

HEATING, VENTILATING AND AIR CONDITIONING

SECTION 232300 - REFRIGERANT PIPING

- 1.1 PERFORMANCE REQUIREMENTS
 - A. QUALITY STANDARDS: ASHRAE 15 AND ASME B31.5.
 - B. LINE TEST PRESSURE FOR REFRIGERANT R-410A:
 - 1. SUCTION LINES FOR AIR-CONDITIONING APPLICATIONS: 300 PSIG (2068 KPA).
 - 2. SUCTION LINES FOR HEAT-PUMP APPLICATIONS: 535 PSIG (3689 KPA).
 - 3. HOT-GAS AND LIQUID LINES: 535 PSIG (3689 KPA).
- 1.2 PRODUCTS
 - A. COPPER TUBE AND FITTINGS: TYPE K
 - B. TIN-BRONZE BELLOWES, FLEXIBLE CONNECTORS.
 - C. VALVES AND SPECIALTIES:
 - 1. DIAPHRAGM PACKLESS VALVES.
 - 2. PACKED-ANGLE VALVES.
 - 3. CHECK VALVES.
 - 4. SERVICE VALVES.
 - 5. SOLENOID VALVES: 24 -V AC.
 - 6. SAFETY RELIEF VALVES.
 - 7. THERMOSTATIC EXPANSION VALVES FOR 40 DEG F (4.4 DEG C) SUCTION TEMPERATURE; ADJUSTABLE SUPERHEAT.
 - 8. HOT-GAS BYPASS VALVES WITH INTERNAL, 24 -V AC
 - 9. STRAIGHT-TYPE STRAINERS.
 - 10. ANGLE-TYPE STRAINERS.
 - 11. MOISTURE/LIQUID INDICATORS.
 - 12. REPLACEABLE-CORE FILTER DRYERS WITH ACTIVATED ALUMINA MEDIA, (2-PSIG (14-KPA) MAXIMUM PRESSURE LOSS.
 - 13. PERMANENT FILTER DRYERS WITH ACTIVATED 2-PSIG (14-KPA)
 - 14. MUFFLERS.
 - 15. RECEIVERS.
 - 16. LIQUID ACCUMULATORS.
- 1.3 REFRIGERANTS
 - A. R-410A.
- 1.4 PIPING APPLICATION SCHEDULES
 - A. PIPING APPLICATIONS FOR REFRIGERANT R-410A: MAXIMUM NPS 4 (DN 100).
 - 1. SUCTION LINES FOR CONVENTIONAL AIR-CONDITIONING APPLICATIONS: COPPER.
 - 2. HOT-GAS AND LIQUID LINES, [AND SUCTION LINES FOR HEAT-PUMP APPLICATIONS]:
 - a. NPS 2 (DN 50) AND SMALLER: COPPER WITH BRAZED OR SOLDERED JOINTS.
 - 3. SAFETY-RELIEF-VALVE DISCHARGE PIPING:
 - a. NPS 2 (DN 50) AND SMALLER: COPPER WITH BRAZED OR SOLDERED JOINTS.
- 1.5 INSULATION
 - A. 3/4" (19MM) MINIMUM THICKNESS, SELF-SEALING CLOSED CELL FOAM INSULATION APPLIED TO SUCTION PIPING.
 - B. PROVIDE LINE SET SHROUD WHERE MOUNTED EXTERIOR TO BUILDING INCLUDING ROOF TO PROTECT INSULATION.

END OF SECTION 232300

HEATING, VENTILATING AND AIR CONDITIONING

SECTION 233113 - METAL DUCTS

- 1.1 MATERIALS
 - A. SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED.
 - B. SINGLE-WALL [ROUND] AND FLAT-OVAL] DUCTS AND FITTINGS: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE", CHAPTER 3, "ROUND, OVAL, AND FLEXIBLE DUCT", BASED ON INDICATED STATIC-PRESSURE CLASS UNLESS OTHERWISE INDICATED. SPIRAL ROUND OR SPIRAL OVAL DUCTS SHALL BE USED WHERE EXPOSED.
 - C. SHEET METAL MATERIALS:
 - 1. GALVANIZED SHEET STEEL.
 - 2. FINISHES FOR SURFACES EXPOSED TO VIEW: MILL PHOSPHATIZED.
 - D. DUCT LINER:
 - 1. FIBROUS GLASS, TYPE I, FLEXIBLE OR TYPE II, RIGID.
 - a. WATER-BASED LINER ADHESIVE: VOC CONTENT OF 80 G/L OR LESS FOR INTERIOR APPLICATIONS.
 - 2. FLEXIBLE ELASTOMERIC.
 - 3. NATURAL FIBER.
 - E. SEALANT MATERIALS:
 - 1. TWO-PART TAPE SEALING SYSTEM: VOC CONTENT OF 250 G/L OR LESS FOR INTERIOR APPLICATIONS.
 - 2. WATER-BASED JOINT AND SEAM SEALANT: VOC CONTENT OF 250 G/L OR LESS FOR INTERIOR APPLICATIONS.
 - 3. FLANGED JOINT SEALANT: VOC CONTENT OF 250 G/L OR LESS FOR INTERIOR APPLICATIONS.
 - 4. FLANGE GASKETS.
 - 5. ROUND DUCT JOINT O-RING SEALS.
- 1.2 SEISMIC-RESTRAINT DEVICES
 - A. CHANNEL SUPPORT SYSTEM.
 - B. STAINLESS-STEEL RESTRAINT CABLES.
 - C. HANGER ROD STIFFENER: STEEL TUBE OR STEEL SLOTTED-SUPPORT-SYSTEM SLEEVE WITH INTERNALLY BOLTED CONNECTIONS TO HANGER ROD.
- 1.3 DUCT CLEANING
 - A. CLEAN NEW AND EXISTING DUCT SYSTEM(S) BEFORE TESTING, ADJUSTING, AND BALANCING.
 - B. CLEAN THE FOLLOWING ITEMS:
 - 1. AIR OUTLETS AND INLETS.
 - 2. SUPPLY, RETURN, AND EXHAUST FANS.
 - 3. AIR-HANDLING UNITS.
 - 4. COILS AND RELATED COMPONENTS.
 - 5. RETURN-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
 - 6. SUPPLY-AIR DUCTS, DAMPERS, ACTUATORS, AND TURNING VANES.
 - 7. DEDICATED EXHAUST AND VENTILATION COMPONENTS AND MAKEUP AIR SYSTEMS.
- 1.4 DUCT SCHEDULE
 - A. ALL DUCTS SHALL BE GALVANIZED STEEL.
- 1.5 HANGERS AND SUPPORT
 - A. HANGER RODS: ELECTROGALVANIZED, ALL-THREAD RODS OR GALVANIZED RODS WITH THREADS PAINTED WITH ZINC-CHROMATE PRIMER AFTER INSTALLATION.
 - B. STRAP AND ROD SIZES: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE," TABLE 5-1 (TABLE 5-1M), "RECTANGULAR DUCT HANGERS MINIMUM SIZE," AND TABLE 5-2, "MINIMUM HANGER SIZES FOR ROUND DUCT."
 - C. STEEL CABLES FOR GALVANIZED-STEEL DUCTS: GALVANIZED STEEL COMPLYING WITH ASTM A 603.
 - D. STEEL CABLE END CONNECTIONS: CADMIUM-PLATED STEEL ASSEMBLIES WITH BRACKETS, SWIVEL, AND BOLTS DESIGNED FOR DUCT HANGER SERVICE; WITH AN AUTOMATIC-LOCKING AND CLAMPING DEVICE.
 - E. DUCT ATTACHMENTS: SHEET METAL SCREWS, BLIND RIVETS, OR SELF-TAPPING METAL SCREWS; COMPATIBLE WITH DUCT MATERIALS.
 - F. TRAPEZE AND RISER SUPPORTS:
 - 1. SUPPORTS FOR GALVANIZED-STEEL DUCTS: GALVANIZED-STEEL SHAPES AND PLATES.
 - 2. SUPPORTS FOR STAINLESS-STEEL DUCTS: STAINLESS-STEEL SHAPES AND PLATES.
 - 3. SUPPORTS FOR ALUMINUM DUCTS: ALUMINUM OR GALVANIZED STEEL COATED WITH ZINC CHROMATE.

END OF SECTION 233113

HEATING, VENTILATING AND AIR CONDITIONING

SECTION 233300 - AIR DUCT ACCESSORIES

- 1.1 QUALITY ASSURANCE
 - A. INSTALLATION STANDARDS: NFPA 90A, NFPA 90B, AND SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE."
 - B. MOTORIZED AND NON-MOTORIZED DAMPERS USED FOR OUTSIDE AIR INTAKES, EXHAUST AND PRESSURE RELIEF (INCLUDING THOSE WITHIN PACKAGED HVAC EQUIPMENT) SHALL HAVE A MAXIMUM AIR LEAKAGE VALUE PER THE ENERGY CODE OR ASHRAE 90.1 WHEN TESTED PER AMCA STD. 500.
- 1.2 PRODUCTS
 - A. BACKDRAFT AND PRESSURE RELIEF DAMPERS: MULTIPLE BLADE, PARALLEL ACTION, GRAVITY BALANCED WITH RETURN SPRINGS.
 - B. BAROMETRIC RELIEF DAMPERS: HORIZONTAL OR VERTICAL MOUNTING; MULTIPLE BLADE, PARALLEL ACTION, GRAVITY BALANCED WITH RETURN SPRINGS.
 - C. MANUAL VOLUME DAMPERS: SINGLE BLADE DESIGN, WITH LINKAGE OUTSIDE AIRSTREAM
 - 1. STANDARD, STEEL, MANUAL VOLUME DAMPERS.
 - 2. STANDARD, ALUMINUM, MANUAL VOLUME DAMPERS.
 - 3. LOW-LEAK, STEEL, MANUAL VOLUME DAMPERS.
 - 4. LOW-LEAK, ALUMINUM, MANUAL VOLUME DAMPERS.
 - D. CONTROL DAMPERS: OPPOSED]BLADE DESIGN; GALVANIZED-STEEL FRAME AND BLADES.
 - E. FIRE DAMPERS: STATIC AND DYNAMIC, REPLACEABLE HEAT-RESPONSIVE DEVICE.
 - F. CEILING RADIATION DAMPERS: REPLACEABLE HEAT-RESPONSIVE DEVICE.
 - G. SMOKE DAMPERS:
 - 1. CURTAIN TYPE WITH BLADES INSIDE AIRSTREAM
 - 2. LEAKAGE: CLASS I
 - H. COMBINATION FIRE AND SMOKE DAMPERS: STATIC AND DYNAMIC HEAT-RESPONSIVE DEVICE
 - I. FLANGE CONNECTORS.
 - J. DUCT SILENCERS: FACTORY FABRICATED AND TESTED, ROUND OR RECTANGULAR.
 - K. TURNING VANES: SINGLE-BLADE, GALVANIZED SHEET STEEL.
 - L. REMOTE DAMPER OPERATORS.
 - M. DUCT-MOUNTED ACCESS DOORS: DOUBLE WALL, RECTANGULAR, GALVANIZED SHEET STEEL WITH INSULATION.
 - N. FLEXIBLE CONNECTORS: INDOOR AND OUTDOOR
 - O. FLEXIBLE DUCTS: INSULATED
 - P. DUCT SECURITY BARS.
 - Q. DUCT ACCESSORY HARDWARE.

END OF SECTION 233300

HEATING, VENTILATING AND AIR CONDITIONING

SECTION 233423 - HVAC POWER VENTILATORS

- 1.1 QUALITY ASSURANCE
 - A. AMCA-CERTIFIED RATINGS SEAL.
- 1.2 CENTRIFUGAL ROOF VENTILATORS
 - A. DIRECT-DRIVE OR BELT-DRIVEN CENTRIFUGAL TYPE, AS SPECIFIED ON PLAN.
 - 1. VARIABLE-SPEED CONTROLLER.
 - 2. DISCONNECT SWITCH.
 - 3. BIRD SCREENS.
 - 4. BACKDRAFT DAMPERS.
 - 5. MOTORIZED DAMPERS.
 - 6. GALVANIZED-STEEL ROOF CURBS WITH BUILT-IN CANT AND MOUNTING FLANGE.
- 1.3 CENTRIFUGAL WALL VENTILATORS
 - A. DIRECT-DRIVE OR BELT-DRIVEN CENTRIFUGAL TYPE, AS SPECIFIED ON PLAN.
 - 1. VARIABLE-SPEED CONTROLLER.
 - 2. DISCONNECT SWITCH.
 - 3. BIRD SCREENS.
 - 4. WALL GRILLE.
 - 5. BACKDRAFT DAMPERS.
 - 6. MOTORIZED DAMPERS.
- 1.4 CEILING-MOUNTED VENTILATORS
 - A. HOUSING: STEEL WITH ACOUSTICAL INSULATION.
 - B. GRILLE: ALUMINUM.
 - C. ACCESSORIES:
 - 1. VARIABLE-SPEED CONTROLLER.
 - 2. MANUAL STARTER SWITCH.
 - 3. TIME-DELAY SWITCH.
 - 4. MOTION SENSOR.
 - 5. CEILING RADIATION DAMPER.
 - 6. WASHABLE FILTER.
 - 7. VIBRATION ISOLATORS.
 - 8. ROOF JACK OR WALL CAP AND TRANSITION FITTINGS.
- 1.5 IN-LINE CENTRIFUGAL FANS
 - A. IN-LINE, CENTRIFUGAL TYPE, AS SPECIFIED ON PLAN.
 - 1. VARIABLE-SPEED CONTROLLER.
 - 2. VOLUME-CONTROL DAMPER.
 - 3. COMPANION FLANGES.
 - 4. FAN GUARDS.
 - 5. MOTOR AND DRIVE COVER (BELT GUARD).

END OF SECTION 233423

HEATING, VENTILATING AND AIR CONDITIONING

SECTION 233713 - DIFFUSERS, REGISTERS, AND GRILLES

- 1.1 PRODUCTS
 - A. SEE MECHANICAL SCHEDULE FOR SPECIFIC DIFFUSERS, REGISTERS, AND GRILLES.
 - B. DIFFUSERS: METAL CONSTRUCTION, EXCEPT USE ALUMINUM MATERIAL WHEN IN DAMP AREAS.
 - 1. ROUND CEILING DIFFUSERS, FULLY ADJUSTABLE
 - 2. RECTANGULAR AND SQUARE CEILING DIFFUSERS, FIXED
 - 3. LOUVER FACE DIFFUSERS.
 - 4. LINEAR BAR DIFFUSERS WITH WIDE CORE SPACING ARRANGEMENT.
 - 5. LINEAR SLOT DIFFUSERS.
 - C. REGISTERS AND GRILLES: METAL CONSTRUCTION, EXCEPT USE ALUMINUM MATERIAL WHEN IN DAMP AREAS.
 - 1. ADJUSTABLE BAR REGISTERS AND GRILLES.
 - 2. FIXED FACE REGISTERS AND GRILLES.
 - 3. LINEAR BAR GRILLES WITH GRID AND PERFORATED FACE ARRANGEMENT.
 - D. EXTERIOR LOUVERS:
 - 1. WEATHERPROOF; RAINPROOF DESIGN.
 - 2. FRAME STYLE SHALL BE COMPATIBLE WITH THE EXTERIOR FINISH OF BUILDING AND WALL CONSTRUCTION.
 - 3. DRAINABLE BLADE CONSTRUCTION.
 - 4. CAULK SLOTS.
 - 5. GALVANIZED REMOVABLE BIRD SCREEN.
 - 6. COORDINATE FINISH WITH ARCHITECT.

END OF SECTION 233713

HEATING, VENTILATING AND AIR CONDITIONING

SECTION 235123 - GAS VENTS

- 1.1 QUALITY ASSURANCE
 - A. CERTIFIED SIZING CALCULATIONS: MANUFACTURER SHALL CERTIFY VENTING SYSTEM SIZING CALCULATIONS.
 - B. COMPATIBLE WITH VENT TYPE AND LISTED ACCESSORIES AS NEEDED FOR A COMPLETE INSTALLATION.

END OF SECTION 235123



© 2015 STARBUCKS COFFEE COMPANY

STARBUCKS COFFEE COMPANY
 2401 UTAH AVENUE SOUTH
 SEATTLE, WASHINGTON 98134
 (206) 318-1575

THESE DRAWINGS AND SPECIFICATIONS ARE CONFIDENTIAL AND SHALL REMAIN THE SOLE PROPERTY OF STARBUCKS CORPORATION, WHICH IS THE OWNER OF THE COPYRIGHT IN THIS WORK. THEY SHALL NOT BE REPRODUCED (IN WHOLE OR IN PART), SHARED WITH THIRD PARTIES OR USED IN ANY MANNER ON OTHER PROJECTS OR EXTENSIONS TO THIS PROJECT WITHOUT THE PRIOR WRITTEN CONSENT OF STARBUCKS CORPORATION. THESE DRAWINGS AND SPECIFICATIONS ARE INTENDED TO EXPRESS DESIGN INTENT FOR A PROTOTYPICAL STARBUCKS STORE (WHICH IS SUBJECT TO CHANGE AT ANYTIME) AND DO NOT REFLECT ACTUAL SITE CONDITIONS. NEITHER PARTY SHALL HAVE ANY OBLIGATION NOR LIABILITY TO THE OTHER (EXCEPT STATED ABOVE) UNTIL A WRITTEN AGREEMENT IS FULLY EXECUTED BY BOTH PARTIES.

STARBUCKS TEMPLATE VERSION | 2016.12.23



325 N. LaSalle St. | Suite 500 | Chicago, IL 60654
 1.312.424.2400 | www.norr.com

ENGINEER OF RECORD



Engineering Consultant

ISSUED FOR CONSTRUCTION - 08/23/2017

PROJECT NAME:
RENOVATION OF STARBUCKS COFFEE PORTLAND, 1080 FOREST AVE.
 PROJECT ADDRESS:
1080 FOREST AVENUE PORTLAND, ME 04103 CUMBERLAND COUNTY

STORE #: 11917
 PROJECT #: 37548-037
 ISSUE DATE: 08/04/2017
 PROGRAM MANAGER: J. BOND
 DESIGNER: A. LEE
 LEED AP: R. TURNER-LAUCK
 PRODUCTION DESIGNER: E. VEGA
 CHECKED BY:

Revision Schedule			
Rev	Date	By	Description

SHEET TITLE:
MECHANICAL SPECIFICATIONS
 SCALE: AS SHOWN

SHEET NUMBER:
M-0003

