CODE EVALUATION REPORT

CERUS-1045

REVISED: June 2025
EXPIRATION: June 2027

PRODUCT(s): **THERMO-KOOL WALK-IN COOLER AND WALK-IN FREEZER PANELS**

REPORT HOLDER: THERMO-KOOL / Mid-South Industries, Inc.

CONTACT DETAILS:
723 East 21 St Street
Laurel, Mississippi
USA 39440

CSI DIVISIONS: 07 00 00 – Thermal, Moisture Protection

CSI SECTION:
07 41 13 – Metal Roof Panels
07 42 13.19 – Insulated Metal Wall Panels

APPLICABLE CODES:
2024, 2021, 2018 International Building Code (IBC)
2022 California Building Code (CBC)
2023 City of Los Angeles Building Code (LABC)

EVALUATED:
Foam Plastic
Surface Characteristics
Structural Capacity

IAS ACCREDITED Product Certification Agency PCA-118

1.0 APPROVED FOR FOLLOWING:

APPROVED TYPES OF CONSTRUCTION:	Types I-V
APPROVED INSTALLATIONS:	THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels used in walls, floors and ceiling of structures intended only for incidental human occupancy in interior and exterior application

2.0 DESCRIPTION:

2.1 General:

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels are factory-manufactured, metal-faced sandwich panels with a foam-in-place polyurethane insulation core. The panels have mechanical cam-locking hardware embedded in the panel edges located at predetermined locations. The standard panel is an unreinforced panel for use in wall, floor and ceiling applications. Reinforced panels that include a hardrail component of high-density polyurethane foam are included during installation to transfer service loads to the underlying structure. The panels are available in the nominal thickness of 4-inches (102 mm) thickness. THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels comply with the 2024 / 2021 / 2018 IBC for use in walk-in cooler and walk-in freezer applications intended only for incidental human occupancy in interior and exterior applications.

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels use under the 2024 / 2021 / 2018 IBC construction requires Engineering Design, considering applicable load requirements, connection details and calculations including site specific requirements for approval by the authority having jurisdiction.

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels for use in wall, floor and ceiling applications, when constructed in accordance with this report, comply with the applicable requirements as defined by 2022 California Building Code and 2023 City of Los Angeles Building Code. See Section 9 of this report for further details.

2.2 Product Description:

2.2.1 Panel Core:

The core material is a polyurethane foam plastic insulation as specified in approved quality documentation. The core has a nominal density 2.25 pcf (36 kg/m^3) and complies with Section 2603.3 of the 2024 / 2021 / 2018 IBC with a flame-spread index of 25 or less and smoke-developed index of 450 or less when tested in accordance with ASTM E84 or UL 723. The polyurethane foam plastic core has flash ignition and self-ignition temperatures exceeding 600 °F and 800 °F (316 °C and 427 °C), respectively, when tested in accordance with ASTM D1929. THERMO-KOOL Walk-In Cooler and Walk-In Freezer are labeled by an approved agency in accordance with Section 2603.2 of the 2024 / 2021 / 2018 IBC.

2.2.2 Panel Facing:

The facing material on both sides of the panels are nominal 0.040-inch-thick (1.0 mm) aluminum 3105-H154 alloy complying ASTM B209 of minimum tensile strength of 26.9 ksi (185 MPa) and yield strength of 24.9 ksi (171 MPa).

2.2.3 Hardrails (Side, Top, Bottom Rail Members):

Hardrail members for the panel are high-density polyurethane foam of nominal density of 10.0 pcf (160 kg/m^3). The Hardrail members are tongue-and-groove shaped with cross-section dimensions of approximately 1.5 inches (38 mm) wide by 4 inches (102 mm) thickness. Ceiling and floor panels have a groove at one end along the entire panel width and in-plane to accept a tongue-end of wall panels. Hardrail components have flash ignition and self-ignition temperatures exceeding 600 °F and 800 °F (316 °C and 427 °C), respectively, when tested in accordance with ASTM D1929.

2.2.4 Cam-Locks:

Mechanical cam-locking hardware ("Instalock" connectors) is factory installed for use to connect walls-to-walls, floor-to-floor, ceiling-to-ceiling, wall-to-floor, and wall-to-ceilings onsite during the panel installation.

3.0 DESIGN:

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels' limitations for wall panel height and the allowable axial loads, allowable transverse load and allowable racking shear load are outlined in Tables 1, 2 and 3 of this report. For THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels used in ceiling applications, the allowable transverse loads are outlined in Table 4 of this report. The maximum allowable loads for panel to floor connections and panel to ceiling connections are outlined in Tables 5 and 6 of this report.

Design loads to be resisted by THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels shall be determined in accordance with the applicable building codes. Loads to be resisted by the panels shall not exceed the allowable loads outlined in this report. Loads in the tables may be applied to shorter panel spans or lengths/heights where supported by Engineering Design.

Extrapolation of allowable loads is outside the scope of this report. Where load combinations are anticipated, the design shall consider the load combinations based on acceptable engineering practice.

4.0 INSTALLATIONS:

4.1 General:

Installation of THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels must comply with the manufacturer's published installation instructions, Engineering Design, this report and the applicable codes(s). Where conflicts exist, this report and the applicable building code govern.

Installation of THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels requires Engineering Design in accordance with Section 16 of the 2024/2021/2018 IBC. The Engineering Design is to consider service loads, and the load path for transmitting load to the underlying substrate, including connection details of panels to the underlying structure. Maximum loads are not to exceed load capacities provided in Section 8 of this report.

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels are to be connected as outlined in Figures 2 and 3 of this report.

4.2 Wall Panels:

Wall panels are connected to each other using the mechanical cam-locking hardware. The high-density polyurethane side, top and bottom rail members are tongue-and-groove shaped. The connection of the wall panels to the supporting structure must be designed by a registered design professional.

4.3 Ceiling/Floor Panels:

Ceiling-to-ceiling, floor-to-floor, wall-to-ceiling and wall-to-floor are connected using the mechanical cam-locking hardware. Each ceiling or floor panel has a groove at one end along the entire panel width and in-plane with the panel facing on one side to accept a tongue-end of a wall panel.

4.4 Thermal Barrier:

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels, require installation of a code prescribed ignition barrier, unless installed in accordance with Section 4.4.1 of this report.

4.4.1 Installation without a Code Prescribed Thermal Barrier:

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels where used in walls, comply for installation without a code prescribed thermal barrier based on compliance with Section 2603.4.1.2 where protected by an automatic sprinkler system in accordance with 2024 / 2021 / 2018 IBC Section 909.3.1.1 where the cooler or freezer and location in the building are sprinklered.

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels systems comply for installation without a code prescribed thermal barrier when installed in non-sprinklered buildings where limited to a maximum 400 ft^2 (37 m^2) aggregate floor area.

5.0 LIMITATIONS:

- Installation of the THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels is to match this report, the Engineering Design and applicable code.
- THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels are limited to use in wall, floor, and ceiling assemblies of buildings intended solely for incidental human occupancy, in both interior and exterior applications. The panels are permitted for use in all construction types as defined by the IBC.
- Installation of THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels shall comply with the design limitations specified in this report. Structural loads must be determined in accordance with the applicable building codes and shall not exceed the allowable values stated in Table 1 through 6 of this report. Where mandated by the authority having jurisdiction, construction documents must be prepared and sealed by a registered design professional.
- The connection details and attachment methods of the panels to the supporting structure are beyond the scope of this report and shall be addressed within the structural design calculations and clearly detailed on the approved construction documents.
- Where installed without a thermal barrier, installation is to comply with Section 4.4 of this report.
- Panel fabrication, identification and installation must comply with this report and the manufacturer's published installation instructions.
- The panels are manufactured under a quality control program with inspections performed by QAI Laboratories.

6.0 SUPPORTING INFORMATION:

The following substantiating data has been evaluated for THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels:

- Data for surface burning characteristics determined in accordance with UL 723 Standard for Test for Surface Burning Characteristics of Building Materials.
- Data for flash ignition and self-ignition temperatures determined in accordance with ASTM D1929 Standard for Test Method for Determining Ignition Temperature of Plastics.
- Data for strength testing of products per ASTM E72 Standard Test Methods for Conducting strength Tests of Panels for Building Construction.
- Data for density determined in accordance with ASTM C271 Standard Test Method for Density of Sandwich Core Materials.
- Data for water absorption determined in accordance with ASTM C272 Standard Test Method for Water Absorption of Core Materials for Sandwich Construction.

7.0 MARKING:

THERMO-KOOL finished products are labeled with the manufacturer's name, location of manufacture, and the QAI CER-1045. An example panel label is outlined in Figure 1 below.

Figure 1 – Representative Example of Product Label

8.0 RESULTS/RATINGS:

8.1 Maximum Allowable Loads for Wall Panels:

Table 1 – Wall Panel Axial Load Capacity[1]

MINIMUM PANEL THICKNESS inches (mm)	MAXIMUM PANEL HEIGHT ft (m)	LOAD @ COMPRESSION LIMIT Δ = 1/8 inch (3.2 mm) lbs/ft (kN/m)	ALLOWABLE LOAD STRENGTH lbs/ft (kN/m)
4 (102)	10 (3.05)	560[2] (8.17)	560[3] (8.17)

1. Capacity values are for panels only. Connection details are outside the scope of this report and to be in accordance with Engineering Design.
2. Load at compression limit is based on allowable strength.
3. Allowable strength load is based off ultimate load with a factor of safety of 3 applied.

Table 2 – Wall Panel Transverse Load Capacity[1,2]

MINIMUM PANEL THICKNESS inches (mm)	MAXIMUM PANEL HEIGHT ft (m)	DEFLECTION LIMIT psf (kPa)			ALLOWABLE PRESSURE psf (kPa)
		L/360	L/240	L/120	
4 (102)	10 (3.05)	16 (0.8)	27 (1.3)	28 (1.3)[3]	28 (1.3)[4]

1. Capacity values are for panels only. Connection details are outside the scope of this report and to be in accordance with Engineering Design.
2. Allowable pressure includes outward and inward pressure directions.
3. Deflection limits noted are governed based off allowable pressure.
4. Allowable strength load is based off ultimate load with a factor of safety of 3 applied.

Table 3 – Wall Panel Racking Shear Capacity[1]

MAXIMUM ASPECT RATIO Height: Width	DRIFT LIMIT = 0.5'' (13 mm) lbs/ft (kN/m)	ALLOWABLE LOAD STRENGTH lbs/ft (kN/m)
1:1	81.3[2] (1.18)	81.3[3] (1.18)

1. Capacity values are for panels only. Connection details are outside the scope of this report and to be in accordance with Engineering Design.
2. Deflection limits noted are governed based off allowable pressure.
3. Allowable strength load is based off ultimate load with a factor of safety of 3 applied.

8.2 Maximum Allowable Loads for Roof Panels:

Table 4 – Roof Panel Transverse Load Capacity[1,2,3]

MINIMUM PANEL THICKNESS inches (mm)	MAXIMUM PANEL HEIGHT ft (m)	DEFLECTION LIMIT psf (kPa)				ALLOWABLE PRESSURE psf (kPa)
		L/360	L/240	L/180	L/120	
4 (102)	10 (3.05)	15	26	30.8[4]	30.8[4]	30.8
	11 (3.35)	13.7	23.8	27.4[4]	27.4[4]	27.4
	12 (3.66)	12.3	21.2	24.0[4]	24.0[4]	24.0
	13 (3.96)	11.0	18.7	20.5[4]	20.5[4]	20.5
	14 (4.27)	9.7	16.1	17.1[4]	17.1[4]	17.1
	15 (4.57)	8.3	13.6	13.7[4]	13.7[4]	13.7
	16 (4.88)	7.0	10.3[4]	10.3[4]	10.3[4]	10.3

1. Capacity values are for panels only. Connection details are outside the scope of this report and to be in accordance with Engineering Design.
2. Allowable pressure includes outward and inward pressure directions.
3. Roof and floor panels are evaluated for short term concentrated live loads of 300 lbs (136 kg). Additional concentrated load resistance where required for service are to be part of the Engineering Design.
4. Deflection limits noted are governed based off allowable pressure.
5. Allowable strength load is based off ultimate load with a factor of safety of 3 applied.

8.3 Maximum Allowable Loads for Connections:

Table 5 – Panel to Floor Connections[1]

FASTENER & CONNECTION TYPE	ALLOWABLE TENSILE VALUE lbf (kN)	ALLOWABLE SHEAR VALUE lbf (kN)	ALLOWABLE SHEAR FOR CAM-LOCK FASTENER AT MAX 23" o.c. lb/ft (kN/m)
Instalock (cam-lock) for panel-to-panel assembly (**Details 3, 4, 5**)	142 (0.63)	192 (0.85)	100 (1.46)
3/8 x 6 lag bolt for foam screed (floor assembly) to wood strip breaker of minimum 2x6 (**Detail 6**)	164 (0.73)	410 (1.82)	214 (3.12)

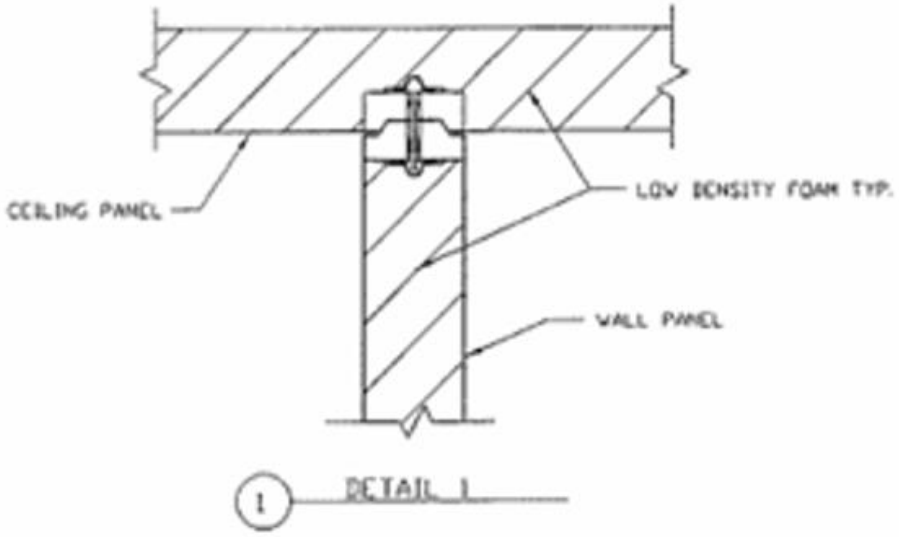
1. Allowable connection loads are based off ultimate load with a factor of safety of 3 applied.

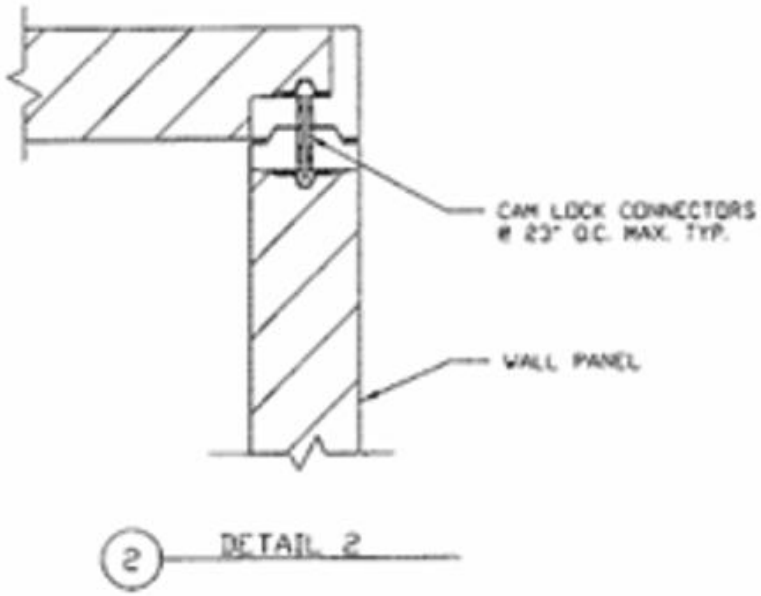
Table 6 – Panel to Ceiling Connections[1]

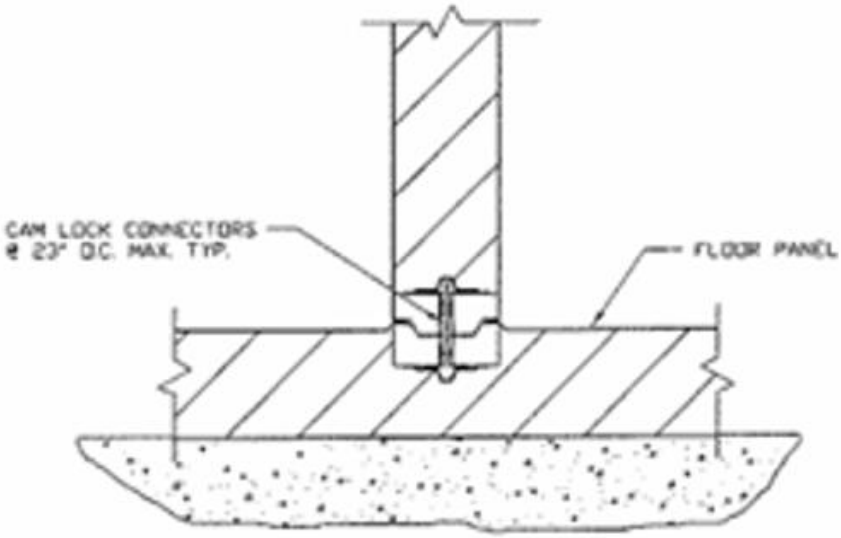
FASTENER & CONNECTION TYPE	ALLOWABLE TENSILE VALUE lbf (kN)	ALLOWABLE SHEAR VALUE lbf (kN)	ALLOWABLE SHEAR FOR CAM-LOCK FASTENER AT MAX 23" o.c. lb/ft (kN/m)
Instalock (cam-lock) for panel-to-panel connections (**Detail 8**)	142 (0.63)	192 (0.85)	100 (1.46)

1. Allowable connection loads are based off ultimate load with a factor of safety of 3 applied.

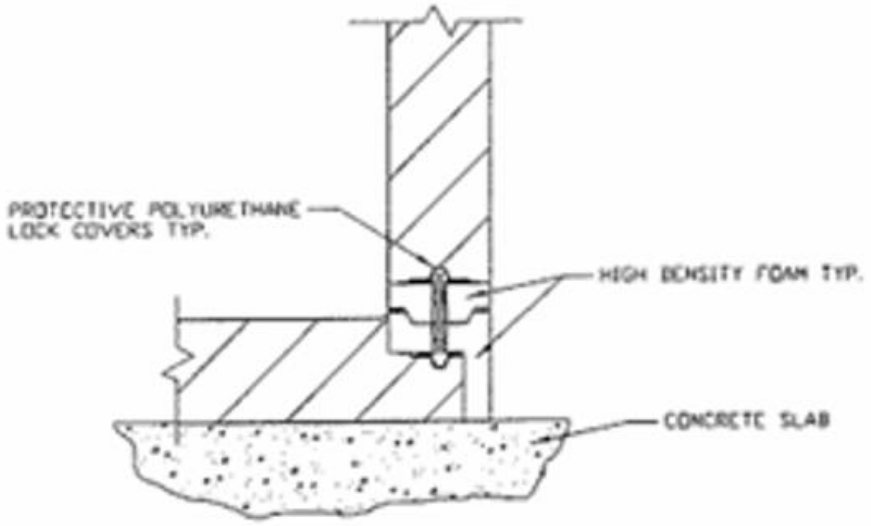
8.4 Standard Walk-In Product Details:



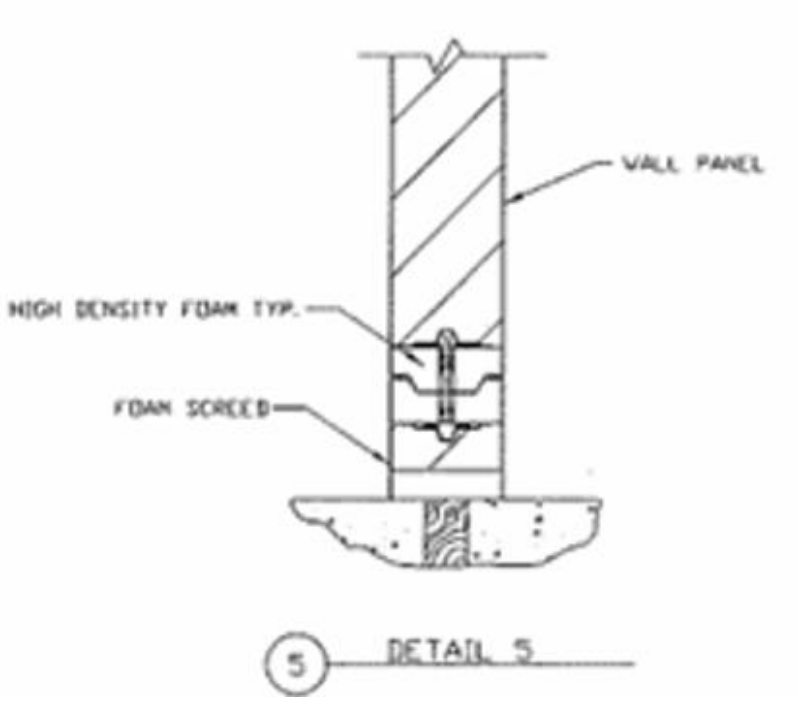


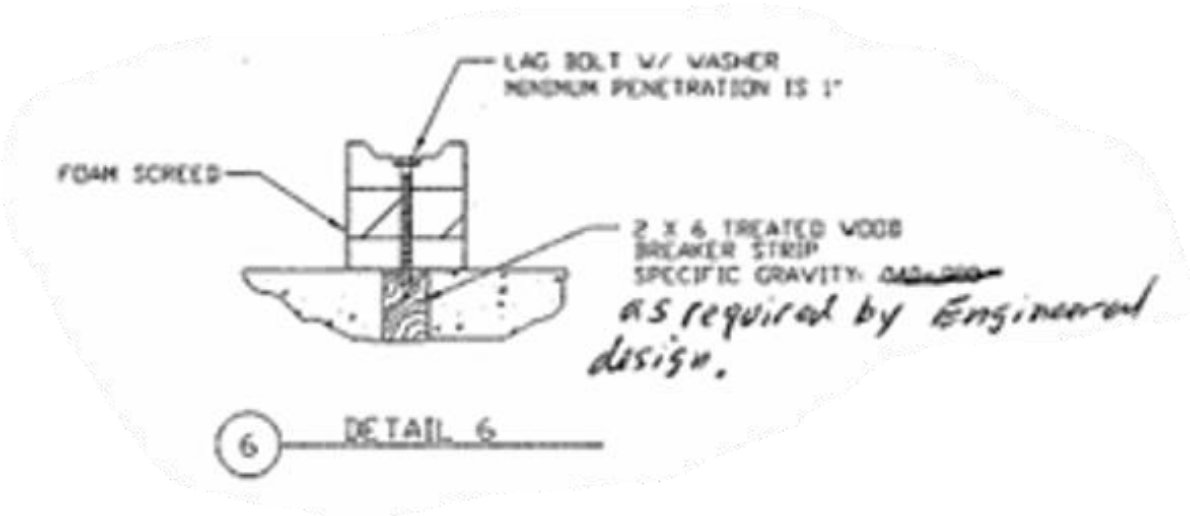


3 DETAIL 3



4 DETAIL 4


WALL PANEL
HIGH DENSITY FOAM TYP.
FOAM SCREED
5
DETAIL 5


LAG BOLT W/ WASHER
MINIMUM PENETRATION IS 1"
FOAM SCREED
2 X 6 TREATED WOOD
BREAKER STRIP
SPECIFIC GRAVITY
as required by Engineered design.
6
DETAIL 6

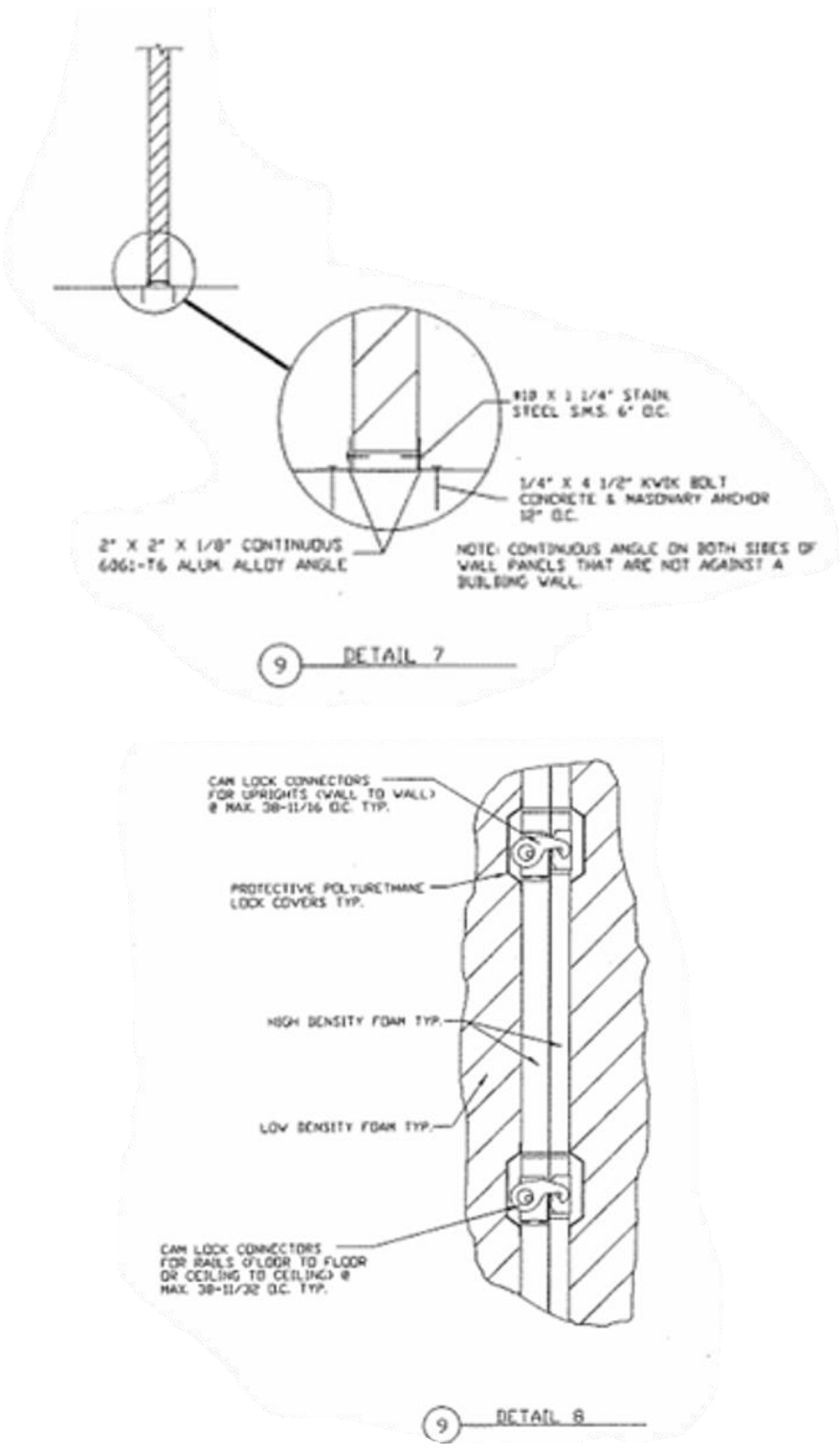


Figure 2 – Standard Walk-In Section Details

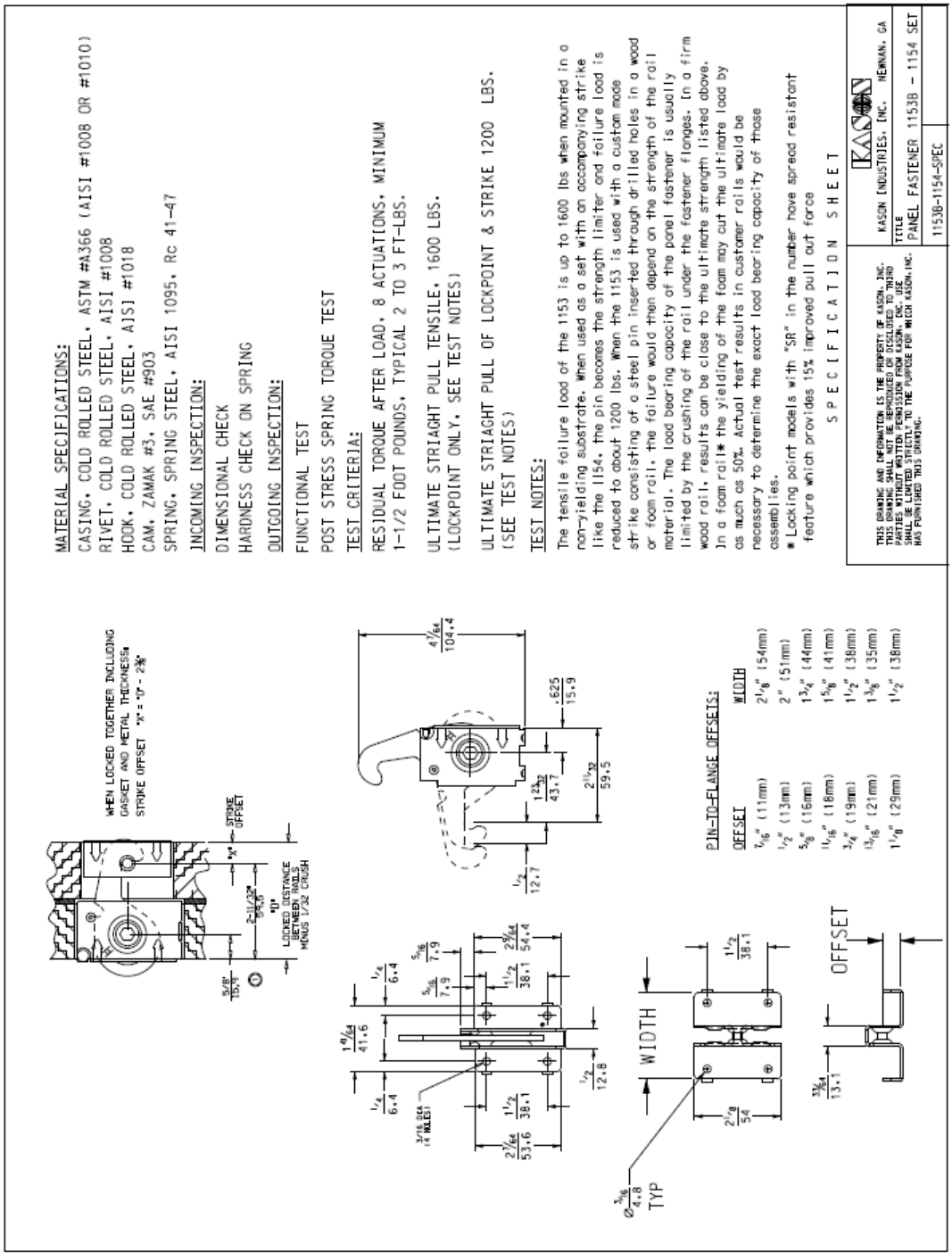


Figure 3 – Mechanical Cam-Locking Device

9.0 SUPPLEMENTAL CODES

9.1 2022 California Building Code:

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels for use in wall, floor and ceiling applications when constructed in accordance with this report comply with requirements of the 2022 California Building Code for use in all types of construction. Use of Thermo-Kool panels requires Engineering Design, including resistance of loads due to seismic. Loads are not to exceed allowable loads as outlined in Tables 1 through 6 of this report.

9.2 2023 Los Angeles Building Code:

THERMO-KOOL Walk-In Cooler and Walk-In Freezer Panels for use in wall, floor and ceiling applications when constructed in accordance with this report comply with requirements of the 2023 City of Los Angeles Building Code for use in all types of construction. Use of Thermo-Kool panels requires Engineering Design, including resistance of loads due to seismic. Loads are not to exceed allowable loads as outlined in Tables 1 through 6 of this report.

10.0 ELIGIBILITY OF REPORT

QAI's Code Evaluation Report complies with the 2024 IBC Section 104.2.3 and 2021 / 2018 IBC Section 104.11 *Alternative materials, design and methods of construction and equipment,* 2024 IBC subsection 104.2.3.6.1 *Evaluation reports* and 2021 / 2018 subsection104.11.1 *Research Reports*. Supporting data has been evaluated by QAI for compliance of the noted materials and assemblies to the applicable code by QAI, and *approved* source as detailed below.

The attached report has been reviewed by a QAI Registered Professional Engineer approved by the specific state Board of Professional Engineers noted on the specific P.E. seal(s).

Per section 1703 of the IBC, QAI is an independent third-party testing, inspection and certification agency accredited by the International Accreditation Service, Inc. (IAS) for this specific scope (see IAS PCA-118). QAI can confirm that based on its IAS accreditation it meets IBC Section 1703.1.1 on *Independence*, Section 1703.1.2 on *Equipment* and Section 1703.1.3 on *Personnel*.

This Evaluation report has been designed to meet the performance requirements of IBC Section 1703.4 and contains the required information to show the product, material or assembly meets the applicable code requirements.

The product is labeled per section IBC 1703 and subject to follow-up inspection per IBC 1703.6 using QAI IAS accredited ISO/IEC 17020 inspection program (see IAS AA-723).

For more information regarding QAI Laboratories, please visit www.qai.org.

The above is an example of the QAI registered Listing mark. The Listing mark may only be used by the Report Holder per the QAI service agreement on products defined in this report. The 'us' indicator in the 4 o'clock position indicates the product complies with the properties evaluated with limitations outlined in this report for use in the US market. A 'c' indicator in the 8 o'clock position indicates the product has been evaluated for use in the Canadian market.

9.0 REFERENCED STANDARDS

UL 723 *Test for Surface Burning Characteristics of Building Materials*
ASTM E84 *Standard Test Method for Surface Burning Characteristics of Building Materials*
ASTM D1929 *Standard Test Method for Determining Ignition Temperature of Plastics*
ASTM E72 *Standard Test Methods of Conducting Strength Tests of Panels for Building Construction*
ASTM C271 *Standard Test Method for Density of Sandwich Core Materials*
ASTM C272 *Standard Test Method for Water Absorption of Core Materials for Sandwich Construction*