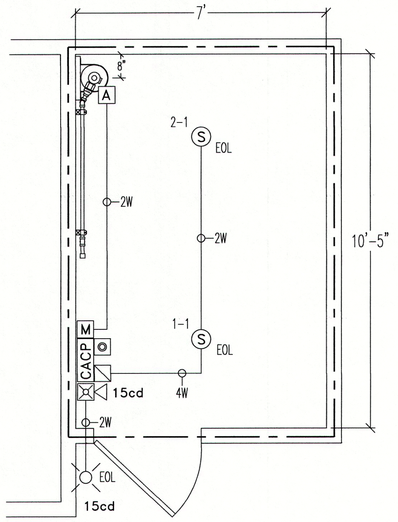
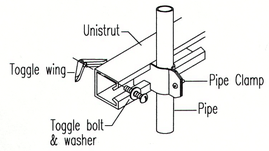


System Layout – Plan View

Scale: 1/2" = 1'-0"

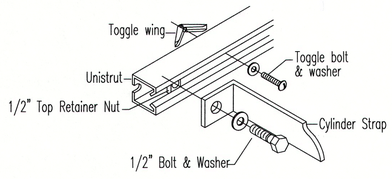
Legend:

- (6) CACP = Suppression Control Panel
- (13) M = Maintenance Bypass Switch
- (4) A = System Actuator
- (5) = Manual Release Station
- (9) = System Abort Station
- (8) S = Photoelectric Smoke Detector
- (10) = System Horn/Strobe
- (11) = Discharge Strobe



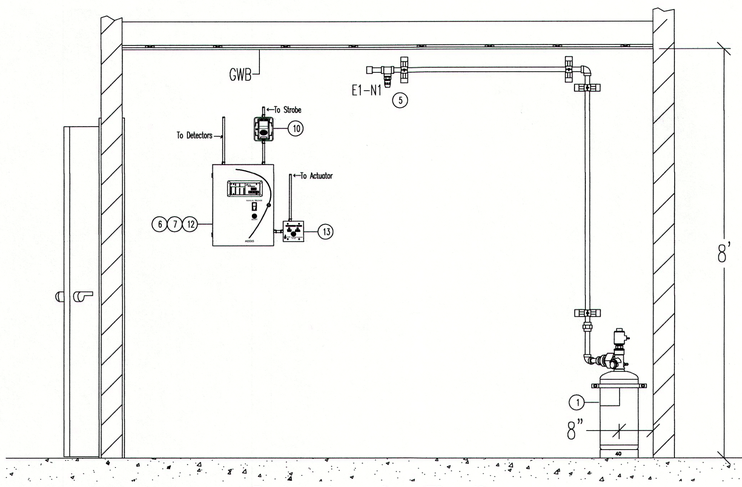
Pipe Mounting Detail

Not to Scale



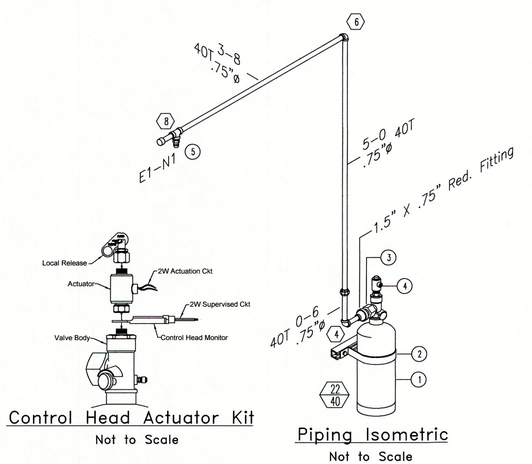
Cylinder Bracket Detail

Not to Scale



System Layout – Elevation

Scale: 1/2" = 1'-0"



Control Head Actuator Kit

Not to Scale

Piping Isometric

Not to Scale

IMPORTANT NOTE:

HILLER NEW ENGLAND FIRE PROTECTION IS NOT RESPONSIBLE FOR THE LOSS OF FM200 FIRE EXTINGUISHING AGENT DUE TO LEAKS IN THE PROTECTED AREA. PRIOR TO ACCEPTANCE, ALL HOLES AND CRACKS SHOULD BE CHECKED FOR TIGHTNESS. EMPTY CONDUITS MUST BE SEALED AND ALL DUCTS AND DAMPERS SHOULD BE TIGHT FITTING.

FM-200 PRESSURE VENTING CALCULATION:

SERVER ROOM:

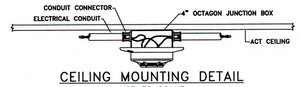
FM-200 CONCENTRATION:	7.0 %
DISCHARGE TIME:	10.0 SECONDS
TOTAL VOLUME:	583.5 cu. Ft.
RELATIVE HUMIDITY:	36 %
WALL STRENGTH:	5.0 lbs. / sq. Ft.
SAFETY FACTOR:	1.2
OUTFLOW VENT REQUIRED:	11.0 sq. in.
INFLOW VENT REQUIRED:	18.0 sq. in.

NOTES:

1. THE ABOVE CALCULATION IS BASED ON THE FSSA GUIDE TO ESTIMATING ENCLOSURE PRESSURE AND PRESSURE RELIEF VENT AREA FOR APPLICATIONS USING CLEAN AGENT FIRE EXTINGUISHING SYSTEMS (FSSA PRG - 01, 1ST EDITION; AUGUST 2008) AND WAS PERFORMED USING THE FSSA PRV ESTIMATOR PROGRAM VERSION 1.0.1.

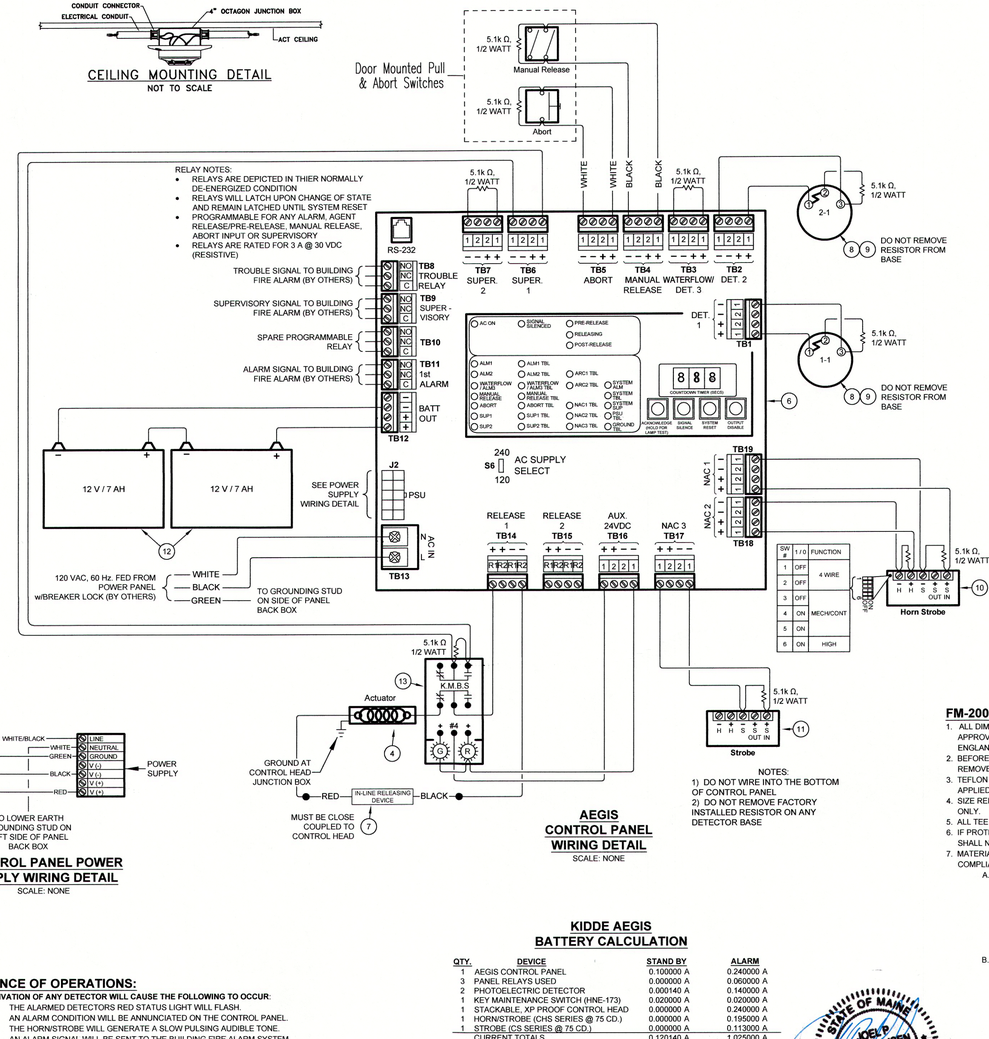
FM-200 QUANTITY CALCULATIONS:

HAZARD:	SERVER ROOM
DESIGN:	TOTAL FLOOD
VOLUME:	583.5 CF
CONCENTRATION:	7.0% @ 70°
MULTIPLICATION FACTOR:	.0341 LB/CF
QUANTITY REQUIRED:	583.5 CF X .0341 LB/CF = 19.9 LB
QUANTITY SUPPLIED:	22.0 LB



CEILING MOUNTING DETAIL

NOT TO SCALE



CONTROL PANEL POWER SUPPLY WIRING DETAIL

SCALE: NONE

AEGIS CONTROL PANEL WIRING DETAIL

SCALE: NONE

SEQUENCE OF OPERATIONS:

1. **ACTIVATION OF ANY DETECTOR WILL CAUSE THE FOLLOWING TO OCCUR:**
   - 1.1. THE ALARMED DETECTORS RED STATUS LIGHT WILL FLASH.
   - 1.2. AN ALARM CONDITION WILL BE ANNUNCIATED ON THE CONTROL PANEL.
   - 1.3. THE HORN/STROBE WILL GENERATE A SLOW PULSING AUDIBLE TONE.
   - 1.4. AN ALARM SIGNAL WILL BE SENT TO THE BUILDING FIRE ALARM SYSTEM.
2. **ACTIVATION OF A SECOND DETECTOR, NOT ON THE SAME DETECTION ZONE AS THE INITIAL ALARMED DETECTOR, WILL CAUSE THE FOLLOWING TO OCCUR:**
   - 2.1. THE ALARMED DETECTORS RED STATUS LIGHT WILL FLASH.
   - 2.2. A PRE-DISCHARGE CONDITION WILL BE ANNUNCIATED ON THE CONTROL PANEL.
   - 2.3. THE HORN/STROBE WILL GENERATE A FAST PULSING AUDIBLE TONE.
   - 2.4. THE HVAC SYSTEM WILL SHUTDOWN.
   - 2.5. THE PROGRAMMED 20 SECOND CONTROL PANEL TIME DELAY WILL BEGIN.
3. **UPON EXPIRATION OF THE CONTROL PANEL'S PROGRAMMED 20 SECOND TIME DELAY, THE FOLLOWING WILL OCCUR:**
   - 3.1. A DISCHARGE CONDITION WILL BE ANNUNCIATED ON THE CONTROL PANEL.
   - 3.2. THE HORN/STROBE WILL GENERATE A STEADY SOUNDING AUDIBLE TONE.
   - 3.3. THE STROBE LIGHT ABOVE THE ENTRANCE DOOR AND AT THE HORN/STROBE LOCATION WILL BEGIN TO OPERATE.
   - 3.4. THE SUPPRESSION SYSTEM WILL BEGIN TO DISCHARGE.
4. **ACTIVATION OF A SUPPRESSION SYSTEM MANUAL ELECTRIC RELEASE STATION WILL CAUSE THE FOLLOWING TO OCCUR:**
   - 4.1. THE ALARMED CONDITION WILL BE ANNUNCIATED ON THE CONTROL PANEL.
   - 4.2. THE HORN/STROBE WILL GENERATE A FAST PULSING AUDIBLE TONE.
   - 4.3. THE HVAC SYSTEM WILL SHUTDOWN.
   - 4.4. AN ALARM SIGNAL WILL BE SENT TO THE BUILDING FIRE ALARM SYSTEM.
   - 4.5. THE MANUAL RELEASE PROGRAMMED 10 SECOND CONTROL PANEL TIME DELAY WILL BEGIN.
   - 4.6. UPON EXPIRATION OF THE CONTROL PANEL'S MANUAL RELEASE PROGRAMMED 10 SECOND TIME DELAY, THE FOLLOWING WILL OCCUR:
     - 4.6.1. A DISCHARGE CONDITION WILL BE ANNUNCIATED ON THE CONTROL PANEL.
     - 4.6.2. THE HORN/STROBE WILL GENERATE A STEADY SOUNDING AUDIBLE TONE
     - 4.6.3. THE STROBE LIGHT ABOVE THE ENTRANCE DOOR AND AT THE HORN/STROBE LOCATION WILL BEGIN TO OPERATE.
     - 4.6.4. THE SUPPRESSION SYSTEM ASSOCIATED WITH THE ACTIVATED MANUAL ELECTRIC RELEASE WILL BEGIN TO DISCHARGE.

NOTES:

a. THE ABORT STATION CAN BE PUSHED AND HELD TO PREVENT THE SUPPRESSION SYSTEM FROM DISCHARGING UNTIL THE CONTROL PANEL CAN BE RESET. IF THE ABORT STATION IS RELEASED PRIOR TO THE RESETTING OF THE CONTROL PANEL, THE SUPPRESSION SYSTEM WILL DISCHARGE AFTER A 10 SECOND TIME DELAY.

b. THE SUPPRESSION SYSTEM MANUAL ELECTRIC RELEASE STATION WILL OVERRIDE THE ABORT STATION.

c. SHOULD A TROUBLE CONDITION OCCUR ON THE CONTROL PANEL, THE TROUBLE CONDITION WILL BE ANNUNCIATED ON THE CONTROL PANEL AND A TROUBLE SIGNAL WILL BE SENT TO THE BUILDING FIRE ALARM SYSTEM.

d. ACTIVATION OF THE KEY SWITCH WILL DISABLE THE SUPPRESSION SYSTEM, CAUSING A TROUBLE CONDITION AND A SUPERVISORY CONDITION ON THE CONTROL PANEL BUT MAINTAINING FULL DETECTION AND REPORTING CAPABILITIES.

e. CYLINDER PRESSURE OF 280 PSI OR LESS WILL CAUSE THE CYLINDER SUPERVISORY PRESSURE SWITCH TO ACTIVATE, CAUSING A SUPERVISORY CONDITION ON THE CONTROL PANEL

KIDDE AEGIS BATTERY CALCULATION

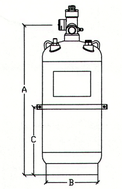
QTY.	DEVICE	STAND BY	ALARM
1	AEGIS CONTROL PANEL	0.100000 A	0.240000 A
3	PANEL RELAYS USED	0.000000 A	0.060000 A
2	PHOTOELECTRIC DETECTOR	0.000140 A	0.140000 A
1	KEY MAINTENANCE SWITCH (HNE-173)	0.020000 A	0.020000 A
1	STACKABLE, XP PROOF CONTROL HEAD	0.000000 A	0.240000 A
1	HORN/STROBE (CHS SERIES @ 75 CD.)	0.000000 A	0.195000 A
1	STROBE (CS SERIES @ 75 CD.)	0.000000 A	0.113000 A
	CURRENT TOTALS	0.120140 A	1.025000 A
	HOURS OF ALARM	x 24 HRS.	x 5 MIN.
	TOTAL AMP-HOURS	2.883360 A-H	0.085075 A-H
	STAND BY + ALARM	2.968435 A-H	
	BATTERY DERATING FACTOR	x 1.20	
	CURRENT REQUIRED	3.562122 A-H	
	CURRENT PROVIDED	7.000000 A-H	

WIRING NOTES

1. ALL WIRING SHALL BE IN ACCORDANCE WITH ARTICLE 760-16B OF THE NATIONAL ELECTRIC CODE (NFPA 70) UNLESS OTHERWISE SPECIFIED BY THE AUTHORITY HAVING JURISDICTION. ALL SUPERVISED CIRCUITS ARE CLASSIFIED AS POWER LIMITED.
2. ALL WIRING SHALL BE RUN IN THIN WALL STEEL TUBING USING METALLIC CABLE ON FLEXIBLE RUNS.
3. ALL WIRING, JUNCTION BOXES, CONDUIT, ETC. SHALL BE PROVIDED AND INSTALLED BY THE FIRE SUPPRESSION SYSTEMS ELECTRICAL CONTRACTOR.
4. THE FIRE SUPPRESSION SYSTEMS ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR MOUNTING AND MAKING FINAL CONNECTIONS TO ALL SUPPLIED DETECTORS, CONTROL PANELS, SIGNALING DEVICES, MANUAL STATIONS, ETC.
5. UNLESS OTHERWISE SPECIFIED, MINIMUM WIRE SIZES SHALL BE AS FOLLOWS:
   - NO. 18 GAUGE: DETECTION CIRCUITS
   - NO. 16 GAUGE: RELEASE AND ALARM CIRCUITS
   - NO. 12 GAUGE: AC POWER AND GROUND
6. NO PARALLEL BRANCHING OF WIRING ON SUPERVISED CIRCUITS IS PERMISSIBLE, UNLESS WHERE SHOWN AND POLARITY MUST BE OBSERVED.
7. ALL FIELD WIRING MUST BE CHECKED FOR SHORTS OR GROUNDS BEFORE CONNECTIONS ARE MADE TO THE CONTROL PANEL. DO NOT MEGGER THE WIRING.
8. SMOKE AND HEAT DETECTOR MINIMUM DISTANCE FROM A WALL IS 4" AND 3 FT. FROM ANY AIR REGISTER.
9. INPUT AND OUTPUT CIRCUIT WIRING SHALL NOT BE RUN IN THE SAME CONDUIT UNLESS SHIELDED FROM EACH OTHER. THE ONLY EXCEPTION IS THE MANUAL RELEASE INPUT CIRCUIT AND THE RELEASING DEVICE OUTPUT CIRCUIT WIRING CAN BE RUN TOGETHER IN THE SAME CONDUIT.
10. AC POWER WIRING SHALL NOT BE RUN IN THE SAME CONDUIT AS DC WIRING, UNLESS SHIELDED FROM EACH OTHER. THIS INCLUDES LOW VOLTAGE AC, i.e. HVAC CONTROLS AND SHUNT TRIP CIRCUITS.
11. THE AC POWER CIRCUIT FOR THE FIRE SUPPRESSION SYSTEM CONTROL PANEL SHALL BE A SEPARATE, DEDICATED CIRCUIT WITH A BREAKER LOCK. DO NOT CONNECT THIS CIRCUIT TO A SHUNT TRIP OPERATED CIRCUIT BREAKER PANEL OR USE IT TO POWER OTHER EQUIPMENT.
12. NO POWER, INCLUDING BATTERIES, SHALL BE APPLIED TO THE CONTROL PANEL UNTIL A HILLER NEW ENGLAND FIRE PROTECTION TECHNICIAN IS ON THE JOB SITE AND HAS CHECKED OUT THE WIRING TO THE CONTROL PANEL. IF UPON ARRIVAL TO THE JOB SITE, THE HILLER NEW ENGLAND FIRE PROTECTION TECHNICIAN FINDS THAT POWER IS, OR HAS BEEN APPLIED, HILLER NEW ENGLAND FIRE PROTECTION WILL ASSUME NO LIABILITY FOR THE MALFUNCTION OF, OR DAMAGE TO THE SYSTEM.
13. RELEASING DEVICES ARE TO BE WIRED WITH LIQUID TIGHT CABLE FROM A JUNCTION BOX MOUNTED ON THE WALL AS CLOSE AS POSSIBLE TO THE RELEASING DEVICE. DO NOT ATTACH THE RELEASING DEVICE TO THE SYSTEM AS A FALSE SYSTEM DISCHARGE COULD OCCUR.
14. IF THERE ARE ANY QUESTIONS IN REGARD TO THE WIRING OR THE EQUIPMENT, PLEASE CONTACT HILLER FIRE PROTECTION AT (978) 657-5550. IF ANY CHANGES ARE TO BE MADE THAT DEVIATE FROM THE PLANS, PLEASE CONTACT HILLER NEW ENGLAND FIRE PROTECTION PRIOR TO MAKING THOSE CHANGES.

EQUIPMENT LIST

EQUIPMENT SUPPLIER	ITEM #	ITEM DESCRIPTION	# OF ITEMS	PART NUMBER
KIDDE	1	40 lb. FM-200 CYLINDER; FILLED TO 22 lbs.	1	90 - 100040 - 001
	2	CYLINDER STRAP; 40 & 70 lb. FM-200 CYLINDERS	1	WK - 283934 - 000
	3	VALVE OUTLET ADAPTER, 1 1/2", 10, 20, 40, 70 & 125 lb. CYL'S		WK - 283904 - 000
	4	ELECTIC CONTROL HEAD ACTUATION KIT: ELECTRIC CONTROL HEAD, STACKABLE, 82 - 486500 - 010 CONTROL HEAD MONITOR, 85 - 100000 - 100 LEVEL OPERATED CONTROL HEAD, 870652 - 000	1	85 - 486500 - 010
	5	180° DISCHARGE NOZZLE; 3/4", 0.1342 ORIFICE	1	90 - 194014 - 144
	6	AEGIS SINGLE HAZARD CONTROL PANEL; w/ ABORT & PULL	1	84 - 732001 - 201
	7	IN-LINE RELEASING DEVICE	1	06 - 220023 - 001
	8	PHOTOELECTRIC SMOKE DETECTOR	2	711U
	9	6" DETECTOR BASE	2	701U
POTTER	10	CHS-24RR HORN/STROBE	1	4890126
	11	CS-24WRR STROBE	1	4890106
POWER SONIC	12	BATTERY; 12 VOLT, 7 A-H	2	PS - 1270
HILLER	13	KEY MAINTENANCE SWITCH; GEMCOM	1	HNE - 173
	14	NAME PLATE; CAUTION	1	HNE - 202
	15	NAME PLATE; CYLINDER (S)	1	HNE - 204
	16	NAME PLATE; MANUAL RELEASE	1	HNE - 200
	17	NAME PLATE; ABORT SWITCH	1	HNE - 201
	18	NAME PLATE; KEY SWITCH	1	HNE - 212
	19	NAME PLATE; HORN/STROBE (SLOW, FAST, STEADY)	1	HNE - 206
	20	NAME PLATE; DISCHARGE STROBE	1	HNE - 205



Cylinder Part #	Tank Fill (lbs.)	Outlet Size	Dim. A Nominal	Dim. B Diameter	Dim. C Height
90-100040-001	18 / 40	1 1/2" NPT	22.8	9.00	10.63

FM-200 PIPING INSTALLATION NOTES

1. ALL DIMENSIONS ARE TO BE FIELD CHECKED. IF PIPING SHOWN INTERFERES WITH ANY OBJECT, APPROVAL FOR CHANGES SHALL BE SECURED PRIOR TO INSTALLATION, WITH HILLER NEW ENGLAND FIRE PROTECTION.
2. BEFORE ASSEMBLY, PIPE IS TO BE REAMED, BLOWN CLEAR AND SWABBED WITH APPROPRIATE SOLVENT TO REMOVE MILL VARNISH AND CUTTING OIL.
3. TEFLON PIPE TAPE OR PIPE JOINT COMPOUND ARE ACCEPTABLE SEALANTS AND MUST BE APPLIED TO MALE THREADS ONLY.
4. SIZE REDUCTIONS MAY BE ACCOMPLISHED WITH THE USE OF CONCENTRIC BELL REDUCING COUPLINGS ONLY.
5. ALL TEE OUTLETS MUST BE HORIZONTAL AND PARALLEL WITH THE FLOOR.
6. IF PROTECTING MORE THAN ONE HAZARD; THE DISTANCE FROM ANY TWO TEES OR A TEE AND AN ELBOW SHALL NOT BE LESS THAN 15 PIPE DIAMETERS.
7. MATERIALS: ALL MATERIALS USED IN THE INSTALLATION OF THE FM-200 SYSTEM SHALL BE IN COMPLIANCE WITH ALL SECTIONS OF NFPA 2001; YEAR 2012 EDITION. THE FOLLOWING RESTRICTIONS APPLY:
   - A. PIPE AND FITTINGS:
     - i. THE DISTRIBUTION PIPING MUST BE CONSTRUCTED OF SCHEDULE 40 PIPING WITH CLASS 300 MALLEABLE IRON THREADED, VICTAULIC OR WELDED STEEL FITTINGS. ALL UNIONS MUST BE CLASS 300. ALL PIPING MUST BE BLACK OR GALVANIZED STEEL OF THE FOLLOWING TYPE AND GRADE: ASTM A-53 SEAMLESS GRADE B OR ASTM A-106 SEAMLESS GRADE B.
     - ii. UNACCEPTABLE MATERIALS ARE ASTM A-120, ASTM A-135, ASTM A-53 TYPE F WELDED PIPE OR ORDINARY CAST IRON PIPE OR FITTINGS.
   - B. HANGERS:
     - i. THE MAXIMUM SPACING BETWEEN HANGERS SHALL NOT EXCEED THOSE LISTED IN THE HANGER SPACING BELOW:

PIPE SIZE IN NPT	MAXIMUM SPACING BETWEEN HANGERS
1/4"	4' - 0"
1/2"	6' - 0"
3/4"	8' - 0"
1"	12' - 0"
1 1/4"	12' - 0"
1 1/2" OR LARGER	15' - 0"

     - ii. A HANGER SHOULD BE INSTALLED BETWEEN FITTINGS WHEN THE FITTINGS ARE MORE THAN 2' - 0" APART.
     - iii. A HANGER SHOULD BE INSTALLED AT A MAXIMUM OF 1' - 0" FROM ANY NOZZLE.
     - iv. THE HANGERS SHALL BE U.L. LISTED AND RIGIDLY SUPPORTED. NO CLEVIS HANGERS ARE ALLOWED.
   - C. BRACING:
     - i. SEISMIC BRACING SHALL BE PROVIDED IN THE ACCORDANCE WITH ALL APPLICABLE STATE AND LOCAL CODE REQUIREMENTS.

STATE OF MAINE
JOEL P. CORNELISSEN
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WEB SITE: www.hillerne.com

BENDETT & McHUGH

30 DANFORTH STREET PORTLAND, ME

KIDDE FM200 FIRE SUPPRESSION & DETECTION SYSTEM FOR THE SERVER ROOM

REVISIONS

NO.	DATE	BY	DESCRIPTION

DRAWN BY: dv
DATE: 7-19-17
CHK'D BY: JK
SIZE: D
NICET CERT #: 099721
LEVEL: IV
APPROVED:

D-0001-1
REV. #: 0
1 OF 1