SECTION 11400

INSULATED COLD STORAGE ROOMS
(FOAMED IN-PLACE INSULATED PANELS)

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Pre-fabricated, free standing walk-in cooler/freezer rooms, metal clad, designed for easy and accurate indoor field assembly, foamed in place, with installation on a recessed concrete floor slab.

B. Related Sections:

1. Division 15 - Mechanical.
2. Division 16 - Electrical.

1.02 REFERENCES

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

1. E84-96a Test Method for Surface Burning Characteristics of Building Materials.

B. National Sanitation Foundation (NSF) Standard No.7.

C. Underwriters Laboratories (UL) related to electrical characteristics.

D. National Electrical Manufacturers Association (NEMA).

E. Factory Mutual (FM) or UL related to fire hazard classification.

1.03 SUBMITTALS

A. Shop Drawings:

1. Submit shop drawings with 1/4" scale minimum dimensioned plans.
2. Include details and locations of special wall openings required by items of equipment extending through walls.
3. Include plans, elevations, and sections, all dimensioned and suitable to be used for actual construction of items specified.

a. Bottom of evaporator components shall be at least

7-6" above finish floor to allow walk-in cooler/ freezer rooms below.

B. Product Data: Submit manufacturer's name, descriptive data, mechanical connections required, and other information necessary for review of standard manufactured items and equipment.

1.04 QUALITY ASSURANCE

A. Avoid conflict with other work and make adequate provisions for prevention of excessive noise or vibration. Equipment shall be arranged and fitted into the available spaces with working parts accessible for service and repair.

B. Source Quality Control:

1. Manufacturer: Provide equipment manufactured by 1 manufacturer, except where otherwise noted, and uniform throughout as to method and type of construction used.
2. Name Plates:

a. Manufacturer and model number.
b. NSF seal of approval.
c. Electrical characteristics.

C. Installation of walk-in cooler/freezer shall be supervised by factory personnel to assure equipment is installed according to manufacturer's recommendations.

D. Furnish 3 complete sets of detailed operating and maintenance instructions and literature on equipment and controls.

E. Furnish freight prepaid and assemble and install cold storage refrigeration systems where shown on plans.

1. The refrigeration system shall have an automatic outdoor, air-cooled remote condensing unit. Locate as shown.
2. Locate a ceiling mounted evaporator unit in the refrigerated room.
3. Provide pipes, fittings, pipe hangers, pipe insulation, refrigerant, specialty items, and controls indicated for a complete and operating system.

1.05 WARRANTY

A. The manufacturer shall warrant the foamed-in-place panels to be free of defects in material and labor under normal service and use for 10 years from the date of original installation by an authorized representative of the manufacturer.

B. Hardware, accessories, and electrical components, except lights and refrigeration systems, covered separately, shall be warranted against defects in material and workmanship under normal use and service for 1 year from the date of installation. The manufacturer shall repair or replace any panel or component found defective within the warranty period.

C. The refrigeration equipment shall be warranted free from defects in material and construction under normal service and use for 1 year from date of substantial completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Insulated Cold Storage Rooms:

1. American Panel Co., Ocala, FL.
2. Bally Engineered Structures, Inc., Bally, PA.
3. W.A. Brown, Salisbury, NC.
4. Elliot Williams, Indianapolis, IN.
5. Harford Insulated Panel Structures, Aberdeen, MD.
6. Kolpak Industries, Inc.,
7. Penn Refrigeration Service Corp.
8. Tafco.
9. Thermo-Kool by Mid South Industries, Inc., Laurel, MS.
10. Tyler Refrigeration Corp, Olive Branch, MS.

2.02 EQUIPMENT

A. The following product specification conforms to walk-in coolers and freezers by Bally Engineered Structures, Inc., and is intended to be a general, descriptive guideline and establish a standard of quality.

B. Walk-in Cooler and Freezer:

1. Provide a walk-in cooler and freezer prefabricated metal clad unit of size as shown on Drawings. The entire walk-in and component parts, including the self-

contained refrigeration systems, shall be listed by UL.

2. Description:

   a. Combination cooler/freezer with floor.
   b. Exterior and Interior: 0.040 patterned aluminum.
   c. UL Rating.
   d. Trim Strips.
   e. Two Door Closers.
   f. Pressure relief port in freezer.
   g. Cylinder locks in door latches.
   h. Low temperature vaporproof fluorescent fixtures in cooler and freezer.

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NOTE TO SPECIFIER: Edit Subparagraph 3. according to walk-in size.

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3. Refrigeration: Pre-Assembled Remote, Air Cooled.

   a. Cooler: PN-75A-3 (3/4 HP Medium Temp) 208/3/60, with BA-75A evaporator coil 208/1/60, Weather Hood, Low Ambient Kit.

   b. Freezer: PL-150A-3 (1-1/2 HP Low Temp) 208/3/60, with BF-150A evaporator coil 208/1/60, Weather Hood, Low Ambient Kit.

   c. Compressor Rack: One DR-200.

4. Panel Construction:

   a. Each panel shall consist of interior and exterior metal skins, formed with steel dies and roll-form equipment.
   b. Rigid type urethane insulation shall be poured foamed-in-place between the metal skins and completely heat-cured to form 4 inch thick insulated panels.
   c. Panel composition (except reinforced ceiling types) shall be 100 percent urethane insulation and be without internal wood or metal structural members.
   d. The panel edges shall be foamed-in-place tongue and groove design with a flexible vinyl gasket also foamed-in-place on both the interior and exterior of each panel. This gasket shall be NSF approved and impervious to grease, oil, stains, water, and mildew.
   e. Insulation: Each panel shall be filled with rigid foamed-in place urethane, 4 inches thick.

1) The urethane shall have a thermal conductivity K Factor of 0.115 BTU/HR/F°/inch, and a coefficient of heat transfer (U Factor) of not more than 0.0287.
2) The "R" Factor shall be at least 34.
3) Insulation shall be 97 percent closed cell to prevent moisture absorption and have a compressive strength at yield point of 35 lbs. per inch.
4) Provide panels with a flame spread rating of 25 or less according to ASTM E84 (UL723). Each panel shall be UL labeled and a smoke rating of less than 450.

f. Foam core of panels shall be UL listed and having a flame spread of 25 or lower and smoke generation of 450 or lower when tested according to ASTM E84. Panels shall be approved by Factory Mutual as a Class I building type.
g. Exteriors of vertical panels except corners and door sections shall have vertical grooves on 5-3/4" centers for added rigidity and uniform appearance.
h. Floor panels shall be similar to all other panels, except the interior edges at the wall line shall have a 1/4" radius cove to eliminate the accumulation of dirt and permit easy cleaning.
i. Panels, except corner panels, shall be made in 23 inch and 46 inch widths, fully interchangeable for fast, easy assembly. Panels 11-1/2" or 34-1/2" wide are to be furnished only if required to fit the allocated space. To assure perfect alignment and maximum strength, corner panels shall employ a right-angle configuration with exterior horizontal dimensions of 12 inches on each side.
j. Panel Fasteners: Assemble walk-in panels with cam-action fastening devices spaced no further than 46 inches. These devices shall be activated by a hex wrench provided by the manufacturer. Access ports to the fastening devices shall be located on the interior to allow assembly of the walk-in from the inside, for close placement of the walk-in panels to existing obstructions. The access ports shall be covered by press-fit plug buttons.

5. Provide partitions to form separate compartments within the walk-in. Partition walls shall be the same as specified for the wall panels and shall lock into special "T" panels at the adjoining walls and into

"breaker" panels in the ceiling and floor. The special wall "T" panels and the floor under the partition shall have the NSF approved radius.

6. Floor Construction:

   a. Walk-in manufacturer shall furnish floor panels.
   b. Construction and preparation for walk-in floor panels shall be carried out by the Contractor.
   c. Design the floor to support uniformly distributed loads up to 600 pounds per square foot.

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NOTE TO SPECIFIER: From the following paragraphs, select either the galvanized steel finish to receive a quarry tile finish floor or the stainless steel finish floor allowed only at a renovation project with a kitchen finish floor other than quarry tile.

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   d. Set floor panels with galvanized steel finish into a 6 inch depression over 10 mil polyethylene sheets with joints lapped 6 inches and sealed to form a watertight seal. Install a 2 inch wearing slab over pre-fabricated floor panel, bringing the floor level with the kitchen floor slab and apply quarry tile to walk-in to provide a smooth and level transition from kitchen quarry tile.

   d. Set floor panels with stainless steel finish into a 4 inch depression over 10 mil polyethylene sheets with joints lapped 6 inches and sealed to form a watertight seal. Set floor panels to provide a smooth and level transition from kitchen floor.

7. Hinged Walk-in Doors and Panels:

   a. Locate entrance doors for each compartment as shown on Drawings.
   b. Door Opening Size:

      1) Cooler: 42 inches wide x 78 inches in a 69 inch panel. Swing into the kitchen.
      2) Freezer: When accessed through the cooler the freezer door shall be 36 inches x 78 inches in a 46 inch or 69 inch panel. Swing into the cooler.
      3) Freezer: When accessed direct from the kitchen, the door shall be 42 inches x 78 inch in a 69 inch panel. Swing into the kitchen.

   c. The door shall be infitting and flush-mounted and

constructed as the vertical panels.

d. A magnetic core, thermoplastic gaskets installed on the top edge and both sides of the door shall keep the door in a closed position, forming a tight seal.
e. Install a flexible, dual-blade wiper gasket at the bottom of the door.
f. NSF-approved gaskets shall be replaceable and resistant to damage from oils, fats, water, and detergent.
g. A U-channel reinforced steel frame around the perimeter of the door opening shall prevent racking or twisting. Aluminum, wood, or plastic are not acceptable.
h. Anti-condensate heater wires, controlled by an automatic thermostat, shall be concealed behind the metal edge of the door jambs on all 4 sides, and any additional heater shall be concealed beneath the exterior edges of the doorcap around its entire perimeter.
i. The door shall also include a vapor-proof interior lamp and junction box for 120 V., 60 cycle, single phase, A.C. service.
j. Provide doors with heavy duty hardware with satin finish, 3 cam lift hinges, cylinder lock and inside safety release to allow exit when door is locked.
k. Provide solid state electronic Digitemp Thermometer for each compartment. Temperature readings shall be in both Fahrenheit (-40 F. to +60 F.) and Celsius (-40 C. to +15.6 C.) scales.
l. Each door shall have a 14.5" x 23" heated observation window.
m. The door and door panel shall bear the UL listing tag.
n. Provide aluminum diamond tread kickplates 32 inches high by the width of the door on both the exterior and the interior of the door cap only.

8. Pressure Relief Port:

a. Allow freezers to relieve positive and negative pressures caused by sudden temperature changes due to product loading, defrost cycles, and door openings.
b. This relief port shall be provided with a heating element to prevent moisture accumulation and frost buildup.
c. Provide 120 volts, 60 hertz, 1 phase, A.C. electrical service.

9. Refrigeration System:

   a. Preassembled, remote, refrigeration systems shall consist of the condensing unit and evaporator coil assemblies furnished complete with necessary controls and component parts properly selected, factory installed, and wired to form a complete and efficient refrigeration system.
   b. Condensing units for systems described shall be designed for remote installation for use with HCFC-22 or other environmentally approved refrigerant. They shall be complete with motor, air-cooled condensers, receiver, accessible hermetic or hermetic type compressors and other necessary components mounted on a common base. Condensing units shall be UL listed.
   c. Evaporator coils for the systems described shall be forced-air type, factory assembled with fan motors, guards, multi-fin and tube type coil, enclosed in a corrosion-resistant cabinet of sturdy construction.
      1) A drain pan fitted with a copper drain pipe connection shall be provided.
      2) For low temperature ranges an automatic defrost system including heaters, drain pan heaters, defrost timer, fan delay control and defrost termination thermostat shall be furnished.
      3) Evaporator coils shall be NSF approved and UL listed.

   d. Refrigeration system shall be engineered to maintain a temperature of 35 degrees F. in cooler, and -10 degrees F. in freezer, based on 16 to 18 hour per day compressor operation.
   e. Provide an outdoor weather hood to protect the condensing units. The hood shall be made removable for easy servicing.
   f. Furnish condensing units in aluminum housing and place as shown on Drawings. Compressor units shall contain a control panel mounted and prewired at factory.

10. Automatic Temperature Control:

   a. Refrigerated room temperatures shall be controlled by a thermostat mounted at each evaporator unit to close the liquid solenoid valve on a wall in room temperature, for automatic recycling pump down, and shut off of the condensing unit.

b. The thermostat and solenoid valve circuit shall be connected to terminals in evaporator unit casing.

11. Low Ambient Controls:

    a. Low ambient controls shall be provided for the above systems when the ambient temperature surrounding the condensing unit drops below 50 degrees F (10 degrees C).
    b. A crankcase heater and condenser fan control shall be provided for proper operation.

12. Temperature Alarm System: Provide 1 audiovisual temperature alarm system, Kason Model No.KTA-111, or the accepted equivalent, mounted on the exposed exterior wall of each cold room, complete with the following:

    a. Compact Lexan case with built-in siren and field adjustable alarm set point.
    b. Temperature probe with thermistor sensor mounted in the return air stream of each evaporator coil and wired back to the alarm unit mounted on the exterior exposed surface of the cold room.
    c. Label each alarm with an approved engraved black plastic label with white letters indicating the cold room served.
    d. The alarm shall be 120/60/1 and shall be supplied with prewired electrical cord for plug-in at the job site.
    e. Perform field wiring of alarm system by qualified electrical contractor.
    f. Provide cord and receptacle of adequate length and approximately, respectively, to accomplish this purpose.

13. Clear Flexible Strip Curtain:

    a. Install across walk-in cooler door.
    b. Secure metal mounting angles and bars to top of door head inside walk-in.
    c. Flexible Strips: 0.080" thick clear flexible strip, 8 inches wide with 4 inch overlap.

14. Cooler/Freezer Room Sizes: Size each cold room (length and width) as shown on Drawings.

    a. Inside Finish Height: 7'-10".
    b. Exterior Finish Height: 8'-6".

15. Special Requirements: Modify accepted manufacturer's standard items and construction to conform with special requirements listed as follows:

a. Floor Sections:

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NOTE TO SPECIFIER: From the following paragraphs, select either the galvanized steel finish to receive a quarry tile finish floor or the stainless steel finish floor allowed only at a renovation project with a kitchen finish floor other than quarry tile.

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1) Furnish each cold room with 4 inch thick prefabricated insulated floor sections similar to wall sections consisting of 4 inches of insulation, a 14 gage galvanized steel wearing surface, and 0.027" aluminum backing sheet.

1) Furnish each cold room with 4 inch thick prefabricated insulated floor sections similar to wall sections consisting of 4 inches of insulation, a 12 gage 18-8 diamond tread stainless steel wearing surface, and 0.027" aluminum backing sheet.

16. Light Fixtures and Switches:

a. Provide low temperature vaporproof 4 foot/2 tube surface mounted fluorescent fixtures with protective plastic housings in quantities as shown on drawings.
b. Light switches shall be in recessed type "FS" boxes with weatherproof plate and press switch cover, and impact resistant red plastic pilot light, constant burning on interior and indicating on exterior.
c. Light switches shall be factory mounted on latch side of doors and prewired with rigid conduit, located within wall panels, to terminate at vapor tight splice boxes. Provide a 1-1/4" diameter hole in ceiling panel with loose escutcheon for electrical connections.

PART 3 EXECUTION

3.01 INSPECTION

A. Field Check: Before fabrication of the walk-in cooler/

freezer rooms, perform a job site field check to determine actual overall size requirements of each walk-in and determine that no job site obstruction exist.

B. Do not proceed with the work of this section until conditions detrimental to the proper and timely completion of the work have been corrected in an acceptable manner.

3.02 INSTALLATION

A. Install walk-in cooler/freezer rooms according to walk-in manufacturer's recommendations and approved shop drawings, including placement of floor, ceiling, and wall sections as prescribed by the walk-in manufacturer.

B. Finished Floor Elevation:

1. Install walk-in cooler/freezer floor sections in a level recessed floor area to have each cold room finished floor elevation flush with adjacent quarry tile kitchen floor at cooler room door opening.
2. Shim floor sections to a level position before completion of remainder of walk-in.
3. Installation shall include delivery and erection of walk-in sections and related accessories.

C. Thermometers and Audiovisual Temperature Alarm System: Mount each thermometer and audiovisual temperature alarm system on the cooler/freezer exterior walls facing kitchen in a location as directed by A/E and connect remote sensing bulbs and other pertinent accessories and appurtenances for a complete operating system.

D. Wiring:

1. Pre-wire at the light switches and light fixtures at the walk-in cooler/freezer room manufacturer.
2. Field wiring on job site is specified in Division 16.

END OF SECTION