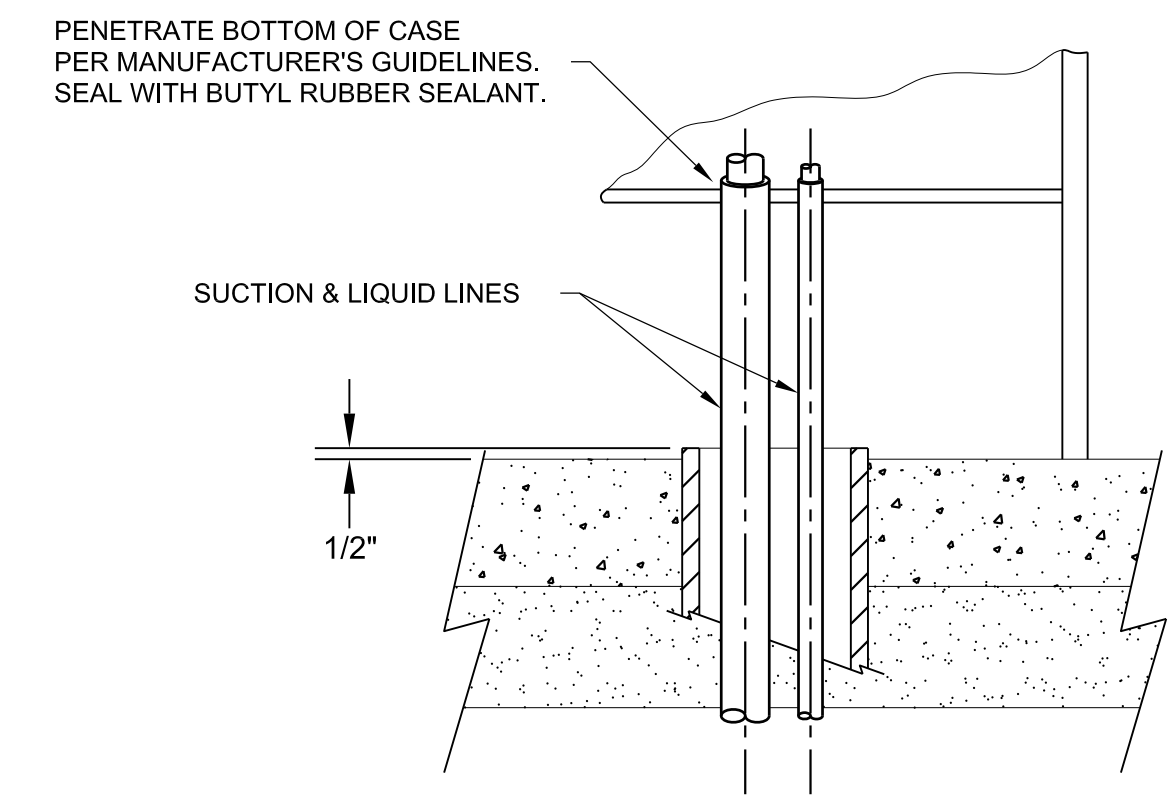
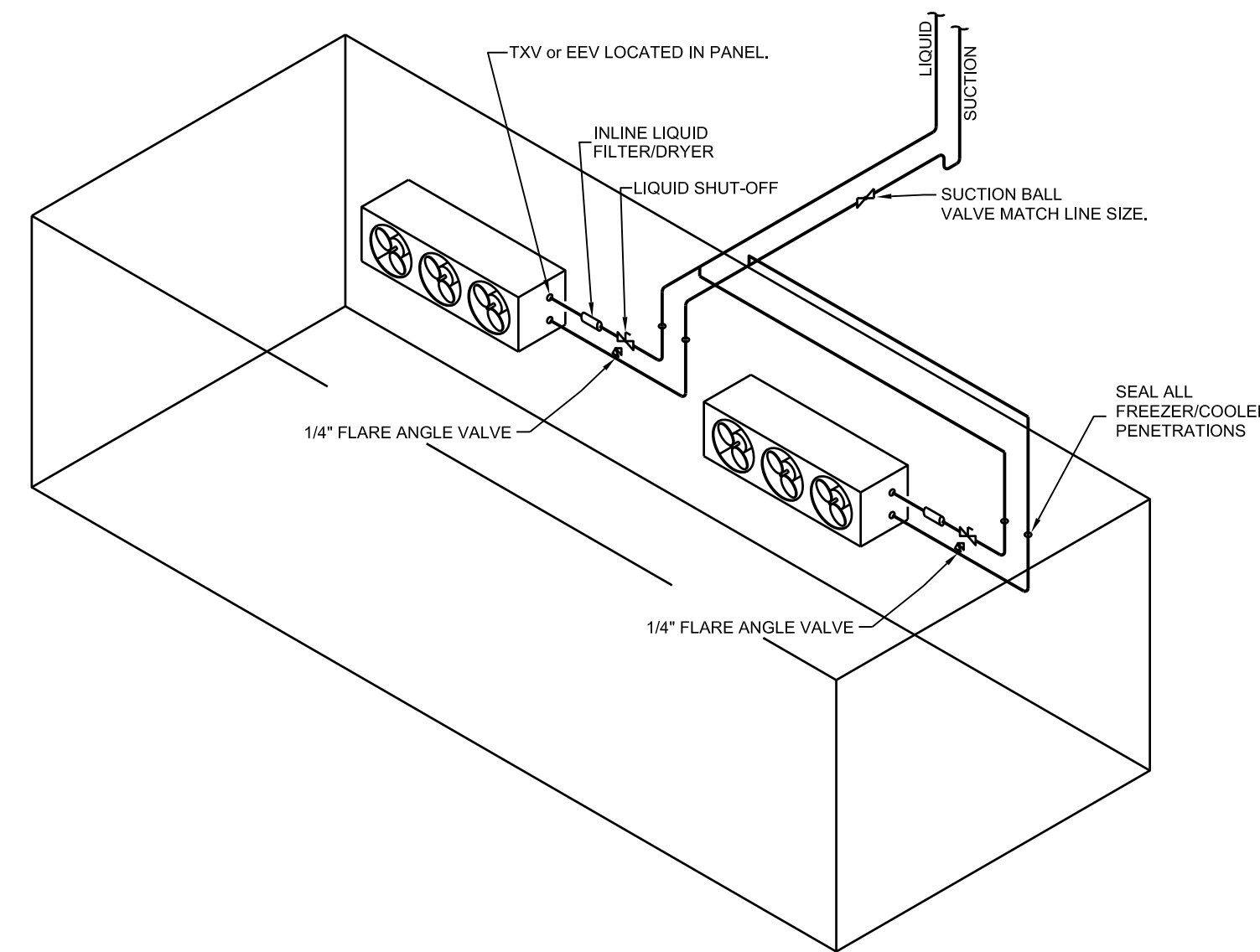


EVAPORATOR MOUNTING DETAIL
SCALE: NOT TO SCALE

- NOTES:
- HANNAFORD SHALL PROVIDE EVAPORATOR AND TXV. ALL OTHER PARTS TO BE SUPPLIED BY CONTRACTOR, AS FOLLOWS:
 - FILTER/DRYER - SPORLAN MODEL 608S.
 - SUCTION LINE SOLENOID-MATCH LINE SIZE, WITH MANUAL STEM.
 - LIQUID AND SUCTION VALVES (MATCH LINE SIZE) AND 1/4" ANGLE VALVE.
 - LIQUID PIPING TO BE 1/2" MIN. SIZE.



SLAB PENETRATION NOTES:

- ROUTE REFRIGERATION LINES THRU SDR35 PVC PIPE.
- FOUR SLAB TO OUTSIDE SURFACE OF PVC PIPE.

G1 DETAIL ~ REFRIGERATION PIPING FOR FREEZERS/COOLERS

NOT TO SCALE

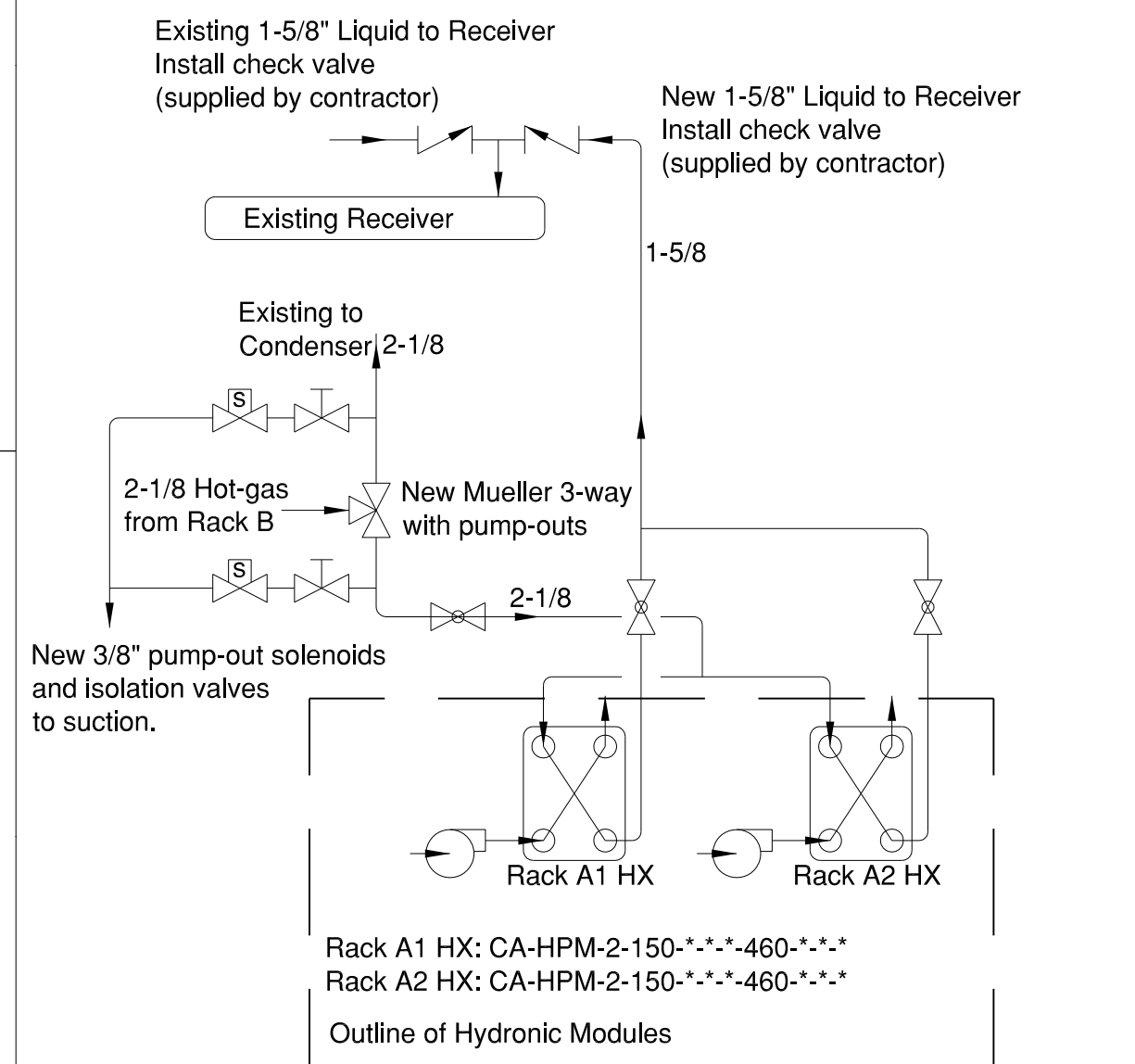
C3 DETAIL ~ REDUCING RISER

NOT TO SCALE

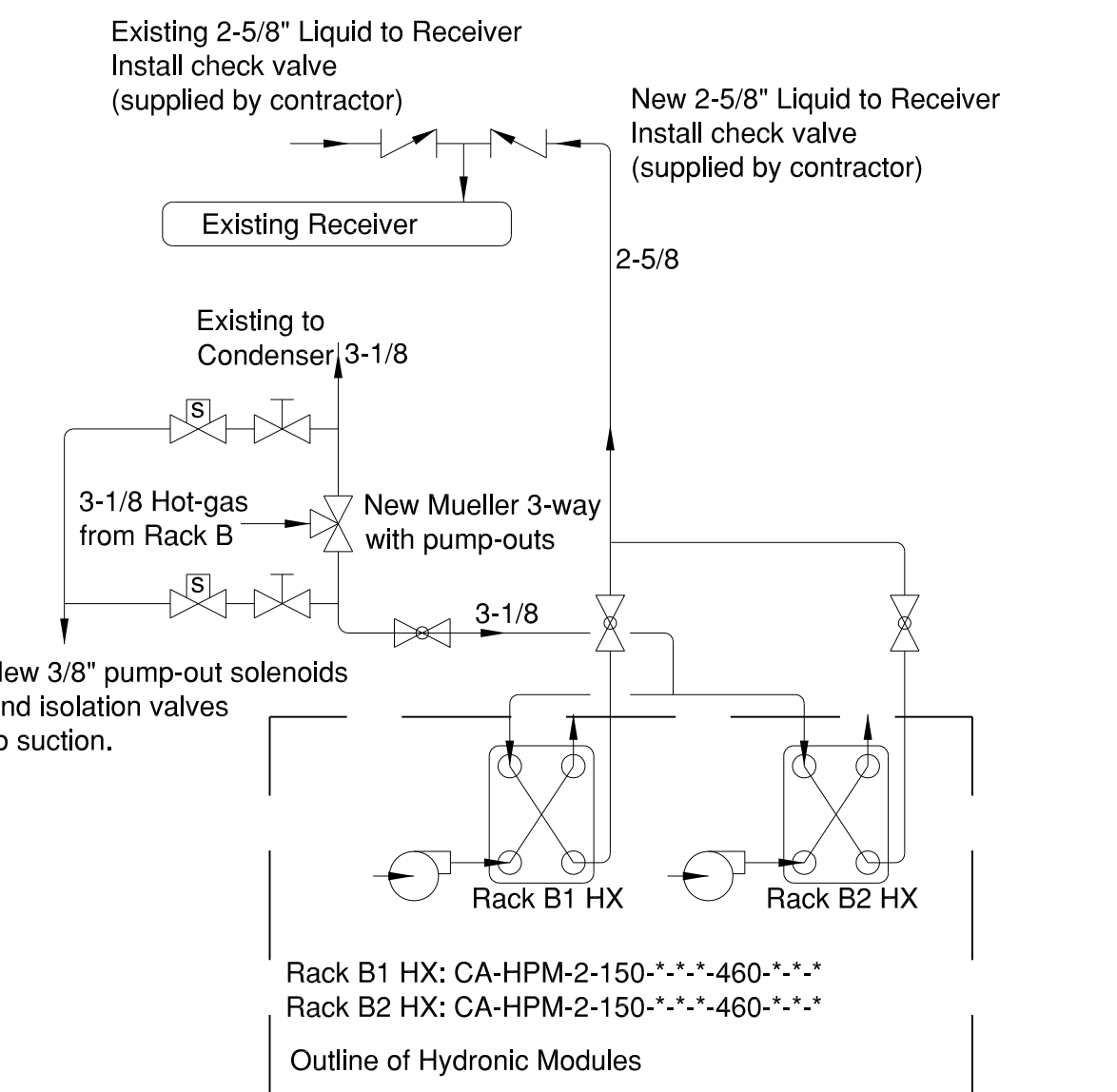
C5 DETAIL ~ TYPICAL REFRIGERATION PIT

NOT TO SCALE

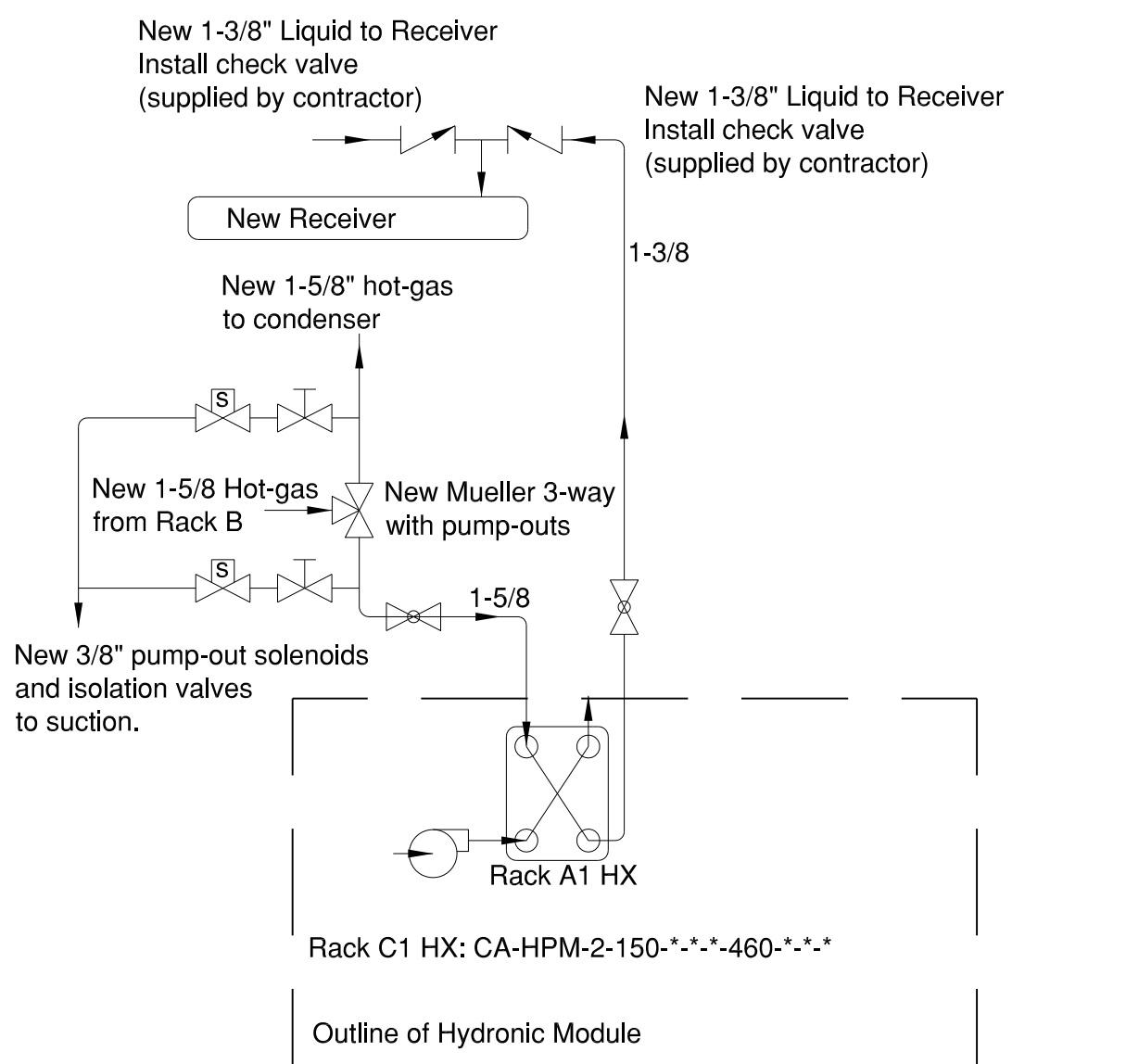
- Notes:
- In compressor room, install 2-1/8" Mueller 3-way valve w/pump outs to suction as shown.
 - Route heat reclaim liquid return to receiver on roof as shown.
 - Install refrigeration ball valves as shown.
 - All parts provided by contractor.



- Notes:
- In compressor room, install 3-1/8" Mueller 3-way valve w/pump outs to suction as shown.
 - Route heat reclaim liquid return to receiver on roof as shown.
 - Install refrigeration ball valves as shown.
 - All parts provided by contractor.



- Notes:
- In compressor room, install 1-5/8" Mueller 3-way valve w/pump outs to suction as shown.
 - Route heat reclaim liquid return to receiver on roof as shown.
 - Install refrigeration ball valves as shown.
 - All parts provided by contractor.



B1 RACK A HEAT RECLAIM PIPING

NOT TO SCALE

B3 RACK B HEAT RECLAIM PIPING

NOT TO SCALE

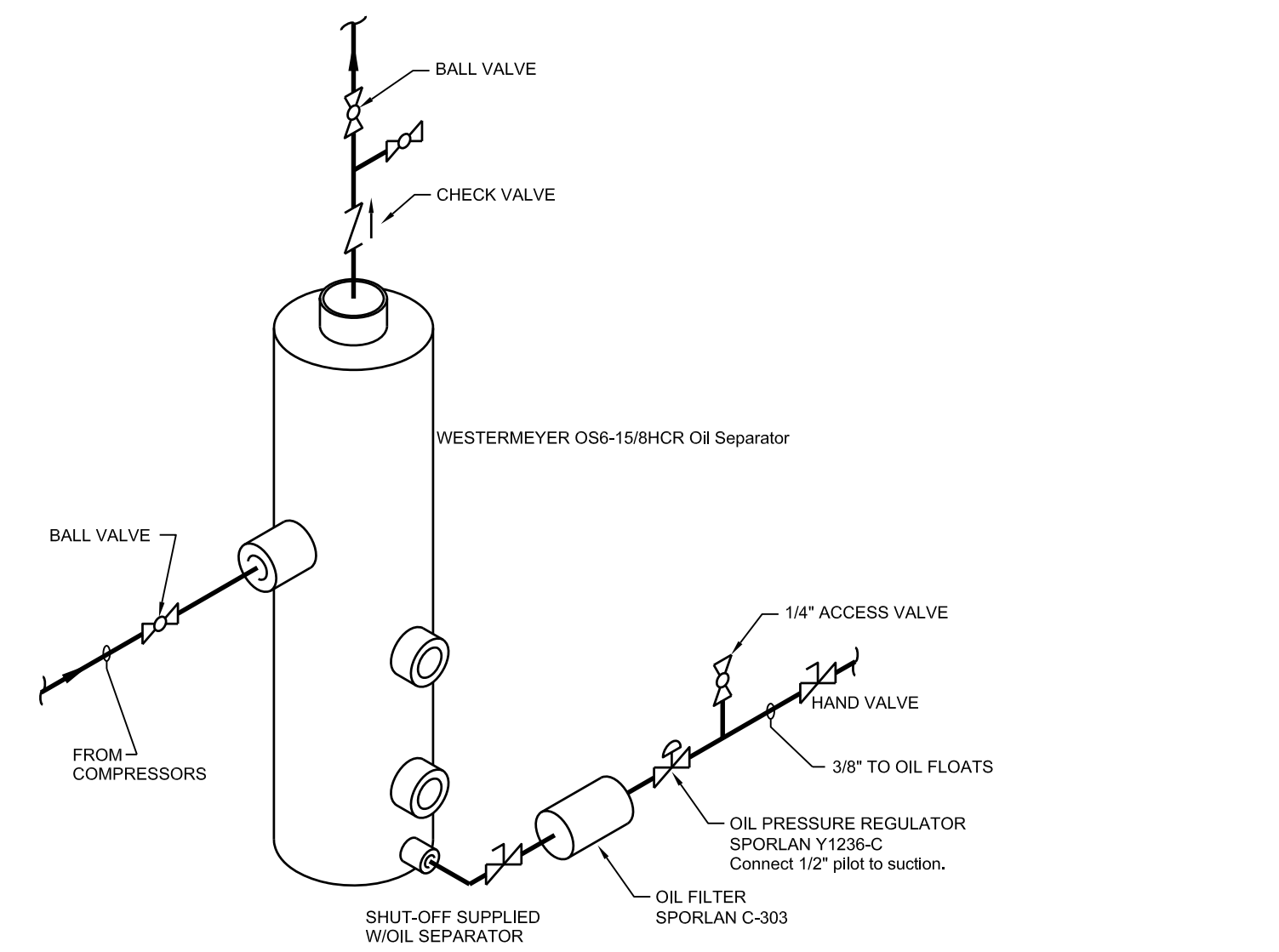
B5 RACK C HEAT RECLAIM PIPING

NOT TO SCALE

COMPRESSORS/CONDENSERS SCOPE OF WORK:

- RACK A (-15F/-25F):
Remove bypass between existing -15F and -25F sections to form a single suction.
Compressors: no change.
Install heat reclaim system per Detail B1.
- RACK B (+20F):
Convert from R22 to R407A.
Install heat reclaim system per Detail B3.
Isolate 3-module of the existing 7 module CanCoil condenser, to be used for new Rack C.
- Rack C (+15F):
Isolate the existing +15F suction rack from the existing +20F suction rack to form an independent +15F rack.
Install new Westermeyer CS6-1 50HCR Oil separator per Detail A3.
Install new 1-5/8" discharge line to 3 modules of the existing 7 module CanCoil condenser.
Install new receiver per Detail A4.
Install heat reclaim system per Detail B5.

- NOTES:
- COMPRESSORS, CONDENSERS AND EVAPORATORS SUPPLIED BY HANNAFORD. ALL OTHER PARTS SHALL BE SUPPLIED BY CONTRACTOR.



- Notes:
- All receiver parts supplied by Hannaford, listed as follows:
 - Qty(1) liquid receiver, 12"OD x 11Rt lg
 - Qty(2) receiver brackets, Standard #12B
 - Qty(1) 1/2"PT 3-way shut-off valve, Henry #925
 - Qty(2) 1/2" nupture disc, Mueller #AJ17971
 - Qty(2) 1/2" relief valve, 450# rating, Superior #3020450
 - Qty(2) 1/2" x 3/8" nipples, brass
 - Qty(2) pressure gauges, high-side, ULR #N2000
 - Secure receiver to 4"x4" PT sleepers, using mounting brackets.
 - Add padding between sleepers and roof, per roofer's recommendation.

A1 SCOPE OF WORK

NOT TO SCALE

A2 OIL SEPARATOR INSTALLATION

NOT TO SCALE

A4 ROOFTOP RECEIVER INSTALLATION

NOT TO SCALE

1.0 REFRIGERANTS AND OILS:

- CONTRACTOR SHALL SUPPLY OIL AND REFRIGERANT PER TABLE 1.1 LISTED BELOW.
- Refrigerant and oil shall be new and delivered to the job site in original containers.
- Under no circumstances shall there be any mixing of refrigerants.
- Venting of refrigerant to the atmosphere is not allowed.
- Only E.P.A. certified technicians are allowed to handle refrigerant and work on any charged system.
- Refrigerant receiver levels shall be at 30% average liquid level when turned over to the owner.
- Record refrigerant charge amounts on rack start-up forms and return to owner.

TABLE 1.1

RACK	REFRIGERANT	OIL SPECIFICATIONS	OIL SPECIFICATIONS		
			TYPE	WT	MANUFACTURER
RACK A (-25F)	R-507 (no change)	POE	150	MOBIL ARCTIC 22	
RACK B (+20F)	convert from R22 to R-407A	POE	150	MOBIL ARCTIC 22	
RACK C (+15F)	convert from R22 to R-407A	POE	150	MOBIL ARCTIC 22	

2.0 PIPE & FITTINGS REQUIREMENTS:

- All pipe shall be Type L copper, manufactured in accordance with ASTM B88, and cleaned, purged, pressurized and capped in accordance with ASTM B266. (Mueller or Compaq only) Manufacturers, Mueller, Compaq, or others with approval from Owner Engineering.
- All fittings shall be refrigeration-grade copper or brass. No swaged fittings are allowed.
- All elbows shall be long radius type. No formed elbows are permitted. Fittings must be used for all line size and direction changes.
- "T" connections may be field manufactured. "T" drill tools must first be approved by Owner Engineering Department.

3.0 BRAZING REQUIREMENTS:

- During brazing operations, dry nitrogen must be bled through piping to prevent oxidation and scaling.
- To prevent internal contamination of the piping, do not use an excessive amount of flux and apply flux to only make portion of joint.
- All joints shall be brazed with silver solder alloy containing not less than 15% silver, except as noted below:
 - Soft solder may be used for case connections.
 - For copper-to-steel, brass-to-steel and steel-to-steel joints, use silver solder alloy containing no less than 55% silver.
 - For copper-to-brass joints, where damage could occur from excess heat such as ball valves, use 95/5 solder.

4.0 PIPING INSTALLATION REQUIREMENTS:

- Piping diagrams and plans shall be followed, except as otherwise instructed by "Owner Representative".
- All piping to be installed to prevent rubbing against any other pipes or objects. Case piping to be routed to clear access to drains, fans, solenoids, TXV's and electrical devices or controls.
- Discharge lines shall slope in the direction of flow.
- Horizontal suction lines shall slope to the compressors at a rate of 1 inch per 20 feet.
- All suction risers shall be constructed per R2 detail drawing.
- Stub-up connections for cases shall be per R2 detail drawing.
- Any above-slab liquid branches shall connect to the bottom of the liquid header. Below-slab liquid branches can be made to any orientation, to simplify installation. All suction branches shall connect to the top of the suction header.
- All liquid and suction lines shall be insulated as follows:
 - Liquid and suction line insulation shall be 1" thick. Use Armstrong Armaflex II, or equivalent having a documented insulation value of K=27 or higher, flame spread of 25/50 per ASTM 84, and a water vapor transmission rate of .10 or less.
 - All insulation joints shall be sealed with rubber cement to insure an air-tight seal. Where possible, insulation shall be slipped over the piping prior to joint brazing. Instead of lengthwise splitting and sealing. Do not insulate liquid lines inside of coolers & freezers.
 - All refrigeration penetrations in refrigerated fixtures and coolers shall be completely sealed with butyl rubber sealant.
 - All refrigeration penetrations into compressor room shall be drilled to size for each line and sealed using Insta-Foam Products "Froth-Pak" (non-combustible) or equivalent.
 - All insulation which is located outdoors must be protected with weather-resistant PVC jacket.
 - All insulation which is located in air plenums must be UV and Plenum rated.
- Above-slab piping shall be supported to prevent vibration and strain, as follows:
 - Support lines with "Unistrut" or equivalent. Maximum support spacing shall be 6 feet in compressor room and 10 feet outside of compressor room.
 - Clamps with Hydrazok (or equivalent) cushion shall be used to facilitate a neat and organized assembly. Corrosion resistant bolts with self-locking nuts shall be used with pipe clamps.
 - Where clamps are not used, galvanized sheet metal saddles, fitted to the diameter of the pipe insulation, shall be placed between the pipe insulation and the supporting member to prevent damage to the insulation. Use silicon adhesive to secure saddle to both sides of hanger. Do not secure saddles to the insulation.
- Below-slab piping shall be routed through sleeves fabricated from schedule SRD35 PVC pipe.
- Temporary physical protection shall be applied to the piping system, as required. Cap ends of pipe not being worked.
- Piping shall be routed to clear evaporator fans, motors and expansion valves.
- All compressor room piping shall be located so that normal servicing of the refrigeration equipment is not hindered. Do not install piping which obstructs the view of the crankcase oil sight-glass or interferes with the removal of the compressors, cylinder heads, end bells, access plates, fans, fan motors, unloader coils, filters and other compressor room parts.
- SECONDARY COOLANT PIPING: Piping shall be Type-L or ACR copper tubing, connected with either soft-solder or 10% Silver Solder. Insulated all piping and fittings with 1" ARMORFLEX (see 4.8.1). Flush and drain all piping prior to filling with propylene glycol.

5.0 EVAPORATOR INSTALLATION FOR CASES, FREEZERS AND COOLERS:

- Evaporators shall be installed per R2 detail drawing, described as follows:
- Evaporators shall be supported from a "Unistrut" frame or equivalent.
 - For Existing, Relocated, Used Cases, and Cooler Evap. Units: Unless already in place, contractor shall install new liquid line hand valve, new Danfoss electronic expansion valve, suction ball valve, and 1/4" brass angle valve in the suction line on the evaporator side of the suction ball valve. Install new liquid filter dryer to match line size, remove any existing filter dryer.
 - For fan coils connected to refrigeration rack per the R1 drawings, pipe per R2 detail drawing.
 - For meat prep room using plenum ceiling, pipe per R2 detail drawing.
 - Remove any existing refrigerant control devices no longer in use in piping, cases, or at racks.

6.0 ICE MACHINE INSTALLATION:

N/A

7.0 FLUID COOLERS:

See R3-1 drawing.

8.0 PRESSURE TESTING, EVACUATION AND CHARGING:

- Refrigeration piping shall be pressure tested as follows:
 - Pressure testing shall be accomplished with dry nitrogen using a pressure regulator.
 - All refrigeration piping shall be tested to 350 psig. Prior to pressure testing, isolate all components that may be damaged by 350 psig pressure, such as transducers, compressors, oil piping, regulators and floats.
 - Display cases shall be pressure tested to greater of either the manufacturer's pressure rating or 250 psig.
 - Time interval for pressure testing shall be 24 hrs for under-slab and 8 hrs for all other piping.
 - If required pressure cannot be maintained, then piping shall be re-pressurized with refrigerant and nitrogen, per EPA guidelines, in order to locate leaks with an electronic leak detector. Repeat pressure test after leaks are repaired.
 - Records must be maintained of pressure readings and time interval for test, for each tested pipe section. Records to be kept on site for inspection.
 - Owner must witness the final testing of all under-slab piping sections. Contractor must provide Owner with 24 hour advanced notice of all under-slab pressure tests.

8.2 After successful pressure testing, the piping system shall be evacuated as follows:

- It is recommended that the contractor use a two-stage vacuum pump with a minimum capacity of 10 CFM and 3/8" ID (min.) copper lines. Vacuum connections should be made at discharge, liquid and suction piping.
- An electronic vacuum gauge, such as manufactured by Robinsair, must be used to measure the internal pipe pressure at the farthest point from the vacuum pump.
- Refrigeration system shall be evacuated as follows:
 - Double evacuation to 1500 microns Hg, breaking the vacuum each time with the proper refrigerant to a positive pressure, per EPA guidelines.
 - Final evacuation to 350 microns Hg. Valve off vacuum pump. The pressure must stay below 500 microns Hg for a four hour period for a successful evacuation.
 - If the pressure rises to 500 microns during the four hour test period, the system is to be re-pressurized per 8.1.5 above.
 - Repeat triple evacuation procedure after leak(s) have been repaired.

8.2.4 Records must be maintained of pressure readings and time interval for test, for each tested pipe section. Records must be kept on site for inspection.

8.2.5 Owner must witness the final evacuation testing of all piping systems. Contractor must provide Owner with 24 hour advanced notice of all evacuation tests.

8.2.6 Contractor must guarantee the integrity of all installed piping systems for a period of one year after store Grand Opening.

8.3 After successful evacuation, the refrigeration system shall be charged with refrigerant and oil using the following guidelines:

- All refrigerant and oil shall be delivered to the job site in original containers.
- Record the amount of refrigerant charged in each system on the start-up report and the refrigerant log located in the compressor room.
- Base initial oil charge on two gallons per compressor. After start-up, adjust to maintain correct oil levels in compressors and oil separators. Record amount of oil charge in each rack.
- Filter change requirements:
 - For remodels: Change all liquid, suction and oil filters at end of project.
 - For new stores: Change all liquid, suction and oil filters within 72 hours after rack start-up and change all liquid, suction and oil filters at end of project.

9.0 SELF CONTAINED REFRIGERATION EQUIPMENT

The refrigeration contractor shall be responsible for the start-up of all self-contained units.

10.0 LOCK OUT / TAG OUT REQUIREMENTS:

All contractors performing work at a Hannaford retail location shall follow, at a minimum, the Hannaford document titled "Lockout Tagout Program for Hannaford Retail Locations". All contractor employees performing a lockout procedure shall be trained and certified as a qualified person as defined by OSHA and NFPA70E. The responsibility of training and documenting contractor employees, and their adherence to safe work practices as defined by OSHA and NFPA70E, lies with their employer.

11.0 COMMISSIONING:

The refrigeration contractor will be part of the Commissioning Team. The contractor must therefore participate in commissioning site inspections, and, upon request, provide installation documentation to the commissioning leaders.

12.0 FILTER CHANGES:

- For remodels:
 - Maintain clean suction, liquid and oil filters through duration of project.
 - At completion of project, change all suction, liquid and oil filters.
- For new construction:
 - After 72hrs from start-up, change all suction, liquid and oil filters.
 - At end of project, change all suction, liquid and oil filters.

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REVISION	DATE	DESCRIPTION

REVISION	DATE	DESCRIPTION

REVISION	DATE	DESCRIPTION

Date: AUGUST, 2011
Drawn By: PDS
Checked By: BEI
Project Mgr: BEI
Project No: 0
Graphic: 0
Scale: 1"=1'-0"

REFRIGERATION NOTES & DETAILS
HANNAFORD SUPERMARKET & PHARMACY No.8351
295 FOREST AVENUE
PORTLAND, MAINE 04101

R2-0