ABBREVIATIONS

NOTE: THIS IS A STANDARD ABBREVIATION LIST. SOME ABBREVIATIONS MAY NOT APPEAR ON THE ACCOMPANYING DRAWINGS.

A	COMPRESSED AIR	FOT	FUEL OIL TRANSFER	OED	OPEN ENDED DUCT
AAV	AUTOMATIC AIR VENT	FOV	FUEL OIL VENT	OS&Y	OUTSIDE STEM AND YOKE
ACV	AUTOMATIC CONTROL VALVE	FPM	FEET PER MINUTE		
AD	ACCESS DOOR, AREA DRAIN	FPS	FEET PER SECOND	P&ID	PROCESS AND INSTRUMENTATION DIAGRAM
AF	ANTIFREEZE	FS	FLOW SWITCH	PA	PLANT AIR
AFF	ABOVE FINISHED FLOOR	FT	FOOT, FEET	PC	PUMPED CONDENSATE
AR	ARGON GAS	FWR	FEED WATER RETURN	PCR	PUMPED CONDENSATE RECIRCULATION
ATC	AUTOMATIC TEMPERATURE CONTROL	FWS	FEED WATER SUPPLY	PCHR	PRIMARY CHILLED WATER RETURN
				PCHS	PRIMARY CHILLED WATER SUPPLY
BAS	BUILDING AUTOMATION SYSTEM	G	NATURAL GAS	PCWR	PROCESS COOLING WATER RETURN
BBD	BOILER BLOWDOWN	GHR	GLYCOL HEATING RETURN	PCWS	PROCESS COOLING WATER SUPPLY
BCWR	BEARING COOLING WATER RETURN	GHS	GLYCOL HEATING SUPPLY	PD	PRESSURE DROP, PUMP DISCHARGE
BCWS	BEARING COOLING WATER SUPPLY	GPH	GALLONS PER HOUR	PGR	PROCESS GLYCOL WATER RETURN
BDD	BACKDRAFT DAMPER	GPM	GALLONS PER MINUTE	PGS	PROCESS GLYCOL WATER SUPPLY
BFP	BACKFLOW PREVENTER	GR	AUTOMOTIVE LUBRICATION PIPING	PH	PHASE
BHP	BRAKE HORSEPOWER			PHR	PRIMARY HEATING RETURN
BMS	BUILDING MANAGEMENT SYSTEM	H	HIGH	PHS	PRIMARY HEATING SUPPLY
BO	BLOW OFF	HB	HOSE BIBB	PIV	POST INDICATING VALVE
BTU	BRITISH THERMAL UNIT	HED	HOSE END DRAIN VALVE	PPH	POUNDS PER HOUR
BTUH	BRITISH THERMAL UNIT PER HOUR	HP	HORSEPOWER	PRV	PRESSURE REDUCING VALVE,
		HPR	HIGH PRESSURE STEAM RETURN		PRESSURE REGULATING VALVE
°C	DEGREE(S) CELSIUS	HPS	HIGH PRESSURE STEAM SUPPLY	PSI	POUNDS PER SQUARE INCH
CA	CONTROL AIR	HR	HEATING WATER RETURN	PSIG	POUNDS PER SQUARE INCH GAUGE
CBD	CONTINUOUS BLOWDOWN	HRR	HEAT RECOVERY RETURN		
CC	CAMPUS CONDENSATE	HRS	HEAT RECOVERY SUPPLY	RA	RETURN AIR, RELIEF AIR
CCMS	CENTRAL CONTROL AND MONITORING SYSTEM	HS	HEATING WATER SUPPLY	RD	REFRIGERANT DISCHARGE
CD	CONDENSATE DRAIN	HT	HEIGHT	RH	RELATIVE HUMIDITY
CF	CHEMICAL FEED	HTHR	HIGH TEMPERATURE HEATING WATER RETURN	RHR	REHEAT WATER RETURN
CFM	CUBIC FEET PER MINUTE	HTHS	HIGH TEMPERATURE HEATING WATER SUPPLY	RHS	REHEAT WATER SUPPLY
CHR	CHILLED WATER RETURN	HW	HOT WATER	RL	REFRIGERANT LIQUID
CHS	CHILLED WATER SUPPLY	HWR	HOT WATER RECIRCULATION	ROR	REVERSE OSMOSIS WATER RETURN
CO	CLEANOUT	HZ	HERTZ	ROS	REVERSE OSMOSIS WATER SUPPLY
CO2	CARBON DIOXIDE			RPM	REVOLUTIONS PER MINUTE
CS	CLEAN STEAM	IA	INSTRUMENT AIR	RS	REFRIGERANT SUCTION
CW	COLD WATER, CITY WATER	ICW	INDUSTRIAL COLD WATER	RV	RELIEF VENT, REFRIGERANT VENT
CWR	CONDENSER WATER RETURN	IHW	INDUSTRIAL HOT WATER	RX	REMOVE EXISTING
CWS	CONDENSER WATER SUPPLY	IHR	INDUSTRIAL HOT WATER RECIRCULATION		
		IN	INCH, INCHES	SA	SUPPLY AIR
D	DEEP, DRAIN WATER	INV EL	INVERT ELEVATION	SAN	SANITARY, SOIL, WASTE
DB	DECIBEL, DRY BULB			SCHR	SECONDARY CHILLED WATER RETURN
DDC	DIRECT DIGITAL CONTROL	KW	KILOWATTS	SCHS	SECONDARY CHILLED WATER SUPPLY
DHR	DISTRIBUTION HEATING WATER RETURN			SD	STORM DRAIN, SMOKE DETECTOR
DHS	DISTRIBUTION HEATING WATER SUPPLY	L	LONG, LENGTH	SF	SQUARE FOOT
DIR	DEIONIZED WATER RETURN	LA	LABORATORY AIR	SHR	SECONDARY HEATING WATER RETURN
DIS	DEIONIZED WATER SUPPLY	LAT	LEAVING AIR TEMPERATURE	SHS	SECONDARY HEATING WATER SUPPLY
DL	DOOR LOUVER	LBS	POUNDS	SL	SOUND LINING
DN	DOWN	LBS/HR	POUNDS PER HOUR	SP	STATIC PRESSURE
DSP	DRY SPRINKLER PIPE	LN	LIQUID NITROGEN	SPR	SPRINKLER LINE
DTR	DUAL TEMPERATURE RETURN	LP	LIQUID PROPANE	SS	STAINLESS STEEL
DTS	DUAL TEMPERATURE SUPPLY	LPG	LIQUID PETROLEUM GAS	SQ FT	SQUARE FOOT
DW	DISTILLED WATER	LPR	LOW PRESSURE STEAM RETURN	SW	SOFT WATER
		LPS	LOW PRESSURE STEAM SUPPLY		
EA	EXHAUST AIR	LV	LABORATORY VENT, LABORATORY VACUUM	ΔT	TEMPERATURE DIFFERENCE
EAT	ENTERING AIR TEMPERATURE	LW	LABORATORY WASTE	TS	TAMPER SWITCH
EJ	EXPANSION JOINT	LWT	LEAVING WATER TEMPERATURE	TSP	TOTAL STATIC PRESSURE
EMS	ENERGY MANAGEMENT SYSTEM			TWR	TEMPERED WATER RETURN
ESP	EXTERNAL STATIC PRESSURE	MA	MEDICAL AIR	TWS	TEMPERED WATER SUPPLY
ETC	ETCETERA	MAV	MANUAL AIR VENT	TW	TREATED WATER
EVAC	GAS EVACUATION	MBH	THOUSAND BRITISH THERMAL UNITS PER HOUR	TYP	TYPICAL
EWT	ENTERING WATER TEMPERATURE	MCC	MOTOR CONTROL CENTER		
EX	EXISTING	MO	MOTOR OIL PIPING	UCD	UNDERCUT DOOR
		MOD	MOTOR OPERATED DAMPER	UL	UNDERWRITERS LABORATORIES
°F	DEGREE(S) FAHRENHEIT	MPR	MEDIUM PRESSURE STEAM RETURN		
F	FIRE LINE	MPS	MEDIUM PRESSURE STEAM SUPPLY	V	VACUUM, VOLTS
FC	FLEXIBLE CONNECTION	MV	MEDICAL VACUUM	VD	VOLUME DAMPER
FD	FIRE DAMPER, FOUNDATION DRAIN			VFD	VARIABLE FREQUENCY DRIVE
FDV	FIRE DEPARTMENT VALVE	N	NITROGEN	VPD	VACUUM PUMP DISCHARGE
FF	FINISHED FLOOR	NA	NOT APPLICABLE	VSD	VARIABLE SPEED DRIVE
FFE	FINISHED FLOOR ELEVATION	NC	NOISE CRITERIA, NORMALLY CLOSED	VTR	VENT THROUGH ROOF
FIN/FT	FINS PER FEET	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION		
FIN/INCH	FINS PER INCH	NO	NORMALLY OPEN, NITROUS OXIDE	W	WATTS, WIDE
FM	FLOWMETER	NPSH	NET POSITIVE SUCTION HEAD	WB	WET BULB
FMF	FLOWMETER FITTING			WC	WATER COLUMN
FOF	FUEL OIL FILL	O	OXYGEN	WG	WATER GAUGE
FOO	FUEL OIL OVERFLOW	OA	OUTSIDE AIR	WH	WALL HYDRANT
FOR	FUEL OIL RETURN	OD	OVERFLOW DRAIN	WWF	WELDED WIRE FABRIC
FOS	FUEL OIL SUPPLY			WWM	WELDED WIRE MESH

GENERAL NOTES

1. NOTIFY THE OWNER, IN WRITING, AT LEAST SEVEN (7) DAYS IN ADVANCE OF ALL REQUIRED SHUTDOWNS OF WATER, FIRE, SEWER, GAS, ELECTRICAL SERVICE, OR OTHER UTILITIES. UPON WRITTEN RECEIPT OF APPROVAL FROM OWNER, SHUTDOWN SHALL BE PERFORMED BETWEEN THE HOURS OF SIX (6) P.M. AND SIX (6) A.M. OR AS DIRECTED OTHERWISE BY THE OWNER AND SHALL BE ACCOMPLISHED AT NO ADDITIONAL CONTRACT COST. AT THE END OF EACH SHUTDOWN ALL SERVICES SHALL BE RESTORED SO THAT NORMAL USE OF THE UTILITIES CAN CONTINUE.
2. WHEN WORKING IN AND AROUND THE EXISTING BUILDING, EXTREME CARE SHALL BE EXERCISED WITH REGARD TO PROTECTION OF THE EXISTING STRUCTURE AND MECHANICAL AND ELECTRICAL SERVICES WHICH WILL REMAIN. REPAIR, REPLACE, OR RESTORE TO THE SATISFACTION OF THE ARCHITECT, ENGINEER AND OWNER ALL EXISTING WORK DAMAGED IN THE PERFORMANCE OF DEMOLITION AND/OR NEW WORK.
3. ALL EXISTING PIPING, EQUIPMENT, DUCTWORK, AND MATERIALS NOT REQUIRED FOR RE-USE OR RE-INSTALLATION (SHOWN OR OTHERWISE) SHALL BE REMOVED. ALL EXISTING MATERIALS AND EQUIPMENT WHICH ARE REMOVED AND ARE DESIRED BY THE OWNER, OR ARE INDICATED TO REMAIN THE PROPERTY OF THE OWNER, SHALL BE DELIVERED TO HIM ON THE PREMISES BY THE CONTRACTOR. ALL OTHER MATERIALS AND EQUIPMENT WHICH ARE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED BY THE CONTRACTOR FROM THE PREMISES.
4. EXISTING CONDITIONS, I.E., PRESENCE AND LOCATION OF DUCTWORK, PIPING, EQUIPMENT AND MATERIALS, INDICATED ARE BASED ON INFORMATION OBTAINED FROM AVAILABLE RECORD DRAWINGS AND FIELD SURVEYS AND ARE NOT WARRANTED TO BE COMPLETE OR CORRECT. CONTRACTOR SHALL FIELD VERIFY EXACT LOCATION OF ALL DUCTWORK, PIPING, EQUIPMENT AND MATERIALS IN THE FIELD PRIOR TO STARTING ALL WORK.
5. EXISTING DUCT, PIPE, AND EQUIPMENT SIZES NOTED ARE FOR THE CONVENIENCE OF THE CONTRACTOR ONLY AND ARE NOT WARRANTED TO BE CORRECT. CONTRACTOR SHALL VERIFY ALL SIZES IN THE FIELD IF THEY EFFECT HIS WORK.
6. EXISTING PIPING NO LONGER REQUIRED TO REMAIN IN SERVICE (SHOWN OR OTHERWISE) SHALL BE DISCONNECTED AND REMOVED BACK TO SERVICE MAINS UNLESS OTHERWISE INDICATED OR NOTED ON THE PLANS. REMOVE EXISTING PIPE HANGERS, SUPPORTS, VALVES, ETC.. EXISTING PIPING INDICATED OR REQUIRED TO REMAIN IN SERVICE OR IN PLACE SHALL BE CAPPED, PLUGGED, OR OTHERWISE SEALED. NO EXISTING PIPING SHALL BE LEFT OPEN END.
7. EXISTING DUCTWORK INDICATED TO BE DISCONNECTED AND REMOVED SHALL INCLUDE ALL RELATED AIR DEVICES, HANGERS, SUPPORTS, ETC., UNLESS OTHERWISE INDICATED OR NOTED ON THE PLANS. EXISTING DUCTWORK WHERE INDICATED TO BE CAPPED OR REQUIRED TO REMAIN IN SERVICE SHALL BE CAPPED WITH 18 GAUGE SHEET METAL. SECURE CAP WITH SHEET METAL SCREWS AND SEAL PERIMETER OF OPENING AIR TIGHT WITH DUCT SEALER. NO EXISTING DUCTWORK SHALL BE LEFT OPEN FOR ANY EXTENDED PERIOD OF TIME. CAP EXISTING DUCTWORK IMMEDIATELY AS REQUIRED OR DIRECTED BY THE ENGINEER. CONTRACTOR SHALL RETURN ALL AIR DEVICES TO OWNER.
8. EXISTING MECHANICAL AND ELECTRICAL EQUIPMENT, PIPING, DUCTWORK, AND MATERIALS AFFECTED BY DEMOLITION OR NEW WORK INSTALLATION AND REQUIRED TO REMAIN IN SERVICE SHALL BE RE-INSTALLED OR SUPPORTED AS REQUIRED IN ACCORDANCE WITH NEW WORK SPECIFICATION. ALL WORK SHALL BE COMPLETED TO THE SATISFACTION OF THE ENGINEER AND OWNER AND AT NO ADDITIONAL CONTRACT COST.
9. PATCH ALL DISTURBED SURFACES, INCLUDING WALLS, CEILINGS, ROOF, AND FLOOR. PATCHING SHALL MATCH EXISTING ADJACENT SURFACES AS TO THICKNESS, TEXTURE, MATERIALS, AND COLOR. ALL PATCHING SHALL BE PERFORMED TO THE SATISFACTION OF THE ARCHITECT, ENGINEER AND OWNER AND AT NO ADDITIONAL CONTRACT COST.
10. IN GENERAL ALL PIPING, EQUIPMENT, DUCTWORK, AND MATERIALS SHOWN "LIGHT" IS EXISTING TO REMAIN. ALL PIPING, CONDUITS, EQUIPMENT, DUCTWORK, AND MATERIALS SHOWN "HEAVY AND DASHED" IS EXISTING TO BE DEMOLISHED.
11. ALL WORK SHALL BE PERFORMED IN A SEQUENCE AND DURING HOURS TO MINIMIZE DISRUPTION TO THE BUILDING WHICH WILL REMAIN OCCUPIED DURING CONSTRUCTION.
12. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE SOUTH CAROLINA CODES, CITY OF COLUMBIA, AND THE LOCAL FIRE MARSHALL'S REQUIREMENTS.
13. THIS CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH ALL OTHER TRADES/ SUBCONTRACTORS INCLUDING BUT NOT LIMITED TO AUTOMATIC TEMPERATURE CONTROLS, ELECTRICAL, AND GENERAL TRADES.
14. CONTRACTOR SHALL MAINTAIN ACCESS TO ALL STAIRWELLS AND EGRESS CORRIDORS DURING CONSTRUCTION.
15. CONCRETE CORING OR CUTTING MAY BE REQUIRED IN ORDER TO RUN MECHANICAL, ELECTRICAL, PLUMBING, CABLING OR OTHER SERVICES TO A SPECIFIC AREA. IT IS IMPERATIVE WHEN CONSIDERING EITHER CORING, CUTTING OR CHIPPING THAT REBAR, PLUMBING, ELECTRICAL SERVICES, ETC WITHIN THE CONCRETE SLAB, WALL OR FLOOR BE LOCATED PRIOR TO DISTURBING THE INTEGRITY OF THE EXISTING CONCRETE. OBTAIN STRUCTURAL DRAWINGS OF THE AREA IN QUESTION AND, USING THE BUILDING GRIDLINES, DETERMINE AND MARK THE EXACT LOCATIONS REQUIRED FOR NEW SERVICES.
16. ALL PENETRATIONS MUST BE SEALED WITH FIRE STOP MATERIAL AFTER SERVICES ARE RUN THROUGH. ALL PENETRATIONS THROUGH EXTERIOR WALLS ABOVE AND BELOW GRADE OR SLAB ON GRADE MUST BE WATERPROOFED.
17. FINAL CEILING HEIGHTS TO BE DETERMINED WITH ARCHITECT IN FIELD AFTER DEMOLITION OF EXISTING CEILINGS. NO FABRICATION OF DUCTWORK, HVAC PIPING OR PLUMBING PIPING SHALL BEGIN UNTIL AFTER THE CONTRACTOR HAS COMPLETED COORDINATION DRAWINGS AND COORDINATED THE CEILING HEIGHTS WITH THE ARCHITECT.
18. AUTOMATIC TEMPERATURE CONTROL CONTRACTOR SHALL DESIGNATE AND NUMBER ALL EQUIPMENT IN ACCORDANCE WITH UNIVERSITY OF SOUTH CAROLINA STANDARDS. NO DUPLICATE DESIGNATION NUMBERS SHALL BE PROVIDED. ALL NUMBERS SHALL BE THE NEXT SEQUENTIAL NUMBER FOR THAT SPECIFIC PIECE OF EQUIPMENT.
19. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER PRIOR TO CLOSING ANY CEILINGS FOR A COMPLETE CHECKOUT OF THE HVAC SYSTEM. THE SYSTEM MUST BE COMPLETE AND OPERATIONAL INCLUDING CONTROLS, REGISTERS, INSULATION, AND BALANCING WITH REPORT. THE SYSTEM SHALL BE RUN THROUGH ITS COMPLETE HEATING AND COOLING CYCLES. THE CONTRACTOR AND ALL APPROVED SUBCONTRACTORS SHALL BE PRESENT AT THE ARCHITECT-ENGINEER CHECKOUT. THE TESTING AND BALANCE AGENCY SHALL CERTIFY THAT THESE CONDITIONS ARE MET.

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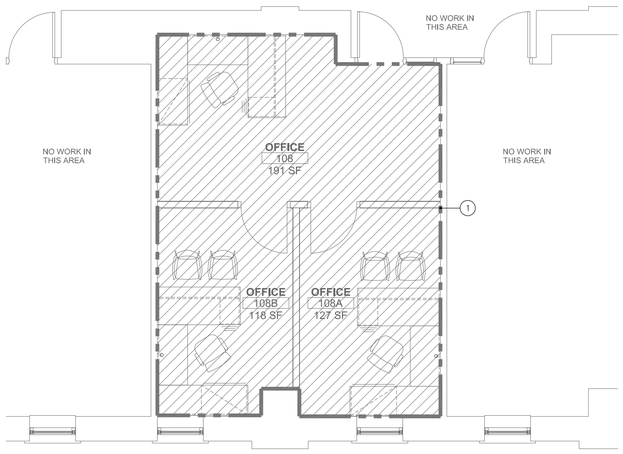
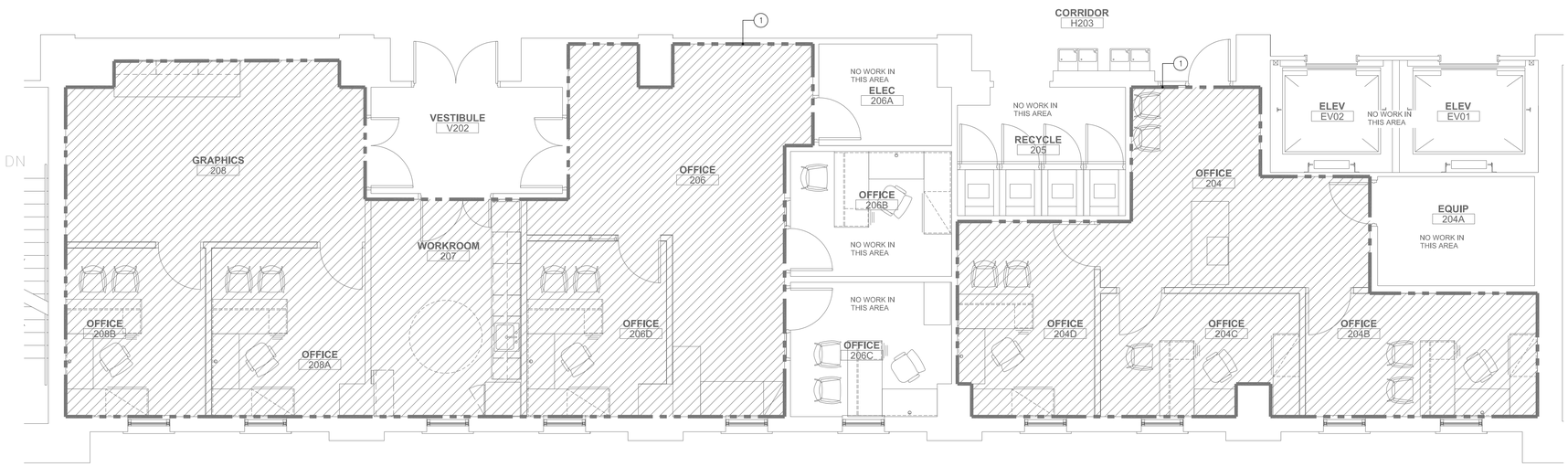
FIRE PROTECTION ABBREVIATIONS AND GENERAL NOTES

FP0.01



FIRST FLOOR – FIRE PROTECTION

SCALE: 1/4"=1'-0"



SECOND FLOOR – FIRE PROTECTION

SCALE: 1/4"=1'-0"

GENERAL NOTES:

1. PROVIDE A COMPLETE HYDRAULICALLY DESIGNED AUTOMATIC WET SPRINKLER SYSTEM FOR ALL AREAS OF WORK. SYSTEM SHALL BE IN ACCORDANCE WITH NFPA 13, NFPA 14 AND THE STATE OF SOUTH CAROLINA FIRE MARSHAL REQUIREMENTS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. REFER TO FIRE SPRINKLER SPECIFICATION SHEET FOR SPACE SPECIFIC HAZARD CLASSIFICATION.
3. THE SPRINKLER CONTRACTOR SHALL REVIEW ALL ARCHITECTURAL AND STRUCTURAL DRAWINGS, INCLUDING ALL REFLECTED CEILING PLANS PRIOR TO PREPARING THE BID. ATTENTION SHALL BE PAID TO STAIRWAYS, ELEVATOR HOISTWAYS, AREAS WITH FLOATING CEILINGS, LARGE EXPOSED DUCTWORK AND VERTICAL SLAB OPENINGS.
4. ALL LOW POINTS OF THE SPRINKLER SYSTEM SHALL BE PROVIDED WITH DRAINS PER THE LATEST EDITION OF NFPA–13. LOW POINT DRAINS SHALL BE CLEARLY MARKED AND PIPED TO THE EXTERIOR OF THE BUILDING. A VALVE DRAWING SHALL BE PROVIDED IN SPRINKLER ROOM SHOWING THE LOCATIONS OF ALL LOW POINT DRAINS. DRAIN DISCHARGE SHALL HAVE THREADED MALE FITTING SIZED TO FIT GARDEN HOSE.
5. ALL SPRINKLER HEAD TEMPERATURE RATINGS SHALL BE ORDINARY (165°F) UNLESS OTHERWISE INDICATED. ALL SPRINKLERS INSTALLED IN GYPSUM, PLASTER AND WOOD CEILING SHALL BE CONCEALED TYPE. ALL SPRINKLERS IN ACOUSTICAL CEILING TILE SHALL BE SEMI–RECESSED TYPE.
6. FIRE PROTECTION PIPE HANGERS SHALL BE INSTALLED AT EVERY JOINT, OR AT A MAXIMUM DISTANCE PER NFPA 13 TABLE 9.2.2.1.
7. FIRE STOP ALL PENETRATIONS OF FIRE RATED ASSEMBLIES. REFER TO ARCHITECTURAL DRAWINGS FOR RATINGS.
8. CONTRACTOR SHALL OBTAIN UPDATED (WITHIN 6 MONTHS) FIRE FLOW TEST DATA PRIOR TO PERFORMING HYDRAULIC CALCULATIONS.
9. PROVIDE SEISMIC BRACING AND SUPPORTS FOR ALL FIRE PROTECTION PIPING TO COMPLY WITH NFPA STANDARD 13 AND IBC 2009.
10. BUILDING FIRE PROTECTION SERVICE SHALL REMAIN IN SERVICE FOR THE DURATION OF CONSTRUCTION. ALL WORK RELATED TO FIRE PROTECTION SYSTEM SHALL BE FULLY COORDINATED WITH THE USC FIRE MARSHAL.

DRAWING NOTES:

(1) SPRINKLER HEADS SHALL BE RELOCATED AS REQUIRED BASED ON HYDRAULIC CALCULATIONS AND ARCHITECTURAL FLOOR PLANS. SPRINKLER HEADS SHALL BE INSTALLED IN CEILING (ACT, GYPSUM, SHAFTWALL) IN ACCORDANCE WITH NFPA–13 AND MANUFACTURER'S INSTRUCTIONS.

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OSE # H27-I988

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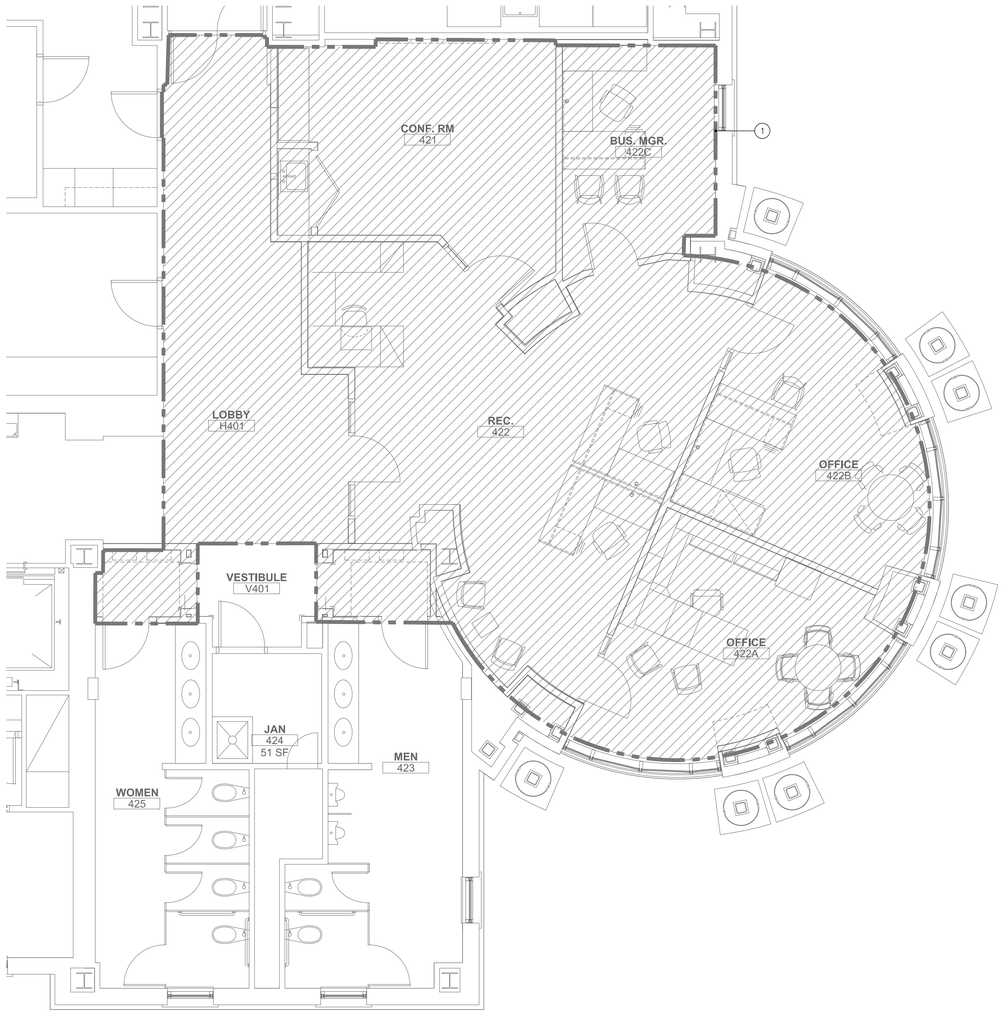
Project: 11USC396
Drawn By: CSL
Checked By: CRB
Date: 5 MAR 2012

FIRE PROTECTION PLAN

FP1.01



FOURTH FLOOR – FIRE PROTECTION

SCALE: 1/4"=1'-0"

GENERAL NOTES:

1. PROVIDE A COMPLETE HYDRAULICALLY DESIGNED AUTOMATIC WET SPRINKLER SYSTEM FOR ALL AREAS OF WORK. SYSTEM SHALL BE IN ACCORDANCE WITH NFPA 13, NFPA 14 AND THE STATE OF SOUTH CAROLINA FIRE MARSHAL REQUIREMENTS. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
2. REFER TO FIRE SPRINKLER SPECIFICATION SHEET FOR SPACE SPECIFIC HAZARD CLASSIFICATION.
3. THE SPRINKLER CONTRACTOR SHALL REVIEW ALL ARCHITECTURAL AND STRUCTURAL DRAWINGS, INCLUDING ALL REFLECTED CEILING PLANS PRIOR TO PREPARING THE BID. ATTENTION SHALL BE PAID TO STAIRWAYS, ELEVATOR HOISTWAYS, AREAS WITH FLOATING CEILINGS, LARGE EXPOSED DUCTWORK AND VERTICAL SLAB OPENINGS.
4. ALL LOW POINTS OF THE SPRINKLER SYSTEM SHALL BE PROVIDED WITH DRAINS PER THE LATEST EDITION OF NFPA–13. LOW POINT DRAINS SHALL BE CLEARLY MARKED AND PIPED TO THE EXTERIOR OF THE BUILDING. A VALVE DRAWING SHALL BE PROVIDED IN SPRINKLER ROOM SHOWING THE LOCATIONS OF ALL LOW POINT DRAINS. DRAIN DISCHARGE SHALL HAVE THREADED MALE FITTING SIZED TO FIT GARDEN HOSE.
5. ALL SPRINKLER HEAD TEMPERATURE RATINGS SHALL BE ORDINARY (165°F) UNLESS OTHERWISE INDICATED. ALL SPRINKLERS INSTALLED IN GYPSUM, PLASTER AND WOOD CEILING SHALL BE CONCEALED TYPE. ALL SPRINKLERS IN ACOUSTICAL CEILING TILE SHALL BE SEMI–RECESSED TYPE.
6. FIRE PROTECTION PIPE HANGERS SHALL BE INSTALLED AT EVERY JOINT, OR AT A MAXIMUM DISTANCE PER NFPA 13 TABLE 9.2.2.1.
7. FIRE STOP ALL PENETRATIONS OF FIRE RATED ASSEMBLIES. REFER TO ARCHITECTURAL DRAWINGS FOR RATINGS.
8. CONTRACTOR SHALL OBTAIN UPDATED (WITHIN 6 MONTHS) FIRE FLOW TEST DATA PRIOR TO PERFORMING HYDRAULIC CALCULATIONS.
9. PROVIDE SEISMIC BRACING AND SUPPORTS FOR ALL FIRE PROTECTION PIPING TO COMPLY WITH NFPA STANDARD 13 AND IBC 2009.
10. BUILDING FIRE PROTECTION SERVICE SHALL REMAIN IN SERVICE FOR THE DURATION OF CONSTRUCTION. ALL WORK RELATED TO FIRE PROTECTION SYSTEM SHALL BE FULLY COORDINATED WITH THE USC FIRE MARSHAL.

DRAWING NOTES:

(1) SPRINKLER HEADS SHALL BE RELOCATED AS REQUIRED BASED ON HYDRAULIC CALCULATIONS AND ARCHITECTURAL FLOOR PLANS. SPRINKLER HEADS SHALL BE INSTALLED IN CEILING (ACT, GYPSUM, SHAFTWALL) IN ACCORDANCE WITH NFPA–13 AND MANUFACTURER'S INSTRUCTIONS.

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FIRE PROTECTION PLAN

FP1.02

THROUGH PENETRATION FIRESTOP SCHEDULE

A. THIS SCHEDULE IDENTIFIES REQUIREMENTS FOR ACCEPTABLE THROUGH PENETRATION FIRESTOPS BASED ON BARRIER TYPE, BASIS OF BARRIER CONSTRUCTION, AND PENETRANT TYPE. THIS IS A STANDARD THROUGH PENETRATION FIRESTOP SCHEDULE. SOME BARRIERS AND/OR PENETRANT TYPES MAY NOT APPEAR ON THE DRAWINGS.
B. THROUGH PENETRATION FIRESTOPS ARE NOT REQUIRED FOR FLOOR PENETRATIONS CONTAINED TOTALLY WITHIN A RATED SHAFT ENCLOSURE.
C. FOR EACH PENETRATION, SELECT A THROUGH PENETRATION FIRESTOP BASED ON ACTUAL FIELD CONDITIONS, WHICH INCLUDE BUT ARE NOT LIMITED TO PENETRATION SIZE, PENETRATION SHAPE, PENETRANT MATERIAL(S), QUANTITY OF PENETRANTS PER PENETRATION, AND LOCATION(S) OF PENETRANT(S) WITHIN PENETRATION.
D. NOMENCLATURE OF UL CLASSIFIED FIRESTOP ASSEMBLIES USED IN THIS SCHEDULE IS IDENTICAL TO THAT USED IN CATALOGS OF APPROVED FIRESTOP MANUFACTURERS (SEE DIVISION 15) AND IN UNDERWRITERS LABORATORIES "FIRE RESISTANCE DIRECTORY."

RATED BARRIER		FIRESTOP ASSEMBLY REQUIREMENTS		PENETRANT TYPE						
TYPE	BASIS OF CONSTRUCTION			NO PENETRANTS	METALLIC, UNINSULATED PIPE OR TUBING (EX. COPPER, IRON, STEEL) (NOTE 14)	NONMETALLIC, UNINSULATED PIPE OR TUBING (EX. PVC, PP, CPVC, GLASS, FRPP)	INSULATED PIPES (EX. COPPER, IRON PLASTIC, STEEL) IN SYSTEMS OPERATING BETWEEN 32°F AND 122°F (NOTE 1)	INSULATED PIPES (EX. COPPER, IRON PLASTIC, STEEL) IN SYSTEMS OPERATING BELOW 32°F OR ABOVE 122°F (NOTE 2)	METAL DUCT (NOTE 3)	RECESSED DEVICES (NOTE 4)
WALL	WOOD STUDS & GYPSUM WALLBOARD (U300 SERIES)	UL CLASSIFIED SERIES	SINGLE PENETRANT	W-L-0000 SERIES OR NOTE 5	W-L-1000 SERIES	W-L-2000 SERIES	W-L-5000 SERIES	W-L-5000 SERIES	W-L-7000 SERIES	W-L-7000 SERIES NOTE 8
			MULTIPLE PENETRANTS		W-L-8000 SERIES (NOTE 6)		W-L-8000 SERIES (NOTE 6)	W-L-8000 SERIES (NOTE 6)	N/A	
		F RATING		EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING
		T RATING		NOTE 10	NOTE 10	NOTE 10	NOTE 10	NOTE 10	NOTE 10	NOTE 10
		EXCEPTIONS/ ADDED REQUIREMENTS		NONE	NOTE 13	NOTE 13	NONE	NOTE 7	NONE	NONE
WALL	METAL STUDS & GYPSUM WALLBOARD (U400 SERIES)	UL CLASSIFIED SERIES	SINGLE PENETRANT	W-L-0000 SERIES OR NOTE 5	W-L-1000 SERIES	W-L-2000 SERIES	W-L-5000 SERIES	W-L-5000 SERIES	W-L-7000 SERIES	W-L-7000 SERIES NOTE 8
			MULTIPLE PENETRANTS		W-L-8000 SERIES (NOTE 6)		W-L-8000 SERIES (NOTE 6)	W-L-8000 SERIES (NOTE 6)	N/A	
		F RATING		EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING
		T RATING		NOTE 10	NOTE 10	NOTE 10	NOTE 10	NOTE 10	NOTE 10	NOTE 10
		EXCEPTIONS/ ADDED REQUIREMENTS		NONE	NOTE 13	NOTE 13	NONE	NOTE 7	NONE	NONE
WALL	POURED CONCRETE, CONCRETE BLOCK OR MASONRY (BLOCK & U900 SERIES) (ANY THICKNESS)	UL CLASSIFIED SERIES	SINGLE PENETRANT	W-J-0000 SERIES OR NOTE 5	C-AJ-1000 OR W-J-1000 SERIES	C-AJ-2000 OR W-J-2000 SERIES	C-AJ-5000 OR W-J-5000 SERIES	C-AJ-5000 OR W-J-5000 SERIES	C-AJ-7000 OR W-J-7000 SERIES	NOTE 8
			MULTIPLE PENETRANTS		C-AJ-8000 OR W-J-8000 SERIES (NOTE 6)		C-AJ-8000 OR W-J-8000 (NOTE 6)	C-AJ-8000 OR W-J-8000 (NOTE 6)	N/A	
		F RATING		EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING	EQUAL TO WALL RATING
		T RATING		NOTE 10	NOTE 10	NOTE 10	NOTE 10	NOTE 10	NOTE 10	NOTE 10
		EXCEPTIONS/ ADDED REQUIREMENTS		NONE	NOTES 12 & 13	NOTE 13	NONE	NOTE 7	NONE	NONE
FLOOR	POURED CONCRETE (ANY THICKNESS)	UL CLASSIFIED SERIES	SINGLE PENETRANT	C-AJ-0000 SERIES F-A-0000 SERIES OR NOTE 5	C-AJ-1000 OR F-A-1000 SERIES	C-AJ-2000 OR F-A-2000 SERIES	C-AJ-5000 OR F-A-5000 SERIES	C-AJ-5000 OR F-A-5000 SERIES	C-AJ-7000 OR F-A-7000 SERIES	NOTE 8
			MULTIPLE PENETRANTS		C-AJ-8000 OR F-A-8000 SERIES (NOTE 6)		C-AJ-8000 OR F-A-8000 (NOTE 6)	C-AJ-8000 OR F-A-8000 (NOTE 6)	N/A	
		F RATING		EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR	EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR	EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR	EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR	EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR	EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR	EQUAL TO FLOOR RATING, BUT NOT LESS THAN 1 HR
		T RATING		NOTE 11	NOTE 11	NOTE 11	NOTE 11	NOTE 11	NOTE 11	NOTE 11
		EXCEPTIONS/ ADDED REQUIREMENTS		NONE	NOTE 12	NONE	NONE	NOTE 7	NONE	NONE

NOTES

1. EXAMPLES OF SYSTEMS THAT OPERATE BETWEEN 32 DEGF AND 122 DEGF:

   CHILLED WATER SUPPLY & RETURN
   HEAT PUMP WATER SUPPLY & RETURN
   DOMESTIC COLD AND TEMPERED WATER
   DOMESTIC HOT WATER LESS THAN 122 DEGF
   DOMESTIC HOT WATER RECIRCULATION LESS THAN 122 DEGF

2. EXAMPLES OF SYSTEMS OPERATING BELOW 32 DEGF OR ABOVE 122 DEGF:

   STEAM SUPPLY & RETURN
   STEAM VENT
   CONDENSATE PUMP DISCHARGE
   BOILER BLOWDOWN
   CRYOGENIC VENT
   ENGINE GENERATOR EXHAUST
   HEATING HOT WATER SUPPLY & RETURN
   HOT-CHILLED WATER SUPPLY & RETURN
   GLYCOL HEATING HOT WATER SUPPLY & RETURN
   DOMESTIC HOT WATER SUPPLY 140 DEGF
   DOMESTIC HOT WATER RECIRCULATION 140 DEGF

3. THIS SCHEDULE'S DATA APPLY ONLY TO PENETRATIONS WITHOUT DAMPERS. FOR DAMPERED PENETRATIONS, REFER TO SPECIFICATIONS. AT DAMPERS, DO NOT APPLY MATERIAL THAT IS NOT INCLUDED IN THE DAMPER'S CLASSIFICATION.

4. EXAMPLES OF RECESSED DEVICES:

   MEDICAL GAS ZONE VALVES
   MEDICAL GAS OUTLETS
   FIRE VALVE CABINETS
   FIRE HOSE CABINETS
   UNIT HEATERS
   FIRE FIGHTERS' PHONE
   FIRE EXTINGUISHER CABINET
   CENTRAL VACUUM OUTLETS

5. SEAL OPENING USING BARRIER'S ORIGINAL CONSTRUCTION.

6. WHERE A SERIES 8000 CLASSIFIED SYSTEM IS NOT AVAILABLE, INSTALL PENETRANTS SINGLY, AND PROVIDE SINGLE-PENETRANT SYSTEMS.

7. FOR SYSTEMS THAT OPERATE BELOW 32°F OR ABOVE 122°F, COMPLY WITH THE FOLLOWING ADDITIONAL REQUIREMENTS:

   A. PROVIDE TPFS SYSTEM USING INTUMESCENT ELASTOMERIC WRAP STRIP AS ITS FILL, VOID, OR CAVITY MATERIAL.
   B. DO NOT USE SERIES 8000 PENETRATIONS. PROVIDE ONLY SINGLE PENETRATIONS.

8. WHERE UL CLASSIFIED SYSTEMS ARE NOT AVAILABLE FOR OTHER RECESSED DEVICES, MAINTAIN CONTINUITY OF RATED BARRIER CONSTRUCTION AROUND RECESS.

9. REQUIREMENTS FOR MEMBRANE PENETRATIONS AND THROUGH PENETRATIONS ARE IDENTICAL.

10. TEMPERATURE (T) RATINGS OF ASSEMBLIES IN WALLS MAY EQUAL ZERO.

11. TEMPERATURE (T) RATINGS OF ASSEMBLIES IN FLOORS SHALL EQUAL THE GREATER OF EITHER THE BARRIER RATING OR ONE HOUR EXCEPT AS FOLLOWS:

    A. AN ASSEMBLY'S T RATING MAY EQUAL ZERO WHEN THE PENETRANT ABOVE THE FLOOR PENETRATION IS CONTAINED AND LOCATED WITHIN THE CAVITY OF A WALL.

12. CLASSIFIED TPFS ASSEMBLY IS NOT REQUIRED WHEN ALL THE FOLLOWING CONDITIONS ARE MET:

    A. PENETRANT HAS A MAXIMUM NOMINAL DIAMETER OF 6-INCHES.
    B. PENETRATION HAS A MAXIMUM AREA OF 144 SQUARE INCHES.
    C. ANNULAR SPACE IS COMPLETELY FILLED WITH CONCRETE, GROUT, OR MORTAR THE FULL THICKNESS OF THE BARRIER.

13. OPENINGS ACCOMMODATING NONCOMBUSTIBLE CONDUITS, PIPES AND TUBES THROUGH SINGLE MEMBRANES WHICH ARE PART OF A FIRE RESISTANCE RATED WALL ASSEMBLY ARE PERMITTED WHEN:

    A. AGGREGATE AREA OF THE MEMBRANE OPENINGS DO NOT EXCEED 100 SQUARE INCHES FOR ANY 100 SQUARE FEET OF WALL AREA.

14. THIS COLUMN ALSO INCLUDES WIRES AND CABLES WITH STEEL JACKETS.

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PUBLIC HEALTH RESEARCH CENTER - INTERIOR RENOVATIONS

OSE # H27-I988

TAG	DESCRIPTION	DATE

Project: 11USC396
Drawn By: PAM
Checked By: BAC
Date: 5 MAR 2012

FIRE PROTECTION SCHEDULE

FP2.01