LEGEND - PIPING and VALVES

—CD—	CONDENSATE DRAIN
—CHWR—	CHILLED WATER RETURN
—CHWS—	CHILLED WATER SUPPLY
— GR —	GLYCOL RETURN
— GS —	GLYCOL SUPPLY
—MPR—	MEDIUM PRESSURE CONDENSATE RETURN
—MPS—	MEDIUM PRESSURE STEAM
—HPR—	HIGH PRESSURE CONDENSATE RETURN
—HPS—	HIGH PRESSURE STEAM
PC	PUMPED STEAM CONDENSATE
— HHWR—	HEATING HOT WATER RETURN
— HHWS—	HEATING HOT WATER SUPPLY
—LPC—	LOW PRESSURE CONDENSATE
—LPS—	LOW PRESSURE STEAM
	BALL VALVE
	BUTTERFLY VALVE
	GATE VALVE
	GLOBE VALVE
	CHECK VALVE
	THREE WAY CONTROL VALVE
	TWO WAY CONTROL VALVE
	FLOW SWITCH
	CIRCUIT SETTER / SHUT OFF VALVE
	STRAINER WITH BLOW DOWN
	THERMOMETER
	SENSOR WELL
	PETE'S PLUG
	TEMPERATURE SENSOR WITH WELL
	PRESSURE GUAGE WITH SHUT-OFF COCK
	STEAM TRAP ASSEMBLY
	RISER UP
	RISER DOWN
	TEE OFF TOP
	TEE OFF BOTTOM
	PIPE CAP
	UNION
	DIRECTION OF FLOW
	DIRECTION OF SLOPE
	CONCENTRIC REDUCER
	ECCENTRIC REDUCER
	AIR VENT

LEGEND - DUCTWORK and ACCESSORIES

	SUPPLY DUCT OR GRILLE
	RETURN DUCT OR GRILLE
	EXHAUST DUCT OR GRILLE
	DUCT ELBOW WITH TURNING VANES
	DUCT TURNING UP
	DUCT TURNING DOWN
TB	SUPPLY AIR TERMINAL BOX
	DUCT TO BE DEMOLISHED
	DIRECTION OF AIR FLOW
FD	FIRE DAMPER (VERTICAL POSTION)
FD	FIRE DAMPER (HORIZONTAL POSITION)
	MOTOR OPERATED DAMPER
	BACKDRAFT DAMPER
	MANUAL (BALANCING) DAMPER
	SMOKE DAMPER
	PARALLEL BLADE DAMPER
	OPPOSED BLADE DAMPER
SD	DUCT MOUNTED SMOKE DETECTOR
	SIDEWALL MOUNTED SUPPLY, RETURN, OR EXHAUST GRILLE OR REGISTER
	PIPING TO BE DEMOLISHED
20/20	RECTANGULAR DUCT (WxH) INSIDE CLEAR
20/20	FLAT OVAL DUCT (WxH)
20ø	ROUND DUCT (IN.)
	ROOM THERMOSTAT OR TEMPERATURE SENSOR
	ROOM HUMIDITY SENSOR
FSD	COMBINATION FIRE / SMOKE DAMPER (VERTICAL POSITION)
DP	MAGNEHELIC DIFFERENTIAL PRESSURE GUAGE
	AIR FLOW
EPO	EMERGENCY STOP FOR AIR HANDLING UNIT
	POINT OF CONNECTION BETWEEN NEW AND EXISTING
	POINT AT WHICH DEMOLITION OF EXISTING AND EXISTING TO REMAIN OCCURS
ER	EXISTING RELOCATED
RE	RELOCATE EXISTING

GENERAL NOTES:

A. PROVIDE ALL WORK, EQUIPMENT, SERVICES, LABOR, AND MATERIALS NECESSARY FOR NEW MECHANICAL SYSTEMS AND FOR THE RENOVATIONS AND ALTERATIONS TO THE EXISTING MECHANICAL SYSTEMS, AS DESCRIBED OR IMPLIED BY THE CONTRACT DOCUMENTS.

B. THE DRAWINGS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO INCLUDE EVERY DETAIL OF CONSTRUCTION, MATERIALS, AND EQUIPMENT. THE CONTRACTOR SHALL FIELD VERIFY THE EXISTING CONDITIONS.

C. REVIEW THE CONTRACT DOCUMENTS OF ALL TRADES AND COORDINATE ALL WORK WITH THE OTHER TRADES AS NECESSARY TO AVOID CONFLICTS AND INTERFERENCES.

D. VISIT THE SITE OF THIS PROJECT AND BECOME THOROUGHLY FAMILIAR WITH ALL EXISTING FIELD CONDITIONS. VERIFY EVERY ASPECT OF THE PROPOSED WORK AS DESCRIBED OR IMPLIED BY THE CONTRACT DOCUMENTS.

E. ALL WORK AND MATERIALS SHALL COMPLY WITH APPLICABLE 2009 STATE, LOCAL, AND NATIONAL CODES (INCLUDING OSHA).

F. LOCATIONS SHOWN FOR DUCTWORK, EQUIPMENT, PIPING, VALVES, DEVICES, ETC., ARE DIAGRAMMATIC. ADJUSTMENTS IN THESE LOCATIONS SHALL BE MADE BY THE CONTRACTOR TO FULLY COORDINATE WITH THE EXISTING CONDITIONS. INSTALL ALL EQUIPMENT SO THAT ALL CODE-REQUIRED AND MANUFACTURER-RECOMMENDED SERVICING CLEARANCES ARE MAINTAINED.

G. COORDINATE ALL SERVICE OUTAGES WITH COTR. AND SAFETY MANAGER.

H. PROVIDE ALL CUTTING AND PATCHING NECESSARY FOR THE PROPER INSTALLATION OF WORK AND TO REPAIR ANY DAMAGE DONE.

I. ALL MEDIUM PRESSURE DUCT BRANCH TAKE-OFFS SHALL BE MADE WITH "LO-LOSS" OR CONICAL TEE TAPS UNLESS NOTED OTHERWISE.

J. DUCT SIZES SHOWN INDICATE NET (INSIDE DIMENSIONS).

K. ALL DUCTWORK FOR THIS PROJECT SHALL BE METAL. FLEXIBLE DUCTWORK IS NOT PERMITTED IN THE INTERSTITIAL SPACE OR ABOVE THE LAY-IN CEILING.

L. ALL ITEMS THAT REQUIRE ACCESS, SUCH AS FOR OPERATING, CLEANING, SERVICING, MAINTENANCE, AND CALIBRATION, SHALL BE EASILY AND SAFELY ACCESSIBLE BY PERSONS STANDING AT FLOOR LEVEL, OR STANDING ON PERMANENT PLATFORMS, WITHOUT THE USE OF PORTABLE LADDERS. EXAMPLES OF THESE ITEMS INCLUDE, BUT ARE NOT LIMITED TO: ALL TYPES OF VALVES, FILTERS AND STRAINERS, TRANSMITTERS, AND CONTROL DEVICES.

M. PROVIDE ALL DAMPERS, BALANCE VALVES, FAN SHEAVES, ETC. NECESSARY FOR COMPLETE TEST, ADJUST AND BALANCE OF NEW AND EXISTING SYSTEMS.

N. PROVIDE DUCT ACCESS DOORS FOR INSPECTION AT EACH NEW FIRE DAMPER, COMBINATION FIRE AND SMOKE DAMPER, SMOKE DAMPER, SMOKE DETECTOR, HUMIDIFIERS AND TERMINAL BOX HEATING COIL.

O. ALL AIR DISTRIBUTION DEVICES, TERMINAL BOXES, COILS AND EQUIPMENT MOUNTED ABOVE CEILINGS SHALL BE COORDINATED WITH THE OTHER BUILDING TRADES FOR PROPER LOCATION AND TO PREVENT INTERFERENCE WITH THE LIGHTS, PLUMBING, FIRE PROTECTION, ETC.

P. HARDCAST ALL EXISTING DUCTWORK TO REMAIN (IN PROJECT AREA). INSULATE WITH EXTERNAL WRAP AS SPECIFIED.

Q. AT LOCATIONS WHERE NEW PIPING IS TO BE CONNECTED TO EXISTING, REPLACE EXISTING PIPE INSULATION DAMAGED AS A RESULT OF THE DEMOLITION AND/OR INSTALLATION OF NEW PIPING.

R. ALL NEW HOT WATER AND CHILLED WATER PIPING SHALL SLOPE UP IN THE DIRECTION OF FLOW WHEREVER POSSIBLE. PROVIDE ALL NECESSARY MANUAL AIR VENT REQUIRED TO VENT AIR FROM THE PIPING SYSTEMS. PROVIDE ALL NECESSARY DRAINS VALVES WITH HOSE END ADAPTERS REQUIRED TO PROPERLY DRAIN PIPING SYSTEMS.

S. COMPLETELY TEST, ADJUST, AND BALANCE ALL EXISTING AIR AND WATER SYSTEMS AFFECTED BY THE NEW RENOVATIONS. ADJUST ALL EXISTING AIR DISTRIBUTION DEVICES, TERMINAL BOXES, COILS, AIR HANDLING UNITS, EXHAUST FANS, PUMPS, ETC.

T. REFER TO ARCHITECTURAL DRAWINGS FOR WALL ELEVATIONS AND REFLECTED CEILING PLANS FOR LOCATIONS OF HVAC DEVICES.

U. COORDINATE ALL WORK WITH PROJECT PHASING. SEE ARCHITECTURAL PLANS.

V. HYDRONIC SERVICE AND BALANCING VALVES SHALL BE EITHER BALL VALVES OR BUTTERFLY VALVES PER SPECIFICATION.

W. PROVIDE BALANCING DAMPER IN ALL BRANCH DUCTS.

X. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR PROJECT BID ALTERNATES.

1

DUCT PRESSURE CLASS TABLE

FAN NO.	DUCT INVOLVED	POSITIVE (P) OR NEGATIVE (N) PRESSURE	MINIMUM PRESSURE CLASS W.G. IN. (MM)
AIR HANDLERS	FROM OUTSIDE AIR INTAKE OR RETURN INLET TO PREHEAT COIL	N	2 (50)
	FROM AFTER FILTER TO TERMINAL BOXES	P	4 (100)
	FROM TERMINAL BOXES TO ROOM OUTLETS	P	2 (50)
GENERAL EXHAUST FANS	FROM ROOM INLETS TO EXHAUST FAN	N	2 (50)

ABBREVIATIONS

AD	ACCESS DOOR
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
APD	AIR PRESSURE DROP
CFM	CUBIC FEET PER MINUTE
DB	DRY BULB
DN	DOWN
DTA	DRIP TRAP ASSEMBLY
EA	EXHAUST AIR
EAT	ENTERING AIR TEMPERATURE
EF	EXHAUST FAN
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
FD	FLOOR DRAIN
FT	FEET OF HEAD
GC	GENERAL CONTRACTOR
GPM	GALLONS PER MINUTE
HOA	HAND OFF AUTOMATIC
HP	HORSE POWER
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LWT	LEAVING WATER TEMPERATURE
N/A	NOT APPLICABLE
NC	NORMALLY CLOSED
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OA	OUTSIDE AIR
OBD	OPPOSED BLADE DAMPER
PD	PRESSURE DROP
RA	RETURN AIR
RH	RELATIVE HUMIDITY
SA	SUPPLY AIR
SAF	SUPPLY AIR FAN
SP	STATIC PRESSURE
SD	SMOKE DAMPER
TSP	TOTAL STATIC PRESSURE
TYP	TYPICAL
UH	UNIT HEATER
VTR	VENT THRU ROOF
WB	WET BULB
WG	WATER GAUGE
WPD	WATER PRESSURE DROP
GS	GLYCOL SUPPLY
GR	GLYCOL RETURN
COTR	CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE

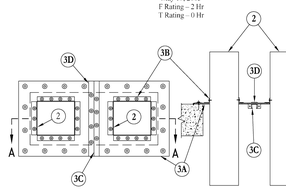
INSTRUMENT LINE SYMBOLS

	DIRECT CONNECTION OR MECHANICAL LINK TO INSTRUMENT
AO	ANALOG OUTPUT
AI	ANALOG INPUT
DO	DIGITAL OUTPUT
DI	DIGITAL INPUT
I	HARDWIRED INLERLOCK
F	INTERFACE TO FIRE ALARM SYSTEM
	INSTRUMENT AIR SUPPLY
	ELECTRICAL SIGNAL LINE
	PNEUMATIC SIGNAL LINE
	VENT TO ATMOSPHERE
	PROCESS ROTAMETER
▲	INSTRUMENT BY ELECTRICAL CONTRACTOR
■	INSTRUMENT BY MECHANICAL CONTRACTOR
	RESTRICTIVE ORIFICE
	HEATING COIL
	COOLING COIL
	LOCAL MOUNTED INSTRUMENT
	FRONT PANEL MOUNTED INSTRUMENT
	REAR PANEL MOUNTED INSTRUMENT
	HARDWARE OR SOFTWARE IMPLEMENTED FUNCTION
	FURNISHED WITH EQUIPMENT
	INSTRUMENT WITH FREEZE PROTECTION
	INSTRUMENT (FUTURE)
	COMBINATION FIELD MOUNTED INSTRUMENTS
	COMBINATION PANEL MOUNTED INSTRUMENTS
	COMBINATION INSTRUMENTS MOUNTED BEHIND PANEL

CONTROL VALVE and DAMPER OPERATIONS

	ELECTRIC ACTUATOR
	CYLINDER, SINGLE ACTION
	CYLINDER, DOUBLE ACTION
NC	3-WAY VALVE NORMALLY CLOSED AND ARROW-FAIL CLOSED POSTITION
FO OR NO	VALVE OPERATOR – FAIL OPEN OR NORMALLY OPEN
	SELF-CONTAINED TEMPERATURE REGULATOR
	SELF-CONTAINED PRESSURE REDUCING AND/OR REGULATING VALVE
	SELF-CONTAINED BACK PRESSURE REGULATING VALVE
	2-WAY SOLENOID VALVE
	3-WAY SOLENOID VALVE
FC OR NC	VALVE OPERATOR – FAIL CLOSED OR NORMALLY CLOSED

System No. C-AJ-7017
May 19, 2005
F Rating – 2 Hr
T Rating – 0 Hr



1. **Floor or Wall Assembly** – Min 2-1/2 in. (64 mm) thick lightweight or normal weight (100-150 pcf or 1600-2400 kg/m³) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max area of opening is 720 sq in. (4645 cm²) with with max dimension of 40 in. (1016 mm).

   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

2. **Through Penetrant** – Max of two steel ducts, nom 12 in. by 14 in. (305 mm by 356 mm) (or smaller) No. 24 gauge (or heavier) to be installed either concentrically or eccentrically within the firestop system. An annular space of 0 in. (point contact) to max 5 in. (0 mm to max 127 mm) is required within the firestop system. A min 4 in. (102 mm) space shall be maintained between two ducts. Steel ducts to be rigidly supported on both sides of floor or wall assembly.

3. **Firestop System** – The firestop system shall consist of the following:

   A. **Fill, Void or Cavity Materials*** – **Intumescent Sheet** – Rigid aluminum foil-faced sheet with galv steel sheet backer. Sheets cut to tightly follow the contours of the duct with a max 1/4 in. (6 mm) gap between the sheets and the ducts. Sheets cut to lap a min of 2 in. (51 mm) on the floor or wall surface on all sides of the opening. Sheet is required to be installed on the top surface of floor or both sides of wall assembly. Sheet to be installed with the galv steel sheet backer exposed (aluminum foil facing against floor or wall surface) and secured to floor or wall surface with min 3/16 in. (5 mm) diam by 1-1/4 in. (32 mm) long steel anchor screws, or equivalent, in conjunction with min 1-1/4 in. (32 mm) diam steel fender washers. Max spacing of fasteners not to exceed 6 in. (152 mm) with additional fasteners located on each side of butted seams made to permit installation of the sheet around the ducts.

   3M COMPANY – CS-195+

   B. **Retaining Angles** – Min 16 gauge galv steel angles sized to lap duct a min of 2 in. (51 mm) and lap intumescent sheet on top surface of floor or both surfaces of wall a min of 2 in. (51 mm). Angles attached to duct and intumescent sheet with min 1-4 in. (6 mm) long, No. 10 (or larger) sheet metal screws spaced a max of 1 in. (25 mm) from each end of duct and spaced a max of 6 in. (152 mm) OC. Prior to the installation of the retaining angles, a min 1/4 in. (6 mm) diam bead of caulk (Item 3E) shall be applied at the intumescent sheet duct interface on the top surface of floor and on both surfaces of wall assembly.

   C. **Support Channel** – Support channel shall be installed flush with top surface of floor or both surfaces of wall, centered between ducts. Support channels to be min 1-5/8 in. by 1-5/8 in. (41mm by 41 mm) and formed of min 0.093 in. (2.4 mm) thick (No. 12 gauge) painted or galv steel. Ends of steel channel bolted or welded to steel angles anchored to inside walls of through opening. Intumescent sheet secured to steel support channels with steel sheet metal screws in conjunction with min 1-1/4 in. (32 mm) diam steel fender washers. When support channel is used beneath butted seam of intumescent sheets, fasteners spaced max 3 in. (76 mm) OC on each side of butted seam. When support channel is located away from intumescent sheet seam, fasteners spaced max 6 in. OC. Prior to installation of the intumescent sheet(s), a nom 1/4 in. (6 mm) diam continuous bead of caulk (Item 3E) shall be applied as gasket over the steel support channel and the edge of intumescent sheet at its interface with surface of floor or wall around entire perimeter of through opening.

   D. **Steel Cover Strip** – Min 2 in. (51 mm) wide strip of min 0.019 in. (0.5 mm) thick (26 ga) galv steel centered over entire length of each butted seam made in the intumescent sheet. Prior to installation of the steel strip, the seams in the intumescent sheet shall be covered with a min 1/4 in. (6 mm) diam bead of caulk (Item 3E). Steel cover strip secured to galv steel sheet backer of intumescent sheet with steel sheet metal screws or steel rivets spaced max 3 in. (76 mm) OC on each side of seam or slit.

   E. **Fill, Void or Cavity Material*** – **Graphite Seal, Caulk, Sealant or Putty** (Not Shown) – One layer of 1/2 in. x 1/2 in. (13 mm by 1.6 mm) adhesive backed graphite intumescent seal positioned under intumescent sheet around entire perimeter of through opening or min 1/4 in. (6 mm) diam continuous bead of caulk or putty applied to edge of intumescent sheet at its interface with surface of floor or wall around entire perimeter of through opening. Min 1/4 in. (6 mm) bead of caulk applied to fill all interstices between duct and intumescent sheet. A min 1/4 in. (6 mm) diam bead of caulk shall be applied at the intumescent sheet duct interface, and to all seams in the intumescent sheet on the top surface of floor and on both surfaces of wall assembly.

   3M COMPANY – E-FIS or Ultra GS seals, CP 25WB+, IC 15WB+ caulk, FB-3000 WT sealant, or MP+ Stix putty.

*Bearing the UL Classification Marking

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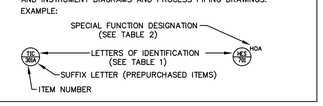
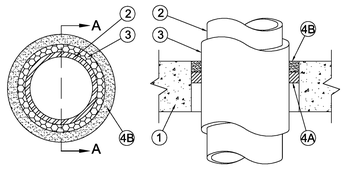
LETTERS OF INSTRUMENT IDENTIFICATION

LETTER	FIRST LETTER	SECOND LETTER	THIRD LETTER
A	ALARM	ALARM ANALYZER	ALARM
ANN	ANNUNCIATOR		
B	BURNER BRIGHTNESS	BATCH BIAS	BOX
C	CONTROL COMPUTER	CONTROL CONTROLLER CONVERTER	CONTROLLER CONVERTER
d	DIFFERENTIAL	DIFFERENTIAL	DIFFERENTIAL
D	DIAPHIRAM DAMPER DENSITY DATA	DELAY DETECTOR DEVIATION DRIVE	DRIVE DISC
E	ELECTRIC ELECTRONIC	ELECTRIC ELEMENT ELECTRONIC	ELECTRIC ELEMENT ELECTRONIC
F	FLOW FIRE	FLOW FILTER	
G	THICKNESS	GAGE	GAGE GLASS
H	HAND	HAND HIGH	HIGH
I	CURRENT	INDICATOR INDICATING	INDICATOR
J	POWER	JUNCTION	
K	CONSISTENCY TIME	TIME	
L	LEVEL LIMIT	LOW LOGGER LIMIT LIGHT	LOW LIMIT
M	MOISTURE MAGNETIC	METER MOTOR MONITOR	METER
O	OPTICAL	OPERATOR ORIFICE	
P	PRESSURE PISTON PNEUMATIC	PRESSURE PANEL PNEUMATIC	PROGRAMMER PANEL
Q	EVENT NUMBER	INTERGRATOR	INTERGRATOR
r	RATIO	RATIO	
R	RESISTANCE REGULATOR RESTRICTION RADIATION	RECORDER RELIEF RECEIVER REGULATOR	RECORDER REGULATOR
S	SIGHT SPEED	SWITCH SELECTOR SAFETY	SWITCH
SCR	SILICON CONTROL RECTIFIER		
SN	SOLENOID		
t	TOTALIZER	TOTALIZER	TOTALIZER
T	TEMPERATURE TORQUE	TRANSMITTER TRANSDUCER	TRANSMITTER TRANSDUCER
TM	TIMER		
TN	TENSION		
U	UNIT	UNIT	
V	VISCOSITY VACUUM VIBRATION VIDEO	VALVE	VALVE
VE	VELOCITY		
W	WEIGHT WIDTH	WELL	WELL
X	MISCELLANEOUS	NUCLEAR SOURCE	
Y	RELAY	RELAY	RELAY
Z	POSTITION		

INSTRUMENT IDENTIFICATIONS WILL BE INCLOSED IN A CIRCLE ON PIPING AND INSTRUMENT DIAGRAMS AND PROCESS PIPING DRAWINGS.
EXAMPLE:



System No. C-AJ-5001
March 05, 2007
F Ratings – 1-1/2, 2 and 3 Hr (See Item 4)
T Ratings – 0, 1/2, 3/4 and 1 Hr (See Items 1A and 4)
L Rating At Ambient – 2 CFM per sq ft
L Rating At 400 F – less than 1 CFM per sq ft



SECTION A-A

1. **Floor or Wall Assembly** – Min 2-1/2 in. (64 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600-2400 kg/.m³) concrete. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 18 in. (457 mm)

   See **Concrete Blocks** (CAZT) category in the Fire Resistance Directory for names of manufacturers.

1A. **Steel Sleeve** – (Optional, not shown) – Nom 10 in. (254 mm) (or smaller) Schedule 10 (or heavier) steel sleeve cast or grouted into floor or wall assembly. Sleeve may extend a max of 2 in. (51 mm) above top of floor or beyond either surface of wall. As an alternate, nom 10 in. (254 mm) diam (or smaller) sleeve fabricated from nom 0.019 in. (0.48 mm) thick galv steel cast or grouted into floor or wall assembly flush with floor or wall surfaces. **T Rating is 0 Hr when sleeve is used.**

2. **Through Penetrant** – Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper pipe, nom 12 in. (305 mm) diam (or smaller) service weight (or heavier) cast iron soil pipe, nom 12 in. (305 mm) diam (or smaller) Class 50 (or heavier) ductile iron pressure pipe or nom 12 in. (305 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe centered in the opening and rigidly supported on both sides of the floor or wall assembly.

3. **Pipe Covering*** – Nom 1/2 to 2 in. (13 to 51 mm) thick hollow cylindrical heavy density (min. 3.5 pcf or 56 kg/m³) glass fiber units jacketed on the outside with an all service jacket. Longitudinal joints sealed with metal fasteners or factory-applied self-sealing lap tape. Transverse joints secured with metal fasteners or with butt strip tape supplied with the product.

   See **Pipe and Equipment Covering – Materials*** (BRGU) category in Building Materials Directory for names of manufacturers. Any pipe covering material meeting the above specifications and bearing the UL Classification Marking with a Flame Spread Index of 25 or less and a Smoke Developed Index of 50 or less may be used.

4. **Firestop System** – The details of the firestop system shall be as follows:

   A. **Packing Material** – Min 1 in. (25 mm) thickness of firmly packed mineral wool batt insulation used as a permanent form. Packing material to be recessed from top surface of floor or sleeve or from both surfaces of wall as required to accommodate the required thickness of caulk fill material (Item B).

   B. **Fill, Void or Cavity Material*** – **Caulk or Sealant** – Applied to fill the annular space flush with the top surface of the floor or sleeve or flush with both surfaces of wall. When nom pipe covering thickness is 2 in. (51 mm), min thickness of caulk fill material is 2 in. (51 mm). When nom pipe covering thickness is 1-1/2 in. (38 mm) or less, min thickness of caulk fill material is 1 in. (25 mm). The hourly F and T Ratings of the firestop system are dependent upon the thickness of the floor or wall, the size of pipe, the thickness of pipe covering material and the size of the annular space (between the pipe covering material and the edge of the circular through opening), as shown in the following table:

Min Floor or Wall Thkns In.(mm)	Max Pipe Diam In. (mm)	Nom Pipe Covering Thkns In. (mm)	Annular Space In. (mm)	F Rating Hr	T Rating Hr
2-1/2 (64)	4 (102)	1 or 1-1/2 (25 or 38)	1/2 to 2-3/8 (13 to 60)	2	1
4-1/2 (114)	4 (102)	2 (51)	1/4 to 3-5/8 (6 to 92)	2	1-1/2
2-1/2 (64)	12 (305)	1 (25)	1/2 to 1-1/2 (13 to 38)	2	1/2
4-1/2 (114)	12 (305)	1 (25)	1/2 to 2-3/8 (13 to 60)	3	1
2-1/2 (64)	12 (305)	1/2 (13)	1/2 to 2-3/8 (13 to 60)	2	0

3M COMPANY – CP 25WB+ or FB-3000 WT

*Bearing the UL Classification Marking

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03/12/2013

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REVISIONS

REV.	DESCRIPTION	DATE
1	DUCT PRESSURE CLASSES	11/25/2013

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RECOMMEND APPROVAL

Requestor:	Date:
Chief of Service:	Date:
Infection Control:	Date:
Chief of Staff:	Date:
Assoc. Med. Ctr. Dir.:	Date:

Drawing Title:
HVAC Legends & Notes U.L.Details

Approved Chief, Engineering Svc.:	Date:
APPROVED BY: MEDICAL CENTER DIRECTOR	Date:

Project Title:
VA-Improve Patient Privacy 4DC Richmond VA

Building No.	Designed by:	Drawn by:	Checked by:
Main	FHT	FHT	CTC

Location
1201 Broad Rock Blvd Richmond, VA 23224

Date: 6/12/2013
Project No.: Owner Proj. #
Project ID No.: 1232

DRAWING NO.
M001
Sheet of

Department of VETERANS AFFAIRS