SECTION 132126 - COLD STORAGE ROOMS

Note that this section has only been edited for NYSOGS standardization and has not been technically edited. The designer shall make all technical edits specific to the project for this section.

This Section includes shop fabricated and site assembled, modular sized insulated panels for cold room walls and ceilings. Typical units include door, frame, and hardware; furnished with or without floors; with or without integral or remote refrigeration unit. Units may be supplied with shelving and other accessories.

This section describes interior installations; when placed outside buildings, additional consideration and supplementary statements are required in this section.

Manufacturers found in SpecAgent for this Section were identified as representative and not as an endorsement for meeting the requirements of this specification.

This Section includes performance, proprietary, and descriptive type specifications. Edit to avoid conflicting requirements.

See the Drawing Coordination Considerations for information needed to coordinate this specification Section with the Drawings.

1. GENERAL
   * + 1. SUMMARY
          1. Section includes prefabricated insulated cold storage rooms with wall [**, floor,**] and ceiling panels; door, frame, and hardware; [**self contained refrigeration unit**] [**refrigeration coils to function with remote unit**]; controls [**and lighting**]; and shelving and supports.
          2. Related Sections:

Section 079200 - Joint Protection.

Section <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_**>: Execution requirements for placement of recessed floor [**frame**] [**panels**] [**screeds**] for unit specified in this section.

Section <**\_\_\_\_\_\_-\_\_\_\_\_\_\_\_\_\_\_\_\_**>: Floor finish in unit.

* + - 1. REFERENCES

List reference standards included within text of this section. Edit the following for Project conditions.

LEED requires compliance with specific editions of referenced standards. Consider including publication dates for referenced standard in this section to ensure the correct standard is used for LEED compliance.

* + - * 1. APA-The Engineered Wood Association:

APA/EWA PS 1 - Voluntary Product Standard for Construction and Industrial Plywood.

* + - * 1. ASTM International:

ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

ASTM A666 - Standard Specification for Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.

ASTM A792 - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.

* + - * 1. California Department of Health Services:

CA/DHS/EHLB/R-174 - Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers, including 2004 Addenda.

* + - * 1. Forest Stewardship Council:

FSC Guidelines - Forest Stewardship Council Guidelines.

* + - * 1. National Electrical Manufacturers Association:

NEMA MG 1 - Motors and Generators.

* + - * 1. NSF International:

NSF 7 - Food Service Refrigerators and Storage Freezers.

* + - * 1. Underwriters Laboratories Inc.:

UL - Electrical Appliance and Utilization Equipment Directory.

* + - 1. SYSTEM DESCRIPTION

Use this article carefully; restrict statements to describe components used to assemble system. Do not repeat statements made in SUMMARY Article, "Section includes" paragraph.

Include one of the following three paragraphs for cooling unit; identify applicable HVAC section number in third paragraph.

* + - * 1. Cooling Unit: Locate [**adjacent to**] [**on top of ceiling panel of**] room near [**door**] <**\_\_\_\_\_\_\_\_**> permitting access for maintenance.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Cooling Unit: Locate remote from cold storage rooms in [**Mechanical**] [**Service**] <**\_\_\_\_\_\_\_\_**> Room Number <**\_\_\_\_\_\_\_\_**>. Pipe coolant to cold rooms.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. [**Central**] cooling [**unit**] [**compressor**] and piping of coolant to cold storage rooms specified in Section <**\_\_\_\_\_\_\_\_**>.
        2. Control Panel: Provide control panel with [**recording dial thermometers,**] alarms, and controls [**at door of each room.**] [**with alarms wired to central remote location.**] [**in remote central location.**]
      1. PERFORMANCE REQUIREMENTS

Use this article carefully; restrict statements to identify system performance requirements or function criteria only.

List parameters governing cold storage room design and function. Assess necessity of supplementary under floor insulation. On large projects with multiple cold storage rooms having variety of temperature requirements, consider including schedule at end of this section. The following paragraphs include suggested performance requirements.

* + - * 1. Wall Panels: Withstand live lateral load of [**100**] <**\_\_\_\_\_\_\_\_**> lbs point load, [**5**] <**\_\_\_\_\_\_\_\_**> psf uniform load.
        2. Ceiling Panels: Withstand their own weight, dead loads, and live loads of <**\_\_\_\_\_\_\_\_**> with maximum deflection of [**1: 180.**] <**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**>

Only include the following paragraph when floor panels are part of unit package.

* + - * 1. Floor Panels: Withstand [**100**] <**\_\_\_\_\_\_\_\_**> psf uniform load without physical damage or indentation of panel or insulation [**and point load of [300] <\_\_\_\_\_\_\_\_> psf**] without indentation.
        2. Cooler Rooms: Maintain [**40**] <**\_\_\_\_\_\_\_\_**> degrees F; plus or minus <**\_\_\_\_\_\_\_\_**> degrees F.
        3. Freezer Rooms: Maintain [**20**] <**\_\_\_\_\_\_\_\_**> degrees F; plus or minus <**\_\_\_\_\_\_\_\_**> degrees F.

Consider effect of requesting the following performance criteria and cost of field testing to confirm specified values.

* + - * 1. Air Tightness of Assembled Unit: Limit air infiltration through assembly to [**0.06**] <**\_\_\_\_\_\_\_\_**> cfm/sq ft of wall area, measured at reference differential pressure across assembly of [**1.57**] [**6.24**] psf when tested in accordance with [**ASTM E283**].
        2. Vapor Seal: Interior room atmospheric pressure of 1 inch sp, 72 degrees F, 40 percent RH: No failure.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Vapor Tightness: Sufficient to eliminate frost accumulation.
      1. SUBMITTALS
         1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
         2. Manufacturer’s installation instructions shall be provided along with product data.
         3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).

Only request submittals needed to verify compliance with Project requirements.

* + - * 1. Section 013300 - Submittals: Submittal procedures.
        2. Shop Drawings:

Indicate layout, room dimensions, materials, components, fasteners, doors, hardware, equipment, finishes, method of installation and assembly, panel placement, supplementary support or bracing, controls, and service rough-in.

* + - * 1. Product Data: Submit data on hardware and fixtures, joint details. Refrigeration system, performance requirements, electrical and piped service connection capacities.

Include the following paragraph for submission of physical samples for selection of finish, color, texture, and other properties.

* + - * 1. Samples:

Submit [**two**] <**\_\_\_\_\_\_\_\_**> samples <**\_\_\_\_**>**x**<**\_\_\_\_**> inch in size illustrating panel finish, hardware, and <**\_\_\_\_\_\_\_\_**>.

Samples: Submit [**two**] <**\_\_\_\_\_\_\_\_**> samples <**\_\_\_\_**>**x**<**\_\_\_\_**> inch in size illustrating panel construction, corner and joint conditions, and <**\_\_\_\_\_\_\_\_**>.

* + - * 1. Manufacturer's Installation Instructions: Submit special procedures, perimeter conditions requiring special attention, and <**\_\_\_\_\_\_\_\_**>.
        2. Manufacturer's Certificate: Certify [**Products**] <**\_\_\_\_\_\_\_\_**> meet or exceed [**UL.**] [**specified requirements.**] <**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**>
      1. SUSTAINABLE DESIGN SUBMITTALS
         1. Section 018113 – LEED Documentation Requirements: Requirements for sustainable design submittals.
         2. Manufacturer's Certificate: Certify products meet or exceed specified sustainable design requirements.

Edit material certifications list to suit products specified in this section and Project sustainable design requirements. Specific certificate submittal and supporting data requirements are specified in Section 018113.

Materials Resources Certificates:

Certify source and origin for [**salvaged**] [**and**] [**reused**] products.

Certify recycled material content for recycled content products.

Certify source for regional materials and distance from Project site.

Certify lumber is harvested from Forest Stewardship Council Certified well managed forest.

Indoor Air Quality Certificates:

Certify each composite wood [**and agrifiber**] product contains no added urea-formaldehyde resins.

* + - * 1. Product Cost Data: Submit cost of products to verify compliance with Project sustainable design requirements. Exclude cost of labor and equipment to install products.

Provide cost data for the following products:

Edit list of material cost data to suit products specified in this section and Project sustainable design requirements. Specific cost data requirements are specified in Section 018113.

Salvaged, refurbished, and reused products.

Products with recycled material content.

Regional products.

Certified wood products.

<**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**>

* + - 1. CLOSEOUT SUBMITTALS
         1. Operation and Maintenance Data: Submit operating equipment, service and lubrication schedules, and <**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**>.
         2. Warranty: Submit manufacturer warranty with forms completed in Director's Representative name and registered with manufacturer.
      2. QUALITY ASSURANCE

Use this article to specify compliance with overall reference standards affecting all products and installation included in this section.

* + - * 1. Perform Work in accordance with [**NSF 7**] <**\_\_\_\_\_\_\_\_**> for cold room construction and [**UL**] <**\_\_\_\_\_\_\_\_**> for operating equipment.
        2. Surface Burning Characteristics:

Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

* + - * 1. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.
        2. Products Requiring Electrical Connection: Listed and classified by [**UL**] [**testing firm acceptable to authority having jurisdiction**] as suitable for purpose specified and indicated.
        3. Perform Work in accordance with [**[State] [Municipality] of <\_\_\_\_\_\_\_\_> [Highways] [Public Work's] standard.**]

Include the following paragraph only when cost of acquiring specified standards is justified.

* + - * 1. Maintain [**one copy**] [**<\_\_\_\_\_\_\_\_> copies**] of [**each**] document on site.
      1. QUALIFICATIONS
         1. Manufacturer: Company specializing in manufacturing Products specified in this section with minimum [**three**] <**\_\_\_\_\_\_\_\_**> years [**documented**] experience.
         2. Design cold room [**roof**] under direct supervision of Professional Engineer experienced in design of this Work and licensed in the State of New York.
      2. DELIVERY, STORAGE, AND HANDLING
         1. Wrap and crate finished components and assemblies at factory to prevent damage or marring of surfaces during shipping and handling.
         2. Do not deliver materials or assemblies to site until installation spaces are ready to receive units.
      3. FIELD MEASUREMENTS
         1. Verify field measurements prior to fabrication.
      4. COORDINATION
         1. Section 013000 - Administrative Requirements: Coordination and project conditions.
         2. Coordinate with concrete work [**for floor recess**] [**for placement of floor panels**] and electrical service.
         3. Sequence installation to ensure utility connections are achieved in orderly and expeditious manner.
      5. WARRANTY

This article extends warranty period beyond one year. Extended warranties increase construction costs and Owner enforcement responsibilities. Specify warranties with caution.

* + - * 1. Furnish [**five**] <**\_\_\_\_\_\_\_\_**> year manufacturer warranty for compressors, refrigerant, and controls.
      1. MAINTENANCE SERVICE
         1. Supply service and maintenance of refrigeration unit for [**two**] <**\_\_\_\_\_\_\_\_**> years from Date of Substantial Completion.

1. PRODUCTS
   * + 1. COLD STORAGE ROOMS

In this article, list manufacturers acceptable for this Project.

* + - * 1. [Manufacturers](http://www.specagent.com/LookUp/?ulid=7917&mf=04&src=wd):

Or approved equivalent.

* + - 1. SUSTAINABILITY CHARACTERISTICS

Edit sustainable design requirements to suit content of this section and Project sustainable design requirements specified in Section 018113.

* + - * 1. Section 018113 – LEED Documentation Requirements: Requirements for sustainable design compliance.
        2. Materials and Resources Characteristics:

Recycled Content Materials: Furnish materials with maximum available recycled content [**including:**] [**.**]

List materials specified in this section required to have recycled content.

<**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**>

Regional Materials: Furnish materials extracted, processed, and manufactured within 500 miles of Project site [**including:**] [**.**]

List materials specified in this section required to be regional materials.

<**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**>

Certified Wood Materials: Furnish wood materials certified in accordance with FSC Guidelines [**including:**] [**.**]

List materials specified in this section required to be certified wood.

<**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**>

Include the following paragraph and subparagraphs for school projects, only.

* + - * 1. Indoor Environmental Quality Characteristics:

Composite Wood [**and Agrifiber**] Products: Maximum volatile organic compound content in accordance with product and testing requirements of CA/DHS/EHLB/R-174.

Include the following paragraph and subparagraphs for projects other than schools.

Sustainable design requirements normally specify maximum VOC content for products that affect indoor air quality. Delete option to extend requirement to exterior applications.

* + - * 1. Indoor Environmental Quality Characteristics:

[**Interior**] Composite Wood [**and Agrifiber**] Products: Contain no added urea-formaldehyde resins.

* + - 1. COMPONENTS

Include one or more of the following materials for cold room construction.

Edit the following paragraph to address whether cooling apparatus is located within each cold room or remotely located for one or more cold rooms.

* + - * 1. Cooling System: Direct expansion refrigerant, [**water**] [**air**] cooled; [**remote located condensing unit for [all] rooms**] [**room internal condensing unit for each room**], [**evaporator,**] [**unit cooler,**] self contained with valves, controls, switches, timers, refrigerant piping, insulated suction lines, and wiring. Size and capacity to maintain environment specified; [**[hot gas] [electric] defrost**] [**electrically heated trace condensate drain**].
        2. Aluminum: [**ASTM B209**] <**\_\_\_\_\_\_\_\_**> alloy, [**[0.050] <\_\_\_\_\_\_\_\_> inch thick, smooth surface.**] [**[0.042] <\_\_\_\_\_\_\_\_> inch thick, stucco embossed surface.**]
        3. Sheet Steel Stock: ASTM A792 aluminum-zinc alloy Coating Designation [**AZ50**] <**\_\_\_\_\_\_\_\_**>.

Insert required coating designation when specifying galvanized steel. Use G (Z) coating classes for zinc coatings and A (ZF) coating classes for zinc-iron alloy coatings for reduced spangle.

* + - * 1. Sheet Steel: [**ASTM A653; [G90] <\_\_\_\_\_\_\_\_> zinc coating**] [**ASTM A792; [AZ50] <\_\_\_\_\_\_\_\_> aluminum-zinc alloy coating**]; [**0.030**] <**\_\_\_\_\_\_\_\_**> inch thick.
        2. Stainless Steel: ASTM A666 Type [**304**] [**316**]; [**No. 4**] <**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**> finish, [**0.036**] <**\_\_\_\_\_\_\_\_**> inch thick.
        3. Insulation: [**Polyurethane foamed-in-place**] <**\_\_\_\_\_\_\_\_**>, density [**2.2**] <**\_\_\_\_\_\_\_\_**> lb/cu ft, K factor of 0.12.
        4. Accessories: [**Ramps,**] thresholds, closure plates, [**hanger rods,**] tie down plates, bolts, screws, and washers; non-corrosive.
        5. Insulating Glass: ASTM E2190 [**certified by [Insulating Glass Certification Council] [and] [Insulating Glass Manufacturers Alliance]**]; [**double**] [**triple**] pane units, [**1/4**] <**\_\_\_\_\_\_\_\_**> inch thick, [**clear**] <**\_\_\_\_\_\_\_\_**> [**float**] [**tempered**] [**wire**] glass panes, [**5/8**] [**1**] <**\_\_\_\_\_\_\_\_**> inch unit thickness, air sealed.

\*\*\*\*\*\* [OR] \*\*\*\*\*\*

* + - * 1. Insulating Glass: [**Double**] [**Triple**] [**Quadruple**] pane units, specified in Section [**088000.**] <**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**>
        2. Plywood: APA/EWA PS-1 Structural I, Grade C-D, Exposure 1, sanded, preservative treated for fungus resistance.
        3. Sealant: [**Silicone base, fungus resistant**] <**\_\_\_\_\_\_\_\_**> type as specified in Section [**079000.**] <**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**>
        4. Door Gaskets: Resilient [**hollow**] neoprene [**; electric heated at freezer doors**]; organic [**grease and oil**] <**\_\_\_\_\_\_\_\_**> resistant, replaceable [**and adjustable**], concealed magnetic strip to maintain air tight seal.
        5. Hardware: [**Cast brass**] [**Forged steel**] <**\_\_\_\_\_\_\_\_**>, nylon bearing self closing hinges, [**roller catch latch and keeper**]; [**cylinder**] [**pad**] lock and inside safety release mechanism.
        6. Shelving and Supports: [**Stainless steel**] <**\_\_\_\_\_\_\_\_**> construction, [**open [rod] [mesh]**] [**flat sheet**] construction, [**free standing**] <**\_\_\_\_\_\_\_\_**> style; <**\_\_\_\_\_\_\_\_**> supports.
        7. Light Fixtures: Vapor tight, incandescent with [**150**] <**\_\_\_\_\_\_\_\_**> watt lamp, operating toggle switch on exterior wall of room with pilot light, wired in rigid conduit.
      1. ELECTRICAL CHARACTERISTICS AND COMPONENTS

Select one or more of the following subparagraphs appropriate to equipment requirements.

* + - * 1. Electrical Characteristics: In accordance with the following:

[**<\_\_\_\_\_\_\_\_> hp**] [**<\_\_\_\_\_\_\_\_> rated load amperes.**]

<**\_\_\_\_\_\_\_\_**> volts, [**single**] [**three**] phase, 60 Hz.

<**\_\_\_\_\_\_\_\_**> amperes maximum [**fuse size**] [**circuit breaker size**] [**overcurrent protection**].

<**\_\_\_\_\_\_\_\_**> minimum circuit ampacity.

<**\_\_\_\_\_\_\_\_**> percent minimum power factor at rated load.

* + - * 1. Motors: NEMA MG 1.

In following paragraph, list controls required for rooms. Commonly used controls are temperature control, defrost timer, adjustable high and low temperature alarm, indicating lights for defrost, cooling, high and low temperatures. Add direct reading thermometer when required.

* + - * 1. Controls: <**\_\_\_\_\_\_\_\_**>.
        2. Thermometer: [**Direct reading**] <**\_\_\_\_\_\_\_\_**> type.
        3. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Enclose terminal lugs in terminal box.
        4. Disconnect Switch: Factory mount disconnect switch [**in control panel**] [**on equipment**].
      1. FABRICATION

Sheet materials may differ for inside and outside panels depending on Project requirements.

* + - * 1. Wall Panels: Comprised of the following:

Exterior Sheet: [**0.030**] <**\_\_\_\_\_\_\_\_**> inch [**aluminum.**] [**sheet steel.**] [**stainless steel.**]

Interior Sheet: [**0.030**] <**\_\_\_\_\_\_\_\_**> inch thick [**aluminum.**] [**sheet steel.**] [**stainless steel.**]

Core: Insulation bonded to exterior and interior sheets.

Panel Width: [**48**] <**\_\_\_\_\_\_\_\_**> inches, one piece floor to ceiling.

Panel Assembly: [**Tongue and groove**] <**\_\_\_\_\_\_\_\_**> edges, integral cam action locking clamps spaced not over [**40**] <**\_\_\_\_\_\_\_\_**> inches oc.

* + - * 1. Ceiling Panels: Same construction as walls except [**exterior**] [**interior**] sheets of [**0.023**] <**\_\_\_\_\_\_\_\_**> inch thick <**\_\_\_\_\_\_\_\_**> metal.

Floor panel metal gages are usually upgraded to 14 gage steel, 12 gage aluminum, or 16 gage stainless steel.

* + - * 1. Floor Panels: Comprised of the following:

Top Sheet: <**\_\_\_\_\_\_\_\_**> inch thick [**stainless steel.**] [**steel.**] [**aluminum.**]

Bottom Sheet: <**\_\_\_\_\_\_\_\_**> inch thick [**aluminum.**] [**steel.**] [**stainless steel.**]

Core: [**5/8**] <**\_\_\_\_\_\_\_\_**> inch thick plywood laminated between top sheet and insulation; fully bonded construction.

Panel Width: [**48**] <**\_\_\_\_\_\_\_\_**> inches, one piece wall to wall.

Panel Assembly: [**Tongue and groove**] <**\_\_\_\_\_\_\_\_**> edges, integral cam action locking clamps spaced not over [**40**] <**\_\_\_\_\_\_\_\_**> inches oc.

Edit the following paragraph based on temperature ranges required by PERFORMANCE REQUIREMENTS article.

Specify 3 inch thickness for temperatures down to - 13 degrees F and 4 inch thickness for temperatures below 113 degrees F; depending on insulation type specified. Only one insulation option is provided in this section.

* + - * 1. Insulation Thickness: [**3**] [**4**] <**\_\_\_\_\_\_\_\_**> inches.

Select insulation thickness for doors in paragraph below based on cold room temperature; generally 2-1/2 inch for coolers and 3 or 4 inches for freezers.

Specify heated gaskets on freezer doors and where condensation could occur at door gasket.

* + - * 1. Doors: Overlap type for [**34 x 78**] <**\_\_\_\_**>**x**<**\_\_\_\_**> inch opening, construction as for walls but with edges closed; [**2-1/2**] [**3**] [**4**] <**\_\_\_\_\_\_\_\_**> inch thick insulation; flexible gasket containing magnetic strip on four edges; [**heated gasket thermostatic control with two way air relief valve**].
        2. View Windows: ASTM E2190 Sealed insulating glass units in [**doors**] [**and**] [**walls**], [**triple**] [**quadruple**] glass at freezers.
      1. FACTORY FINISHING

Select one or more of the following finishes to suit materials specified.

* + - * 1. Exterior [**Aluminum**] [**Steel**] Cladding: [**[White] <\_\_\_\_\_\_\_\_> color [as selected].**] [**Baked acrylic enamel.**] [**Clear anodized.**] [**Mill finish.**]
        2. Interior [**Aluminum**] [**Steel**] Cladding: [**[White] <\_\_\_\_\_\_\_\_> color [as selected].**] [**Baked acrylic enamel.**] [**Clear anodized.**] [**Mill finish.**]
        3. Stainless Steel: [**No. 4**] <**\_\_\_\_\_\_\_\_**> finish.
        4. Hardware: [**Polished chrome.**] [**Satin chrome.**] <**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**>

1. EXECUTION
   * + 1. EXAMINATION
          1. Section 013000 - Administrative Requirements: Coordination and project conditions.
          2. Verify surfaces, prepared openings, and roughed-in utilities are ready to receive work and opening dimensions are as [**indicated on shop drawings.**] [**instructed by manufacturer.**]
       2. INSTALLATION

Use the following paragraph when floor panels are included.

* + - * 1. Set floor panels in place and align. Connect to floor drains. Seal joints continuously and lock panels tightly together.

Use the following paragraph when no floor panels are used or where floor slab has been recessed and insulated by other sections. Floor screeds are sometimes called floor runners and designed to receive wall panels.

* + - * 1. Set [**wall attachments**] [**floor screeds**] on floor and anchor securely. [**Align over insulated break of recessed insulated floor slab**].

Equipment mounting option in the following paragraph is intended for attached equipment occurring in refrigerated rooms such as for medical or laboratory purposes.

* + - * 1. Cut holes, install anchors, and seal room panels for plumbing, power, and lighting. Provide reinforcing or anchorage in walls for mounting <**\_\_\_\_\_\_\_\_**> equipment as specified in Section <**\_\_\_\_\_\_\_\_**>.
        2. Assemble wall panels; lock in place with cam locks. Brace securely until ceiling panels are installed.
        3. Install ceiling panels; lock into wall panels. [**Provide supplementary ceiling hanger supports to building structure above.**]
        4. Install sill plate at door opening [**and heated thresholds and ramps**].
        5. Hang doors. Adjust to operate smoothly.

The following paragraph is intended for refrigeration unit mounted on top of cold room.

* + - * 1. Locate condensing unit for each room on top of ceiling [**above door**] [**as indicated on Drawings**]. Support evaporator coil on room interior and make connections as required for utilities and services. Wire-in alarm unit [**and door and threshold heaters**]. Connect units to valved water piping. Run condensate line to nearest drain.

Include the following paragraph with caution. Installed trim inhibits ventilation of refrigeration equipment and physical access to maintain equipment.

* + - * 1. Install ceiling trim and ceiling fascia, [**cover plates between top of room and finished ceiling**] and end closure plates between room and adjacent wall.
        2. Seal joints and services through walls with sealant to provide moisture and vapor seal.
      1. FIELD QUALITY CONTROL
         1. Test and adjust control equipment to meet specified performance requirements.
         2. Operate each room and test full range of functions over continuous 48 hour period, recording physical data on operating equipment. Continuously record temperature and humidity.
         3. Test each room for air tightness.
         4. Adjust and re-test rooms not meeting specified requirements.
         5. Submit three copies of written quality control test report.

Exercise caution with the following paragraph. When unit is closed and not operational, odors can develop. Cold rooms can be safely closed when unit is operating.

* + - * 1. Shut off equipment and controls and lock doors to prevent operation or access by unauthorized persons.
      1. CLEANING
         1. Remove temporary protection from prefinished surfaces.
         2. Wash and clean [**floor,**] walls, and ceiling inside room and exposed surfaces on outside. Clean [**glass,**] fixtures and fittings.
      2. DEMONSTRATION AND TRAINING

This article suggests program for demonstration of rooms and equipment for large installation. Edit to suit.

* + - * 1. Demonstrate, in presence of Director’s Representative, operation, function, and maintenance of each room and its associated equipment.
        2. Manufacturer's Demonstration Representative: Fully knowledgeable of operating and servicing the work.
      1. SCHEDULES

Include schedule when number of refrigerated rooms are on project; identify room size and height, temperature requirements, door sizes and designs, and other variables.

Consider the following examples when developing Project schedule.

* + - * 1. Refrigerators # 1 and 2 in Kitchen 101: Prefinished aluminum outer sheet, stainless steel inner sheet, 3 inch thick panels, 36 x 84 inch door with 12 x 12 inch double pane sealed glass unit, floor of quarry tile on insulated concrete specified in Section 093000.
        2. Freezer in Kitchen 101: Prefinished aluminum outer sheet, prefinished steel inner sheet, stainless steel floor sheet, 5 inch thick wall panels, 4 inch thick floor panels, 30 x 84 inch door with 12 x 12 inch quadruple pane sealed glass unit.

END OF SECTION 132126