

PART 1 - GENERAL

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| <u>1.1 GENERAL</u> | .1 | This section provides performance specifications for the provision of a prefabricated, floor-mounted bin cooler complete with split refrigeration unit as indicated on Drawings. |
| <u>1.2 RELATED REQUIREMENTS</u> | .1 | Section 01 45 00 - Quality Control. |
| | .2 | Section 01 91 13 - Commissioning. |
| <u>1.3 REFERENCES</u> | .1 | American National Standards Institute/American Society of Mechanical Engineers (ANSI/ASME)
.1 ANSI/ASME B16.26-2013, Cast Copper Alloy Fittings for Flared Copper Tubes.
.2 ANSI/ASME B16.29-2012, Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings-DWV. |
| | .2 | American National Standards Institute/National Fire Protection Association (ANSI/NFPA)
.1 ANSI/NFPA 255-2006, Standard Method of Test of Surface Burning Characteristics of Building Materials. |
| | .3 | American Society for Testing and Materials International, (ASTM)
.1 ASTM A 167-99(R2009), Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
.2 ASTM A 240/A 240M-2014, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.
.3 ASTM A 480/A 480M-2014A, Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet and Strip.
.1 Finish for sheet: No. 4 Finish-General purpose polished finish, one or both sides.
.4 ASTM A 653/A 653M-2013, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.5 ASTM B 88M-2009, Standard Specification for Seamless Copper Water Tube (Metric).
.6 ASTM B 280-2013, Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service. |

1.3 REFERENCES
(Cont'd)

- .3 (Cont'd)
 - .7 ASTM E 84-2014, Standard Test Method for Surface Burning Characteristics of Building Materials.
 - .8 ASTM E 162-2013, Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source.
- .4 Canadian General Standards Board (CGSB)
 - .1 CAN/CGSB-19.13-M87, Sealing Compound, One-Component, Elastomeric, Chemical Curing.
- .5 Canadian Standards Association (CSA International)
 - .1 CSA C22.2 No.137-M1981(R2009), Electric Luminaires for Use in Hazardous Locations.
- .6 Underwriters' Laboratories of Canada
 - .1 CAN/ULC-S704-2011, Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
 - .2 CAN/ULC-S705.1-2001, Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density, Material Specification.

1.4 ACTION AND INFORMATIONAL SUBMITTALS

- .1 Submit in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate:
 - .1 Construction details of equipment by drawings and manufacturer's literature.
 - .2 Roughing-in requirements for mechanical and electrical services.
 - .3 Installation details.
- .3 Provide operation and maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Stainless steel sheet: to A240/A240M, type 304 with No. 4 finish.
- .2 Galvanized steel sheet: commercial grade to ASTM A 653/A 653M, with zinc coating (galvanized) to ASTM A 653/A 653M.
- .3 Mild steel sheet: cold rolled to Society of Automotive Engineers (SAE) 1010 to 1020 suitably prepared for specified finish.

2.1 MATERIALS
(Cont'd)

- .4 Aluminum sheet: utility sheet with "stucco" pattern finish on exterior panels and smooth finish on interior panels.
- .5 Galvalume: steel sheet with aluminum zinc alloy coating with baked on polyester finish.
- .6 Sealant: to CAN/CGSB-19.13, colour to match panel.
- .7 Isolating coating: to manufacturer's recommendations.
- .8 Insulation for panels and screeds: to CAN/ULC-S705.1, Class 3, poured type foamed-in-place polyurethane (urethane), 75 mm thick.

2.2 FABRICATION

- .1 Overall dimensions to suit rough opening dimensions of location: 5,200mm wide x 4,200 mm long.
- .2 Interior clear height: 2,440 mm.
- .3 Single Door Opening: standard 1,980 mm high x 915 mm wide, swing as indicated.
- .4 Panel sections: precision die formed metal pans accurately spaced and insulated. Panel edges and corners to have tongue and grooves, formed-in-place, to assure airtight, vapour proof joints using gaskets or sealants.
- .5 Wall and ceiling panels: nominal 300, 600 and 1200 mm widths.
- .6 Corner panels: 300 x 300 mm wide externally.
- .7 Door panels: insulated and finished as per exterior and interior panels with 915 x 1980 mm clear door opening, reinforced to prevent door panels from twisting, racking or warping. Ensure that doors will close and seal opening. Equip each door panel with.
 - .1 One, in fitting flush mounted type, door (swing as indicated) to fit door opening, insulated and finished same as panels, having 1220 high x 1.6 mm thick stainless steel push/kick-plates on both exterior and interior and having soft thermoplastic gasket with magnetic steel core at top and both sides, adjustable rubber wiper gasket at bottom. Gaskets to be oil, fat, water and sunlight resistant and be replaceable.
 - .2 Hinges, spring loaded, self-closing type, with stainless steel pin and nylon cam-type bearing, of satin finished aluminum.

2.2 FABRICATION
(Cont'd)

- .7 Door panels:(Cont'd)
 - .3 One latch, to match hinges, for opening door by breaking force of trigger-action door closer and magnetic gasket. Latch to have inside safety release handle capable of opening door from within.
 - .4 One trigger-action positive door closer, located on interior, to assist in positive closing of door.
 - .5 Threshold plates: 2.0 mm stainless steel and removable.
 - .6 One 50 mm diameter flush-face dial-type thermometer to provide temperature readings from -10°C to 30° C and mounted on hinge side of panel approximately 1525 mm from floor. Cover sensing bulb with protective stainless steel moulding.
 - .7 One incandescent vapour-tight luminaire, with guard, mounted not less than 1980 mm from floor on interior of panel, operated from toggle switch with pilot light, mounted 1372 mm from floor on exterior of panel, adjacent to latch. All factory pre-wired and terminating in vapour-tight junction box that light is mounted on.
- .8 Ceiling panels: reinforced internally or externally as required, to support evaporator. Where external reinforcement is needed and through fasteners are used, fasteners to be of low heat conducting material such as teflon. Insert fasteners in teflon sleeves to prevent compressing of insulation.
- .9 Screeds: same construction materials and finish as wall panels. Length and configuration to match wall and corner panels. Reinforce screeds internally at 584 mm minimum centres to accommodate fastening to building and/or wearing floor. Reinforcing and floor fastenings to form an integral part of panel locking devices system.
- .10 Panel thickness and finish for exterior and interior panels: 0.8 mm core galvanized steel, factory painted, colour white.
- .11 Locking devices: panel sections to have cam-action locking devices, spaced at maximum 950 mm vertically, 600 mm horizontally. Male and female lock pockets.
- .12 Fluorescent lights: to CSA 22.2 No.137, Class III Hazardous Locations.
 - .1 Two lamp, 1220 mm long, minus 18° HPF ballast.
 - .2 Satin anodized aluminum housing.
 - .3 Completely gasketed enclosure.
 - .4 High impact opal acrylic lenses.
 - .5 Pressure locking devices.
 - .6 White baked-on acrylic finishes.

2.2 FABRICATION
(Cont'd)

- .12 Fluorescent lights:(Cont'd)
 - .7 Lamps: 1220 mm long fluorescent colour corrected, full spectrum, rapid start.
 - .8 Energy efficient ballasts.
- .13 Removable closure panels: extend from outside edge of erected prefabricated ceiling panels horizontally to adjacent finished building walls. Extend cover strips or angles from building floor to ceiling closure panels between exposed ends of walk-in boxes and building wall. Closure panels, cover strips or angles to match exposed exterior wall panels.
- .14 Temperature alarm system: self-contained with visual and audible alarm. Include following:
 - .1 Power source failure alarm with adjustable set point for temperature.
 - .2 Jack for remote alarm telephone dialer and enunciator panel.
 - .3 Digital thermometer with minus 10°C to plus 30°C range.
 - .4 Built-in battery and charger.

2.3 REFRIGERATION
EQUIPMENT

- .1 Refrigeration equipment: split unit type, pre-assembled condenser and evaporator sub assemblies, with low ozone depletion potential (ODP) HFC refrigerant blend, fully automatic in operation, and to conform to following minimum requirements:
 - .1 The refrigeration system must be able to maintain a temperature of 1°C inside the bin cooler with temperatures ranging from 18°C to 27°C inside the WMB and temperatures ranging from -21°C to 26°C DB/19°C WB outdoors.
 - .2 Single point power connection.
 - .3 Electrical Service Voltage: 208 VAC 3 phase.
 - .4 Electrical Central Voltage: 120 VAC single phase.
 - .5 Building Roof-mounted Condensing Unit: complete with motor, air-cooled condenser, safety screen, receiver, hermetic or accessible hermetic type compressor, and other necessary components, sleeper mounted in flexible manner on common base.
 - .6 Evaporator: forced-convection, unit-cooler type, suspended from walk-in cooler ceiling, with forced-air discharged parallel to ceiling. Assemble air circulating motor, multfin and tube type coil and grille within protective housing also, contain expansion valve, with strainer, heat exchanger and inlet and outlet connections within same housing complete with safety screen. Air circulation motors: lifetime sealed. Entire unit-cooler assembly readily accessible for cleaning. Provide drip pan and drain

2.3 REFRIGERATION EQUIPMENT (Cont'd)	.1	(Cont'd)
	.6	Evaporator:(Cont'd) connection. Equip unit coolers with mounting brackets for installation and controls for safe and satisfactory operation. Provide disconnect switch within 600 mm of evaporator motor.
	.7	Thermostat controlled, wiring coordinated with electrical installations indicated.
	.2	Refrigerant tubing: .1 Conform to ASTM B 88M and ASTM B 280 requirements. .2 Relief valve discharge pipe on outdoor installations to be copper tube type "L" with brazed joints. .3 Fittings: .1 Conform to ANSI/ASME B16.26 and ANSI/ASME B16.29. .2 Long radius type for elbows and return bends.
	.3	Provide pre-assembled remote refrigeration equipment complete with electrical and refrigeration connections including necessary components factory-installed on both evaporator and condensing unit assemblies, prewired, ready for site connections.
	.4	Evaporator assembly in addition to evaporator, to include heat exchanger, temperature control and expansion valve.
	.5	Condensing unit assembly, in addition to condensing unit, to include sight glass, drier, time clock, vibration eliminator, suction accumulator, crankcase heater, winter control and protective hood.
2.4 DRAIN LINES AND HEATER CABLES	.1	Provide necessary drain lines to funnel drains and heater cables as required.
2.5 SOURCE QUALITY CONTROL	.1	Confirm equipment is manufactured and installed by company having personnel skilled in manufacturing and installing of prefabricated walk-in freezers and coolers and has continuous proven experience within last five years.
	.2	Departmental Representative will conduct shop inspection of equipment fabrication prior to delivery to site in accordance with Section 01 45 00 - Testing and Quality Control.

PART 3 - EXECUTION

3.1 INSTALLATION

- .1 Supply appropriate protection apparatus.
- .2 Install in accordance with manufacturer's recommendations.
- .3 Erect work true-to-line, plumb, square and level with joints aligned. Fit joints and intersecting members accurately and in true planes adequately fastened.
- .4 Insulate to prevent electrolysis between metal and concrete by applying coating of asphaltic paint to metal surface, applied in accordance with manufacturer's instructions. Insulation to be dry before assembling floor panels in place.
- .5 Unless otherwise indicated, install units within 25 mm of building walls. Fasten screeds to building and/or wearing floor in accordance with manufacturer's instructions.
- .6 Caulk around perimeter of floor panels and screeds after installation on floor slab.
- .7 Cut or drill holes in panels, as required, to accommodate electrical and mechanical services, runs or connections.
 - .1 Insert teflon sleeves into holes and seal.
 - .2 After installation of services, fill remaining space with insulation.
- .8 Cap wrench access holes with an in-fitting, flush, stainless steel removable plug.
- .9 Install removable closure panels, cover strips, and angles.

3.2 CLEANING AND
ADJUSTING

- .1 Upon completion of Work:
 - .1 Clean equipment and apparatus in accordance with Section 01 45 00 - Testing and Quality Control.
 - .2 Remove protective coverings and test and adjust operating equipment.
 - .3 Re-finish damaged coatings and finishes.
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3.3 COMMISSIONING .1 Commission walk-in cooler in accordance with manufacturer's recommendations, to satisfaction of Departmental Representative, and in accordance with Section 01 91 13.

PART 1 - GENERAL

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| <u>1.1 GENERAL</u> | .1 | This section provides performance specifications for the provision of one (1) industrial roll-on roll-off (RORO) self-contained waste compactor. |
| <u>1.2 RELATED REQUIREMENTS</u> | .1 | Section 01 49 00 - Testing and Quality Control. |
| | .2 | Section 01 91 31 - Commissioning. |
| <u>1.3 REFERENCES</u> | .1 | American Society for Testing and Materials International, (ASTM)
.1 ASTM A 48/A 48M-03(2012), Standard Specification for Gray Iron Castings.
.2 ASTM A 307-2012, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
.3 ASTM A 653/A 653M-2013, Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
.4 ASTM B 32-2008, Standard Specification for Solder Metal. |
| | .2 | Canada General Standards Board (CGSB)
CAN/CGSB-1.40-M97, Anticorrosive Structural Steel Alkyd Primer. |
| | .3 | Canadian Standards Association (CSA International)
.1 CSA G40.20/G40.21-2013, General Requirements for Rolled or Welded Structural Quality Steel/Structural Quality Steel.
.2 CSA W59-2013, Welded Steel Construction (Metal Arc Welding) (Metric Version).
.3 ANSI Z 245.2-2008, Stationary Compactors, Safety Requirements. |
| <u>1.4 SYSTEMS DESCRIPTIONS</u> | .1 | Provide self contained waste compactor suitable for exterior use. |
| | .2 | Responsibility includes design, fabrication, transportation, site assembly, commissioning and demonstration of equipment. |
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1.5 DESIGN
REQUIREMENTS

- .1 Heavy-duty self-contained waste compactor suitable for exterior use to meet the following minimum requirements:
 - .1 All systems weatherproof.
 - .2 Removable access panels.
 - .3 Single point power connection.
 - .4 Electrical service voltage: 600 VAC. 3 PH all circuits fused.
 - .5 Electrical control voltage: 120 VAC. 1 PH all circuits fused, UL listed control panel.
 - .6 Operation: three (3) push button station, Start/Stop/Reverse, key on/off lockable, and emergency stop.
 - .7 80% full warning light.
 - .8 Electrically powered hydraulic pump compaction action. Auto-shut-down and safety retract.
 - .9 Minimum normal hydraulic ram force: 175kN.
 - .10 Hydraulic fluid reservoir heater.
 - .11 Charge box (compactor hopper) capacity: 1.30m³ waste rating.
 - .12 Waste capacity: 30m³, fully enclosed.
 - .13 Truck deliverable RORO configuration.
 - .14 Heavy duty steel construction suitable for intended use.
 - .15 Finishing: Industrial preparation, primer and paint coatings to manufacturer's specifications.
 - .16 Finish paint colour: Industrial green.
 - .17 Through-the-wall rear-feed chute to be provided compatible with waste compactor charge box and building wall details.

1.6 PERFORMANCE
REQUIREMENTS

- .1 Conform to Waste Equipment Technology Association (WASTEC) Rating Criteria.

1.7 SHOP DRAWINGS

- .1 Submit shop drawings in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Indicate truck delivery and removal configuration construction details, point loads, anchor bolt locations, clearances required, including clearances for access and service and electrical requirements.

1.8 CLOSEOUT
SUBMITTALS

- .1 Provide maintenance data for waste compactors for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.
- .2 Include following information: description of operation, servicing, adjusting/testing,

1.8 CLOSEOUT SUBMITTALS (Cont'd) .2 Include following information:(Cont'd) inspection/checking, list of lubricates and hydraulic fluid.

PART 2 - PRODUCTS

2.1 MATERIALS .1 Standard of acceptance:
.1 Marathon Ramjet RJ-250SC.
.2 Nedland Industries NSC-200-40, 30m³ (40 cu yd) self-contained compactor.
.3 Rotobale Compaction Solutions Inc. RC Series, 30m³ (40 cu yd) self-contained compactor.

PART 3 - EXECUTION

3.1 PLACEMENT .1 Place self-contained waste compactor in accordance with manufacturer's instructions.
.2 Touch up damaged painted and primed surfaces after installation as directed.

3.2 INSTALLATION .1 Provide through-the-wall chute assembly in accordance with manufacturer's recommendation and approved shop drawings.

3.3 DEMONSTRATION .1 Before acceptance of waste compactor system, arrange for demonstration of equipment to Departmental Representative. Demonstration to be performed by competent representative of equipment manufacturer to assure proper function, operation and explanation. Give Departmental Representative minimum of 72 hours advance notice in writing of demonstration.
.2 Instruct maintenance personnel three (3) hours minimum in use of equipment.