FIRE SUPPRESSION SYSTEM SPECIFICATIONS:

I. GENERAL

I. APPLICABLE STANDARDS AND PUBLICATIONS:
THE DESIGN, EQUIPMENT, INSTALLATION, TESTING AND MAINTENANCE OF THE FM-200 SUPPRESSION SYSTEM SHALL BE IN ACCORDANCE WITH THE APPLICABLE REQUIREMENTS SET FORTH IN THE LATEST EDITION OF THE FOLLOWING CODES AND STANDARDS:

1) NFPA NO. 2001 – CLEAN AGENT FIRE EXTINGUISHING SYSTEMS
2) NFPA NO. 70 – NATIONAL ELECTRICAL CODE
3) NFPA NO. 72 – STANDARD FOR PROTECTIVE SIGNALING
4) NFPA NO. 75 – ELECTRONIC COMPUTER SYSTEMS
5) FACTORY MUTUAL APPROVAL GUIDE
6) U.L. LISTINGS
7) REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION (AHJ)

2. REQUIREMENTS:
THE FM-200 SUPPRESSION SYSTEM INSTALLATION SHALL BE MADE IN ACCORDANCE WITH THE DRAWINGS, SPECIFICATIONS AND APPLICABLE STANDARDS. SHOULD A CONFLICT OCCUR BETWEEN THE DRAWINGS AND SPECIFICATIONS, THE SPECIFICATIONS SHALL PREVAIL.

3. EXCLUSIONS:
THE WORK LISTED BELOW SHALL BE PROVIDED BY OTHERS OR UNDER OTHER SECTIONS OF THIS SPECIFICATION:

1) 120 VAC POWER SUPPLY TO THE FM-200 CONTROL PANEL
2) INTERLOCK WIRING AND CONDUIT FOR SHUTDOWN OF HVAC, DAMPERS AND/OR ELECTRIC POWER SUPPLIES, RELAYS OR SHUNT TRIP BREAKERS
3) CONNECTION TO LOCAL OR REMOTE FIRE ALARM SYSTEMS OR LISTED CENTRAL ALARM STATION(S)

4. QUALITY ASSURANCE:

A) MANUFACTURER:
1) THE MANUFACTURER OF THE FM-200 SUPPRESSION SYSTEM HARDWARE AND DETECTION COMPONENTS SHALL HAVE A MINIMUM OF 10 YEARS EXPERIENCE IN THE DESIGN AND MANUFACTURE OF SIMILAR TYPE OF SUPPRESSION SYSTEMS AND WHO CAN REFER TO SIMILAR INSTALLATIONS PROVIDING SATISFACTORY SERVICE.
2) ALL DEVICES, COMPONENTS AND EQUIPMENT SHALL BE NEW AND STANDARD PRODUCTS OF THE MANUFACTURERS LATEST DESIGN, SUITABLE TO PERFORM THE FUNCTIONS INTENDED.
3) ALL DEVICES AND EQUIPMENT SHALL BE U.L. LISTED AND/OR FM APPROVED.

B. INSTALLER:
1) THE INSTALLING CONTRACTOR SHALL BE TRAINED BY THE MANUFACTURER TO DESIGN, INSTALL, TEST AND MAINTAIN FM-200 FIRE SUPPRESSION SYSTEMS.
2) THE INSTALLING CONTRACTOR SHALL BE AN EXPERIENCED FIRM REGULARLY ENGAGED IN THE INSTALLATION OF AUTOMATIC FM-200, OR SIMILAR, FIRE SUPPRESSION SYSTEMS IN STRICT ACCORDANCE WITH NFPA STANDARDS.
3) INSTALLING CONTRACTOR'S MAIN OFFICE SHALL BE LOCATED WITHIN MASSACHUSETTS.

5. SYSTEM DESCRIPTION AND OPERATION:

A) THE SYSTEM SHALL BE A TOTAL FLOODING FM-200 EXTINGUISHING SYSTEM AND MICROPROCESSOR BASED CONTROLS MANUFACTURED BY: FENWAL FIRE PROTECTION SYSTEMS
ADVANCED SAFETY SYSTEMS (978) 532-5730

SUPPLIED BY: CONTRACTOR TBD

B) THE SYSTEM SHALL PROVIDE AN FM-200 MINIMUM DESIGN CONCENTRATION OF 7%, BY VOLUME, IN ALL AREAS AND/OR PROTECTED SPACES AT THE MINIMUM ANTICIPATED TEMPERATURE WITHIN THE PROTECTED AREA.
C) THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SEALING AND SECURING THE PROTECTED SPACES AGAINST AGENT LOSS AND/OR LEAKAGE DURING THE 10 MINUTE "HOLD" PERIOD.
D) DETECTORS SHALL BE WIRED IN A "VERIFIED DETECTION" METHOD OF OPERATION, USING THE CLASS "A" WIRING ARRANGEMENT. NO OTHER DETECTION / WIRING ARRANGEMENT WILL BE ACCEPTABLE.

E) AUTOMATIC OPERATION OF EACH PROTECTED AREA SHALL BE AS FOLLOWS:
1) ACTUATION OF ONE (1) DETECTOR (ALARM STATUS), WITHIN THE SYSTEM, SHALL:
A) ILLUMINATE THE LIQUID CRYSTAL DISPLAY ON THE CONTROL PANEL FACE. INDICATING ZONE AND LOCATION OF ALARM IN ENGLISH TEXT.
B) ENERGIZE AN ALARM BELL
C) TRANSFER AUXILIARY CONTACTS WHICH CAN PERFORM AUXILIARY SYSTEM FUNCTIONS SUCH AS: TRANSMIT A SIGNAL TO A FIRE ALARM SYSTEM.

2) ACTUATION OF A 2ND DETECTOR (PRE-DISCHARGE STATUS), WITHIN THE SYSTEM, SHALL:
A) ILLUMINATE THE LIQUID CRYSTAL DISPLAY ON THE CONTROL PANEL FACE.
B) ENERGIZE A PULSING ALARM HORN DEVICE.
C) SHUT DOWN THE HVAC SYSTEM AND/OR CLOSE DAMPERS.
D) START TIME-DELAY SEQUENCE
E) SYSTEM ABORT SEQUENCE IS ENABLED AT THIS TIME.

3) AFTER COMPLETION OF THE TIME-DELAY SEQUENCE, THE FM-200 SYSTEM SHALL DISCHARGE AND THE FOLLOWING SHALL OCCUR:
A) DISPLAY STATUS ON LIQUID CRYSTAL SCREEN ON THE CONTROL PANEL FACE.
B) ENERGIZE A VISUAL INDICATOR OUTSIDE THE HAZARD IN WHICH THE DISCHARGE OCCURRED.
C) ACTIVATE THE ALARM HORN IN A STEADY STATE

4) THE SYSTEM SHALL BE CAPABLE OF BEING ACTUATED BY MANUAL DISCHARGE DEVICES LOCATED AT EACH HAZARD EXIT. OPERATION OF A MANUAL DEVICE SHALL DUPLICATE THE "VERIFIED DETECTION" SEQUENCE DESCRIPTION ABOVE EXCEPT THAT THE TIME DELAY AND ABORT FUNCTIONS SHALL BE BYPASSED. THE MANUAL DISCHARGE STATION SHALL BE OF THE ELECTRICAL ACTUATION TYPE AND SHALL BE SUPERVISED AT THE MAIN CONTROL PANEL.

6) SYSTEM INSPECTION AND CHECKOUT:
AFTER THE SYSTEM INSTALLATION HAS BEEN COMPLETED, THE ENTIRE SYSTEM SHALL BE CHECKED OUT, INSPECTED AND FUNCTIONALLY TESTED BY QUALIFIED, TRAINED PERSONNEL, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED PROCEDURES AND NFPA STANDARDS. THE COMPLETE SYSTEM SHALL BE FUNCTIONALLY TESTED, IN THE PRESENCE OF THE OWNER OR HIS REPRESENTATIVE, AND ALL FUNCTIONS, INCLUDING SYSTEM AND EQUIPMENT INTERLOCKS, MUST BE OPERATIONAL AT LEAST FIVE (5) DAYS PRIOR TO THE FINAL ACCEPTANCE TESTS.
A) EACH DETECTOR SHALL BE TESTED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDED PROCEDURES, AND TEST VALUES RECORDED.
B) ALL SYSTEM AND EQUIPMENT INTERLOCKS , SUCH AS DOOR RELEASE DEVICES, AUDIBLE AND VISUAL DEVICES, EQUIPMENT SHUTDOWNS, LOCAL AND REMOTE ALARMS, ETC. SHALL FUNCTION AS REQUIRED AND DESIGNED.
C) EACH CONTROL PANEL CIRCUIT SHALL BE TESTED FOR TROUBLE BY INDUCING A TROUBLE CONDITION INTO THE SYSTEM.
D) TRAINING REQUIREMENTS:
PRIOR TO FINAL ACCEPTANCE, THE INSTALLING CONTRACTOR SHALL PROVIDE OPERATIONAL TRAINING TO EACH SHIFT OF THE OWNERS PERSONNEL. EACH TRAINING SESSION SHALL INCLUDE SYSTEM CONTROL PANEL OPERATION, MANUAL AND ABORT FUNCTIONS, TROUBLE PROCEDURES, AUXILIARY FUNCTIONS AND EMERGENCY PROCEDURES.
E) OPERATION AND MAINTENANCE: PRIOR TO FINAL ACCEPTANCE, THE INSTALLING CONTRACTOR SHALL PROVIDE COMPLETE OPERATION AND MAINTENANCE INSTRUCTION MANUALS, FOUR (4) COPIES FOR EACH SYSTEM TO THE OWNER. ALL ASPECTS OF SYSTEM OPERATION AND MAINTENANCE SHALL BE DETAILED, INCLUDING PIPING ISOMETRICS AND WIRING.

F) INSTALLING CONTRACTOR SHALL OFFER A 3 YEAR WARRANTY ALONG WITH A YEARLY SERVICE CONTRACT
G) FAN PRESSURE TEST SHALL BE PERFORMED AND APPROVED BY THE AHJ. MINIMUM HOLD TIME SHALL BE 10 MINUTES.

II. SYSTEM OPERATIONAL REQUIREMENTS

1. DETECTORS SHALL BE LOCATED AWAY FROM AIRSTREAM SUPPLY AIR DUCTS.
2. ALL DAMPERS AND/OR AIR HANDLING UNITS SHALL BE SHUTDOWN AS REQUIRED (BY OTHERS) VIA CONTACTS PROVIDED IN CONTROL PANEL.
3. BELLS, HORNS AND STROBES SHALL HAVE THEIR BOTTOMS AT HEIGHTS ABOVE THE FINISHED FLOOR OF NOT LESS THAN 80 INCHES AND NO GREATER THAN 96 INCHES.
4. THE MAXIMUM HEIGHT OF MANUAL RELEASE/ABORT STATIONS IS TO BE 48 INCHES TO ITS CENTER LINE.
5. ALL FIRE RATED FLOOR AND/OR WALL PENETRATIONS SHALL BE SEALED WITH AN APPROVED FIRE STOPPING COMPOUND. (BY OTHERS)

III. MECHANICAL

1. THE PIPING SYSTEM SHALL BE INSTALLED IN ACCORDANCE WITH NFPA 2001.
2. ALL PIPING MUST BE RIGIDLY SUPPORTED BY A COMBINATION OF PIPE HANGERS AND RIGID SUPPORT BRACKETS. SPLIT-RING TYPE PIPE HANGERS SHOULD BE USED TO SUPPORT THE "DEAD LOAD" OF THE PIPE SYSTEM. PIPE HANGERS SHALL BE SPACED AT INTERVALS NOT EXCEEDING 15 FEET. RIGID PIPE SUPPORTS ARE REQUIRED TO SUPPORT THE "LIVE LOAD" OF THE PIPE SYSTEM DURING DISCHARGE. RIGID BRACING IS REQUIRED AT EACH DIRECTIONAL CHANGE FITTING TEE AND NOZZLE. ALL DROPS TO 180 DEGREE NOZZLES REQUIRE BACK-BRACING IN THE OPPOSITE DIRECTION OF THE DISCHARGE.
3. ALL PIPE FITTINGS TO COMPLY WITH STRENGTH REQUIREMENTS IN NFPA 2001, CURRENT EDITION. ALL PIPE REDUCTIONS TO BE MADE USING CONCENTRIC REDUCERS ONLY, REDUCING BUSHINGS.
4. CUT-GROOVE FITTINGS ARE ACCEPTABLE IF THEY ARE RATED FOR A MINIMUM OF 620 PSIG WORKING PRESSURE. LUBRICATE GASKET ON ALL CUT-GROOVE FITTINGS USING NON-PETROLEUM BASED LUBRICANT. ROLL-GROOVING IS NOT ACCEPTABLE.
5. PIPE FITTINGS – CLASS 300 MALLEABLE IRON FITTINGS SHALL BE USED UP TO THREE INCH PIPE. 1000 LB. DUCTILE IRON OR FORGED STEEL FITTINGS SHALL BE USED ON ALL LARGER SIZES. ALL FLANGED JOINTS SHALL BE CLASS 300.
CLASS 150 AND ORDINARY CAST IRON FITTING SHALL NOT BE USED.
6. PIPING – BLACK STEEL PIPE SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS.

ASTM A-106 SEAMLESS, GRADE C SCHEDULE 40 – 1/8 INCH THRU 8 INCH
ASTM A-106/A-53 SEAMLESS GRADE A OR B SCHEDULE 40 – 1/8 INCH THRU 8 INCH
ASTM A-53 ERW GRADE A OR B SCHEDULE 40 – 1/8 INCH THRU 8 INCH
ASTM A-53 FURNACE WELD CLASS F SCHEDULE 40 – 1/8 INCH THRU 1 1/2 INCH
ASTM A-53 FURNACE WELD CLASS F SCHEDULE 80 – 2 INCH THRU 8 INCH

CAST IRON PIPE, ASTM A-120 OR NONMETALLIC PIPE SHALL NOT BE USED.

7. THE PIPING SYSTEM SHALL BE REAMED AND CLEANED BEFORE ASSEMBLY. AFTER ASSEMBLY THE SHALL BE BLOWN OUT BEFORE DISCHARGE NOZZLES OR OTHER DISCHARGE DEVICES ARE INSTALLED.
8. PIPE TAPE OR SEALANT SHALL BE APPLIED TO THE MALE THREADS ONLY.
9. SYSTEM FLOW CALCULATIONS ARE BASED ON THE PIPING SYSTEM BEING INSTALLED EXACTLY AS INDICATED ON THE SYSTEM PLANS. ANY PIPING CHANGE IN THE FIELD MUST BE APPROVED PRIOR TO FABRICATION AND INSTALLATION.

IV. ELECTRICAL

1. ELECTRICAL CONDUIT AND WIRING SHALL CONFORM WITH THE NEC, NFPA STANDARDS, STATE AND LOCAL BUILDING CODES.
2. POWER LIMITED CIRCUITS SHALL BE ISOLATED FROM NON-POWER LIMITED CIRCUITS, ELECTRIC LIGHTS OR POWER CIRCUITS BY A MINIMUM OF 2 INCHES.
3. ALL WIRING SHALL BE RUN IN CONDUIT AND SHALL BE PROPERLY SUPPORTED AND GROUNDED. ALL EXPOSED CONDUIT SHALL BE ELECTRO MECHANICAL TUBING (EMT). ALL UNDERFLOOR CONDUITS SHALL BE EMT, EXCEPT CONDUIT UP TO DETECTORS. CONDUITS BELOW RAISED FLOOR SHALL BE MOUNTED TO SLAB WITH FLEXIBLE CONDUIT (B/X TYPE OR SEAL TIGHT TYPE) UP TO DETECTORS. ALL WIRE AND CONDUIT SHALL BE INSTALLED IN ACCORDANCE WITH NFPA ARTICLE 70, NATIONAL ELECTRIC CODE (NEC).
4. POWER LIMITED CIRCUITS SHALL NOT BE PLACED IN THE SAME CONDUIT, ENCLOSURE, RACEWAY, ETC. WITH NON-POWER LIMITED CIRCUITS.
5. WIRING FOR AGENT RELEASE MODULES SHALL NOT BE CARRIED IN SAME CONDUIT AS BELL, HORN AND STROBE CIRCUITS.
6. DEVICE POLARITY MUST BE OBSERVED.
7. FIRE ALARM CIRCUITS ARE INTERNALLY SUPERVISED, NO "TEE" TAPPING IS ALLOWED.
8. WIRING SHALL BE AS FOLLOWS:

DETECTION ON LOOP = CLASS "A" 4 CONDUCTOR = 18 GAUGE (MIN.), TFN, SOLID
MANUAL RELEASE = CLASS "B" 2 CONDUCTOR = 18 GAUGE (MIN.), TFN, SOLID
ABORT CIRCUIT = CLASS "B" 2 CONDUCTOR = 18 GAUGE (MIN.), TFN, SOLID
BELL CIRCUIT = CLASS "B" 2 CONDUCTOR = 14 GAUGE (MIN.), THHN, STRANDED
HORN/STROBE CIRCUIT = CLASS "B" 2 CONDUCTOR = 14 GAUGE (MIN.), THHN, STRANDED
AGENT RELEASE = CLASS "A" 4 CONDUCTOR = 14 GAUGE (MIN.), TFN, SOLID

9. SYSTEM AND CONTROL WIRING:
ALL FM-200 SYSTEM WIRING SHALL BE FURNISHED AND INSTALLED BY THE FM-200 SYSTEM CONTRACTOR.
A) ALL WIRING SHALL BE INSTALLED IN ELECTRICAL METALLIC TUBING (EMT) OR CONDUIT.
B) ALL SYSTEM COMPONENTS SHALL BE SECURELY SUPPORTED INDEPENDENT OF THE WIRING. RUNS OF CONDUIT AND WIRING SHALL BE STRAIGHT, NEATLY ARRANGED, PROPERLY SUPPORTED, INSTALLED PARALLEL AND PERPENDICULAR TO WALLS AND PARTITIONS.
C) THE SIZES OF THE CONDUCTORS SHALL BE THOSE SPECIFIED BY THE MANUFACTURER. COLOR CODES SHALL BE USED. ALL WIRES SHALL BE TAGGED AT ALL JUNCTION POINTS AND SHALL BE FREE FROM GROUNDS AND CROSSES BETWEEN CONDUCTORS. FINAL CONNECTIONS BETWEEN EQUIPMENT AND THE SYSTEM WIRING SHALL BE MADE UNDER THE DIRECT SUPERVISION OF A FACTORY TRAINED REPRESENTATIVE.
D) ALL WIRING SHALL BE INSTALLED BY QUALIFIED INDIVIDUALS, IN A NEAT AND WORKMANLIKE MANNER, TO CONFORM TO THE NATIONAL ELECTRICAL CODE, ARTICLE 725, FOR CLASS 1 SIGNAL SYSTEMS, EXCEPT AS OTHERWISE PERMITTED FOR LIMITED ENERGY CIRCUITS, AS DESCRIBED IN NFPA 72 – 1993 EDITION. WIRING INSTALLATION SHALL MEET ALL STATE AND LOCAL CODES.

10. CEILING DETECTORS SHALL BE FASTENED DIRECTLY TO CEILING AND SUPPORTED WITH APPROVED BAR BOX HANGER. CONDUITS SHALL BE HUNG FROM STRUCTURE WITH FLEXIBLE CONDUIT TO BAR BOX.

V – PORTABLE FIRE PROTECTION EQUIPMENT

1. PROVIDE ONE PORTABLE FIRE EXTINGUISHER APPROVED AND LABELED BY UL IN ACCORDANCE WITH THE NATIONAL FIRE CODE.

FIRE EXTINGUISHER SHALL BE CARBON DIOXIDE, MINIMUM 15 LB. CAPACITY WITH PRESSURE INDICATING GAUGE FOR CLASS A, CLASS B, AND CLASS C FIRES, UL RATING 10 B:C. PROVIDE STANDARD SURFACE-MOUNTED WALL BRACKET MOUNT NEAR DOOR.

CITY OF PORTLAND, MAINE – RESURGAM

Reviewed for Code Compliance
Inspections Division
Approved with Conditions

Date: 07/19/13

PORTLAND 2 ME

CONSTRUCTION DRAWINGS		
1	06/05/13	FOR SUBMITTAL
0	05/02/13	FOR SUBMITTAL
A	04/18/13	FOR COMMENT

Dewberry

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CHECKED BY:	PPB
PROJECT NUMBER:	50002925
JOB NUMBER:	50055368

SITE ADDRESS

202 WOODFORD STREET
PORTLAND, ME 04103

SHEET TITLE

FIRE SUPPRESSION SYSTEM SPECIFICATIONS

SHEET NUMBER

FS-2