

ICC-ES Evaluation Report

ESR-3775

Reissued August 2024

This report also contains:


- CBC Supplement

Subject to renewal August 2026

- LABC Supplement

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<p>DIVISION: 07 00 00— THERMAL AND MOISTURE PROTECTION</p> <p>Section: 07 41 13—Metal Roof Panels</p> <p>Section: 07 42 13—Metal Wall Panels</p>	<p>REPORT HOLDER: LEER, INC.</p>	<p>EVALUATION SUBJECT: LEER SOFT RAIL AND WOOD RAIL COOLER AND FREEZER PANELS</p>	
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1.0 EVALUATION SCOPE

1.1 Compliance with the following codes:

- 2021, 2018 and 2015 [International Building Code® \(IBC\)](#)

For evaluation for compliance with codes adopted by the [Los Angeles Department of Building and Safety \(LADBS\)](#), see [ESR-3775 LABC Supplement](#).

Properties evaluated:

- Structural
- Fire resistance

2.0 USES

The Leer Soft Rail and Wood Rail Cooler and Freezer Panels consist of structural insulated roof/ceiling panels, and exterior and interior load-bearing or nonload-bearing wall panels for Type V-B construction. The panels are also available as floor panels when installed over structural concrete floor.

3.0 DESCRIPTION

3.1 General:

The Leer Soft Rail and Wood Rail Cooler and Freezer Panels are factory-assembled, metal-faced, sandwich panels with a chemically bonded foam-in-place foam plastic core. The Leer Soft Rail Cooler and Freezer panels longitudinal edges have a tongue and groove design with hook and pin cam-lock devices embedded in panel edges. The Wood Rail Cooler and Freezer Panels consists of solid sawn lumber rails along the perimeter of the panel and hook and pin cam-lock devices embedded in the lumber rails. The Soft Rail Cooler and Freezer panels are available in nominal thicknesses of 4.25 and 5 inches (108 and 127 mm). The Soft Rail Cooler and Freezer panels are maximum 45.94 inches (1167 mm) wide and vary from 81.25 to 173.25 inches (2064 to 4401 mm) long. The Soft Rail Cooler and Freezer ceiling panels also come with stiffeners, as described in Section 3.2.3, on the exterior metal facer and are then foamed-in-place. The Wood Rail Cooler and Freezer panels are available in nominal thicknesses of 4 and 5.5 inches (102 and 140 mm). The Wood Rail Cooler and Freezer panels are maximum 47 inches (1194 mm) wide and vary from 90.5 to 204 inches (2299 to 5182 mm) long.

3.2 Material:

3.2.1 Panel Core: The core material of the panels is a polyurethane foam plastic as specified in the approved quality documentation. The core has a nominal density of 2.2 pcf (35.2 kg/m³). The foam plastic has a flame-spread index of 25 or less and a smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723.

3.2.2 Panel Facings: The facing material on both sides of the panels is No. 26 gage steel [base metal thickness of 0.019 inch (0.48 mm)] stucco embossed conforming to ASTM A653, having a hot-dip galvanized G60 coating. The material has minimum yield and tensile strengths of 47.4 ksi and 63.6 ksi (327 and 438 MPa), respectively. For the floor panels, the walking surface face is either No. 16 gage [base-metal thickness of 0.06 inch (1.5 mm)] Type 304 stainless steel conforming to ASTM A240 or 0.050-inch-thick (1.3 mm) 3003-H14 aluminum.

3.2.3 Stiffeners: Stiffeners for the Soft Rail Cooler and Freezer roof panels are hat channel shaped having a No 14 gage [base-metal thickness of 0.07 inch (1.8 mm)] steel conforming to ASTM A653, having a hot-dipped galvanized G90 coating. The hat channel section has a height of 1 inch (25.4 mm) and an overall width of 4 inches (102 mm).

3.2.4 Top and Bottom Channels: Top and bottom channels for the Soft Rail Cooler and Freezer panels are L-shaped channels measuring 2.5-by-2.5-inch (63 mm) and made from No 14 gage [base-metal thickness of 0.07 inch (1.8 mm)] steel conforming to ASTM A653, having a hot-dipped galvanized G90 coating. Top and bottom channels for the Wood Rail Cooler and Freezer panels are L-shaped channels measures 2.5-inch-by-2.5-inch (63 mm) by ¼-inch-thick (6.4 mm) 6061 alloy aluminum.

3.2.5 Wood Rails: The wood rails for the Wood Rail Cooler and Freezer panels are made from solid sawn Spruce Pine Fir No 2.

3.2.6 Cam-Locks: The cam-locks are made from steel as specified in approved quality control program. The cam-locks are installed during panel fabrication. The spacing of the cam-locks are as shown in [Figures 1](#) and [2](#) for the Soft Rail Cooler and Freezer panels and [Figures 3](#) and [4](#) for the Wood Rail Cooler and Freezer panels. The quantity of cam locks required for panels is shown in [Table 6](#).

4.0 DESIGN AND INSTALLATION

4.1 Design:

The allowable uniform transverse load, uniform axial compression load and shear loads for wall panels are as shown in [Tables 1](#) through [3](#). The allowable uniform transverse loads for roof panels are as shown in [Table 4](#). Where loading conditions result in the panels resisting combined stresses, the sum of the ratios of applied loads over allowable loads must be less than 1.0.

The cam-lock connection strength is shown in [Table 5](#).

When used as shear walls under the IBC, the panels are limited to use in Seismic Design Categories A, B, and C.

The bottom and top channels and connections must be designed to resist the applied forces.

See [Figures 1](#) and [2](#) for Soft Rail Cooler and Freezer panel configurations. See [Figures 3](#) and [4](#) for Wood Rail Cooler and Freezer panel configurations.

4.2 Installation:

4.2.1 General: Installation of Leer Soft Rail Cooler and Freezer panels and Wood Rail Cooler and Freezer panels must comply with this report and the manufacturer's published installation instructions. The manufacturer's published installation instructions must be available at the jobsite at all times during installation.

4.2.2 Wall Panels: Wall panels are connected to each other using the cam-lock mechanism. The connection of the wall panels to supporting structure must be design by registered design professional. When the Soft Rail Cooler and Freezer Panels are used as shear walls, one of the legs of the top and bottom channels must be fastened to the interior panel facer with ¼-inch-diameter (6.4 mm) self-drilling screws at 12 inches (305 mm) on center and the other leg of the channels must be fastened as determined by registered design professional. When the Wood Rail Cooler and Freezer Panels are used as shear walls, one of the legs of the top and bottom channels must be fastened to the interior panel facer with No. 10 self-drilling screws at 6 inches (152 mm) on center and the other leg of the channels must be fastened as

determined by registered design professional. When used in exterior applications, the exterior face of the wall panels is required to be covered with a wall covering complying with the applicable code or recognized in an ICC-ES evaluation report. Flashing in accordance with 2021 and 2018 IBC Section 1404 (2015 IBC 1405.4), must be installed. The water resistive barrier must be provided in accordance with 2021 and 2018 IBC Section 1403.2 (2015 IBC Section 1404.2). The wall covering must be installed to resist applicable forces, to the satisfaction of the code official. Where required by the code official, the attachment of the exterior cladding to the wall panel must be designed by a registered design professional.

4.2.3 Roof/Ceiling Panels: The Soft Rail roof/ceiling panels must be supported by the wall panels and connected to the wall panels using the cam-lock mechanism. The Wood Rail roof/ceiling panels must be supported by the wall panels and connected using lag bolts. The roof/ceiling panels connect to each other using the cam lock mechanism. A roof covering complying with IBC Chapter 15 must be installed on the exterior side of the roof panels. Roofs with hot-asphalt or hot-coal tar pitch are prohibited. Underlayment and flashing must be installed in accordance with the applicable code. The roof covering must be installed to resist the applicable forces, to the satisfaction of the code official. The roof covering must be installed in accordance with Leer's recommendations.

4.2.4 Thermal Barrier:

4.2.4.1 Wall and Roof: A thermal barrier is not required on the interior side of the wall and roof panels based on IBC Section 2603.9 testing in accordance with UL 1715.

4.2.4.2 Floor: A thermal barrier complying with IBC Section 2603.4.1.14 is required on the walking surface of the floor panels. A thermal barrier complying with IBC Section 2603.4.1.14 is not required for Soft Rail and Wood Rail floor panels that come with ½-inch-thick (12.7 mm) plywood.

5.0 CONDITIONS OF USE:

The Leer Soft Rail and Wood Rail Cooler and Freezer Panels described in this report comply with, or are suitable alternatives to what is specified in, the codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1** Panel fabrication, identification and installation must comply with this report and the manufacturer's published installation instructions. In the event of conflicts between this report and the manufacturer's published instructions, the more restrictive governs.
- 5.2** Design loads must be determined in accordance with the applicable code, and must be equal to, or less than, the values given in [Tables 1](#) through [4](#) of this report.
- 5.3** All construction documents specifying the building panels must comply with the design limitations of this report. Design calculations and details for the specific applications must be furnished to the code official verifying compliance with this report and applicable codes. The documents must be prepared by a registered design professional where required by the statutes of the jurisdiction in which the project is to be constructed.
- 5.4** All wall-to-floor and roof-to-wall details must be designed such that gravity loads are applied to the wall panels as described in the footnotes to [Table 3](#).
- 5.5** Connection and attachments of the panel to the foundation or supporting structure and to other panels are outside the scope of this report and must be addressed in the design calculations and details.
- 5.6** When used as shear walls under the IBC, the panels are limited to use in Seismic Design Categories A, B and C.
- 5.7** Use of the panels is limited to Type V-B construction.
- 5.8** Use of the foam plastic in areas subject to damage from termites must be in accordance with IBC Section 2603.8.
- 5.9** The concrete slab or foundation must be designed by a registered engineer in accordance with applicable codes for the imposed loads.
- 5.10** Use of roof panels as horizontal diaphragms is outside the scope of this report.
- 5.11** For the roof panels, justification must be submitted to the code official demonstrating that the panels with the roof covering comply as a Class A, B or C roof assembly as required by IBC Section 2603.6, with the classification complying with the minimum classification required for the building.
- 5.12** The panels are manufactured under a quality control program with inspections by ICC-ES.

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with the [ICC-ES Acceptance Criteria for Sandwich Panels \(AC04\)](#), dated June 2019 (editorially revised December 2020).
- 6.2 Room corner fire test data in accordance with UL 1715.

7.0 IDENTIFICATION

- 7.1 Each LLeer Soft Rail and Wood Rail Cooler and Freezer Panels is identified by a label bearing the company name (Leer, Inc.) and address, the product name, and the evaluation report number (ESR-3775).
- 7.2 The report holder's contact information is the following:

LEER, INC.
206 LEER STREET
NEW LISBON, WISCONSIN 53950
(608) 562-7100
www.leerinc.com

TABLE 1—ALLOWABLE UNIFORM TRANSVERSE LOADS FOR LEER SOFT RAIL COOLER AND FREEZER AND WOOD RAIL COOLER AND FREEZER WALL PANELS (psf)^{1,2}

PANEL TYPE	WALL SPAN (ft)	ALLOWABLE UNIFORM APPLIED LOAD	
		Deflection Limit	Transverse Load (psf)
SOFT RAIL 4.25 and 5 INCHES THICK ³	6.77	L/180	76
	9.77	L/180	30
	13.35	L/180	12
WOOD RAIL 4 INCHES THICK ⁴	7.42	L/180	72
	11.42	L/180	31
	16.75	L/180	16
WOOD RAIL 5.5 INCHES THICK ⁴	7.33	L/180	133
	11.25	L/180	45
	16.25	L/180	26

For SI: 1 ft= 0.305 m; 1 psf= 47.9 Pa.

¹Allowable load values are based on simply supported spans with loads uniformly distributed. Where non-uniform loads are applied to the panel, an equivalent uniform load must be determined for comparison with the values within this table.

²Deflection limitations are based on Table 1604.3 of the IBC.

³Panels must be installed in accordance with Section 4.2 of this report. Panels must be supported by a 4-inch wide bearing support at each end. Alternate support conditions must be designed by registered design professional.

⁴Panels must be installed in accordance with Section 4.2 of this report. Panels must be supported by a 3-inch wide bearing support at each end. Alternate support conditions must be designed by registered design professional.

TABLE 2—ALLOWABLE UNIFORM AXIAL LOADS FOR LEER SOFT RAIL AND WOOD RAIL COOLER AND FREEZER WALL PANELS^{1,2,3}

PANEL TYPE	MAXIMUM PANEL UNSUPPORTED HEIGHT (ft)	ALLOWABLE AXIAL LOAD (plf)
SOFT RAIL 4.25 and 5 INCHES THICK ⁴	6.77	100
	13.77	
WOOD RAIL 4 INCHES THICK	8	
	11.67	
	17	
WOOD RAIL 5.5 INCHES THICK	7.52	
	11.53	
	16.53	

For SI: 1 foot=0.305 m; 1 plf=14.6 N/m.

¹Panels must be installed in accordance with Section 4.2 of this report.

²Wall panel facers must be installed bearing on structural support at top and bottom.

³Allowable axial load is assumed to be uniformly distributed at the top of the wall panel centered on the panel thickness.

⁴A steel channel complying with Section 3.2.4 must be installed at the bottom of the panel.

TABLE 3—ALLOWABLE RACKING SHEAR LOADS FOR LEER SOFT RAIL AND WOOD RAIL COOLER AND FREEZER WALL PANELS^{1,2,3}

PANEL TYPE	PANEL DIMENSIONS	ALLOWABLE SHEAR LOAD (plf)
SOFT RAIL 4.25 and 5 INCHES THICK ^{3,5}	Two panels consisting of 93.25-inch-high wall panels connect to each other using cam-lock mechanism	193
WOOD RAIL 4 INCHES THICK	Two panels consisting of 93.25-inch-high wall panels connect to each other using cam-lock mechanism	444
WOOD RAIL 5.5 INCHES THICK	Two panels consisting of 93.25-inch-high wall panels connect to each other using cam-lock mechanism	538

For SI: 1 foot=0.305 m; 1 plf=14.6 N/m.

¹Panels must be installed in accordance with Section 4.2 of this report.

²A top and base channel as described in Section 3.2.4 must be installed on the interior side at the top and bottom of the wall panel and must be connected to supporting structure as determined by registered design professional.

³The maximum shearwall aspect (height-to-width) ratio is 1.01:1.

⁴The maximum shearwall aspect (height-to-width) ratio is 0.99:1.

⁵A steel channel complying with Section 3.2.4 must be installed at the top and bottom of the panel.

TABLE 4—ALLOWABLE UNIFORM TRANSVERSE LOADS FOR LEER SOFT RAIL AND WOOD RAIL COOLER AND FREEZER ROOF PANELS (psf)^{1,2,3}

PANEL TYPE	ROOF PANEL STIFFENERS	ROOF SPAN (ft)	ALLOWABLE UNIFORM APPLIED LOAD	
			Deflection Limit	Transverse Load (psf)
SOFT RAIL 4.25 and 5 INCHES THICK ³	NONE	7.42	L/180	20
		11.25	L/180	20
		14.12	L/180	6
	STIFFENERS ⁶	7.42	L/180	20
		11.25	L/180	20
		14.12	L/180	20
WOOD RAIL 4 INCHES THICK ⁴	NONE	7.75	L/180	20
		11.75	L/180	20
		15.75	L/180	13
WOOD RAIL 5.5 INCHES THICK ⁴	NONE	7.75	L/180	20
		11.75	L/180	20
		16.33	L/180	20

For SI: 1 ft= 0.305 m; 1 psf= 47.9 Pa.

¹Allowable load values are based on simply supported spans with loads uniformly distributed. Where non-uniform loads are applied to the panel, an equivalent uniform load must be determined for comparison with the values within this table.

² Deflection limitations are based on Table 1604.3 of the IBC with the exception that creep of the foam core has been considered when panels are subjected to long term snow loads.

³Panels must be installed in accordance with Section 4.2 of this report. Panels must be supported by a 4-inch wide bearing support at each end. Alternate support conditions must be designed by registered design professional.

⁴Panels must be installed in accordance with Section 4.2 of this report. Panels must be supported by a 3-inch wide bearing support at each end. Alternate support conditions must be designed by registered design professional.

⁵The roof maintenance worker live load noted in IBC Table 1607.4 is included in the above spans.

⁶Three (3) stiffeners as described in Section 3.2.3 foamed in place on the exterior face side spaced 11.5 inches on center.

TABLE 5- CAM LOCK CONNECTION CAPACITY¹

PANEL TYPE	ALLOWABLE LOAD (LBF)		
	LOAD DIRECTION		
	Tension	Shear (in-plane)	Shear (out-of-plane)
Soft Rail 4.25 and 5 inches thick	100	139	184
Wood Rail 5.5 inches thick	362	384	745

For **SI**: 1 inch= 25.4 mm; 1 lbf=4.45N.

¹The tabulated load applies to a single cam lock connection installed in accordance with Leer's published installation instructions.

Table 6- SOFT RAIL AND WOOD RAIL PANEL CONFIGURATIONS

PANEL TYPE	PANEL HEIGHT OR LENGTH (INCHES)	QUANTITY OF CAM-LOCKS ON LONGITUDINAL EDGES	QUANTITY OF CAM-LOCKS ON AT TOP AND BOTTOM OF PANELS
Soft Rail Wall Panels	81.25	3	2
	93.25	4	2
	117.25	5	2
	165.25	7	2
Soft Rail Roof Panels	93	3	4
	139	4	4
	173.5	5	4
Wood Rail Wall and Roof Panels	Up to 144	3	None
	Greater than 144	4	None

For **SI**: 1 inch= 25.4 mm

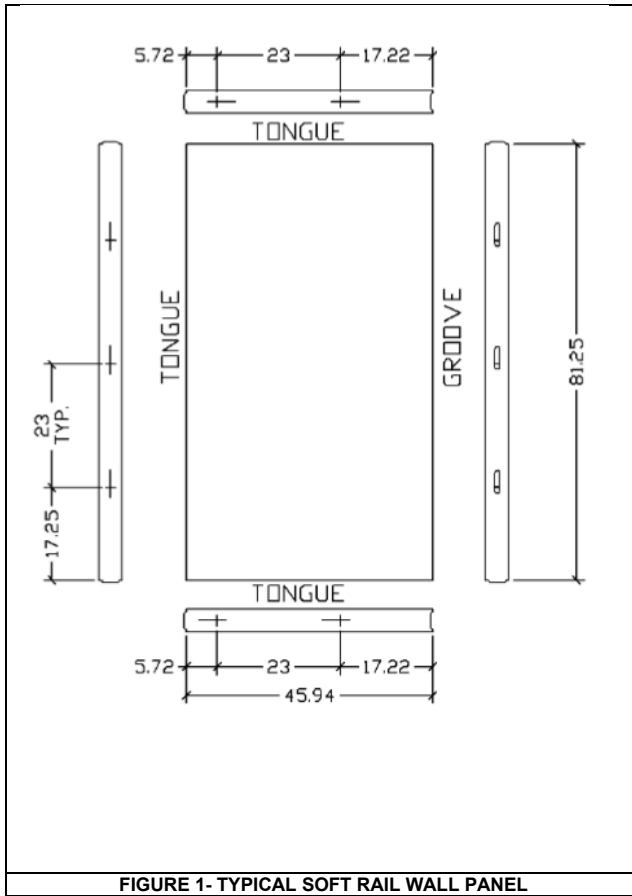


FIGURE 1- TYPICAL SOFT RAIL WALL PANEL

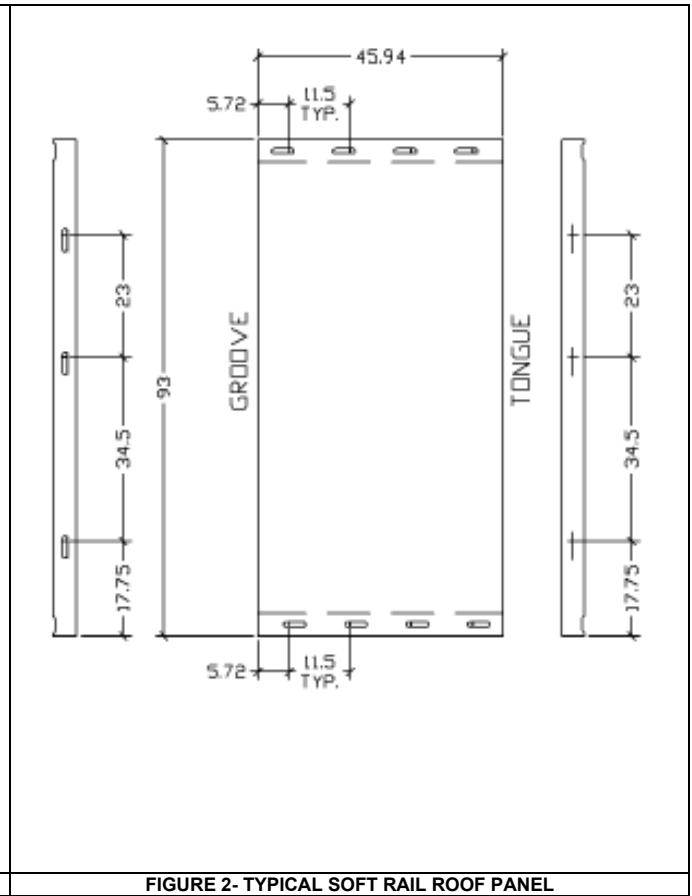


FIGURE 2- TYPICAL SOFT RAIL ROOF PANEL

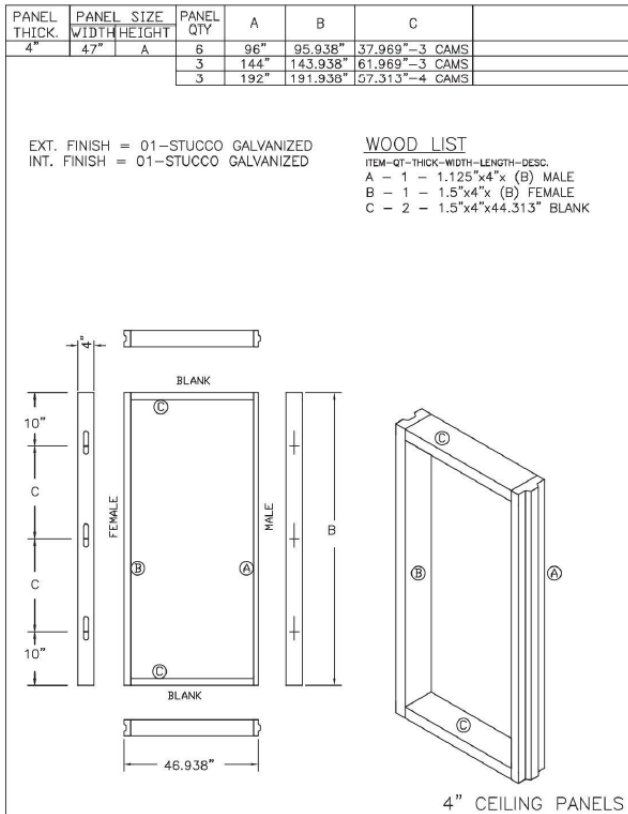


FIGURE 3- WOOD RAIL ROOF AND FLOOR PANELS

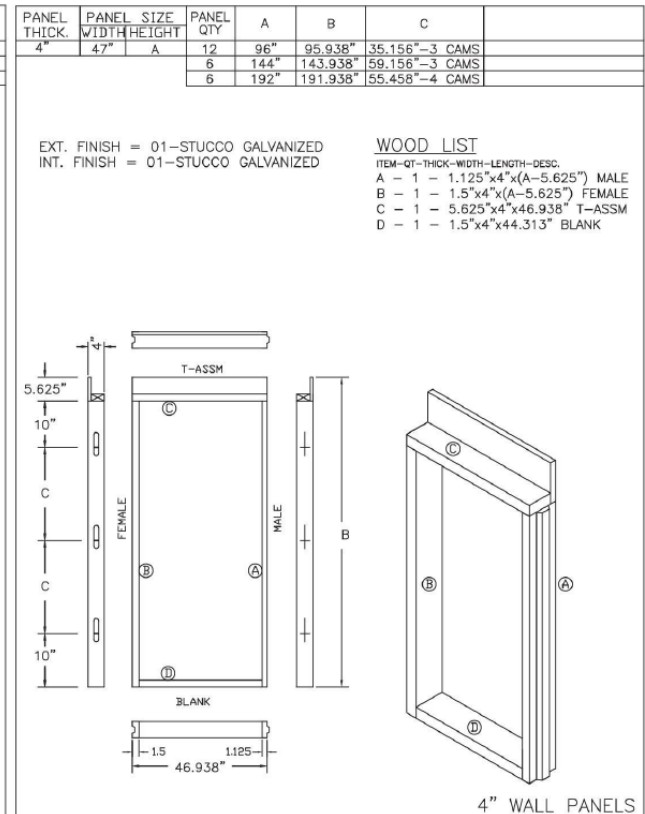


FIGURE 4- WOOD RAIL WALL PANELS (4-INCH SHOWN)

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION

Section: 07 41 13—Metal Roof Panels

Section: 07 42 13—Metal Wall Panels

REPORT HOLDER:

LEER, INC.

EVALUATION SUBJECT:

LEER SOFT RAIL AND WOOD RAIL COOLER AND FREEZER PANELS

1.0 REPORT PURPOSE AND SCOPE

Purpose:

The purpose of this evaluation report supplement is to indicate that Leer Soft Rail and Wood Rail Cooler and Freezer Panels, described in ICC-ES evaluation report [ESR-3775](#), have also been evaluated for compliance with the code noted below as adopted by the Los Angeles Department of Building and Safety (LADBS).

Applicable code edition:

- 2020 *City of Los Angeles Building Code* (LABC)

2.0 CONCLUSIONS

The Leer Soft Rail and Wood Rail Cooler and Freezer Panels, described in Sections 2.0 through 7.0 of the evaluation report [ESR-3775](#), comply with the LABC Chapters 14, 15, and 26, and are subject to the conditions of use described in this supplement.

3.0 CONDITIONS OF USE

The Leer Soft Rail and Wood Rail Cooler and Freezer Panels, described in this evaluation report must comply with all of the following conditions:

- All applicable sections in the evaluation report [ESR-3775](#).
- The design, installation, conditions of use and identification are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report [ESR-3775](#).
- The design, installation and inspection are in accordance with additional requirements of LABC Chapters 14, 15, 16, 17, and 26, as applicable.

This supplement expires concurrently with the evaluation report, reissued August 2024.

DIVISION: 07 00 00—THERMAL AND MOISTURE PROTECTION**Section: 07 41 13—Metal Roof Panels****Section: 07 42 13—Metal Wall Panels****REPORT HOLDER:**

LEER, INC.

EVALUATION SUBJECT:

LEER SOFT RAIL AND WOOD RAIL COOLER AND FREEZER PANELS

1.0 REPORT PURPOSE AND SCOPE**Purpose:**

The purpose of this evaluation report supplement is to indicate that Leer Soft Rail and Wood Rail Cooler and Freezer Panels, described in ICC-ES evaluation report ESR-3775, have also been evaluated for compliance with the code noted below.

Applicable code edition:

- 2019 *California Building Code* (CBC)

For evaluation of applicable chapters adopted by the California Office of Statewide Health Planning and Development (OSHPD) AKA: California Department of Health Care Access and Information (HCAI) and the Division of State Architect (DSA), see Sections 2.1.1 and 2.1.2 below.

2.0 CONCLUSIONS**2.1 CBC:**

The Leer Soft Rail and Wood Rail Cooler and Freezer Panels described in Sections 2.0 through 7.0 of the evaluation report ESR-3775 comply with the CBC Chapter 14, 15, and 26 provided the design and installation are in accordance with the 2018 *International Building Code*® (IBC) provisions noted in the evaluation report and the additional requirements of CBC Chapters 14, 15, 16, 17 and 26, as applicable.

2.1.1 OSHPD: The applicable OSHPD Sections and Chapters of the CBC are beyond the scope of this supplement.

2.1.2 DSA: The applicable DSA Sections and Chapters of the CBC are beyond the scope of this supplement.

This supplement expires concurrently with the evaluation report, reissued August 2024.