

Bally Building Analysis

Quote ID: 169945-1--CCW

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Job:

Date: 12/6/2016

Building Size: Width: 9'-8" Lenth: 11'-7" Height: 9'-2"

Location: , MO

Code: UBC

Load: 6 psf (Dead) + 10 psf (Live) = 16 psf (Total) Wind Speed: 44 mph

Wall Type: 4 inch Panel with 24 Gauge Skin Thickness: 4 " Skin: 0.026

Ceiling Type: 4 inch Panel with 24 Gauge Skin Thickness: 4 " Skin: 0.026

Structural Calculations

Wind Loads: Wind Pressure $Q = 4.53$ psf, UBC specs @ $ce = 0.9$
Side Wall Windward 3.62419 psf, Leeward 2.26512 psf
Roof Uplift 3.17117 psf, Endwall 5.43629 psf
Ceiling Reaction $p1 = 156.3326$ lbs $p2 = 130.4646$ lbs, Wavg = 26.9927 lb/ft

Wall Span: Q wall allow > WSWE = 3.62 or LSWE = 2.27 or Endwall = 5.44 or 15 psf
 Q wall allow = $1.33 * k3 = 49.06$ psf @ span = 9.17 ft > WSWI or LSWE or EW

Ceiling Span: Q ceiling allow > DL + LL = 610 psf or RUWI - $0.8 * DL = -1.62883$
 Q ceiling allow = $k3 = 34.21$ psf @ span = 9.67 ft

Ceiling Diaphragm: 0 -1 16. 0
Wceiling allow > Wactual = 26.9927 plf
Wall = $k * k1 / k2 = 387 * 92.0 / 201.26 = 176.91$ plf > Wactual @ L1 = 11.58

Ceiling Diaphragm - Short Direction: 0 -1 16 0
Wceiling allow > Wactual = 26.9927 plf
Wall = $k * k1 / k2 = 387 * 161.0 / 140.17 = 444.52$ plf > Wactual @ L1 = 9.67

Short Wall Diaphragm: 6.67 ft
Wact < Vallow = 333 or 750 w/reinf Bolt act < Bolt allow = 625 for WA1
Wact = $p1 * h * 12 / k4 / nos = 156.33 * 9.17 * 12 / 61.56 / 3 = 93$ < Vallow = 333
Bolt act = $p1 * h * 12 / k5 = 156.33 * 9.17 * 12 / 133.02 = 129.28$ Width = 6.67

Long Wall Diaphragm: 11.58 ft
Wact < Vallow = 333 or 750 with Reinf Bolt act < Bolt allow = 625 for WA1
Wact = $p2 * h * 12 / k4 / nos = 130.46 * 9.17 * 12 / 105.05 / 3 = 46$ < Vallow = 333
Bolt act = $p2 * h * 12 / k5 = 130.46 * 9.17 * 12 / 355.33 = 40.39$ Width = 11.58

Tuesday, December 06, 2016



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Bally Building Analysis

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Structural Steel Requirement

No Structural Steel is Required.

***** Details Required *****

Shear Plates NOT Required on Ceilings Parallel to Short Side or the Short Wall

Shear Plates NOT Required on Ceiling Joints Parallel to Long Side

Shear Plates NOT Required on the Long Wall Diaphragm

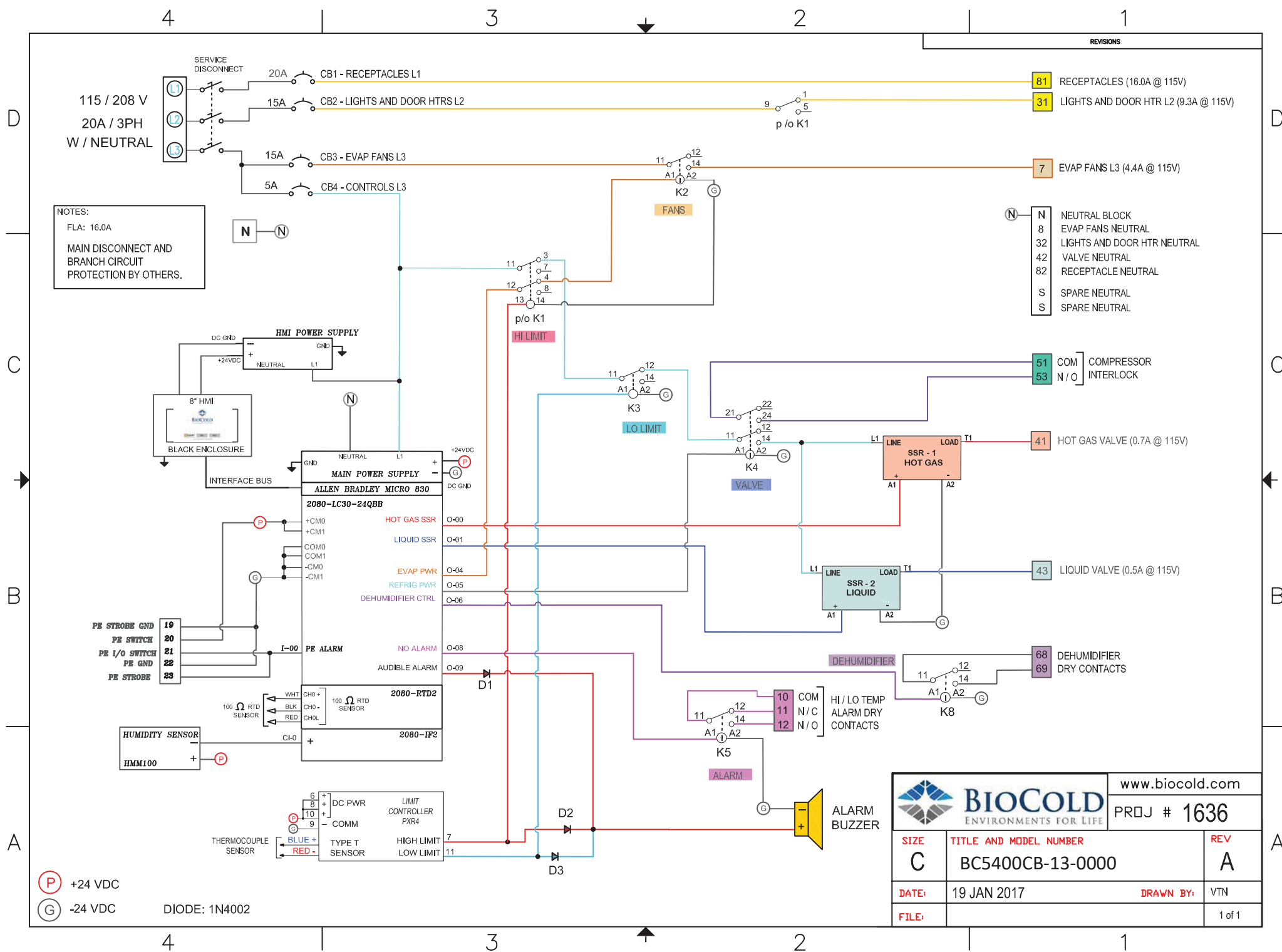
Note: The Above Design Includes Consideration for a Door in the Short Wall Diaphragm

***** Steel Weight *****

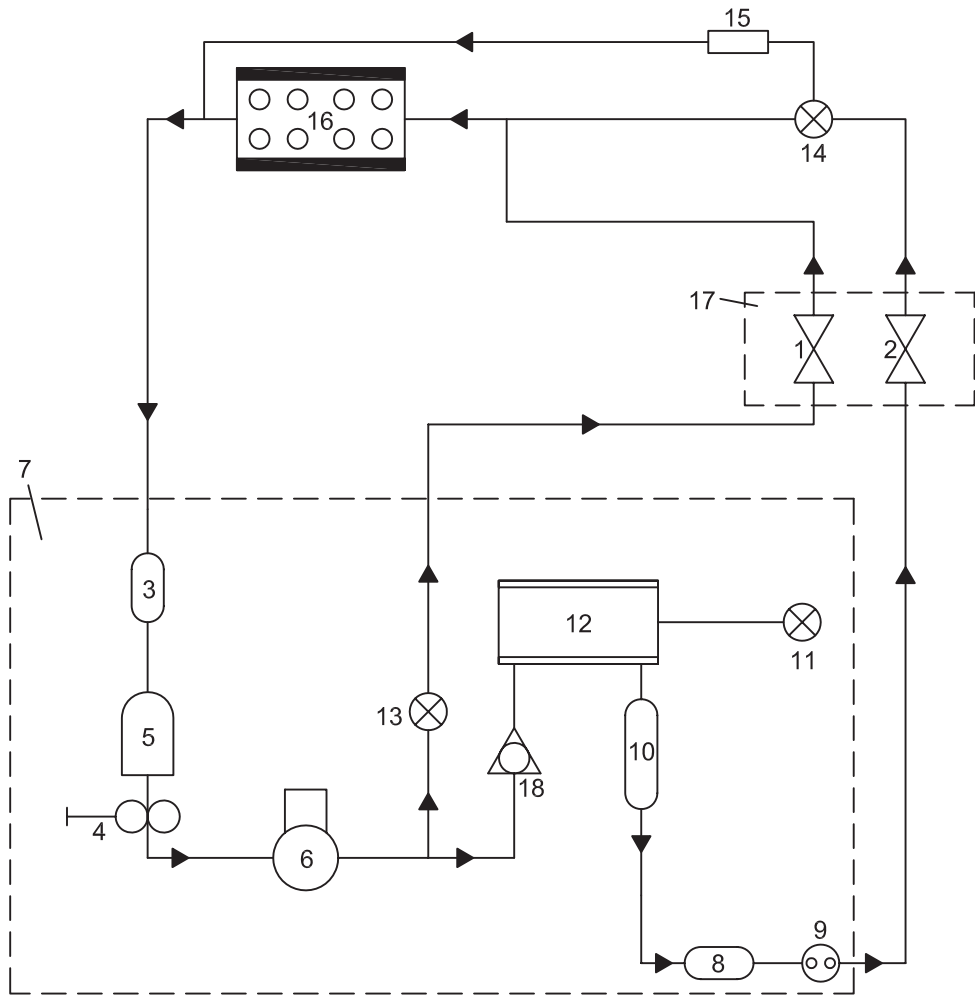
Steel Weight = (Column + Beam) * Markup 0 Shear Plates

Weight = (0.0 + 0.0) * 1.08 = 0 lbs





ZERO TO 100% RAPID CYCLE CONTINUOUS PROPORTIONAL PULSE WIDTH MODULATION HOT GAS BY-PASS REFRIGERATION SYSTEM



1. 5/8" HOT GAS SOLENOID VALVE (SPORLAN XRM)
2. 3/8" LIQUID SOLENOID VALVE (SPORLAN XUP)
3. SUCTION LINE FILTER DRIER
4. CRANKCASE PRESSURE REGULATOR (WARM ROOMS ONLY)
5. SUCTION ACCUMULATOR
6. MOTOR COMPRESSOR
7. CONDENSING UNIT BASE
8. LIQUID LINE FILTER DRIER
9. LIQUID LINE SIGHT GLASS
10. LIQUID RECEIVER
11. WATER REGULATOR (WATER COOLED CONDENSERS ONLY)
12. CONDENSER
13. HOT GAS BY-PASS SHUT OFF VALVE
14. EXPANSION VALVE
15. EXTERNAL EQUALIZER
16. EVAPORATOR (AIR HANDLER)
17. VALVE PANEL INSTALLED ON TOP OF ROOM
18. CHECK VALVE

BIOCOLD[®] ENVIRONMENTAL, INC.

160 OLD STATE ROAD - ELLISVILLE, MO 63021
PHONE: 636/ 349-0300 FAX: 636/ 349-0419

GENERAL DESIGN INFORMATION

BALLY IS ONE OF THE MOST EXPERIENCED AND INNOVATIVE MANUFACTURERS OF WALK-INS AND REFRIGERATED STRUCTURES

Bally has been a leader in the cold storage industry since we introduced Insulated Refrigerated Structures more than 80 years ago. Bally is responsible for many advances in technology that are now considered standard manufacturing practices.

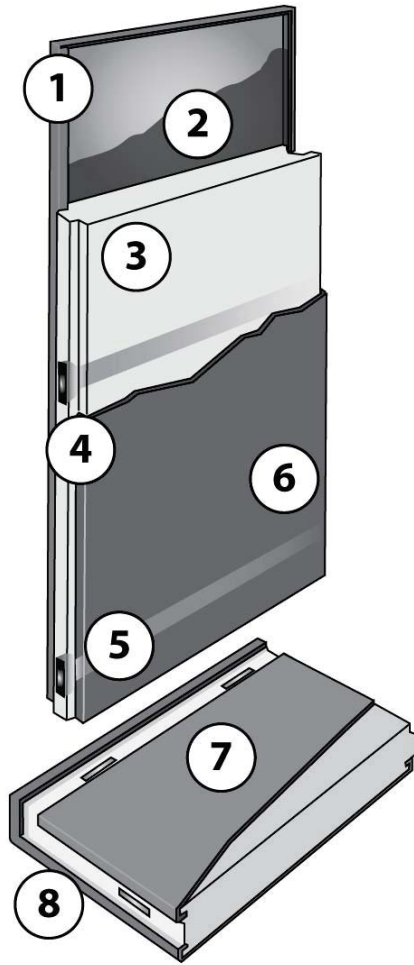
Today, we remain faithful to our tradition of innovation. Bally pioneered the use of non-ozone depleting panels and our panels were the first to receive FM Class I, and UL listings. To comply with the Energy Independence Security Act of 2007, Bally introduced the use of HFC-245fa into our foam. Through our many developments, we've continued to rely on the outstanding fundamentals of our product line, features like these that set us apart:



- **Foamed-in-place, non-ozone depleting urethane insulation.** Our foam uses a low pressure expanding agent that produces 98% closed-cell insulation; maintaining exact thicknesses and precise edges while performing at temperatures ranging from -80°F (-62.2°C) to 200°F (93.3°C).
- **Fast, easy assembly.** Our precisely formed, lightweight panels are available in 4", 5", or 6" thicknesses. The Bally Speed-Lok joining system allows our Walk-Ins and Refrigerated Buildings to be quickly and easily transported and assembled at the job site.
- **Refrigeration Systems.** Bally Refrigeration Products provide a number of pre-assembled remote Refrigeration Systems. They are available in varied designs, mounting styles, capacities, and voltages. Refrigeration Systems are individually configured so they have the correct size, power and capacity for each Bally structure.



GENERAL DESIGN



Smallest building size is 3'11" x 5'10".
Size increases in 11½" increments.

Our panels are precisely formed in custom-designed molds then injected with foam insulation to provide dimensional stability through a wide range of temperatures.

1. Exterior metal vertical panel skins. *(See below for available finishes.)*
2. Bally wash primer for optimum foam adhesion.
3. Foamed-in-place, non-ozone depleting urethane insulation.
4. Accurately molded urethane creates tongue and groove edges.
5. Speed-Lok joining mechanism creates snug joints with heavy-gauge steel straps that connect locking arms with locking pins on opposite edges of each panel.
6. Interior metal vertical panel skin. *(See below for available finishes.)*
7. Interior metal floor panel skin. *(See below for available finishes.)*
8. Exterior metal floor panel skin. Edges capped with matching metal when Stainless steel or White galvanized steel is specified for vertical. *(See below for available finishes.)*

Verticals	Heights:	6'10"-10'10", 11'4"-19'4", 19'8"-27'8" In 1' increments. <i>(May be fabricated in 2 pieces)</i>
	Widths:	11½", 17¼", 23", 34½", or 46" Corners 12" x 12" Outside width
Ceiling & Floor	End:	23½" Widths
	Center:	11½", 17¼", 23", 34½", or 46" Widths
Hinged Entrance Doors 4" 5", or 6"	Heights:	6'10", 7'10" <i>(For taller buildings, correctly sized panels are installed above the door panels.)</i>
	Widths:	46" wide panels: 24", 30", 34", 36" openings 57½" wide panels: 36", 42", 48" openings 69" wide panels: 36", 42", 48", or 60" openings

Heights shown are for vertical panels only; for overall height, add thickness of appropriate floor and ceiling panels. Lengths vary. 4" and 5" thick floor and ceiling panel maximum length: 11'6" multi-span; 17'4" for single span *(indoors)*. Beading occurs on panels greater than 130" in height to improve stability; panels shorter than 130" are not beaded.

PANEL FINISHES

Bally panels are constructed with standard metal finishes. *Custom options and colors are available.*

Vertical Panel Finishes

Stainless steel
Galvanized steel
Smooth White galvanized steel
Smooth White aluminum
Stucco-Embossed Galvalume steel
Stucco-Embossed Stainless steel
Stucco-Embossed Aluminum
Stucco-Embossed White Aluminum
Stucco-Embossed White galvanized steel
Stucco-Embossed Sand-tan galvanized steel

Floor Metal and Diamond Tread Finishes

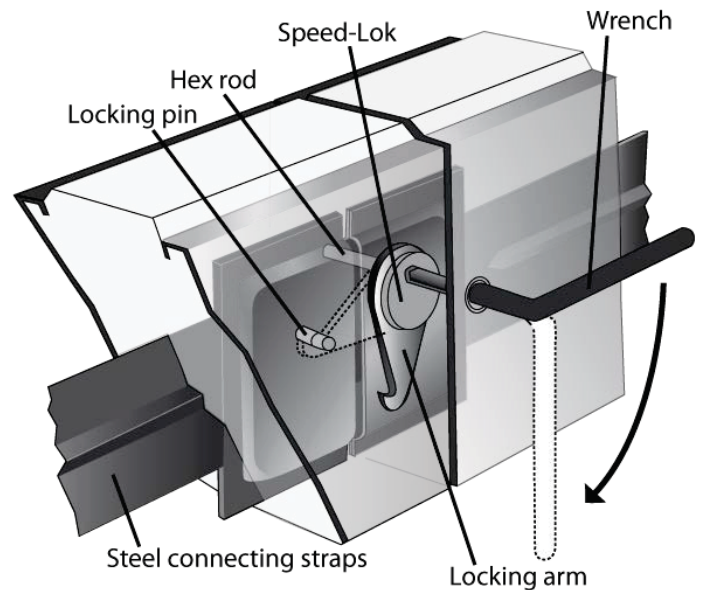
16 ga. Stainless Steel 600 lbs/sq-ft
.080 Rigidized Aluminum
.100 Smooth Aluminum
16 ga. Galvanized Steel
.125 Aluminum Diamond Tread
.060 Rigidized Stainless Steel

GENERAL DESIGN

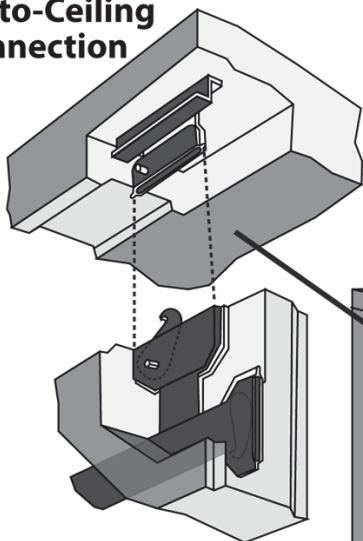
THE BALLY SPEED-LOK

Bolstered by a steel strap foamed into the panels, Bally Speed-Loks help to create strong structures. The Speed-Lok's simplicity allows a structure to be assembled in a fraction of the time compared to conventional construction and aids in the ability to expand, disassemble, or relocate a Bally structure with ease. The Bally Speed-Lok is operated solely by a hex wrench, and consists of:

- **Locking pin:** This steel rod is precisely positioned so that the locking arm engages it tightly.
- **Locking arm:** A cam-mounted arm with a hooked end. When a hex wrench is used to turn the arm, the eccentric movement of the cam first enables the hook to engage the pin and then draws the panels tightly together.

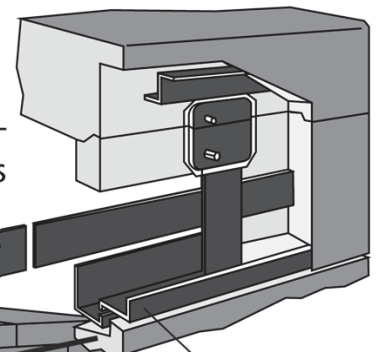


Wall-to-Ceiling Connection

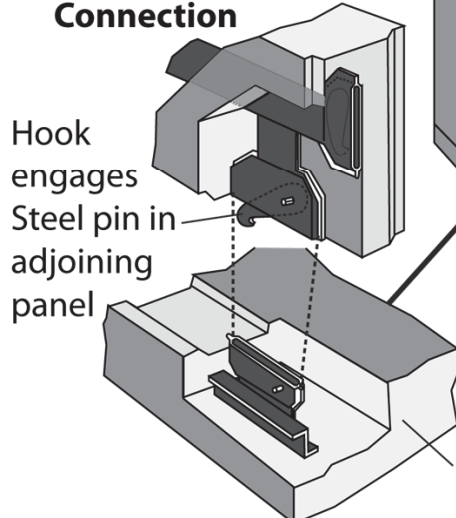


Door Frame Connection

2" Steel Straps for Lock-to-Lock Connections

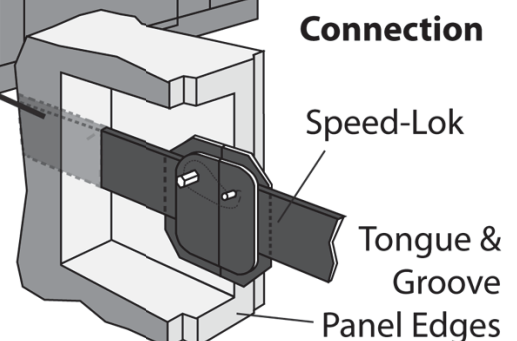


Floor-to-Wall Connection



Door Frame Connects to Wall & Ceiling Panels

Wall Panel Connection



Foamed-in-place, non ozone-depleting urethane insulation

GENERAL DESIGN

BALLY PANEL INSULATION

The current insulation formula used in Bally panels relies on Hydrofluorocarbon (HFCs), specifically HFC-245fa, meeting standards for Chlorofluorocarbon (CFC) reduction, the U.S. Clean Air Act, and the EISA Act of 2007. Compared to the CFCs they replace, HFCs reduce ozone depletion by a factor of ten while creating insulation with outstanding resistance to the transfer of heat. Urethane insulation is substantially more effective at resisting the transfer of heat than other common insulating materials. Advantages of Bally Insulation:

- **Dimensional stability:** Bally's non-ozone depleting urethane uses a low pressure expanding agent that produces 98% closed-cell insulation that maintains its shape and size through a wide range of temperatures.
- **Lightweight:** Poured-foam urethane insulation makes Bally panels light in weight, so they are easy to handle during installation.
- **Energy efficiency:** The insulating superiority of a Bally structure reduces energy expenditures resulting in cost savings.

INSULATION RATINGS

Bally Insulation	K-Factor	R-Value		
		4"	5"	6"
Cooler Panels	.137	29.2	36.5	43.9
Freezer Panels	.123	32.6	40.8	48.9

In 2009, federal law went into effect requiring Walk-In Cooler and Freezer panels to contain insulation with ratings of at least R-25 for Coolers and R-32 for Freezers. R-values and K-factors measure thermal resistance and heat conductivity which are determined by ASTM c518. Coolers are tested at 55°F mean temperature with a 40° temperature difference. Freezers are tested at 20°F mean temperature with a 40° temperature difference.

Bally units comply or surpass applicable Flame Spread -25, UL, UL 723, & NSF standards in a manner conforming to ASTM E-84, and Factory Mutual standards.

LAWS, APPROVALS & LISTINGS

Our products are in compliance with the Energy Independence and Security Act of 2007, and additionally backed with approvals and listings from leading independent quality certification organizations. Buyers can be sure that Bally products live up to these stringent standards.

EISA

Bally panels and refrigeration systems are in accordance with the Energy Independence and Security Act of 2007.



Underwriters Laboratories

Flame spread and smoke developed listings appear on tags on every Bally panel; proving that the panels are UL-classified. UL listings have also been granted to electrical systems in Bally structures, including interior lights, door heaters and refrigeration systems.



Factory Mutual

Bally panels have been approved as a Class 1 building material by Factory Mutual Insurance System. This approval means that Bally wall and ceiling panels meet FM standards for Walk-Ins and Refrigerated Buildings without sprinklers. (Local codes vary)



National Sanitation Foundation

Bally installations that incorporate floor panels with a 3/8" coved offset are Certified by NSF.



New York City

Stringent tests on our insulation have earned Bally panels the Materials and Equipment Approval of the City of New York. To conform to the standards Bally makes special wiring systems and low-voltage heaters when needs dictate.



City of Houston

Tests on our panels have earned Bally the City of Houston Approval.



Miami Dade

Bally has received approval from Miami-Dade County, Florida NOA # 12-0313.02 Expires: 2.7.2018



Contact factory regarding other approvals.

2

DOORS

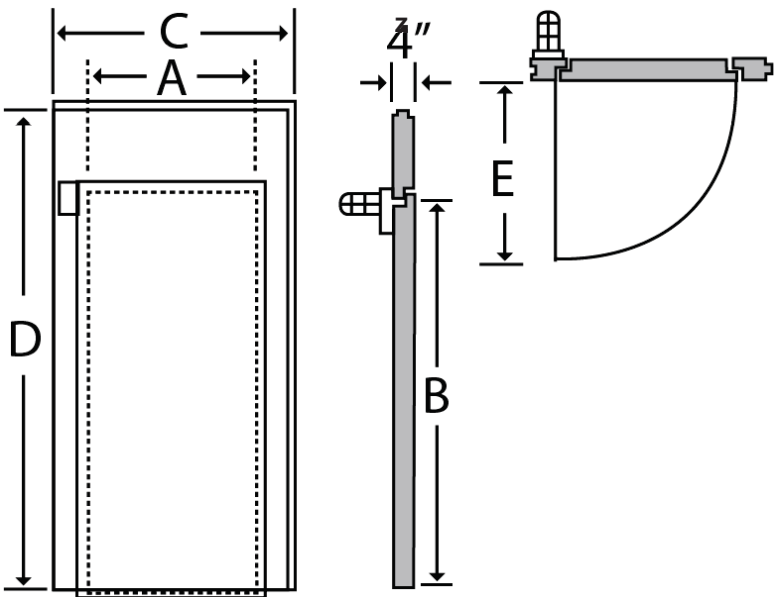
DEPEND ON BALLY FOR LONG LIFE AND RELIABLE SERVICE

Our doors use the same construction as our panels: rigid insulation foamed-in-place and securely bonded to metal skins for tremendous structural strength. A reinforced U-channel steel frame with a thermal breaker prevents twisting, sagging, and eliminates the need for structural members. The durability of this construction results in an exceptionally strong door.

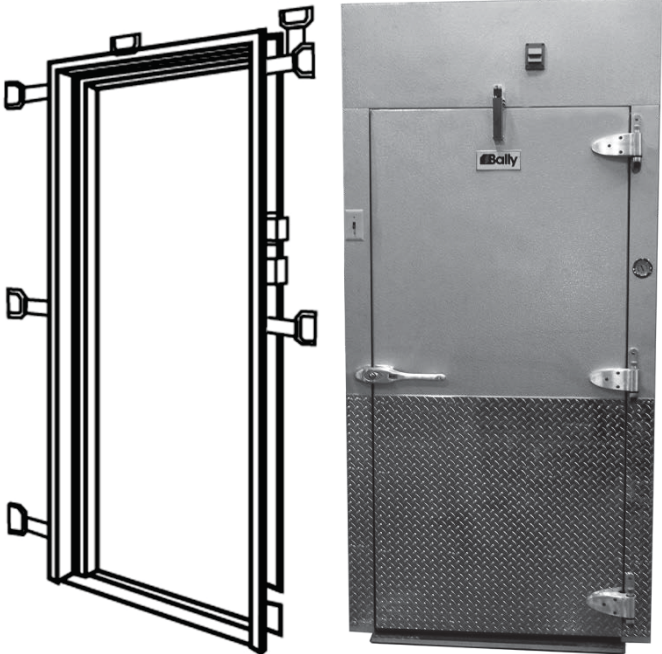
- Bally doors include fingertip-touch latch with lock set. A magnetic gasket provides a snug seal.
- Heater wires concealed in the perimeter of Bally door jambs prevent the formation of condensation or frost.
- Bally offers a wide selection of sizes and options.

DIMENSIONAL DATA:

Hinged Entrance Door Panels



120V., 60Hz., 1 Phase service is required for lights and anti-condensate heaters on door panels (220V. available). Connections are made to the junction box at the light, which is always inside the Walk-In, directly opposite the top hinge.



	Door Opening		Door Panels Used w/Floor Panels			Total Amps **
	A	B	C*	D	E	
7'6" High Walk-In	2'6"	6'6"	3'10"	6'10"	3'1"	3.14
	2'6"	6'6"	5'9"	6'10"	3'1"	3.14
	3'0"	6'6"	3'10"	6'10"	3'7"	3.56
	3'0"	6'6"	5'9"	6'10"	3'7"	3.56
	3'6"	6'6"	5'9"	6'10"	4'1"	3.35
	4'0"	6'6"	5'9"	6'10"	4'7"	3.18
	5'0"	6'6"	5'9"	6'10"	5'6"	3.94
8'6" High Walk-In	2'6"	6'6"	3'10"	7'10"	3'1"	3.14
	2'6"	6'6"	5'9"	7'10"	3'1"	3.14
	2'6"	7'0"	3'10"	7'10"	3'1"	3.65
	2'6"	7'0"	5'9"	7'10"	3'1"	3.65
	3'0"	6'6"	3'10"	7'10"	3'7"	3.65
	3'0"	6'6"	5'9"	7'10"	3'7"	3.65
	3'0"	7'0"	3'10"	7'10"	3'7"	3.46
	3'0"	7'0"	5'9"	7'10"	3'7"	3.46
	3'6"	6'6"	5'9"	7'10"	4'1"	3.35
	3'6"	7'0"	5'9"	7'10"	4'1"	3.26
	4'0"	6'6"	5'9"	7'10"	4'7"	3.18
	4'0"	7'0"	5'9"	7'10"	4'7"	4.24
	5'0"	7'0"	5'9"	7'10"	5'6"	3.85

**Total amps include anti-condensate heaters and one 32-watt compact florescent light.

*Consult factory for details. 4'9½" door panel available for 30", 36", 42" and 48" door openings requiring special locations. For 6'6" Walk-Ins, 5'6" high door openings can be supplied. Partition door panels, when used with floor panels, are identical to exterior door panels except that the stepplate is flush. For Walk-Ins higher than 8'6", an additional filler wall panel is used above an 8'6" high door panel.



**ASTM D1929-96 (reapproved 2001)
Standard Test Method for Determining
Ignition Properties of Plastics**

Polyurethane Foam

Project No. 3195428SAT-001A

November 24, 2009

Prepared for:

**Bally Refrigerated Boxes, Inc.
135 Little Nine Drive
Morehead City, NC 28557**

**Intertek Testing Services NA, Inc.
16015 Shady Falls Road
Elmendorf, Texas 78112
Telephone: 210-635-8100 Fax: 1-210-635-8101
e-mail: www.intertek-etlsemko.com**

ABSTRACT

Specimens submitted by Bally Refrigerated Boxes, Inc. and identified as "Polyurethane Foam" were tested in accordance with the ASTM D 1929 Standard Test Method for Determining Ignition Temperature of Plastics with the following results:

Flash-Ignition Temperature: 440°C (824°F) Flaming

Spontaneous-Ignition Temperature: 520°C (968°F) Flaming

This report contains a total of five pages.

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"These tests results relate only to the behavior of the test specimens under the particular conditions of the test. They are not intended to be used, and shall not be used, to assess the potential fire hazards of a material in use."



Thomas Haynes
Technician

November 24, 2009

Reviewed and approved:



Servando Romo
Project Manager

November 24, 2009



INTRODUCTION

This test standard outlines a laboratory determination of the spontaneous-ignition and flash-ignition temperatures of plastics using a hot air furnace.

This standard should be used solely to measure and describe the properties of materials, products, or systems in response to heat and flame under controlled laboratory conditions and should not be considered or used for the description, appraisal, or regulation of the fire hazard of materials, products, or systems under actual fire conditions.

Test results from this standard method can be of considerable value in comparing the relative ignition characteristics of different materials. Values obtained represent the lowest ambient air temperature that will cause ignition of the material under piloted and non-piloted conditions such as those presented herein. Test values are expected to rank materials according to ignition susceptibility under actual use conditions.

This test however, is not intended to be the sole criterion for fire hazard. In addition to ignition temperatures, fire hazard includes such other factors as burning rate or flame spread, intensity of burning, fuel contribution, products of combustion, and others.

DEFINITIONS

Flash-Ignition Temperature - The lowest initial temperature of air passing around the specimen at which a sufficient amount of combustible gas is evolved to be ignited by a small external pilot flame.

Spontaneous-Ignition Temperature or Self-Ignition - The lowest initial temperature of air passing around the specimen at which, in the absence of an ignition source, the self-heating properties of the specimen lead to ignition or ignition occurs of itself, as indicated by an explosion, flame, or sustained glow.

Glowing Combustion - In some cases slow decomposition and carbonization of the plastic results only in glow of short duration at various points in the specimen without general ignition actually taking place.

TEST PROCEDURE

The test apparatus is a hot air ignition furnace with an inside diameter of 76 mm (3 in), with an adjustable movement of hot air rising up through it. The electrically heated furnace is adjusted so that the air temperature (at a given air velocity rate) is at a preselected and equilibrated temperature, and then the test specimen is lowered to the approximate center of the tube furnace with a specimen holder. A cover is then placed over the top of the furnace, which contains a 25 mm diameter hole in the center, through which excess furnace air and any gases given off by the specimen escape. If that test is to be for flash-ignition, a small pilot flame is placed over the hole in the cover to ignite the gases if an ignitable concentration occurs. Thermocouples located in the center of the test specimen, and slightly below and to one side of the specimen monitor the test.

The determination of flash and spontaneous-ignition temperatures is then determined to be the temperatures at which the material will flash or self-ignite at that temperature, but not at 10°C lower.

Thermoplastic materials may be tested in pellet form normally supplied for molding. Where only sheet samples are available for thermosetting materials, 20 by 20 mm (3/4 in. x 3/4 in.) squares of the available sheet or film shall be stacked to a height that gives the required mass. A total specimen weight of 3 ± 0.2 grams is required. Materials that have a density of less than 100 kg/m^3 need to be 20mm by 20mm by 50mm (3/4 in. x 3/4 in. x 2 in.) and have no required mass.

TEST SPECIMEN

Specimens submitted by: Bally Refrigerated Boxes, Inc.

Date received: November 18, 2009 (This specimen was received in good condition.)

Date tested: November 24, 2009

Sample Form: Foam

Specimen I.D.: Polyurethane Foam

Description: Yellow Foam

Environmental Conditions: 70°F and 40% r.h.

This Test Witnessed by: n/a



Specimen preparation: The polyurethane foam material was cut into 0.75" X 0.75" X 2" pieces. For this test, it took 1 piece to make a specimen. Test specimens were conditioned at $23 \pm 2^{\circ}\text{C}$ ($73.4 \pm 3.6^{\circ}\text{F}$) and $50 \pm 5\%$ relative humidity for not less than 40 hours prior to test.

Test specimens were conditioned as specified and then tested in accordance with ASTM D 1929. The furnace temperature was taken to be that measured by the "furnace air thermocouple" and the specimen temperature was monitored by a thermocouple located within the steel specimen cup. When the furnace temperature was stable at the selected temperature, the specimen was placed into the specimen cup and the test begun. The current to the furnace heating coils was governed by a variable transformer. Once the furnace was equilibrated to the starting temperature, the variac setting was not changed, regardless of the furnace temperature during the test.

TEST RESULTS & OBSERVATIONS

Time in (min:sec)

Flash-Ignition: Smoking at 0:05; Ignition at 0:31
Combustion was by flaming

Spontaneous-Ignition: Smoking at 0:04; Ignition at 0:18
Combustion was by flaming

Air flow through the furnace for all tests was metered at 25 mm/s, in accordance with ASTM D 1929 section 8.

CONCLUSIONS

The flash-ignition temperature of this material was determined to be 440°C (824°F) and the spontaneous -ignition temperature was determined to be 520°C (968°F).

The spontaneous-ignition temperature is also called the self-ignition temperature. The ASTM D 1929 standard (section 3.2.3.) defines both terms (spontaneous-ignition and self-ignition) the same way.



BLBT.R18109 Building Units

Page Bottom

Building Units

[See General Information for Building Units](#)

BALLY REFRIGERATED BOXES INC

R18109

135 LITTLE NINE DR
MOREHEAD CITY, NC 28557 USA

Panels consisting of a foamed plastic core having aluminum or steel sheet on each side.

	Core Mtl		3 In. Thk Painted Steel Finished Panel		3 In. Thk Unpainted Steel Finished Panel	
Flame spread	25		25		25	
Smoke developed	110-170		450		Over 500	
	Core Mtl	4 to 6 In. Thk Finished Panel				
		Unpainted Aluminum Interior Surface		Unpainted Steel Exterior Surface		
Flame spread	25	20		25		
Smoke developed	105	350		500		
	Core Mtl	4 to 6 In. Thk Unpainted Aluminum Finished Panel	4 to 6 In. Thk Unpainted Steel Finished Panel		4 to 6 In. Thk Painted Steel Finished Panel	
Flame spread	25	20	25		25	
Smoke developed	105	350	500		450	
	Core Mtl	4 to 6 In. Thk Aluminum Coated Steel Finished Panel		4 to 6 In. Thk Painted or Unpainted Steel Finished Panel		
Flame spread	25	20		25		
Smoke developed	105	500		Over 500		
	Core Mtl	4 to 6 In. Thk Unpainted Aluminum Finished Panel			4 to 6 In. Thk Painted or Unpainted Steel Finished Panel	
Flame spread	25	25			25	
Smoke developed	65-90	400			Over 500	
		Core Mtl	4 In. Thk Painted or Unpainted Steel Panel			
Flame spread		25	20			
Smoke developed		65-90	Over 500			
		4 to 6 In. Thk			3 to 6 In. Thk	

		Core Mtl	Painted or Unpainted Aluminum Finished Panel		Painted or Unpainted Steel Finished Panel	
Flame spread		25	20		25	
Smoke developed		200	400		Over 500	
	Core Mtl	4 to 6 In. Thk Aluminum Coated Steel Finished Panel	4 to 6 In. Thk Finished Panel			
			Painted or Unpainted Aluminum Interior Surface		Unpainted Steel Exterior Surface	
Flame spread		25	25		20	25
Smoke developed		200	Over 500		400	Over 500
	Core Mtl	4 to 6 In. Thk Reinforced Plastic Faced Finished Panel	4 to 6 In. Thk Aluminum Coated Steel Finished Panel	4 to 6 In. Thk Finished Panel		
				Painted or Unpainted Aluminum Surface	Painted or Unpainted Steel Surface	
Flame spread		25	40	25	20	25
Smoke developed		250	Over 500	Over 500	400	Over 500
	4 In. Thk Core Mtl		5-6 In. Thk Core Mtl		4-6 In. Painted or Unpainted Aluminum or Steel Finished Panel	
Flame spread		25		35		25
Smoke developed		170		300		Over 500
Flame spread		25		20		25
Smoke developed		250		350-450		Over 500
			Core Mtl		4-6 In. Painted or Unpainted Aluminum or Steel Finished Panel	
Flame spread		25		25		
Smoke developed		300		Over 500		
			Core Mtl		4 In. Painted or Unpainted Aluminum or Steel Finished Panel	
Flame spread		25		25		
Smoke developed		350-450		Over 500		

Last Updated on 2004-12-07

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WEBSTER INTERDISCIPLINARY SCIENCE BUILDING

ROOM #376 | CTR SECTION #130383 | WEBSTER, MO

EQUIPMENT AND MATERIAL COMPONENT LISTING

DESCRIPTION	PRODUCT
Insulated panel structure	Bally Refrigerated Boxes
24x14 view window	Norfab
Control Systems	7" Color Touchscreen
Temperature Controller	Allen Bradley
Lighting	BioCold 48" LED Fixtures
Compressor-Condensing Unit	Keeprite KEZA011H8-HT3B Outdoor Air-Cooled
Evaporator Unit Cooler	Larkin ACM156AE
Copper Tubing	Mueller Streamline Type L ACR
Brazing material	Harris Stay Silv 15
Solenoid valves	Sporlan Rapid Cycle Valves
Piping insulation	Armaflex





BIOCOLD
ENVIRONMENTS FOR LIFE

February 7, 2016

Paric Construction
Attn: Devin Gates
77 Westport Drive, Suite 250
Maryland Heights, Missouri 63146

RE: Submittal 130383-006 for the Controlled Temperature Room at Webster University Science Building

Dear Mr. Gates:

BioCold Environmental, Inc. is pleased to provide the following documents as our re-submittal package for the walk-in controlled temperature room at the Webster University Interdisciplinary Science Building in Webster, Missouri. This packet responds to each of the items identified in the review comments provided by Cannon Design.

COMMENTS:

1. **Comply with codes per specification 13083.1.3.A.**
All equipment and installation methods will be in compliance with the relevant codes and regulatory requirements of ASHRAE, the Air Conditioning and Refrigeration Institute (ARI), the American Society for Testing and Materials (ASTM), the National Electrical Manufacturer's Association (NEMA), the National Sanitation Foundation's Standard #7 (NSF), and the Sealed Insulating Glass Manufacturer's Association. **OK**
2. **Provide Items 2, 3, 4 per Spec 1.4-A.**
Please see enclosed for drawing more clearly indicating the following: (2) electrical schematic with j-box locations and conduit sizes; (3) refrigerant schematic showing lines and locations of system components, and (4) re-stated design and performance criteria. **OK**
3. **Provide equipment anchorage information per 1.4.B**
Please see updated shop drawing showing equipment anchorage detail(s). **OK**
4. **Provide samples.**
Samples have been previously provided. We have attempted to obtain custom samples per the specification requirements, but the manufacturer is not able to provide the specified wall/ceiling assembly samples. We have numerous installations in the St. Louis area, and would be pleased to provide either a site visit or photos of other installations. **OK**
5. **Provide warranty information.**
Please see warranty letter included in the re-submittal package. **OK**

A/E: I will submit the sample received by bio-cold which under previous discussion with Kelvin does not meet requirements. Please let me know how to proceed.
- Devin

6. **Provide ASTM E84 information per specification 130383.2.2.D.3.**
Please see updated insulated panel data sheets indicating the ASTM E84 compliance. **OK**
7. **Coordinate installation and service clearance requirements with all other trades.**
Clearance requirements will be coordinated during field measurements and throughout the installation process. **OK**
8. **The electrical drawings show a 20A/2pole (3wire) circuit for the evaporator serving the cold room. This shop drawing indicates a 20A/3pole (4wire) circuit to the control panel.**
This has been coordinated with the electrical contractor. All control wiring from the control panel to equipment within the room is by BioCold. **OK**
9. **Coordinate with GC and electrical contractor.**
We have already had coordination conversations with the GC and electrical contractor and will continue to coordinate throughout the installation process. **OK**
10. **GC to confirm dimensions work with the floor depression provided.**
BioCold will also field verify all dimensions prior to fabrication.
11. **Relocate GFCI receptacles to 42" AFF.** **Provide GCI receptacles at 42" AFF. Casework countertop is 34" high with 4" backsplash so there will no conflict.**
Please confirm desired receptacle height. The specification indicates that the receptacles should be 42" AFF **unless otherwise noted**. The elevation on A0615/14 clearly scales the receptacles at 48" AFF on center. We are more than willing to relocate the receptacles to 42" AFF on center, but want to confirm that this will not interfere with the casework/counters.
12. **GC to coordinate backing requirements for casework installation with casework manufacturer.**
By others. **GC to coordinate.**
13. **GC to coordinate piping routes and condenser location on roof.**
These routes and locations are being coordinated with the GC. **OK**
14. **Provide closure trim angles at walls & ceiling. Color to match cold room panels.**
Closure trim in matching finish will be provided. Trim to be field measured prior to fabrication. **OK**
15. **Adjust partition wall in front of cold room as needed to accommodate touchscreen controller.**
Please see revised shop drawing for requested clearances. **OK**
16. **Inside clear height to 8'-0" AFF.**
The inside ceiling height will be 8'-10" AFF. With an evaporator that extends 9" from the ceiling, this leaves an inside clear height of 8'-1" AFF. **OK**
17. **Provide equipment seismic anchorage information per 1.4-B.**
See item #3 above. **OK**
18. **Coordinate with GC & provide needed for connections to building automation system, smoke detector and sprinkler per specification 130383.2.6.C.**
Wall and ceiling panels are adequate to support smoke detector without additional reinforcement required. The exact location for smoke detector can be field coordinated. Sprinkler lines are typically cored by the sprinkler contractor. BioCold does not recommend



GC will
coordinate with
FP contractor.
-Devin Gates

OK

sleeved penetrations, as this creates additional possibility for moisture infiltration. BioCold is willing to make sprinkler penetrations if locations are marked by the sprinkler contractor. This will be coordinated in the field during installation. **GC TO COORDINATE CONNECTION TO BUILDING AUTOMATION SYSTEM, IF NEEDED.**

19. Provide information per specification 130383 2.3.A.1 & 2 and 2.3.B.

The performance information has been updated to include additional information as requested. **OK**

20. Provide panel joint securing and sealing information per spec 2.2.D.2.

See Bally Refrigerated Boxes product data sheets. All panels are constructed with cam lock fasteners and NSF-approved gaskets foamed in place. Flush-mounted caps are provided to close wrench holes. **OK**

21. Provide foam-in-place isocyanurate insulation per specification 130383.2.2.D.2.a.

Polyurethane (PUR) insulation is used by insulated panel manufacturers with cam-lock panel construction due to its high expansion rate (approx. 20:1) and insulation value. Continuous panel line manufacturers often use polyisocyanurate (PIR) insulation which has an expansion rate of approximately 5:1. This makes it acceptable for long panel sheets, but not for foaming around cam locks, conduits, j-boxes, etc. It also has a slightly lower R-value. Polyisocyanurate insulation is not available in cam-lock panel construction. **OK**

22. Provide K-factor of 0.118 per specification 130383.2.2.D.2a.

The K-factor of insulated panel construction varies under different temperature conditions. For cooler applications (mean temperature of 55°F), the insulated panels have an R-value of 28.8 for a 4" thick panel, which equates to a K-value of .139. Under freezer application conditions (mean temperature of 20°F), the K-value drops to .125, reflecting an R-value of 32.1. In either case, 4" thick insulated panels are no longer able to achieve the specified K-values due to changes in the blowing agents used to foam the panels, as mandated by the Montreal Protocol and subsequent environmental regulatory changes. This is consistent across panel manufacturers.

A/E: Confirm
this is
acceptable
-DG

OK

23. Provide ASTM E84 information per specification 130383.2.2.D.3.

See item #6 above. **OK**

A/E:
Confirm
this is
acceptable
-DG

24. Per spec 2.2.E.3 double gasketing on 3 sides of door and wiper gasket on bottom. Self-closing.

We have been unable to locate a double-gasket for 3 sides of the door, unless we were to apply a surface-mounted gasket in addition to the magnetic gasket built into the door. There is a double sweep gasket at the bottom of the door.

PROVIDE SURFACE-MOUNTED GASKET IN ADDITION TO MAGNETIC GASKET. CALL TO DISCUSS IF THERE ARE ANY DISADVANTAGES.

25. Provide manual defrost capabilities per spec 2.3.E.3.i.

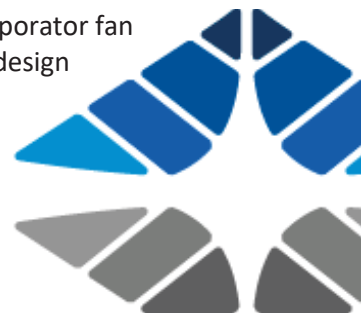
OK The controls offer both automatic and manual defrost capabilities.

26. Provide NFPA 70 and UL508A compliance per spec 2.3.D.5.

The control panel is in compliance with NFPA 70 and carries a UL508A certification and will be labeled as such. **OK**

27. Per spec 2.4.B.7, max sound level in room of 65 dba exclusive of occupancy generated noise.

Sound characteristics vary based on room configuration, and sound ratings for evaporator fan coils are not available from the manufacturers. We are providing the quietest coil design



available (center-mount) and have never had an issue with sound characteristics of these evaporators. OK

28. Per spec 2.4.B. Provide automatic hot gas defrost. Provide fully redundant system.

The room is equipped with both automatic and manual hot gas defrost options. The system is designed such that regular defrost cycles are not required during normal operation. Per pre-bid conversations, redundant refrigeration systems are not required on this project, and were excluded from the scope of our subcontract agreement. OK

29. Provide and coordinate curbs, piping for condenser per spec 2.4.B.4 & 6. Coordinate with GC piping routes, condenser location on roof and power requirements.

These items are being coordinated with the GC. OK

30. Provide condensing unit and capacities per architectural specifications and drawings. Install unit and piping per cooler manufacturer requirements and mount on supports shown on architectural drawings.

The condensing unit and capacities are shown in the product data submittal. Please note that we have upsized the condensing unit slightly from the previous submittal to ensure that we have adequate capacity for pulldown and recovery times. The unit will be installed per manufacturer's requirements and mounted on roof curbs per the project drawings. OK

31. Cold room cooler: Provide unit and capacities per architectural specifications and drawings. Install unit per manufacturer requirements and as shown on architectural drawings.

The evaporator coil and its capacity are shown in the product data and its location indicated on our shop drawing. The evaporator coil has also been upsized to match the increased capacity of the condensing unit as noted above. OK

32. Refrigerant piping shall be installed per cooler manufacturer requirements. Refer to mechanical plans for general diagrammatic routing. Coordinate routing with all other trades.

Piping shall be installed per manufacturer requirements and routing coordinated with other trades. OK

33. Refrigerant pipe insulation. Provide jacketing for exterior piping per specification 232500-2.2-D-5. . . .

The aluminum jacketing requirement was not indicated or referenced in our specification section. We will be pleased to provide pricing for this work, but do not have it included.

Provide the refrigerant insulation jacketing per the specification section given.

Mechanical contractor to provide jacketing if cold room manufacturer doesn't provide.

GC TO COORDINATE.

34. Condensing unit. Provide unit designed and with necessary accessories to operate in conditions between 0 deg. F and 105 deg. F. ambient temperature.

The condensing unit is designed for operation between -20°F and +110°F. OK

35. Condensing unit. Provide unit with outdoor enclosure (H) model designation.

Unit will be provided with outdoor enclosure as indicated on equipment listing and shop drawing. OK

36. Condensing unit. Provide with accumulator and high pressure safety switch.

The condensing unit will be provided with both a suction accumulator and high pressure safety switch. OK

Curbs have
been
coordinated
and
installed
-DG



37. Condensing unit: Provide sealed liquid line filter drier and sight glass.

The condensing unit will be provided with both a sealed liquid line filter drier and sight glass. OK

38. Submittal is missing efficiency information. Provide this data.

There is no published efficiency data available at this time. Efficiencies can be calculated from FLA and BTU outputs. All equipment is compliant with federal energy standards.

39. Submittal is missing warranty information. Provide warranty information.

See item #5 above. OK

40. Electrical information in cold room submittal do not match electrical requirements called for in cold room product data submittal.

See item #8 above. OK

41. Provide self-closing door.

Door is self-closing with cam-lift hinges and hydraulic closer device. OK

42. Heaters to be positioned for easy accessibility for service & replacement.

Anti-condensate heaters are positioned under a trim piece at the perimeter of the door that can be removed with a Phillips screwdriver and easily replaced if necessary. OK

Thank you for reviewing these materials. If you have any questions or need additional information, please respond via email to joshua@biocold.com or juffman@biocold.com.

Regards,



Joshua Baker
President



A/E: Please
confirm this is
acceptable

Shop Drawing Submittal Review

Transmitted To: Cannon Design

Date: February 24, 2017

Attention: stl-cac@cannondesign.com

Contact Person / WTA Field Inspector:
Patrick Garner

Project Name: Webster University-**ISB**

Reviewed by: Jerry Reckmann (Mech)
Mark de la Fuente (Elec)

Project No. WT 14127.01

☐ UPS ☐ Courier ☒ **Email**

Copies	No.	Description
1 PDF	130383E02A	(Submittal No.'s:) (R&B-CXSRG) - Resubmittal
		(Cannon #130383- 006 REV002)-(Paric #15051-0490)-(WES #607)
		➤ Cold Room Product Data

***Submittal Review Comments**

Electrical Review Comments: The BioCold lamp and ballast information does not appear to be correct. The document indicates three 2-watt lamps and a six-watt ballast. The Topaz lamps included in this submittal indicate they are 22-watts each. Provide a ballast compatible with provided lamps.

Coordinate all electrical installation requirements with electrical contractor and manufacture.

Mechanical Review Comments: Provide the refrigerant insulation jacketing per the specification section given. Mechanical contractor to provide jacketing if cold room manufacturer doesn't provide.

c: **Kelvin Patel**
Kpatel@cannondesign.com

☐ Furnish as Submitted

☒ ***Furnish as Noted**

☐ Rejected

☐ Revise & Resubmit

☐ Reviewed

☐

Corrections or comments made on shop drawings during this review do not relieve contractor from compliance with requirements of drawings and specifications. This check is only for review of general conformance with the design concept of project and general compliance with information given in contract documents. Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.



77 Westport Plaza
Suite 250
St. Louis, MO 63146

TRANSMITTAL

No. 15051-0490

Paric Corporation

PROJECT: 15051-Webster University Interdisciplinary Science Building

DATE: 02/09/2017

TO: Cannon Design
1100 Clark Ave
St Louis MO 63102

Fax;
314-241-2203

RE: Cold Room Product Data REV1

ATTN: Kelvin Patel

JOB: 15051

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings	☒ Approval	☐ Approved as Submitted
☐ Letter	☐ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	SENT VIA:	☐ Returned
☐ Specifications	☐ Attached	☐ Returned for Corrections
☒ Other: Prodcut Data	☐ Separate Cover Via:	☐ Due Date:

<i>Item</i>	<i>Package</i>	<i>Code</i>	<i>Rev.</i>	<i>Copies</i>	<i>Date</i>	<i>Description</i>	<i>Status</i>
Submittal		130383-006	2		02/09/2017	Cold Room Product Data REV1	Submitted

NOTES:

CC:

Signed: _____
Devin Gates