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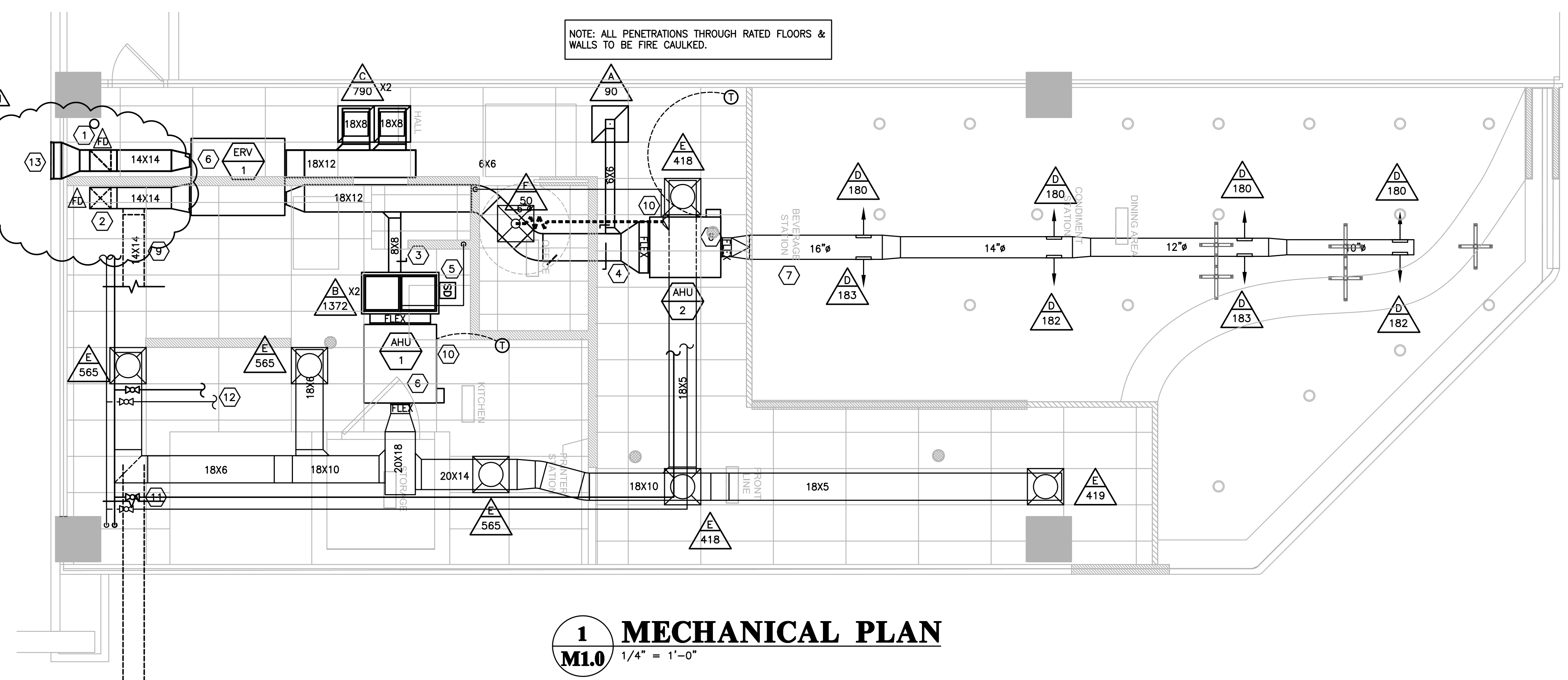
Through Penetrations
Misc. Mechanical
7000 Series
Concrete
CAI

System No. C-AJ-7016
May 19, 2005
F Rating = 2 Hr (See Item 1)
T Rating = 0 Hr

- Floor or Wall Assembly - Min 2-1/2 in. (64 mm) thick or min 4-1/2 in. (114 mm) thick lightweight or normal weight (150-150) pcf or 1000-2000 kg/m³ concrete. Wall shall also be constructed of any U.S. Classified Concrete Block. The F Rating is 2 Hr and T Rating is 0-1/2 Hr. (44 mm) or min 4-1/2 in. (114 mm) thick masonry. Min area of opening is 776 sq in. (5000 cm²) with min dimension of 24 in. (610 mm) for 2-hr assemblies and 54 sq in. (3500 cm²) with min dimension of 14 in. (356 mm) for 1-hr assemblies. See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
- Through Penetration - One steel duct to be installed either concentrically or eccentrically within the firestop system. An annular space of min 1/8 in. (3 mm) to max 1/4 in. (6 mm) is required within the firestop system for the annular and min 1/8 in. (3 mm) annular space to max 2 in. is required within the firestop system for 3-hr assemblies. Steel duct to be rigidly supported on both sides of floor or wall assembly. The following sizes of steel ducts may be used:
 - Steel Duct - Min 12 in. by 14 in. (305 mm by 356 mm) (or smaller) No. 22 gauge (or heavier) galv. steel duct.
 - Steel Duct - Min 10 in. by 12 in. (254 mm by 305 mm) (or smaller) No. 24 gauge (or heavier) galv. steel duct.
- Firestop System - The firestop system shall consist of the following:
 - Packing Material - Min 1 in. (25 mm) thickness of tightly packed mineral wool insulation firmly packed into opening on a permanent basis. Packing material to be covered floor top surface of floor or floor both surfaces of wall or required to accommodate the required thickness of cast-in-place concrete.
 - Fire Seal or Core Material - Cast-in-place or precast - Min 1 in. (25 mm) thickness of fire resistant material applied within annular, flush with top surface of floor or both surfaces of wall assembly. At point contact location between duct and concrete, a min 1/4 in. (6 mm) diam bead of sealant shall be applied to the concrete/duct interface on the top surface of floor and on both surfaces of wall assembly. See Concrete Blocks (CAZT) category in the Fire Resistance Directory for names of manufacturers.
 - Retaining Angles - Min 1/2 in. (13 mm) galv. steel angles attached to duct with min 1/2 in. (13 mm) long, No. 10 (or larger) sheet metal screws spaced max of 1 in. (25 mm) from each end of duct and spaced max of 6 in. (152 mm) OC.

*Bearing the U.S. Classification Marking

This material was extracted and drawn by the Fire Protection Products from the 2007 edition of the U.S. Fire Resistance Directory.
 554 **3M Fire Protection Products** www.3m.com/firestop C-AJ-7016 - 1 of 1 Product Support Line 1-800-328-1487 Copyright © 2005 3M



NOTE: THE ADDITIONAL HEAT & MOISTURE LOADS GENERATED BY THE KITCHEN COOKING EQUIPMENT HAS BEEN ACCOUNTED FOR IN THE LOAD CALCULATIONS IN ACCORDANCE WITH NCMC 507.2.2.

KEYNOTES

- TERMINATE ERV DISCHARGE EXHAUST DUCT THROUGH FLOOR INTO PARKING DECK CEILING. COVER OPENING WITH 1/2" WIRE SCREEN. PROVIDE FIRE DAMPER WHERE DUCT PENETRATES RATED FLOOR.
- INSULATE OUTSIDE AIR DUCT FROM FLOOR TO ERV INLET. PROVIDE FIRE DAMPER WHERE DUCT PENETRATES RATED FLOOR.
- BALANCE TREATED OUTSIDE AIR TO AHU-1 TO 256 CFM.
- BALANCE TREATED OUTSIDE AIR TO AHU-2 TO 1360 CFM.
- PROVIDE SMOKE DETECTOR ON RETURN OF AHU-1 BEFORE OUTSIDE AIR CONNECTION. WIRE TO SHUT DOWN UNIT UPON ACTIVATION.
- SUSPEND ALL MECHANICAL EQUIPMENT FROM OVERHEAD STRUCTURE WITH VIBRATION ISOLATION TYPE HANGERS.
- SUPPLY DUCT OVER SEATING AREA TO BE GALVANEAL TO BE PAINTED. COLOR SELECTED BY OWNER.
- 30"x24" INTAKE LOUVER EQUAL TO RUSKIN MODEL ELF375DX. PAINTED BLACK TO MATCH ADJACENT EXTERIOR SURFACE. CONSULT WITH BUILDING ENGINEER BEFORE CUTTING OPENING. KEEP OPENING AS HIGH AS POSSIBLE.
- RUN OUTSIDE AIR DUCT UNDER FLOOR IN PARKING DECK CEILING AS HIGH AS POSSIBLE.
- ROUTE 3/8" TRAPPED CONDENSATE LINE TO MOP SINK. PROVIDE AIR HANDLING UNIT WITH AUXILIARY DRAIN PAN WITH WATER DETECTION SWITCH INTERLOCKED WITH UNIT.
- REROUTE EXISTING 1-1/2" CHWS&R PIPING TO NEW AHU-2. SEE DETAIL ON SHEET M2.0.
- PROVIDE NEW 1-1/2" CHWS&R PIPING, VALVES, ETC TO NEW AHU-1. SEE DETAIL ON SHEET M2.0.
- 24"x24" EXHAUST LOUVER EQUAL TO RUSKIN MODEL ELF375DX. PAINTED TO MATCH ADJACENT EXTERIOR SURFACE. CONSULT WITH BUILDING ENGINEER BEFORE CUTTING OPENING. KEEP OPENING AS HIGH AS POSSIBLE.

OUTSIDE AIR CALCULATIONS
(BASED ON TABLE 403.3 OF 2009 NC MECH CODE)

DINING AREA - AHU-2
OCCUPANT LOAD: 64
PER TABLE 403.3 FOR DINING ROOM: 64 PEOPLE X 20 CFM/PERSON = 1280 CFM

KITCHEN AREA - AHU-1
OCCUPANT LOAD: 17.08 (854 SQ FT X 20 OCC/1000 SQ FT)
PER TABLE 403.3 FOR KITCHEN: 17.08 PEOPLE X 15 CFM/PERSON = 256 CFM

SPACE PRESSURIZATION CALCULATION

TOTAL OUTSIDE AIR FOR KITCHEN = 256 CFM
 TOTAL OUTSIDE AIR FOR DINING ROOM = 1280 CFM
 TOTAL OUTSIDE AIR TO SPACE = 1536 CFM*

TOTAL EXHAUST AIR RESTROOM = DELETED
 TOTAL EXHAUST AIR FROM SPACE THROUGH ERV = 1580 CFM
 TOTAL EXHAUST AIR FROM SPACE = 1580 CFM*

*BUILDING OWNER REQUESTED A SLIGHT NEGATIVE PRESSURE IN TENANT SPACE RELATIVE TO CORRIDOR.

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT
METHOD OF COMPLIANCE
Prescriptive Energy Cost Budget

Thermal Zone 7A

Exterior design conditions
 winter dry bulb 18°F
 summer dry bulb/wet bulb 95°F DB/74°F WB

Interior design conditions
 winter dry bulb 70°F
 summer dry bulb 75°F
 relative humidity 50%

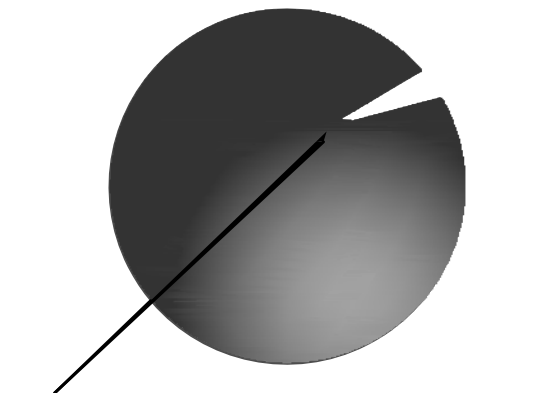
Building Heating Load 57.2 MBH
 Building Cooling Load 14 tons

Mechanical Spacing Conditioning System	
Unitary	Chilled Water Fan Coil Units with Pretreated Outside Air
description of units	NA
heating efficiency (COP) @ 47°F	NA
cooling efficiency (EER)	NA
heat output of unit (mbh)	20,500 Btuh to 41,000 Btuh Range
cooling output of unit (mbh)	67,200 Btuh to 131,800 Btuh Range

List equipment efficiencies: See Above

DESIGNER STATEMENT:
 To the best of my knowledge and belief, the design of this building complies with the mechanical systems, service systems and equipment requirements of the North Carolina State Building Code, 2002 Energy.

SIGNED: _____
 NAME: Robin S. McCombs
 TITLE: Professional Engineer



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OCTANE CAFE'
OVERSTREET MALL
CHARLOTTE, NC

101 SOUTH TRYON ST
SUITE 1
CHARLOTTE, NC 28202

REVISION	DATE
1	7.1.09

DRAWN BY: RSM
 CHECKED BY: RSM
 CONTRACT DATE: 5.15.09
 PROJECT NUMBER:

MECHANICAL PLAN

M1.0