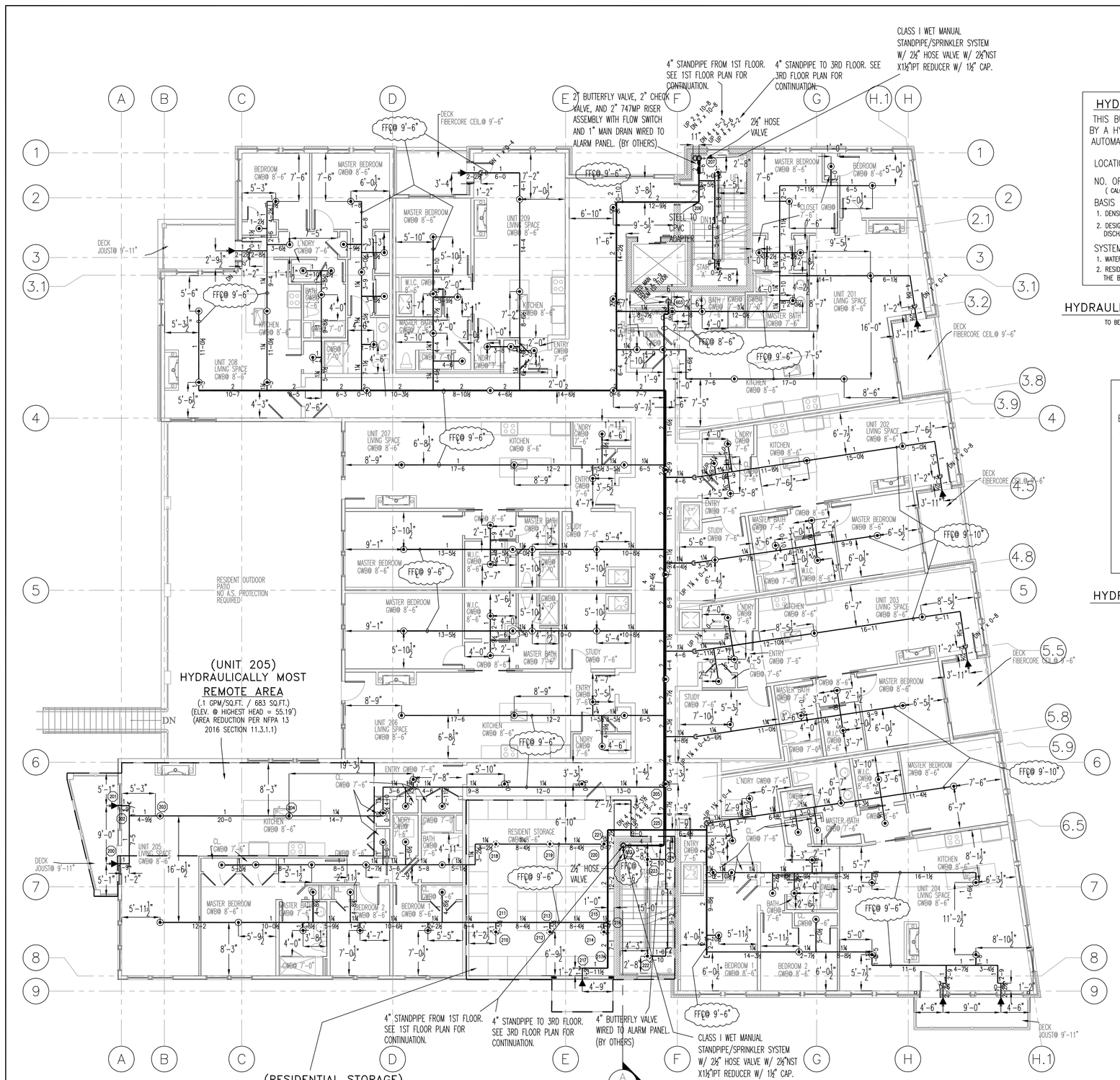


FIRE SPRINKLER PLAN – SECOND FLOOR

SCALE: 1/8"= 1'-0"
AREA PROTECTED: 14,897 SQ.FT.
FINISH FLOOR ELEVATION: 45.69'

HYDRAULIC–SYSTEM

THIS BUILDING IS PROTECTED BY A HYDRAULICALLY DESIGNED AUTOMATIC SPRINKLER SYSTEM.

LOCATION: UNIT 205

NO. OF SPRINKLERS: 4 (CALCULATED)

BASIS OF DESIGN:
1. DENSITY (GPM/SQ.FT.) .1
2. DESIGNED AREA OF DISCHARGE (sq.ft.) 4 HEADS

SYSTEM DEMAND:
1. WATER FLOW RATE (GPM) 83.6
2. RESIDUAL PRESSURE AT THE BASE OF THE RISER 80.118 (PSI)

HYDRAULIC DATA NAMEPLATE
TO BE MOUNTED AT SYSTEM RISER

HYDRAULIC–SYSTEM

THIS BUILDING IS PROTECTED BY A HYDRAULICALLY DESIGNED AUTOMATIC SPRINKLER SYSTEM.

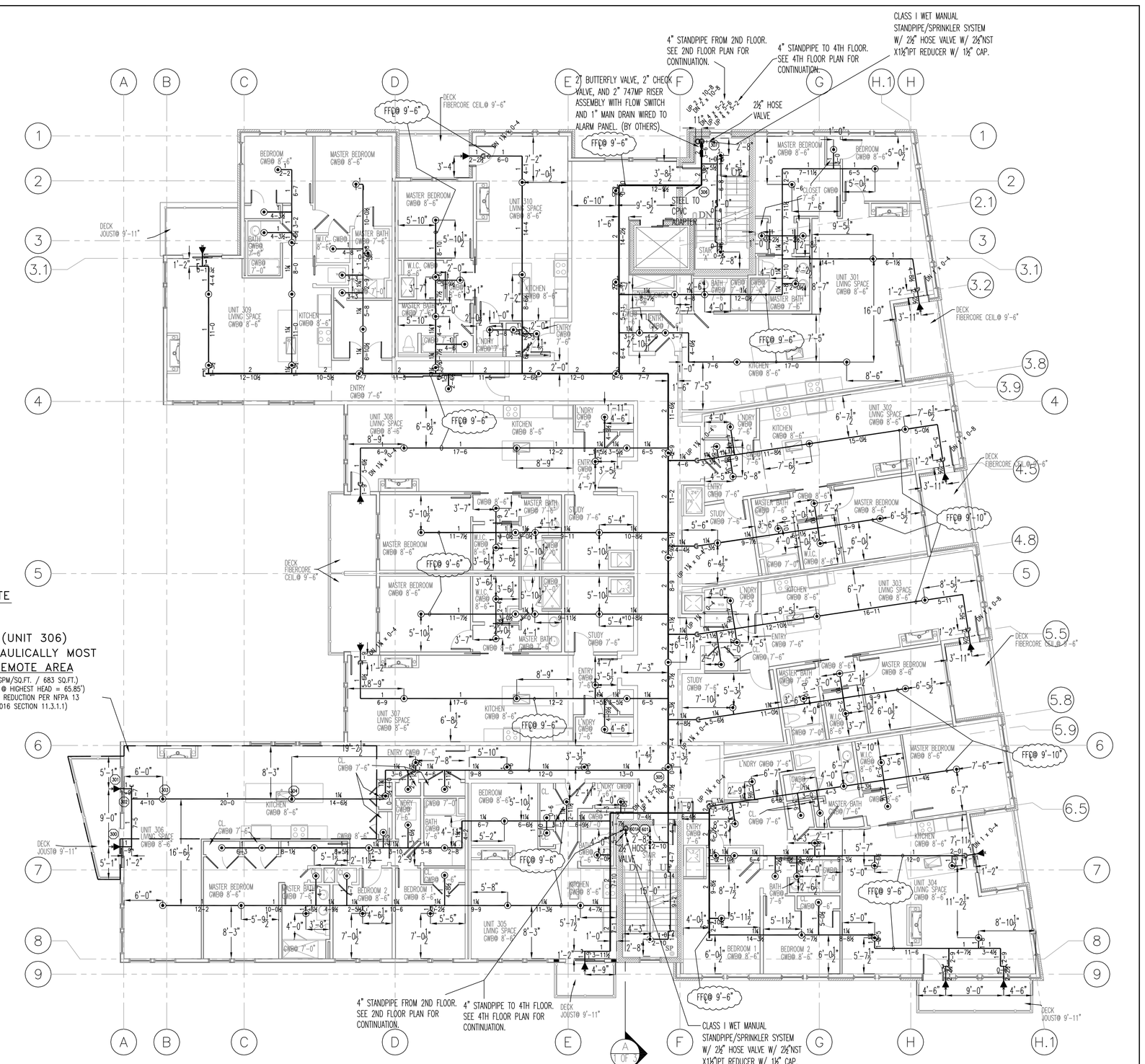
LOCATION: UNIT 306

NO. OF SPRINKLERS: 4 (CALCULATED)

BASIS OF DESIGN:
1. DENSITY (GPM/SQ.FT.) .1
2. DESIGNED AREA OF DISCHARGE (sq.ft.) 4 HEADS

SYSTEM DEMAND:
1. WATER FLOW RATE (GPM) 83.65
2. RESIDUAL PRESSURE AT THE BASE OF THE RISER 89.576 (PSI)

HYDRAULIC DATA NAMEPLATE
TO BE MOUNTED AT SYSTEM RISER



FIRE SPRINKLER PLAN – THIRD FLOOR

SCALE: 1/8"= 1'-0"
AREA PROTECTED: 14,989 SQ.FT.
FINISH FLOOR ELEVATION: 56.35'

Second Floor Sprinkler Head Schedule

Symbol	Count	Thread	K–Factor	Description	Note
⊙	134	1/2"	4.9	RELIABLE RFC49 SIN#RA0616 FAST RESPONSE 165° RESIDENTIAL CONCEALED PENDENT WITH WHITE COVER PLATE	on Drop
⊙	10	1/2"	5.6	RELIABLE G5–56 SIN#RA3415 QUICK RESPONSE 165° CONCEALED PENDENT WITH WHITE COVER PLATE	on Drop
◀	1	1"	5.6	RELIABLE F3QR SIN#R5734 200° DRY WHITE HORIZONTAL SIDEWALL	on Line
◀	9	1"	4.4	RELIABLE F3RS44 SIN#R5231 175° RESIDENTIAL DRY WHITE HORIZONTAL SIDEWALL	on Line
154 = Total Number of Heads This Floor					

Third Floor Sprinkler Head Schedule

Symbol	Count	Thread	K–Factor	Description	Note
⊙	141	1/2"	4.9	RELIABLE RFC49 SIN#RA0616 FAST RESPONSE 165° RESIDENTIAL CONCEALED PENDENT WITH WHITE COVER PLATE	on Drop
⊙	4	1/2"	5.6	RELIABLE G5–56 SIN#RA3415 QUICK RESPONSE 165° CONCEALED PENDENT WITH WHITE COVER PLATE	on Drop
◀	13	1"	4.4	RELIABLE F3RS44 SIN#R5231 175° RESIDENTIAL DRY WHITE HORIZONTAL SIDEWALL	on Line
158 = Total Number of Heads This Floor					

RELIABLE RFC49

RFC49 RESIDENTIAL CONCEALED PENDENT SPRINKLER DESIGN REQUIREMENTS

MODEL	COVERAGE AREA: MAX. SPACE BETWEEN SPRINKLERS	COVERAGE AREA: MAXIMUM LOCATION FROM WALL	MINIMUM DESIGN FLOW (PRESSURE)
			MINIMUM FLOW & PRESSURE FOR HORIZONTAL CEILING (MAX. 2" RISE FOR 12" RUN)
			155°/175°F/68°C
RFC49 LL CONCEALED PENDENT	12 x 12	6'(OR LESS)	13GPM(7.0psi)
	14 x 14	7'	13GPM(7.0psi)
	16 x 16	8'	13GPM(7.0psi)
	18 x 18	9'	17GPM(12.0psi)
	20 x 20	10'	20GPM(16.7psi)

K–FACTOR = 4.9 , ½" N.P.T.
MINIMUM SPACING 8'-0"
MAXIMUM HEAD SPACING FROM ANY WALL 10'-0"
MAXIMUM SPACING BETWEEN HEADS 20'-0"

CPVC INSTALLATION GUIDLINES

APPLYING CEMENT. SETTING AND CURE TIMES

PREPARE PIPE BY BEVELING OUTSIDE END 10° TO 15°, DEBURRING END AND WIPING AWAY EXCESS FILINGS. APPLY A HEAVY, EVEN COAT OF SOLVENT CEMENT TO THE OUTSIDE END OF THE PIPE, A MEDIUM COAT TO THE INSIDE OF THE FITTING SOCKET AND FOR PIPE SIZES LARGER THAN 1", APPLY A SECOND COAT TO THE END OF THE PIPE. BEVELING ALLOWS THE CEMENT TO REMAIN ON THE FITTING SOCKET INSIDE WALL.

A BEAD OF SOLVENT CEMENT SHOULD BE EVIDENT AROUND THE PIPE AND FITTING JUNCTURE. IF THIS BEAD IS NOT CONTINUOUS AROUND THE SOCKET SHOULDER, IT MAY INDICATE THAT INSUFFICIENT CEMENT WAS APPLIED.

WIPE OFF EXCESS CEMENT ON THE OUTSIDE OF THE JOINT. THE SOLVENTS WILL EVAPORATE, BUT THE SOLVENT CEMENT INSIDE THE FITTING WILL STAY THERE.

WARNING
AVOID APPLYING TOO MUCH CEMENT. DO NOT ALLOW THE CEMENT TO DRIP BEYOND THE BOTTOM OF FITTING SOCKET. EXCESSIVE CEMENT ON THE PIPE AND/OR FITTING CAN RESULT IN DECREASING THE OVERALL STRENGTH OF THE PIPE AND/OR FITTING AND MAY CAUSE CRACKS WHEN PRESSURE IS APPLIED. FAILURE TO COMPLY COULD RESULT IN PROPERTY DAMAGE DUE TO LEAKS.
SOLVENT CEMENT SET AND CURE TIMES ARE A FUNCTION OF PIPE SIZE, TEMPERATURE, RELATIVE HUMIDITY, AND TIGHTNESS OF FIT. DRYING TIME IS FASTER FOR DRIER ENVIRONMENTS, SMALLER PIPE SIZES, HIGH TEMPERATURES, AND TIGHTER FITS. THE ASSEMBLY MUST BE ALLOWED TO SET, WITHOUT ANY STRESS ON THE JOINT, FOR 1 TO 5 MINUTES, DEPENDING ON THE PIPE SIZE AND TEMPERATURE. FOLLOWING THE INITIAL SET PERIOD, THE ASSEMBLY CAN BE HANDLED CAREFULLY AVOIDING SIGNIFICANT STRESSES TO THE JOINT. REFER TO THE CURE TIME TABLES FOR MINIMUM CURE TIMES PRIOR TO PRESSURE TESTING.
STORE CEMENT IN A WARMER AREA WHEN NOT IN USE AND MAKE SURE THEY REMAIN FLUID. DO NOT ALLOW THE CEMENT TO FREEZE OR BECOME "JELLY-LIKE". GELLED CEMENT SHALL BE DISCARDED.

CURE TIMES WITH ONE STEP SOLVENT CEMENT
200 psi (MAXIMUM) TEST PRESSURE

PIPE SIZE inches	Ambient Temperature During Cure Period: 60°F to 120°F	40°F to 59°F	0°F to 39°F
3/4"	45 min.	1.5 hr.	24 hr.
1"	45 min.	1.5 hr.	24 hr.
1–1/4"	1.5 hr.	16 hr.	120 hr.
1–1/2"	1.5 hr.	16 hr.	120 hr.
2"	6 hr.	36 hr.	See Note 1
2–1/2"	8 hr.	72 hr.	See Note 1
3"	8 hr.	72 hr.	See Note 1

Note 1 *For these sizes, the solvent cement can be applied at temperatures below 40°F, however, the sprinkler system temperature must be raised to a temperature of 40°F or above and allowed to cure per the above recommendations prior to pressure testing.*

USE SPEARS BLUE 75 PIPE JOINT COMPOUND OR TEFLON TAPE ON ALL STEEL OR BRASS PIPE THREADS.

SPRINKLER HEADS SHALL BE INSTALLED ONLY AFTER ALL THE CPVC PIPE AND FITTINGS, INCLUDING THE SPRINKLER HEAD ADAPTERS, ARE SOLVENT WELDED TO THE PIPING AND ALLOWED TO CURE FOR A MINIMUM OF 30 MINUTES. SPRINKLER HEAD FITTINGS SHOULD BE VISUALLY INSPECTED AND PROBED WITH A WOODEN DOWEL TO INSURE THAT THE WATER WAY AND THREADS ARE CLEAR OF ANY EXCESS CEMENT.

IT IS AN UNACCEPTABLE PRACTICE TO THREAD THE SPRINKLER HEAD INTO THE ADAPTER FITTING PRIOR TO CEMENTING THE ADAPTER TO THE DROP.

ONCE AN INSTALLATION IS COMPLETED AND CURED, PER THE APPROPRIATE TABLE, THE SYSTEM SHOULD BE TESTED WITH WATER AT 200 PSI FOR 2 HOURS, OR AT 50 PSI IN EXCESS OF THE MAXIMUM PRESSURE WHEN THE MAXIMUM PRESSURE TO BE MAINTAINED IN THE SYSTEM IS IN EXCESS OF 150 PSI, IN ACCORDANCE WITH THE REQUIREMENTS ESTABLISHED BY NFPA 13. SPRINKLER SYSTEMS IN ONE AND TWO FAMILY DWELLINGS AND MOBILE HOMES MAY BE TESTED AT LINE PRESSURE IN ACCORDANCE WITH THE REQUIREMENTS ESTABLISHED BY NFPA 13D. WHEN PRESSURE TESTING, THE SPRINKLER SYSTEM SHALL BE FILLED WITH WATER AND AIR BLED FROM THE HIGHEST AND FARTHEST SPRINKLER HEAD BEFORE TEST PRESSURE IS APPLIED. AIR OR COMPRESSED GAS SHOULD NEVER BE USED FOR PRESSURE TESTING. IF A LEAK IS FOUND, THE FITTING MUST BE CUT OUT AND DISCARDED. A NEW SECTION CAN BE INSTALLED USING COUPLINGS OR A UNION. UNIONS SHOULD BE USED IN ACCESSIBLE AREA ONLY.
NOTES:
LISTINGS AND APPROVALS DO NOT COVER ANY PAINTED CPVC FIRE SPRINKLER PRODUCTS. WATER-BASED ACRYLIC LATEX PAINT IS THE PREFERRED AND RECOMMENDED PAINT TO BE USED ON FLAMEGUARD CPVC PIPE AND FITTINGS. OIL OR SOLVENT-BASED PAINTS MAY BE CHEMICALLY INCOMPATIBLE WITH FLAMEGUARD CPVC.

TEFLON THREAD TAPE IS THE RECOMMENDED SEALANT FOR THREADED CONNECTIONS TO CPVC FIRE SPRINKLER PRODUCTS. WHEN USING SPEARS BLUE 75 THREAD SEALANT, IT SHOULD BE APPLIED TO MALE THREADS ONLY.

FIRESTOP SYSTEMS SUCH AS HILTI FS-ONE HAVE BEEN FOUND TO BE COMPATIBLE WITH CPVC FIRE SPRINKLER PRODUCTS. A LIST OF THESE FIRESTOP SYSTEMS CAN BE FOUND ALONG WITH APPROVED THREAD SEALANTS ON-LINE AT WWW.BLAZEMASTER.COM. USE ONLY THOSE PRODUCTS THAT HAVE BEEN APPROVED.
WWW.SPEARSMFG.COM/FLAMEGUARD/FGAPL-7

GROOVED COUPLING ADAPTERS ARE DESIGNED FOR USE WITH FLEXIBLE COUPLINGS. THE USE OF RIGID STYLE COUPLINGS WILL DAMAGE THE COUPLING ADAPTERS.

① HAND INSTALL UNTIL SNUG
② WITH WRENCH ON SPRINKLER HEAD ROTATE HEAD CLOCKWISE UNTIL FRAME IS PROPERLY ALIGNED. BRASS INSERT AND HEAD WILL ROTATE TOGETHER
③ NEVER REVERSE OR BACKUP THREADED ASSEMBLY.

NOTE: BACKUP WRENCH MAY BE APPLIED TO BRASS INSERT FLATS ONLY FOR REMOVAL OF SPRINKLER HEAD.

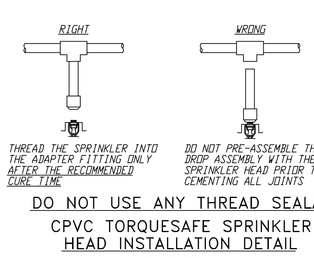
REVIEW DO'S AND DON'TS

DO'S

- MAKE CERTAIN THAT THREAD SEALANTS, GASKET LUBRICANTS, OR FIRE STOP MATERIALS ARE COMPATIBLE WITH CPVC
- KEEP PIPE AND FITTINGS IN ORIGINAL PACKAGING UNTIL NEEDED
- COVER PIPE AND FITTINGS WITH AN OPAQUE TARP IF STORED OUTDOORS
- USE TOOL SPECIFIC FOR USE WITH PLASTIC PIPE AND FITTINGS
- USE PROPER SOLVENT CEMENT AND FOLLOW APPLICATION INSTRUCTIONS
- CUT THE PIPE ENDS SQUARE
- DEBURR AND BEVEL THE PIPE END WITH A CHAMFERING TOOL.
- ROTATE THE PIPE A 1/4 TURN WHEN BOTTOMING PIPE IN FITTING SOCKET
- AVOID PUDDLING OF CEMENT IN FITTINGS AND PIPE
- MAKE CERTAIN NO SOLVENT IS ON SPRINKLER HEADS AND ADAPTER THREADS
- MAKE CERTAIN THAT SOLVENT CEMENT DOES NOT RUN AND PLUG THE SPRINKLER HEAD ORIFICE.
- FILL LINES SLOWLY AND BLEED AIR FROM THE SYSTEM PRIOR TO FLUSHING AND PRESSURE TESTING
- SUPPORT SPRINKLER HEAD PROPERLY TO PREVENT LIFT UP OF THE HEAD THROUGH THE CEILING WHEN ACTIVATED.
- KEEP THREADED ROD WITHIN 1/16" OF THE PIPE TO USE AS OF THE HEAD THROUGH THE CEILING WHEN ACTIVATED.
- INSTALL SPEARS FLAMEGUARD CPVC FIRE SPRINKLER PRODUCTS IN WET SYSTEMS ONLY.
- USE GLYCERIN AND WATER SOLUTIONS FOR FREEZE PROTECTION
- ALLOW FOR MOVEMENT DUE TO EXPANSION AND CONTRACTION.

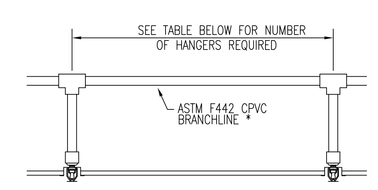
DON'TS

- DO NOT USE EDIBLE OILS SUCH AS CRISCO AS A GASKET LUBRICANT.
- DO NOT USE PETROLEUM OR SOLVENT-BASED SEALANTS, LUBRICANTS OR FIRE STOP MATERIALS.
- DO NOT USE ANY GLYCOL-BASED SOLUTIONS AS AN ANTI-FREEZE.
- DO NOT USE SOLVENT THAT EXCEEDS ITS SHELF LIFE OR HAS DISCOLORED OR JELLIED.
- DO NOT ALLOW SOLVENT TO PLUG THE SPRINKLER HEAD ORIFICE.
- DO NOT CONNECT RIGID METAL COUPLERS TO CPVC GROOVED ADAPTERS
- DO NOT THREAD, GROOVE, OR DRILL CPVC PIPE
- DO NOT USE SOLVENT CEMENT NEAR SOURCES OF HEAT, OPEN FLAME OR WHEN SMOKING.
- DO NOT PRESSURE TEST WITH AIR.
- DO NOT USE RATCHET CUTTERS BELOW 50°F
- DO NOT USE CPVP PIPE THAT HAS BEEN STORED OUTDOORS, UNPROTECTED AND IS FADED IN COLOR.
- DO NOT ALLOW THREADED ROD TO COME IN CONTACT WITH PIPE.
- DO NOT INSTALL SPEARS FLAMEGUARD CPVC FIRE SPRINKLER PRODUCTS IN COLD WEATHER WITHOUT ALLOWING FOR EXPANSION.



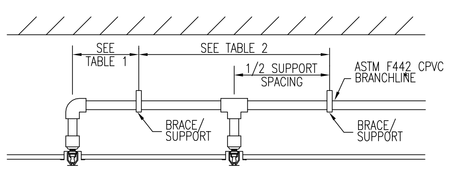
DO NOT USE ANY THREAD SEALANT

CPVC TORQUESAFE SPRINKLER HEAD INSTALLATION DETAIL
NOT TO SCALE



MINIMUM ALLOWABLE HANGERS PER LENGTH OF PIPE	PIPE LENGTH: 1 HANGER	2 HANGERS	3 HANGERS
3/4"	0'-0" TO 5'-6"	5'-7" TO 11'-0"	11'-1" TO 16'-6"
1"	0'-0" TO 6'-0"	6'-1" TO 12'-0"	12'-1" TO 18'-0"
1 1/4"	0'-0" TO 6'-6"	6'-7" TO 13'-0"	13'-1" TO 19'-6"
1 1/2"	0'-0" TO 7'-0"	7'-1" TO 14'-0"	14'-1" TO 21'-0"
2"	0'-0" TO 8'-0"	8'-1" TO 16'-0"	16'-1" TO 24'-0"
2 1/2"	0'-0" TO 9'-0"	9'-1" TO 18'-0"	18'-1" TO 27'-0"
3"	0'-0" TO 10'-0"	10'-1" TO 20'-0"	20'-1" TO 30'-0"

NATIONAL SANITATION FOUNDATION (NSF) APPROVED FOR USE WITH POTABLE WATER



CPVC PIPE INSTALLATION DETAIL
NOT TO SCALE

TABLE 1 MAXIMUM SUPPORT SPACING DISTANCE END LINE SPRINKLER HEAD DROP ELBOW: PIPE SIZE	SYSTEM PRESSURE < 100 psi	> 100 psi
3/4"	9'	6'
1"	12"	9"
1 1/4"	16"	12"
1 1/2" – 3"	24"	12'

TABLE 2 MAXIMUM SUPPORT SPACING DISTANCE INLINE SPRINKLER HEAD DROP TEE: PIPE SIZE	SYSTEM PRESSURE < 100 psi	> 100 psi
3/4"	4'	3'
1"	5'	4'
1 1/4"	6'	5'
1 1/2" – 3"	7'	7'

CPVC HANGER INSTALLATION DETAIL
NOT TO SCALE

GENERAL NOTES	DATE	REVISIONS
SPRINKLER SYSTEM INSTALLATION TO COMPLY WITH NFPA PAMPHLET # 13 (2016)		
BRANCH LINE (1") PIPING TO BE BLACK SCHEDULE 40 JOINED BY THREADED DUCTILE IRON FITTINGS		
MAIN & LINE PIPING (1¼"-4") TO BE SCHEDULE # 10 BLACK WITH GROOVED ENDS & WELDED OUTLETS JOINED BY MECHANICAL COUPLINGS		
ALL CONCEALED PIPING ON 2ND, 3RD, & 4TH FLOORS (1"-2") TO BE CPVC PLASTIC PIPE JOINED WITH PLASTIC GLUED FITTINGS (C=150).		
OWNER TO PROVIDE SUFFICIENT HEAT THROUGHOUT BUILDING TO PREVENT FREEZING OF WATER FILLED SPRINKLER PIPING AND EQUIPMENT. (MIN 40° F)		

REQUIRED APPROVALS	
OWNER / ARCHITECT	
STATE FIRE MARSHAL	
PORTLAND FIRE DEPT.	
DRAWN BY	EWM
NICET LEVEL	CERT.#
CHECKED BY	GRD
NICET LEVEL III	CERT.# 090388
CONTRACTOR LICENSE #	101
CONTRACTOR RMS #	291

62 INDIA ST.
PORTLAND, ME.

CONTRACT WITH: LANDRY FRENCH CONST.

EASTERN FIRE PROTECTION
AUBURN/LEWISTON INDUSTRIAL AIRPARK, AUBURN, MAINE 04210

FIRE SPRINKLER PLANS & DETAILS
DWG. NO. 3 OF 3
JOB NUMBER 5583–SP–17
SCALE AS NOTED
DATE 6/9/17