sheathing
	5. Division 07 – Thermal and Moisture Protection: Metal Composite Material Wall Panels
	6. Division 07 – Thermal and Moisture Protection: Weather Barriers
	7. Division 07 – Thermal and Moisture Protection: Fluid-Applied Membrane Air Barriers
	8. Division 07 – Thermal and Moisture Protection: Sheet Metal Flashing and Trim
	9. Division 08 – Openings: Aluminum Windows
	10. Division 08 – Openings: Glazing
	11. Division 08 – Openings: Glazed Aluminum Curtain Walls

1.03 REFERENCES

1. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed have either been identified by the International Building Code (IBC) or local building code or are specific requirements for this building construction type.
2. American Society of Civil Engineers (ASCE):
3. ASCE/SEI 7 Minimum Design Loads for Buildings and Other Structures
4. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
5. ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
6. ASTM International:
7. ASTM C209 Standard Test Methods for Cellulosic Fiber Insulating Board
8. ASTM C518 Standard Test Method for Steady-State Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus
9. ASTM C1289 Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
10. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics

1. ASTM D2126 Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging
2. ASTM D3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
3. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials
4. ASTM E96 Standard Test Methods for Water Vapor Transmission of Materials
5. International Energy Conservation Code (IECC)
6. National Fire Protection Association (NFPA):
7. NFPA 285 Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components

1.04 DESCRIPTION

1. Performance Requirements:
2. Provide installed CI rigid insulation panels designed to withstand project-specific design loads while maintaining Deflection and Thermal Movement and Fire Performance without defects, damage, or failure as defined by the Manufacturer and required by this section. Fasteners must satisfy the thermal bridge requirements of ASHRAE 90.1.
3. Deflection and Thermal Movement: Provide installed CI rigid insulation panels that have been designed to resist project-specific wind loads, acting both inward and outward:
4. CI Rigid Insulation Panel Deflection: Deflection of the CI rigid insulation panel face shall not exceed L/120 normal to plane of the wall, where L is the unsupported span of the CI rigid insulation panel between load transfer locations.
5. Thermal Movements: Allow for free and noiseless horizontal and vertical thermal movement due to expansion and contraction of plywood sheathing over a temperature range of -20°F to +180°F at the CI rigid insulation panel surface.
	1. Buckling, undue stress on fasteners, or any other detrimental effects of thermal movement are not permitted.
	2. Installation procedures shall consider the ambient temperature range at the time of the respective operation.
6. Fire Performance: Wall assemblies containing CI rigid insulation panels shall meet the requirements of NFPA 285 using the Intermediate-Scale Multi-Story Test Apparatus (ISMA), where required by code based on the design of this project.

1.05 SUBMITTALS

1. General: Provide submittals in accordance with Conditions of the Contract and Division 01 Submittal Procedures Section as follows:
2. Product Data: Submit material descriptions, dimensions of individual components, and profiles for each type of CI rigid insulation panel.
3. Samples:
4. Submit 6 inches x 6 inches, or size as required, demonstrating CI rigid insulation panel construction. Samples to be provided in thickness specified.
5. Quality Assurance Submittals:
6. CI Rigid Insulation Panel Material Certification: Submit an official written statement from the Manufacturer documenting that product raw materials meet specified standards. Certification shall be backed by test reports and/or material certificates.
7. CI Rigid Insulation Panel Certification: Submit an official written statement from the Manufacturer documenting that the CI rigid insulation panels comply with specified Performance Requirements and Testing Performance sections indicated in this specification. Certification shall be backed by test reports.
8. Closeout Submittals:
9. Warranty: Submit Manufacturer and Installer warranty documents as specified within the Warranty section of this specification.

1.06 QUALITY ASSURANCE

1. Qualifications:
2. Manufacturer Qualifications: Company with a minimum of 15 years of continuous experience manufacturing CI rigid insulation panels in the United States of America of the type specified:
3. Able to provide a list of other projects of similar size including approximate date of installation for each.
4. Installer Qualifications:
5. The Installer shall have:
	1. Been in business of a similar trade and under the present company name for at least five (5) years prior to the start of this project, and
	2. Experience with similar-sized sheathing installations, and
	3. Completed at least ten (10) successful sheathing installations within the last three (3) years
		1. Acceptable, varying combinations of successful sheathing installations and/or years of experience shall be determined at the discretion of the Manufacturer.
6. The Installer must be capable of providing field service representation during installation.
7. Regulatory Code Agencies Requirements: Provide CI rigid insulation panels that have been evaluated and/or are in compliance with the following, where required:
8. International Code Council (ICC)
9. International Energy Conservation Code (IECC)
10. ASHRAE
11. [**Other agency required of this project**]

Retain Pre-installation Meeting if required.

1. Pre-installation Meeting: Conduct pre-installation meeting to verify project requirements, substrate conditions, and Manufacturer’s installation details.

1.07 DELIVERY AND STORAGE

1. Upon receipt, perform visual inspection of CI rigid insulation panels and inventory to identify any damages that may have occurred during shipping or any missing CI rigid insulation panels.
2. Storage:
3. Store CI rigid insulation panels horizontally on pallets in a dry, well-ventilated environment under the protection of a temporary or permanent structure. If required to be stored in an exterior area, CI rigid insulation panels must be placed under a well-ventilated, waterproof covering.
4. Store CI rigid insulation panels a minimum of 4” above ground level to avoid contact with standing moisture (e.g. water, snow, etc.).
5. Store CI rigid insulation panels in an area protected from other construction activities and associated debris.
6. Storage temperatures are not to exceed 120°F. Protect CI rigid insulation panels from moisture and direct sunlight while on the job-site.
7. Do not stack more than 1500 pounds of CI rigid insulation panels on one pallet. Other materials shall not be stacked on, or placed in contact with, CI rigid insulation panels to prevent staining, denting, or other damages.

1.08 PROJECT CONDITIONS

1. Substrate Requirements: Exterior wall assembly, including exterior sheathing, with appropriate fire rating in place prior to CI rigid insulation panels.
2. Field Measurements: Verify locations of wall framing members and wall opening dimensions by field measurements prior to the installation of the CI rigid insulation panels. Field measurements to be taken once all substrate materials and adjacent materials are installed.
3. Verify spacing of wall framing members meets Manufacturer’s requirements.
4. Notify General Contractor and Architect of spacing discrepancies.
5. Substrate Tolerances: The General Contractor is responsible for providing an acceptable substrate per Manufacturer’s requirements including:
6. Adjacent substrate faces out-of-plane offset: +/- 1/8 inch, and
7. Level, plumb, and location control lines as indicated: 1/4 inch in any 20 feet, and
8. Any building elevation direction deviation: +/- 1/2 inch

1.09 WARRANTY

1. Project Warranty: Refer to Conditions of the Contract for project warranty provisions.
2. Manufacturer’s Material Warranty: Submit, to the Owner, the Manufacturer’s standard warranty.
3. Warranty Period:
4. Material and Product Integrity: Thirty (30) days against plywood delamination due to manufacturing defects. Checking, leafing, splitting, and broken grain shall be excluded.
5. Thermal Performance: Fifteen (15) years against loss of thermal resistance greater than twenty (20) percent from published R-Value at 75 °F in accordance with ASTM C518.
6. Installation Warranty: Installer shall submit to the Owner a standard warranty document executed by an authorized company official. The warranty shall be in addition to, and not a limitation of, other rights Owner may have under the Contract Documents.
7. Warranty Period:
8. Workmanship: One (1) year warranty period commencing on Date of Substantial Completion.

PART 2 – PRODUCTS

2.01 CI RIGID INSULATION PANEL MANUFACTURERS

1. CI Rigid Insulation Panel Manufacturers:
2. Omega CI rigid insulation panels by Laminators Inc. – [www.laminatorsinc.com](http://www.laminatorsinc.com)

Contact a local Laminators Inc. Architectural Sales Representative for assistance with additional listings.

1. [**Other rigid insulation panel manufacturer who meets the requirements of this specification**]
2. [**Other rigid insulation panel manufacturer who meets the requirements of this specification**]

2.02 BOARD INSULATION

1. CI Rigid Insulation Panel Description
2. Construction:
3. A closed cell foam plastic core bonded on both sides to a coated glass facer with an additional fire-treated plywood layer on one side.
4. Thickness: 2.1 inches (nom), typ.
5. Foam Core: Polyisocyanurate (ISO), Type II, Class 2, Grade 3
6. Fire-Treated Plywood Thickness: 5/8 inch
7. Product:
8. On Types I, II, III, and IV Construction to any height above grade in accordance with the provisions of IBC Sections 2603.5.1 through 2603.5.7.
9. On Type V Construction to any height above grade in accordance with the provisions of IBC Sections 2603.2, 2603.3, and 2603.4.
10. Testing Performance:
11. ASTM C209: Water absorption of the foam core less than 0.1% by volume.
12. ASTM C518: Thickness / R-Value of the CI rigid insulation panel of 2.1 inches / R-9.6 hr °F ft2 / BTU
13. ASTM D1621: Compressive strength of the foam core rating of Grade 3 (25 psi minimum).
14. ASTM D2126: Dimensional stability of the foam core measured at 2% (lineal change) when tested at 7 days.
15. ASTM D3273: Resistance to mold of the foam core passes (10).
16. ASTM E84: Flame Spread Index (FSI) of the foam core of 20 and Smoke Developed Index (SDI) of the foam core of 250.
17. ASTM E96: Moisture vapor permeance of the foam core less than 1.2 perms (Class III).
18. CI Rigid Insulation Panel Fasteners
19. Type: As required by Manufacturer.

2.03 RELATED MATERIALS

1. General: Refer to Related Sections specified herein for other materials, including concrete, masonry, framing, sheathing, barriers, flashing and trim, windows, glazing, and/or curtain walls.

PART 3 – EXECUTION

3.01 INSTALLER INSTRUCTIONS

1. Compliance: Comply with Manufacturer’s product data, including, but not limited to, installation guides, design details, product technical bulletins, supplemental technical instructions, and any other product packaging instructions.

3.02 PREPARATION

1. Site Verification of Conditions: Verify that conditions of substrate previously installed under other sections are acceptable for the CI rigid insulation panels installation. Documentation should be provided indicating any conditions detrimental to the performance of the CI rigid insulation panels.

3.03 INSTALLATION

1. CI Rigid Insulation Panel Installation:
2. Handling:
3. Handle CI rigid insulation panels with work gloves to avoid hand injury from any plywood edges and to prevent potential irritation from the polyisocyanurate core.
4. When removing individual CI rigid insulation panels from stacks, always lift one CI rigid insulation panel completely off the next to prevent localized surface gouges or crushing of the polyisocyanurate core.
5. Install the CI rigid insulation panels plumb, level, and true in accordance with Manufacturer’s requirements.
6. Do not over-tighten fasteners along CI rigid insulation panel perimeter.
7. Cleanly trim CI rigid insulation panels to fit. Insulate any miscellaneous gaps and voids.
8. Fit insulation tight to fenestrations and service openings, and match depth of CI rigid insulation panels.
9. Protect CI rigid insulation panel edges from direct exposure to water and maintain dry conditions at all times. Any wet conditions shall be allowed to completely dry prior to the application of the air and water barrier (AWB).
10. Install AWB over CI rigid insulation panels as specified in Section 072726.
11. Installation Tolerances:
12. Adjacent vertical or horizontal CI rigid insulation panel out-of-plane offset: +/- 1/8 inch
13. Vertical or horizontal joint width: +/- 1/16 inch
14. Maximum vertical or horizontal joint intersection deviation: 1/4 inch in any 20 feet
15. Do not cut or trim CI rigid insulation panels during installation in a manner which would damage the surface, decrease strength, or result in a failure in performance.
16. Related Products Installation Requirements: Refer to other sections in Related Sections for installation of related products.

3.04 REMEDIATION

1. Remediation:
2. Remove and replace CI rigid insulation panels damaged as a direct result of activities in the CI rigid insulation panel Installation section.
3. CI rigid insulation panel Installation completion shall be agreed-upon between the Installer and the General Contractor.
4. Following CI rigid insulation panel Installation completion, any determination of replacement of CI rigid insulation panels is at the discretion of the Architect. Such replacement shall become the responsibility of the General Contractor.
5. Removal and replacement of CI rigid insulation panels damaged by other trades shall be the responsibility of the General Contractor.
6. If required after CI rigid insulation panel Installation, any additional protection of the CI rigid insulation panels shall be the responsibility of the General Contractor.
7. Remove from project site damaged CI rigid insulation panels and other debris attributable to work of this section.

END OF SECTION