



Reviewed for Fire Code Compliance  
 Leslie Jackson  
04/18/2024 9:33:08 AM

# Application for Plan Review

Application # \_\_\_\_\_ - \_\_\_\_\_

Date Received: \_\_\_\_\_ Received By: \_\_\_\_\_

Name of Project: Jumiper Villiage Building 300

Physical Address of Project: 1208 North Main Street

Lillington, NC 27546

Plans Submitted By: Wayne Automatic Fire Sprinkler

Project Phone: ( 704 )- 782 - 3032

Contact Person/Address: Donald Hawkins

222 Capitol Court

Ocoee, Florida 34761

Contact Email: dhawkins@waynefire.com

Contact Phone: ( 407 )- 877 - 5514 ( 407 )- 547 - 9103

Contractor's Name/Info: Wayne Automatic Fire Sprinklers

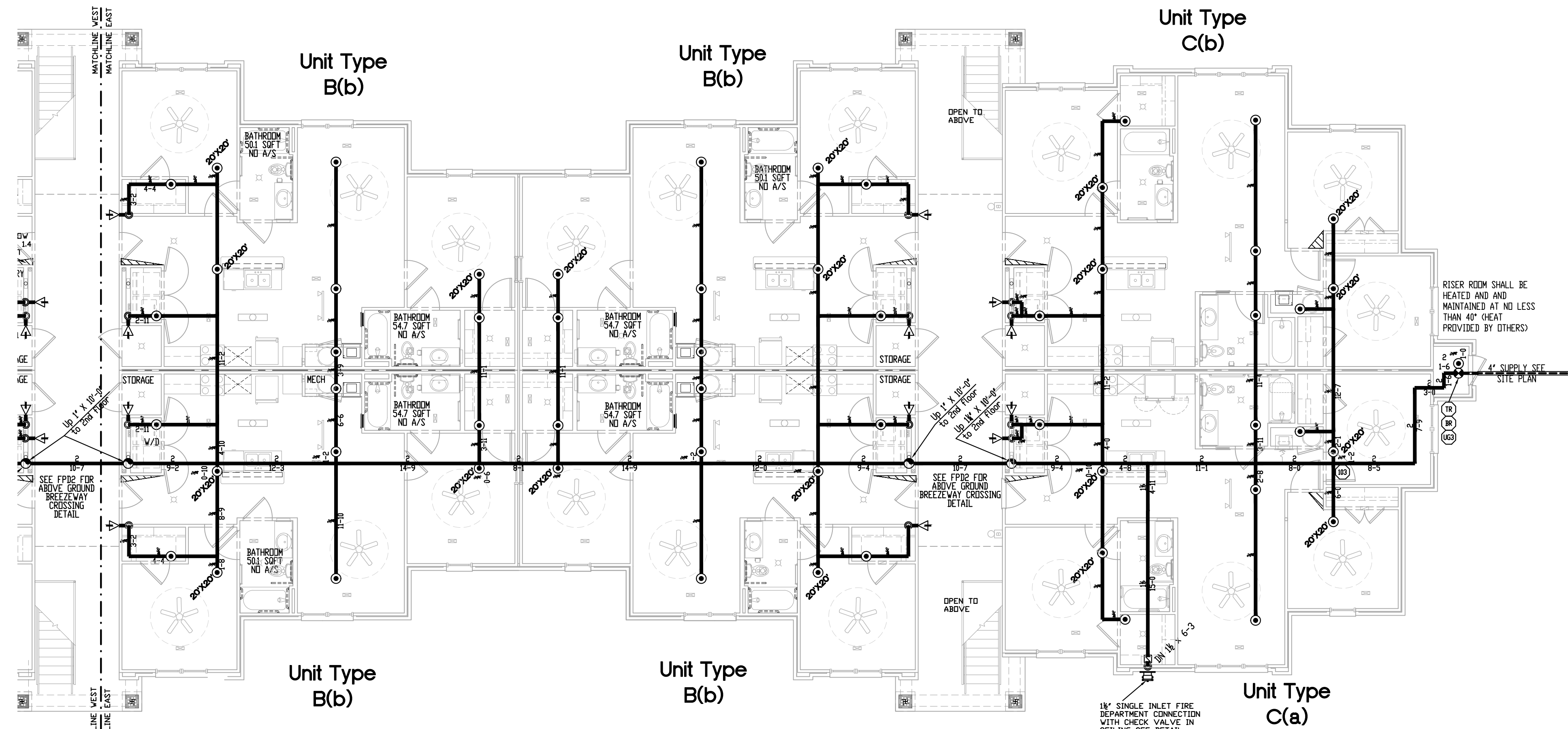
4370 Motorsport Drive

Concord, NC 29027-8977

Contractor's Phone: ( 704 )- 782 - 8977

- Plans that are submitted will be reviewed as quickly as possible with an average time of review between 7-10 working days.
- Status checks may be conducted on plan reviews by visiting the website <http://hteweb.harnett.org/Click2GovBP/Index.jsp> or by calling the Harnett County Central Permitting Office (910-893-7525, Option #2), or the Harnett County Fire Marshal's Office (910-893-7580).
- Approved plans must be picked up from the Central Permitting Office and all fees paid before any required inspections can be conducted.

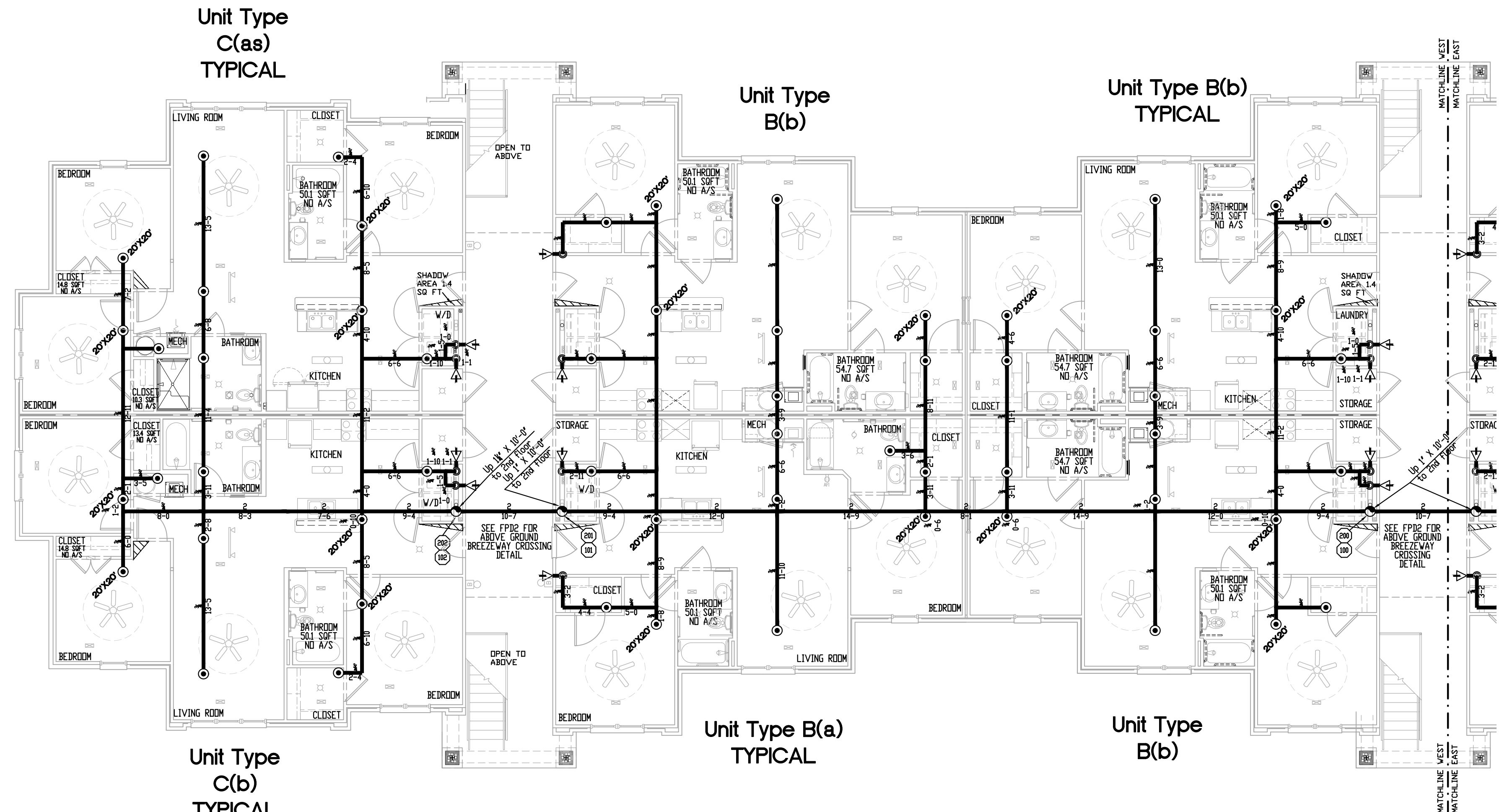




## BUILDING 300 - 1ST FLOOR FIRE SPRINKLER LAYOUT (EAST)

15,237 Sq Ft

SCALE 1/8" = 1'-0"

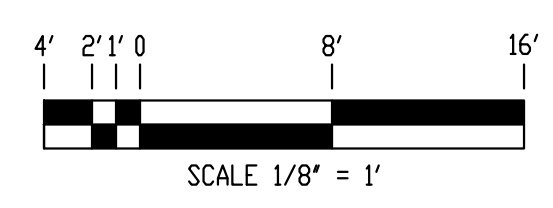


## BUILDING 300 - 1ST FLOOR FIRE SPRINKLER LAYOUT (WEST)

15,237 Sq Ft

SCALE 1/8" = 1'-0"

- NOTE:
- FOR FIRE SPRINKLER RISER DETAIL SEE SHEET FP3.
  - PIPE LENGTHS FOR TYPICAL UNITS AND UNITS WITHOUT HYDRAULIC CALCULATION POINTS HAVE BEEN OMITTED FOR CLARITY.
  - A 1 HOUR FIRE WALL IS PROVIDED BY OTHERS BETWEEN DWELLING UNITS.
  - CEILING IN UNITS ARE 8'-0" AFF. UNLESS NOTED OTHERWISE.
  - THE RISER ROOM SHALL BE HEATED AND MAINTAINED AT NO LESS THAN 40° HEAT IS TO BE PROVIDED BY OTHERS.
  - HORIZONTAL SIDEWALL SPRINKLERS ON THE TOP FLOOR ARE SUPPLIED BY AN 3' x 8'-3" SECTION OF CPVC PIPE.



Christopher A. Williams  
Professional Engineer  
North Carolina License # 29745

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**IMPORTANT OWNER INFORMATION**  
THIS DRAWING IS BASED ON THE OWNER'S ACCEPTANCE OF THE CURRENTLY ADOPTED EDITIONS OF THE LOCAL CODES OF ORDINANCES AND ALL APPLICABLE REGULATIONS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR THE RESPONSIBILITY FOR PROVIDING MAINTENANCE AND REPAIRS TO THE SYSTEMS SHOWN ON THIS DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESPONSIBILITY FOR PROVIDING MAINTENANCE AND REPAIRS TO THE SYSTEMS SHOWN ON THIS DRAWING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESPONSIBILITY FOR PROVIDING MAINTENANCE AND REPAIRS TO THE SYSTEMS SHOWN ON THIS DRAWING.

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**CPVC COMPATIBILITY NOTICE**  
CPVC FIRE SPRINKLER PIPING SYSTEMS HAVE BEEN SUCCESSFULLY USED IN RESIDENTIAL UNITS IN NEW CONSTRUCTION. CPVC AND CPVC COMPATIBLE PRODUCTS ARE AVAILABLE FROM A LIMITED NUMBER OF MANUFACTURERS. CPVC COMPATIBLE PRODUCTS ARE AVAILABLE FROM A LIMITED NUMBER OF MANUFACTURERS. CPVC COMPATIBLE PRODUCTS ARE AVAILABLE FROM A LIMITED NUMBER OF MANUFACTURERS. CPVC COMPATIBLE PRODUCTS ARE AVAILABLE FROM A LIMITED NUMBER OF MANUFACTURERS.

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**GRAPHICS ELEMENTS NOTE**  
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**WATER SUPPLY INFORMATION**

TEST	ACTUAL	DESIGN OR ESTIMATED AS REVISED BY A.U.D.	TEST	ACTUAL	DESIGN OR ESTIMATED AS REVISED BY A.U.D.
STATIC PRESSURE	80	-	HYDRANT ELEV.	163	(3'-0")
RESIDUAL PRESSURE	68	-	DATE OF TEST	3-28-2024	-
FLOW IN GPM	1060	-	TYPE OF TEST	RESIDUAL	-
PITOT READING	40	-	NUMBER OF PORTS FLOWED	1	-

TEST PROVIDED BY: Lillington Fire Department  
HYDRANT LOCATION: Parker Lane and North Main Street - Hydrant #224

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**DESIGN CRITERIA**

DESIGN AREA #	HAZARD CLASS	TYPE OF SPINKLER IN DESIGN AREA	MINIMUM DENSITY	DESIGN AREA SF.	PST REQ'D @ BASIN	GPM REQ'D @ BASIN	PST REQ'D @ TEST	ELEVATION @ HIGHEST SPINKLER	HOSE, INCHES/OUTSIDE	DOMESTIC BEHIND
-	-	-	-	-	-	-	-	-	-	-

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**SPRINKLERS SPACING**

SYMBOL	MAXIMUM	MINIMUM	COMMENTS
⊙	18' x 18' UNID	8'	8'-0" MAX SPACING OFF WALLS UNID DEFLECTOR TO BE INSTALLED 1" - 4" BELOW CEILING.
⊗	225 SQ FT	8'	8'-0" MAX SPACING OFF WALLS UNID DEFLECTOR TO BE INSTALLED 1" - 4" BELOW CEILING.
⊙	16' x 16' UNID	8'	8'-0" MAX SPACING OFF WALLS UNID DEFLECTOR TO BE INSTALLED 1" - 4" BELOW CEILING.
⊗	196 SQ FT	8'	8'-0" MAX SPACING OFF WALLS UNID DEFLECTOR TO BE INSTALLED 1" - 4" BELOW CEILING.

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**SPRINKLERS**

SYMB	QTY	1ST	2ND	3RD	4TH	SIN	SIZE	K	TEMP	MODEL
⊙	114	112	-	-	-	R3516	1/2"	49	175°	RELIABLE MODEL F1 R49 WHITE RESIDENTIAL PENDENT WITH WHITE SEMI-RECESSED ESCUTCHEON
⊗	6	-	-	-	-	V3506	1"	56	200°	VICTORIAN MODEL V3506 WHITE QUICK RESPONSE BAY FLEXIBLE PENDENT SPRINKLER WITH WHITE ESCUTCHEON
⊙	24	24	24	-	-	R3531	1/2"	44	175°	RELIABLE MODEL F1 R44 WHITE RESIDENTIAL HORIZ. SIDEWALL WITH WHITE SEMI-RECESSED ESCUTCHEON
⊗	24	24	24	-	-	R5714	1"	56	200°	RELIABLE MODEL F30R WHITE QUICK RESPONSE 30" HORIZONTAL SIDEWALL SPRINKLER WITH WHITE SLEEVE AND SKIRT ESCUTCHEON, 12" LONG
	138	142	142	-	-					TOTAL PER FLOOR
	422									TOTAL THIS BUILDING

---

DATE	SUBMITTALS	BY
3-16-2021	QA Review	DH
2-1-2023	Permit	DH

---

NO.	DATE	REVISIONS	BY
1	XX/XX/XX	-	-

---

**Wayne Automatic Fire Sprinklers, Inc.**  
MAIN OFFICE - ORLANDO, FLORIDA  
222 CAPITOL COURT, ORLANDO, FLORIDA 32781  
PHONE: (407) 858-3030 FAX: (407) 858-8088

---

<p>JACKSONVILLE, FL 3808 CENTER PALM DRIVE JACKSONVILLE, FL 32216-2276 PHONE: (904) 328-3272 FAX: (904) 328-0724</p>	<p>TAMPA, FL 3808 CENTER PALM DRIVE TAMPA, FL 33613-2277 PHONE: (813) 830-3272 FAX: (813) 830-0382</p>	<p>ORLANDO, FL 3808 CENTER PALM DRIVE ORLANDO, FL 32716-2276 PHONE: (407) 858-3030 FAX: (407) 858-8088</p>
<p>FT. MYERS, FL 4825 LINDSEY AVE. FT. MYERS, FL 33907-4824 PHONE: (888) 428-2827 FAX: (888) 428-2827</p>	<p>CONCORD, NC 4825 LINDSEY AVE. CONCORD, NC 28027-4827 PHONE: (704) 788-2827 FAX: (704) 788-2827</p>	<p>STATE LICENSES NC SPRINKLER DESIGN NC ALARM DESIGN BY LV NC SPRINKLER IN NC ALARM 3005</p>

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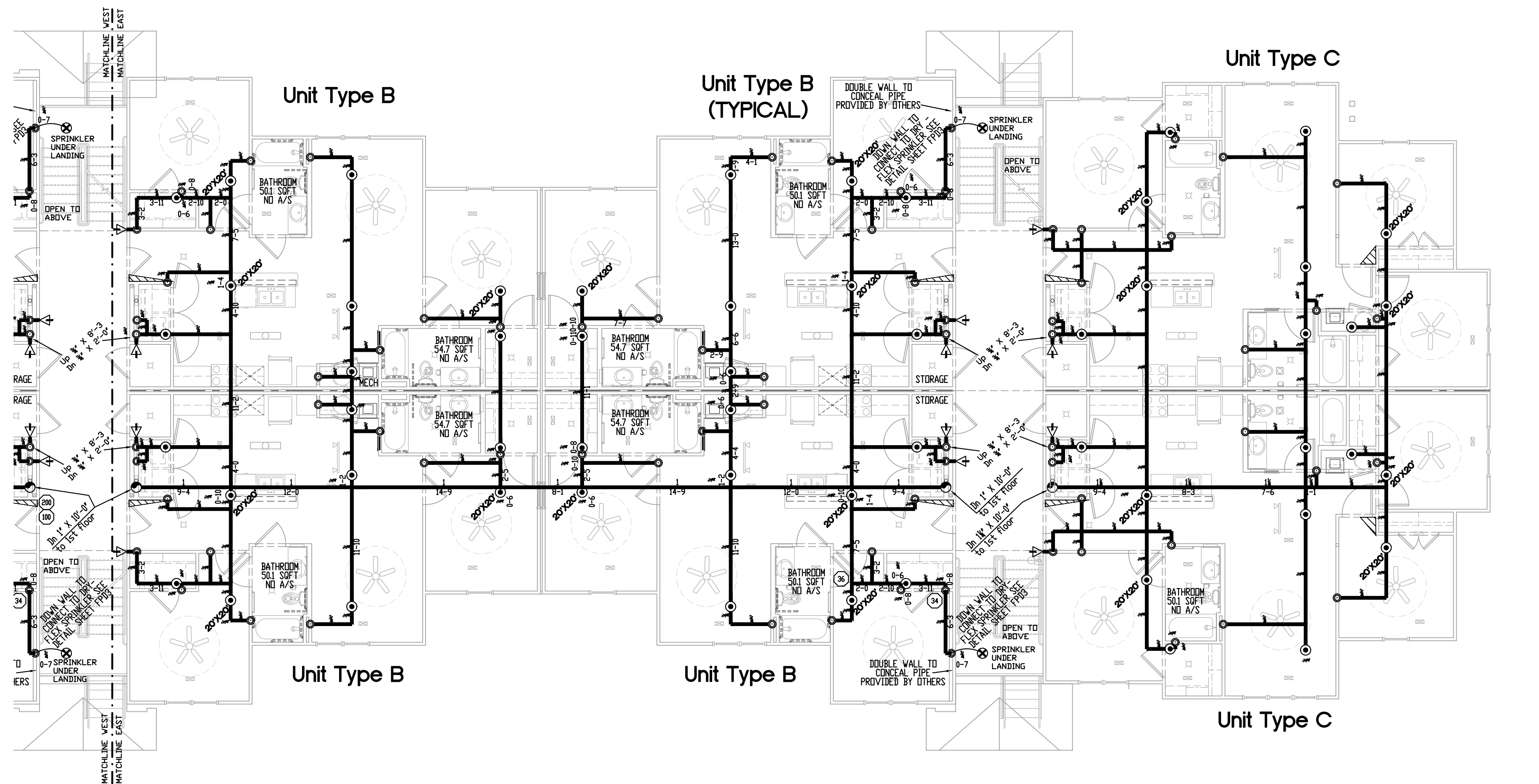
**JUNIPER VILLAGE**  
PARKER LANE  
LILLINGTON, NORTH CAROLINA

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Wynnefield Properties  
5614 Riverdale Road  
Jamestown, NC 27282

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SHEET TITLE: Building 300 1st Floor Fire Sprinkler Plan  
DRAWN BY: Donald Hawkins  
TOTAL A/S: 938  
DATE: 3-5-2021  
CONTRACT #: 102001  
CENTER OF TILE JOINT:  YES  NO CENTER ON FIXTURES JOINT:  YES  NO  
SHEET # **FP3.1** CONSTRUCTION TYPE: V-B OCCUPANCY: R-2

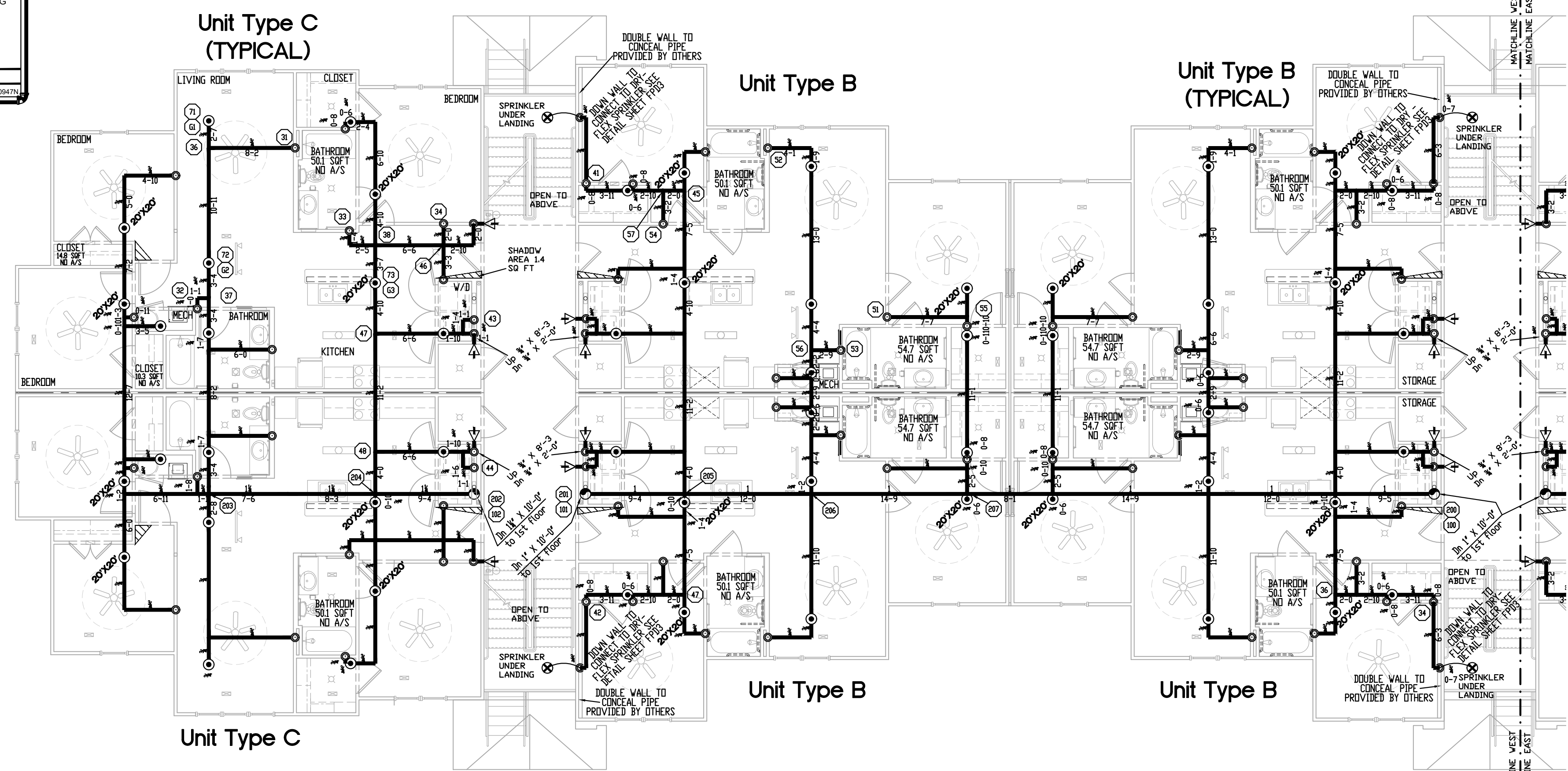


## BUILDING 300 - 2nd FLOOR FIRE SPRINKLER LAYOUT (EAST)

14,732 Sq Ft

SCALE 1/8" = 1'-0"

<b>WAYNE</b> Automatic Fire Sprinklers, Inc.	
DESIGN AREA 3.4 2nd FLOOR UNIT C COMMON AREA COMPARTMENT DESIGN PER NFPA 13R, SECTION 7.1.1	
G1 16' W X 16' SPACING 16 GPM @ 13.3 PSI	G2 16' W X 16' SPACING 16 GPM @ 13.3
G3 20' X 20' SPACING 20 GPM @ 16.7	
DENSITY: 0.5 DOMESTIC DEMAND - 147 GPM	



## BUILDING 300 - 2nd FLOOR FIRE SPRINKLER LAYOUT (WEST)

14,732 Sq Ft

SCALE 1/8" = 1'-0"

**Christopher A. Williams**  
Professional Engineer  
North Carolina License # 29745

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**IMPORTANT OWNER INFORMATION**  
THIS DRAWING IS BASED ON THE OWNER'S ACCEPTANCE OF THE CONTRACT ADMINISTERED UNDER THE STATE OF NORTH CAROLINA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROVISION OF ALL MATERIALS AND LABOR AND THE MAINTENANCE OF THE SYSTEM. PLEASE CONTACT THE NEAREST OFFICE OF WAYNE AUTOMATIC FIRE SPRINKLERS, INC.

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**CPVC COMPATIBILITY NOTICE**  
CPVC FIRE SPRINKLER SYSTEMS HAVE BEEN USED SUCCESSFULLY FOR MORE THAN 25 YEARS IN NEW CONSTRUCTION. CPVC AND CPVC FITTINGS ARE COMPATIBLE WITH ALL CPVC PIPE AND FITTINGS. CPVC CAN BE JOINED WITH CHLORAL HYDRATE IN THE CONSTRUCTION INDUSTRY. CPVC SHALL BE USED IN ALL CPVC SYSTEMS. CPVC SHALL BE USED IN ALL CPVC SYSTEMS. CPVC SHALL BE USED IN ALL CPVC SYSTEMS. CPVC SHALL BE USED IN ALL CPVC SYSTEMS.

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**GRAPHICS ELEMENTS NOTE**  
THE GRAPHICS ELEMENTS SHOWN ON THIS DRAWING ARE THE PROPERTY OF WAYNE AUTOMATIC FIRE SPRINKLERS, INC. THE ARCHITECTURAL, CIVIL, STRUCTURAL, OR MECHANICAL ENGINEER OR ARCHITECT SHALL BE RESPONSIBLE FOR THE CORRECTNESS OF THE GRAPHICS ELEMENTS SHOWN ON THIS DRAWING. THE ARCHITECTURAL, CIVIL, STRUCTURAL, OR MECHANICAL ENGINEER OR ARCHITECT SHALL BE RESPONSIBLE FOR THE CORRECTNESS OF THE GRAPHICS ELEMENTS SHOWN ON THIS DRAWING.

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WATER SUPPLY INFORMATION			
ACTUAL	DESIGN OR ESTIMATED	TEST	TEST
STATIC PRESSURE	80	HYDRANT ELEV.	163 (3'-0")
RESIDUAL PRESSURE	68	DATE OF TEST	3-26-2024
FLOW IN GPM	1060	TYPE OF TEST	3-20' AM
PITOT READING	40	NUMBER OF PORTS FLOWED	1

TEST PROVIDED BY: Lillington Fire Department  
HYDRANT LOCATION: Parker Lane and North Main Street - Hydrant #224

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DESIGN CRITERIA	
DESIGN AREA #	DA 3.4
HAZARD CLASS	NFPA 13R
# OF SPRINKLERS IN DESIGN AREA	3
MINIMUM DENSITY	0.5
DESIGN AREA SF.	3 Sprinklers
PSI REQ'D @ BASE	45.8
GPM REQ'D @ BASE	30.5
PSI REQ'D @ TEST	57.7
GPM REQ'D @ TEST	197.1
ELEVATION @ HIGHEST SPRINKLER	27'-6" AFF
HEAD: INDOOR/OUTDOOR	
DOMESTIC DEMAND	147

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SPRINKLERS SPACING			
SYMBOL	MAXIMUM	MINIMUM	COMMENTS
⊙	18' x 18' UNID	8' BETWEEN SPRINKLERS	8'-0" MAX SPACING OFF WALLS UNID DEFLECTOR TO BE INSTALLED 1'-0" BELOW CEILING.
⊗	225 SQ FT	8' BETWEEN SPRINKLERS	8'-0" MAX SPACING OFF WALLS UNID DEFLECTOR TO BE INSTALLED 1'-0" BELOW CEILING.
⊠	16' x 16' UNID	8' BETWEEN SPRINKLERS	8'-0" MAX SPACING OFF WALLS UNID DEFLECTOR TO BE INSTALLED 1'-0" BELOW CEILING.
⊡	196 SQ FT	8' BETWEEN SPRINKLERS	8'-0" MAX SPACING OFF WALLS UNID DEFLECTOR TO BE INSTALLED 1'-0" BELOW CEILING.

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QUANTITY - SPRINKLERS						
SYMB	1ST	2ND	3RD	4TH	SIN	TEMP/MODEL
⊙	114	112	-	-	R3516 1/2"	49 175' RELIABLE MODEL F1 R49 49 WHITE RESIDENTIAL PENDENT WITH WHITE SEMI-RECESSED ESCUTCHEON
⊗	-	6	-	-	V3506 1"	56 200' VICTORIAN MODEL V3506 WHITE QUICK RESPONSE BAY FLEXIBLE PENDENT SPRINKLER WITH WHITE ESCUTCHEON
⊠	-	-	118	-	R3531 1/2"	44 175' RELIABLE MODEL F1 R44 44 WHITE RESIDENTIAL HORIZ. SIDEWALL WITH WHITE SEMI-RECESSED ESCUTCHEON
⊡	24	24	24	-	R5714 1"	56 200' RELIABLE MODEL F306 WHITE QUICK RESPONSE BAY HORIZONTAL SIDEWALL SPRINKLER WITH WHITE SLEEVE AND SKIRT ESCUTCHEON 12" LONG
	138	142	142	-		TOTAL PER FLOOR
						422 TOTAL THIS BUILDING

---

DATE	SUBMITTALS	BY
3-16-2021	QA Review	DH
2-1-2023	Permit	DH

---

NO.	DATE	REVISIONS	BY
1	XX/XX/XX		

---

**Automatic Fire Sprinklers, Inc.**

**MAIN OFFICE - ORLANDO, FLORIDA**  
222 CAPITOL COURT, ORLANDO, FLORIDA 32781  
PHONE: (407) 858-3030 FAX: (407) 858-8028

JACKSONVILLE, FL 3800 UNIVERSITY BLVD. SUITE 100 JACKSONVILLE, FL 32216-2277 PHONE: (904) 380-3242 FAX: (904) 380-0242	TAMPA, FL 3800 UNIVERSITY BLVD. SUITE 100 TAMPA, FL 33613-2277 PHONE: (813) 850-3242 FAX: (813) 850-0242	ORLANDO, FL 3800 UNIVERSITY BLVD. SUITE 100 ORLANDO, FL 32716-2277 PHONE: (407) 858-3030 FAX: (407) 858-8028
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**JUNIPER VILLAGE**  
PARKER LANE  
LILLINGTON, NORTH CAROLINA

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Wynfield Properties  
5614 Riverdale Road  
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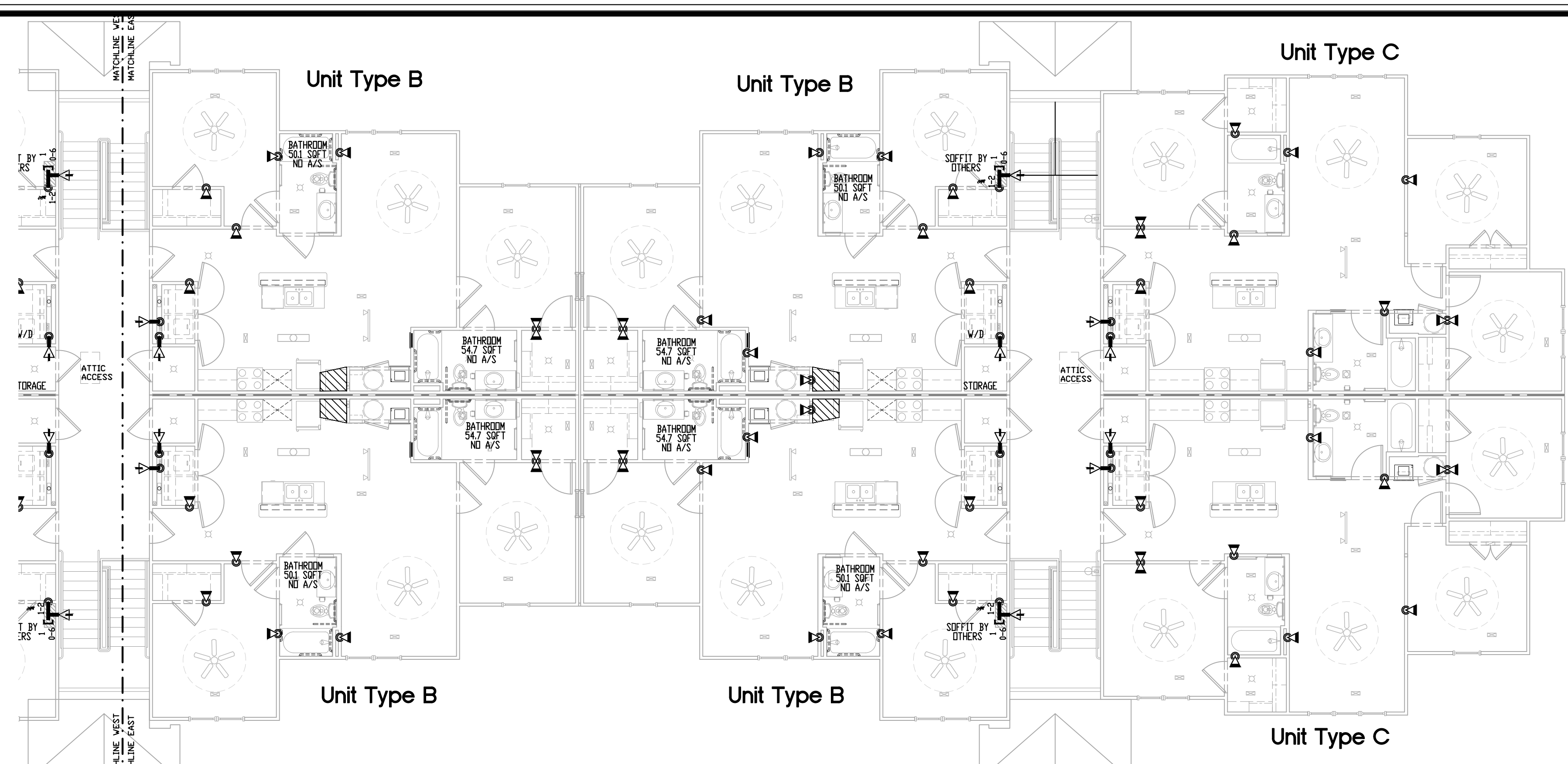
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SHEET TITLE: Building 300 2nd Floor Fire Sprinkler Plan	CONTRACT # 102001
DRAWN BY: Donald Hawkins	CENTER OF TITLE: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
TOTAL A/S: 938	CENTER ON FIXTURES: <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
DATE: 3-5-2021	CONSTRUCTION TYPE: V-B
DATE: 3-5-2021	OCCUPANCY: R-2

FP3.2

NOTE:

- FOR FIRE SPRINKLER RISER DETAIL SEE SHEET FP03.
- PIPE LENGTHS FOR TYPICAL UNITS AND UNITS WITHOUT HYDRAULIC CALCULATION POINTS HAVE BEEN OMITTED FOR CLARITY.
- A 1 HOUR FIRE WALL IS PROVIDED BY OTHERS BETWEEN DWELLING UNITS.
- CEILING IN UNITS ARE 8'-0" AFF UNLESS NOTED OTHERWISE.
- THE RISER ROOM SHALL BE HEATED AND MAINTAINED AT NO LESS THAN 40°.
- GREAT IS TO BE PROVIDED BY OTHERS.
- HORIZONTAL SIDEWALL SPRINKLERS ON THE TOP FLOOR ARE SUPPLIED BY AN 1/2" X 8'-3" SECTION OF CPVC PIPE.



**BUILDING 300 - 3rd FLOOR FIRE SPRINKLER LAYOUT (EAST)**  
 14,746 Sq Ft SCALE 1/8" = 1'-0"

UNIT B and C	
TOTAL FIXTURE LOAD PER ITEM	
NUMBER OF ITEMS	
BATH GROUPS W/ FLUSH TANK	2 6 12
BATH TUB OR SHOWER STALL	- 2 0
KITCHEN SINKS	1 2 2
LAVATORY	- 1 0
WATER CLOSET W/ FLUSH TANK	- 3 0
DISHWASHERS	1 1 1
WASHING MACHINES	1 2 2
TOTAL FIXTURE LOAD PER UNIT	17

	UNIT B	UNIT C
TOTAL FIXTURE LOAD PER UNIT	17	17
TOTAL UNITS PER BUILDING	24	12
TOTAL LOAD UNITS PER UNIT	408	204
TOTAL UNIT DEMAND PER BUILDING	612	
TOTAL DOMESTIC DEMAND PER BLDG IN GPM	147	
INTERPOLATION USED		

TABLES A.9.6 (a)/(b) DOMESTIC DEMAND  
 SCALE: NONE  
 0033N

**W.A.C.E.T. Inc.**  
 Christopher A. Williams  
 Licensed Professional Engineer  
 North Carolina License # 29745

**IMPORTANT OWNER INFORMATION**  
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**WATER SUPPLY INFORMATION**

STATIC PRESSURE	ACTUAL	DESIGN	TEST
RESIDUAL PRESSURE	80	80	80
FLOW IN GPM	1060	1060	1060
PITOT READING	40	40	40

TEST PROVIDED BY: Lillington Fire Department  
 HYDRANT LOCATION: Parker Lane and North Main Street - Hydrant #224

**DESIGN CRITERIA**

DESIGN AREA #	BA 3.1	BA 3.2	BA 3.3
HAZARD CLASS	NFPA 13R	NFPA 13R	NFPA 13R
# OF SPRINKLERS IN DESIGN AREA	4	4	4
MINIMUM DENSITY	.05	.10	.05
DESIGN AREA SF.	4 Sprinklers	4 Sprinklers	4 Sprinklers
PSI REQ'D @ 150°F	60.5	37.7	58.4
GPM REQ'D @ 150°F	65.9	62.3	71.2
PSI REQ'D @ TEST	72.1	49.3	69.8
GPM REQ'D @ TEST	212.8	209.3	218.2
ELEVATION @ HIGHEST SPRINKLER	27'-6" AFF	27'-6" AFF	27'-6" AFF
HEAD: INSIDE/OUTSIDE	147	147	147
DOMESTIC DEMAND	147	147	147

**SPRINKLERS SPACING**

SYMBOL	MAXIMUM	MINIMUM	COMMENTS
⊙	18" x 18" UND	8" BETWEEN SPRINKLERS	8" MAX SPACING OFF WALLS UNLESS DEFLECTOR TO BE INSTALLED 1" - 4" BELOW DEFLECTOR
⊗	225 SQ FT	7" BETWEEN SPRINKLERS	7" MAX SPACING OFF WALLS UNLESS DEFLECTOR TO BE INSTALLED 1" - 12" BELOW CEILING
⊙	16" x 16" UND	8" BETWEEN SPRINKLERS	8" MAX SPACING OFF WALLS UNLESS DEFLECTOR TO BE INSTALLED 1" - 12" BELOW CEILING
⊗	196 SQ FT	7" BETWEEN SPRINKLERS	7" MAX SPACING OFF WALLS UNLESS DEFLECTOR TO BE INSTALLED 1" - 6" BELOW CEILING

**SPRINKLERS**

SYMB	1ST	2ND	3RD	4TH	SIN	SIZE	K	TEMP	MODEL	
⊙	114	112	-	-	R3516	1 1/2"	49	175°	RELIABLE MODEL FT 89 WHITE RESIDENTIAL PENDENT WITH WHITE SEMI-RECESSED ESCUTCHEON	
⊗	-	6	-	-	V3506	1"	56	200°	VICTORIAN MODEL V3506 WHITE QUICK RESPONSE BIFLEXIBLE PENDENT SPRINKLER WITH WHITE ESCUTCHEON	
⊙	-	-	118	-	R3531	1 1/2"	44	175°	RELIABLE MODEL FT 89 WHITE RESIDENTIAL HORIZ. SIDEWALL WITH WHITE SEMI-RECESSED ESCUTCHEON	
⊗	24	24	24	-	R5714	1"	56	200°	RELIABLE MODEL FOR WHITE QUICK RESPONSE BIFLEXIBLE SIDEWALL SPRINKLER WITH WHITE SLEEVE AND SKIRT ESCUTCHEON 12" LONG	
	138	142	142	-					TOTAL PER FLOOR	
										422
										TOTAL THIS BUILDING

**DATE**      **SUBMITTALS**      **BY**

3-16-2021	QA Review	DH
2-1-2023	Permit	DH

**NO.**      **DATE**      **REVISIONS**      **BY**

1	XX/XX/XX		
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**W.A.C.E.T. Inc.**  
 Automatic Fire Sprinklers, Inc.  
 MAIN OFFICE - ORLANDO, FLORIDA  
 222 CAPITOL COURT, ORLANDO, FLORIDA 32781  
 PHONE: (407) 858-3030 FAX: (407) 858-8088

JACKSONVILLE, FL      TAMPA, FL      GERRITTS BEACH, FL  
 3808 LORRY PALM DRIVE      4025 METRO DRIVE      4025 METRO DRIVE  
 JACKSONVILLE, FL 32209-2746      TAMPA, FL 33607-0207      GERRITTS BEACH, FL 32146  
 PHONE: (904) 328-3274      PHONE: (813) 830-0208      PHONE: (904) 871-4624  
 FAX: (904) 328-0282      FAX: (813) 830-0282      FAX: (904) 871-4624

FT. MYERS, FL      CONCORD, NC      STATE LICENSE  
 4025 METRO DRIVE      4025 METRO DRIVE      NC SPRINKLER DIVISION  
 FT. MYERS, FL 33907-4804      CONCORD, NC 28027-6877      NC ALARM 8808 OF LV  
 PHONE: (888) 422-2022      PHONE: (704) 788-8888      1C ALARM 3005  
 FAX: (888) 422-2022      FAX: (704) 788-8888

**JUNIPER VILLAGE**  
 PARKER LANE  
 LILLINGTON, NORTH CAROLINA

Wynnefield Properties  
 5614 Riverdale Road  
 Jamestown, NC 27282

**SHEET TITLE:** Building 300 3rd Floor Fire Sprinkler Plan  
**DRAWN BY:** Donald Hawkins  
**TOTAL A/S:** 938  
**DATE:** 3-5-2021  
**CONTRACT #:** 102001  
**CENTER OF TILE JOINT:**  YES  NO **CENTER ON FIXTURES:**  YES  NO  
**SHEET #:** FP3.3 **CONSTRUCTION TYPE:** V-B  
**OCCUPANCY:** R-2

**DESIGN AREA 3.1**  
 3rd FLOOR UNIT C COMMON AREA  
 COMPARTMENT DESIGN PER NFPA 13R,  
 SECTION 7.1.1

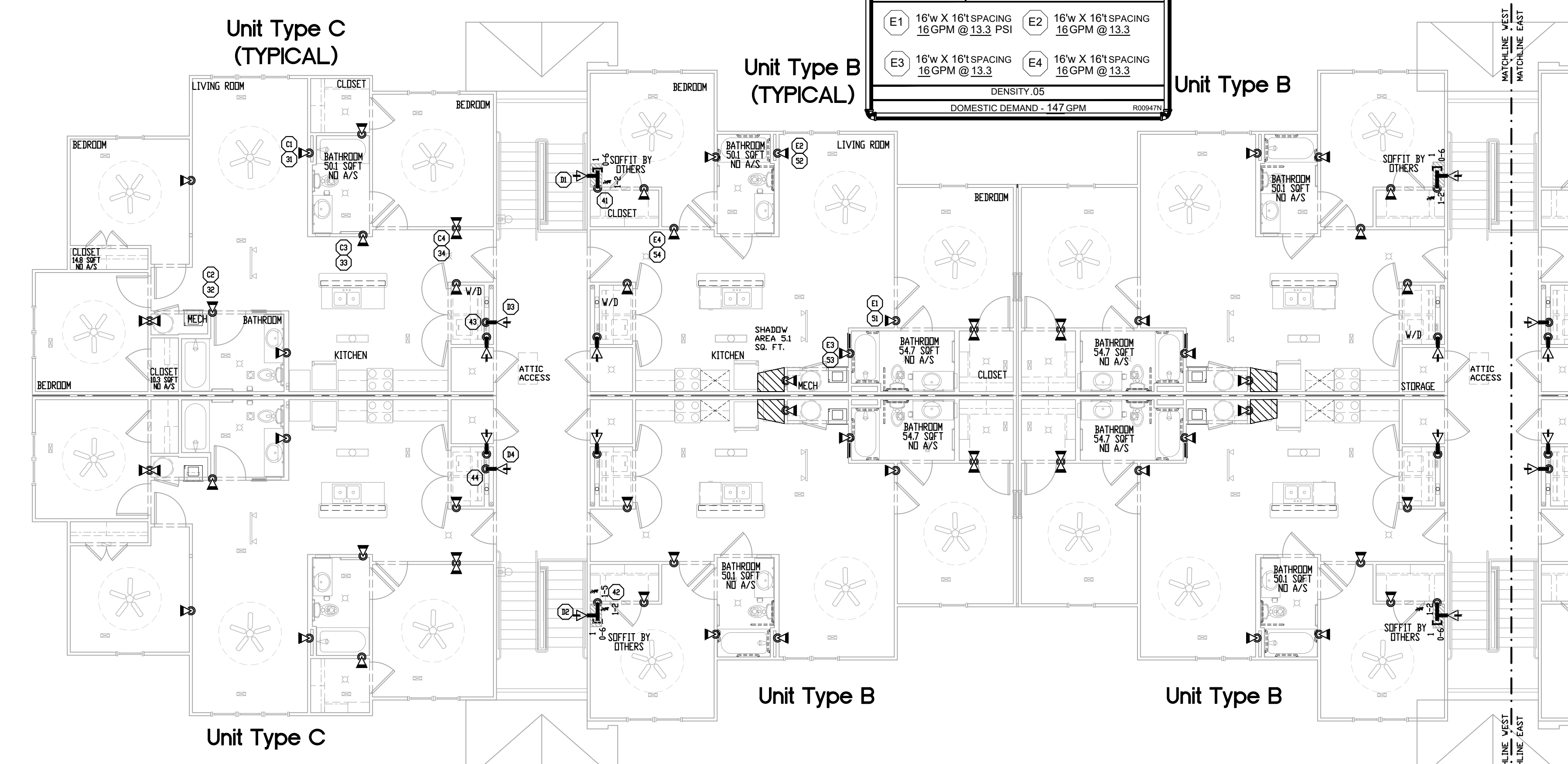
C1	16'W X 16' SPACING 16GPM @ 13.3 PSI	C2	16'W X 16' SPACING 16GPM @ 13.3
C3	16'W X 16' SPACING 16GPM @ 13.3	C4	16'W X 16' SPACING 16GPM @ 13.3

DENSITY: .05  
 DOMESTIC DEMAND - 147 GPM

**DESIGN AREA 3.2**  
 3rd FLOOR OUTSIDE DWELLING UNIT  
 DESIGN PER NFPA 13R,  
 SECTION 7.2

D1	122 FT <sup>2</sup> .10 DENSITY @ 7 PSI	D2	122 FT <sup>2</sup> .10 DENSITY @ 7 PSI
D3	122 FT <sup>2</sup> .10 DENSITY @ 7 PSI	D4	122 FT <sup>2</sup> .10 DENSITY @ 7 PSI

DENSITY: .10  
 DOMESTIC DEMAND - 147 GPM



**BUILDING 300 - 3rd FLOOR FIRE SPRINKLER LAYOUT (WEST)**  
 14,746 Sq Ft SCALE 1/8" = 1'-0"

**NOTE:**

- FOR FIRE SPRINKLER RISER DETAIL SEE SHEET FP03.
- PIPE LENGTHS FOR TYPICAL UNITS AND UNITS WITHOUT HYDRAULIC CALCULATION POINTS HAVE BEEN OMITTED FOR CLARITY.
- A 1 HOUR FIRE WALL IS PROVIDED BY OTHERS BETWEEN DWELLING UNITS.
- CEILING IN UNITS ARE 8'-0" AFF UNLESS NOTED OTHERWISE.
- THE RISER ROOM SHALL BE HEATED AND MAINTAINED AT NO LESS THAN 40°.
- GREAT IS TO BE PROVIDED BY OTHERS.
- HORIZONTAL SIDEWALL SPRINKLERS ON THE TOP FLOOR ARE SUPPLIED BY AN 1/2" X 8'-3" SECTION OF CPVC PIPE.

DESIGN AND INSTALLATION TO BE IN ACCORDANCE WITH 2013 EDITION OF NFPA 13R AND 2013 EDITION OF NFPA 13 WHERE DESIGNATED BY NFPA 13R.

DESIGN AND INSTALLATION TO BE IN ACCORDANCE WITH ALL APPLICABLE LOCAL AND STATE CODES.

ALL PIPE AND FITTINGS USED ON THIS PROJECT TO BE IN ACCORDANCE WITH APPLICABLE CODES AND WAFS STANDARDS. SEE PIPE AND FITTINGS GENERAL NOTES (WAFS DETAIL #00599N).

ALL HANGERS SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 13 AND THEIR LISTING.

ALL SEISMIC BRACING, IF REQUIRED, SHALL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH NFPA 13 AND THEIR LISTING.

ALL PENETRATIONS THROUGH RATED BUILDING ASSEMBLIES SHALL BE SEALED WITH FIRE CAULK IN ACCORDANCE WITH DETAILS PROVIDED. WAFS POLICY IS TO USE HILTI FS ONE OR STI LC.

UNDERGROUND MAINS AND LEAD-INS SHALL BE FLUSHED AND SIGNED TEST CERTIFICATES PROVIDED BEFORE A CONNECTION IS MADE TO THE SPRINKLER SYSTEM.

ALL PIPING SHALL BE INSPECTED AND APPROVED BY PROPER AUTHORITIES PRIOR TO COVERING WITH DRYWALL. COPIES OF SIGNED TEST CERTIFICATES ARE TO BE FORWARDED TO THE PROPER RECIPIENTS.

ALL SYSTEMS SHALL BE TESTED AT 500 PSI FOR 2 HOURS.

ALL SPPRITS REQUIRED TO CONCEAL SPRINKLER PIPING ARE BY OTHERS.

ALL WIRING OF DEVICES (FLOW SWITCHES, TAMPER SWITCHES, COMPRESSORS, ETC) IS BY OTHERS.

CONNECTION OF SPRINKLER DEVICES TO THE BUILDING ALARM OR MONITORING SYSTEM IS BY OTHERS.

ALL PAINTING OF PIPE AS REQUIRED IS BY OTHERS.

ALL INSULATION REQUIRED FOR FREEZE PROTECTION OF SPRINKLER PIPING IS BY OTHERS.

HEATING OF ROOMS TO MAINTAIN TEMPERATURES OF 40 DEGREES OR GREATER IS BY OTHERS.

FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED NOT LESS THAN 18" AND NOT MORE THAN 48" ABOVE THE LEVEL OF THE ADJACENT GRADE.

SPRINKLERS SHALL NOT BE INSTALLED PRIOR TO THE FITTINGS BEING CEMENTED IN PLACE.

ALL SPRINKLERS IN DWELLING UNITS SHALL BE UL LISTED OR FM APPROVED RESIDENTIAL SPRINKLERS.

ALL SPRINKLERS OUTSIDE OF DWELLING UNITS SHALL BE QUICK RESPONSE, RESIDENTIAL SPRINKLERS SHALL BE ALLOWED AS PER NFPA 13R SECTION 6.4.7.

SPARE SPRINKLERS OF EACH TYPE, TEMPERATURE RATING AND OFFICE SIZE AND APPROPRIATE WRENCH OR WRENCHES SHALL BE LEFT ON THE PREMISES ON A SINGLE PROPERTY UNDER THE SAME OWNERSHIP. SPRINKLERS WILL BE PROVIDED IN A SINGLE LOCATION.

REFER TO SPACING NOTES ON PLANS FOR MAXIMUM CALCULATED SPACING ALLOWANCES.

SPRINKLERS SHALL BE PROVIDED IN ALL OPEN ENDED CORRIDORS THAT ARE NOT SEPARATED FROM THE EXIT STAIRS PER IBC/WHOLEY SECTION 903.2.2.

SPRINKLERS SHALL BE INSTALLED IN ALL AREAS EXCEPT AS FOLLOWS:

- BATHROOMS WHERE THE AREA DOES NOT EXCEED 55 SQ FT (INCLUDING TUBS AND SHOWERS).
- CLOTHES CLOSETS, LINEN CLOSETS AND PANTRIES WITHIN THE DWELLING UNITS THAT DO NOT EXCEED 24 SQUARE FEET, THE LEAST DIMENSION DOES NOT EXCEED 3 FEET, AND THE WALLS AND CEILING ARE SURFACED WITH NONCOMBUSTIBLE OR LIMITED-COMBUSTIBLE MATERIALS AS DEFINED BY NFPA 220, STANDARD ON TYPES OF BUILDING CONSTRUCTION.
- ANY PORCHES, BALCONIES (EXCEPT THOSE OF TYPE V CONSTRUCTION), CORRIDORS, AND STAIRS THAT ARE OPEN AND ATTACHED.
- ATTICS, PENTHOUSE EQUIPMENT ROOMS, ELEVATOR MACHINE ROOMS, CONCEALED SPACES DEDICATED EXCLUSIVELY TO AND CONTAINING ONLY DWELLING UNIT VENTILATION EQUIPMENT, CRAWL SPACES, FLOOR/CEILING SPACES, NONCOMBUSTIBLE ELEVATOR SHAFTS WHERE THE ELEVATOR CARS COMPLY WITH ANSI A717 AND OTHER CONCEALED SPACES THAT ARE NOT USED OR INTENDED FOR LIVING PURPOSES OR STORAGE AND DO NOT CONTAIN FUEL-FIRED EQUIPMENT.
- CLOSETS ON EXTERIOR BALCONIES AND EXTERIOR BREEZEWAYS/CORRIDORS, REGARDLESS OF SIZE OR CONTENTS, AS LONG AS THERE ARE NO DOORS OR UNPROTECTED PENETRATIONS FROM THE CLOSET DIRECTLY INTO THE DWELLING UNIT.
- CEILING POCKETS THAT MEET THE FOLLOWING REQUIREMENTS:
  - THE TOTAL VOLUME OF THE UNPROTECTED CEILING POCKET DOES NOT EXCEED 100 CU FT.
  - THE DEPTH OF THE UNPROTECTED CEILING POCKET DOES NOT EXCEED 12 IN.
  - THE ENTIRE FLOOR OF THE UNPROTECTED CEILING POCKET IS PROTECTED BY THE SPRINKLERS AT THE LOWER CEILING ELEVATIONS.
  - THE INTERIOR FINISH OF THE UNPROTECTED CEILING POCKET IS NONCOMBUSTIBLE OR LIMITED-COMBUSTIBLE CONSTRUCTION.

WAFS TO PROVIDE ALL REQUIRED SIGNAGE PER NFPA 13R INCLUDING BUT NOT LIMITED TO VALVES, AND HYDRAULIC PLACARDS.

NFPA 13R 2013 GENERAL NOTES  
 SCALE: NONE

ALL MATERIAL APPLICABLE TO THIS PROJECT WILL BE INDICATED WITH A (C)

ALL PLASTIC PIPE 3/4" THROUGH 2 1/2" SHALL BE UL LISTED OR FM APPROVED CPVC MANUFACTURED IN ACCORDANCE WITH ASTM F-442.

ALL PLASTIC FITTINGS SHALL BE UL LISTED OR FM APPROVED CPVC MANUFACTURED IN ACCORDANCE WITH ASTM F438, ASTM F439 OR ASTM F1970.

ALL CPVC PIPE AND FITTINGS SHALL BE ASSEMBLED USING 'ONE STEP' 500 CEMENT.

CPVC PIPE SHALL BE ALLOWED TO BE USED IN ORDINARY HAZARD ROOMS OF 400 SQUARE FEET OR LESS OF OTHERWISE LIGHT HAZARD OCCUPANCIES (NFPA 13 SECTION 6.3.6.2 OR NFPA 13R SECTION 5.2.2.3).

ALL 1" TO 2" THREADED GALVANIZED PIPE WILL BE SCHEDULE 40 HOT DIPPED GALVANIZED MANUFACTURED IN ACCORDANCE WITH ASTM A-795 OR ASTM A-53.

ALL 1" TO 2" THREADED BLACK STEEL PIPE SHALL BE UL LISTED/FM APPROVED AND MANUFACTURED IN ACCORDANCE WITH ASTM A-193 OR A-795, ACCEPTABLE PIPE BRANDS ARE WHEATLAND 'MEGA-FLOW', ALLIED 'DYNA-FLOW', BULL MOOSE TUBE 'EDDYFLOW', WHEATLAND 'STEADY-THREAD'. ALL PIPE SHALL BE CPVC COMPATIBLE.

ALL 1/4" TO 2" GROOVED BLACK STEEL PIPE SHALL BE UL LISTED/FM APPROVED AND MANUFACTURED IN ACCORDANCE WITH ASTM A796, ACCEPTABLE BRANDS ARE BULL MOOSE 'EDDYFLOW', WHEATLAND 'MEGA-FLOW', ALLIED 'DYNA-FLOW' AND WELDED TUBE-BERKELEY 'STEADY-THREAD'. ALL PIPE SHALL BE CPVC COMPATIBLE.

ALL 1/4" TO 4" GROOVED BLACK STEEL PIPE SHALL BE SCHEDULE 10, UL LISTED/FM APPROVED AND MANUFACTURED IN ACCORDANCE WITH ASTM A-795, ACCEPTABLE MANUFACTURERS ARE BULL MOOSE, WHEATLAND, ALLIED AND WELDED TUBE-BERKELEY. ALL PIPE SHALL BE CPVC COMPATIBLE.

ALL GROOVED STEEL PIPE 6" AND LARGER SHALL BE SCHEDULE 10 HOT DIPPED GALVANIZED AND MANUFACTURED IN ACCORDANCE WITH ASTM A-795.

ALL GROOVED STEEL PIPE 6" AND LARGER SHALL BE SCHEDULE 10 HOT DIPPED GALVANIZED AND MANUFACTURED IN ACCORDANCE WITH ASTM A-795.

ALL STEEL PIPE SHALL HAVE A CORROSION RESISTANCE RATIO (CRR) OF NOT LESS THAN 10 PER WAFS STANDARDS.

ALL BLACK THREADED FITTINGS SHALL BE DUCTILE IRON CLASS 150 OR CLASS 300 ANSI B16.3, CAST IRON CLASS 150 OR CLASS 250 ANSI B14 OR MALLEABLE IRON CLASS 150 OR CLASS 300 ANSI B16.3.

ALL GALVANIZED THREADED FITTINGS SHALL BE MALLEABLE IRON CLASS 150 OR CLASS 300 ANSI B16.3 WITH GALVANIZED COATING IN ACCORDANCE WITH ASTM A-153.

ALL WELDED OUTLETS SHALL BE UL LISTED OR FM APPROVED AND MANUFACTURED IN ACCORDANCE WITH ANSI B16.1.

GROOVED FITTINGS SHALL BE UL LISTED OR FM APPROVED AND MANUFACTURED IN ACCORDANCE WITH ASTM A-538 FOR DUCTILE IRON OR ASTM A-47 FOR MALLEABLE IRON.

ALL GALVANIZED GROOVED FITTINGS SHALL BE UL LISTED OR FM APPROVED AND MANUFACTURED IN ACCORDANCE WITH ASTM A-538 FOR DUCTILE IRON OR ASTM A-47 FOR MALLEABLE IRON. GALVANIZED COATING SHALL BE IN ACCORDANCE WITH ASTM A-153.

ALL GROOVED STEEL PIPE SHALL BE ROLL GROOVED PER PIPE MANUFACTURER REQUIREMENTS.

SHADOWED FLOOR AREA NOTES  
 (BASED ON NFPA 13R 2013 EDITION)

IN REGARDS TO OBSTRUCTIONS AND SHADOWED FLOOR AREAS, PLEASE NOTE THE FOLLOWING EXCEPTS FROM NFPA 13R 2013 EDITION:

6.4.6.3.3.1 SHADOW AREAS SHALL BE PERMITTED IN THE PROTECTION AREA OF A SPRINKLER AS LONG AS THE CUMULATIVE DRY AREAS DO NOT EXCEED 15 FT<sup>2</sup> (1.4 M<sup>2</sup>) PER SPRINKLER.

6.4.6.3.3.2 SHADOW AREAS IN CORRIDORS UP TO 2 FT (0.61 M) IN DEPTH AND UP TO 9 FT (2.7 M) IN LENGTH BEHIND SIDEWALL SPRINKLERS SHALL BE PERMITTED AS SHOWN IN FIGURE 6.4.6.3.3.2.

FIGURE 6.4.6.3.3.2 Shadow Areas Behind Sidewalls in Corridors

6.4.6.3.3.3 SMALL AREAS CREATED BY ARCHITECTURAL FEATURES SUCH AS PLANTER BOX WINDOWS, BAY WINDOWS, AND SIMILAR FEATURES SHALL BE EVALUATED AS FOLLOWS:

- WHERE NO ADDITIONAL FLOOR AREA IS CREATED BY AN ARCHITECTURAL FEATURE, NO ADDITIONAL SPRINKLER PROTECTION IS REQUIRED.
- WHERE ADDITIONAL FLOOR AREA IS CREATED BY AN ARCHITECTURAL FEATURE, NO ADDITIONAL SPRINKLER PROTECTION IS REQUIRED, PROVIDED ALL OF THE FOLLOWING CONDITIONS ARE MET:
  - THE FLOOR AREA SHALL NOT EXCEED 18 FT<sup>2</sup> (1.7 M<sup>2</sup>).
  - THE FLOOR AREA SHALL NOT BE GREATER THAN 2 FT (0.65 M) IN DEPTH AT THE DEEPEST POINT OF THE ARCHITECTURAL FEATURE TO THE PLANE OF THE PRIMARY WALL WHERE MEASURED ALONG THE FINISHED FLOOR.
  - THE FLOOR SHALL NOT BE GREATER THAN 9 FT (2.7 M) IN LENGTH WHERE MEASURED ALONG THE PLANE OF THE PRIMARY WALL.
  - MEASUREMENT FROM THE DEEPEST POINT OF THE ARCHITECTURAL FEATURE TO THE SPRINKLER SHALL NOT EXCEED THE MAXIMUM LISTED SPACING OF THE SPRINKLER.
  - THE HYDRAULIC DESIGN SHALL NOT BE REQUIRED TO CONSIDER THE AREA CREATED BY THE ARCHITECTURAL FEATURE.

SHADOWED FLOOR AREA NOTES  
 (BASED ON NFPA 13R 2013 EDITION)

System No. F-C-2270  
 F Rating - 1 Hr  
 T Rating - 1 Hr

1. FLOOR-CEILING ASSEMBLY - THE FIRE-RATED SOLID OR TRUSSED LUMBER JOIST FLOOR-CEILING ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN INDIVIDUAL U300 SERIES FLOOR-CEILING DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY. THE GENERAL CONSTRUCTION DETAILS OF THE FLOOR-CEILING ASSEMBLY ARE SUMMARIZED BELOW:

- FLOORING SYSTEM - LUMBER OR PLYWOOD SUBFLOOR WITH FINISH FLOOR OF LUMBER, PLYWOOD OR FLOOR TOPPING MATERIALS AS SPECIFIED IN THE INDIVIDUAL FLOOR-CEILING DESIGN. MAX DIAM OF FLOOR OPENING IS 3 IN.
- WOOD JOISTS - NOM 2 BY 10 IN LUMBER JOISTS SPACED 16 IN OC WITH NOM 1 BY 3 IN LUMBER BRIDGING AND WITH ENDS FIRED TOPPED AS AN ALTERNATE TO LUMBER JOISTS, NOM 10 IN DEEP (OR DEEPER) LUMBER STEEL OR COMBINATION LUMBER AND STEEL JOISTS, TRUSSES OR STRUCTURAL WOOD MEMBERS\* WITH BRIDGING AS REQUIRED WITH ENDS FIRED TOPPED.
- CEILING - (NOT SHOWN) - RESILIENT GALV STEEL FURRING INSTALLED PERPENDICULAR TO WOOD JOISTS (ITEM 1B) BETWEEN WALLBOARD (ITEM 1D) AND WOOD JOISTS AS REQUIRED IN THE INDIVIDUAL FLOOR-CEILING DESIGN.
- CHASE WALLS - NOM 4 FT WIDE BY 5/8 IN THICK AS SPECIFIED IN THE INDIVIDUAL FLOOR-CEILING DESIGN. THROUGH PENETRANT (ITEM 3) SHALL BE ROUTED THROUGH A 1 HR FIRE-RATED SINGLE, DOUBLE OR STAGGERED WOOD STUD/GYPSUM WALLBOARD CHASE WALL CONSTRUCTED OF THE MATERIALS AND IN THE MANNER SPECIFIED IN THE INDIVIDUAL U300 SERIES WALL AND PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
  - STUDS - NOM 2 BY 4 IN LUMBER STUDS.
  - GYPSUM BOARD - NOM 5/8 IN THICK AS SPECIFIED IN THE INDIVIDUAL U300 SERIES WALL AND PARTITION DESIGN IS 3 IN.
  - TOP PLATE - THE DOUBLE TOP PLATE SHALL CONSIST OF TWO NOM 2 BY 4 IN LUMBER PLATES. MAX DIAM OF OPENING IS 3 IN.
  - WALL AND PARTITION DESIGN - WALL AND PARTITION DESIGN SHALL BE AS SPECIFIED IN INDIVIDUAL THROUGH PENETRANTS - ONE NONMETALLIC PIPE CONDUIT OR TWO CONCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN THE PENETRANT AND THE PERIPHERY OF THE OPENING SHALL BE A MIN 0 IN (POINT CONTACT) TO A MAX OF 5/8 IN. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR-CEILING ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF NONMETALLIC PIPES MAY BE USED:
    - CHARLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - NOM 2 IN DIAM (OR SMALLER) FLOWGUARD GOLD® SR115 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
    - CHARLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - NOM 2 IN DIAM (OR SMALLER) BLAZEMASTER® SR135 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
- FILL, VOID OR CAVITY MATERIAL\* - SEALANT - MIN 3/4 IN THICKNESS OF FILL MATERIAL APPLIED WITHIN THE ANNULUS, FLUSH WITH TOP SURFACE OF FLOOR AND FLUSH WITH BOTTOM SURFACE OF LOWER TOP PLATE. AT POINT CONTACT LOCATION, A MIN 1/2 IN DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED FLUSH WITH BOTTOM SURFACE OF LOWER TOP PLATE.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS-DNE SEALANT  
 \*BEARING THE UL CLASSIFICATION MARK

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HilTI Firestop Systems

FIRE CAULK - HILTI SYSTEM No. F-C-2270  
 UP TO 2" CPVC & WOOD FLOOR TRUSS - 1-HOUR

CURE TIMES WITH ONE STEP SOLVENT CEMENT  
 200 PSI (MAXIMUM) TEST PRESSURE (SEE NOTE 1)

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.	1.6 HR.	120 HR.
1 1/2"	1.5 HR.	1.6 HR.	120 HR.
2"	6 HR.	36 HR.	SEE NOTE 2
2 1/2"	8 HR.	72 HR.	SEE NOTE 2
3"	8 HR.	72 HR.	SEE NOTE 2

CURE TIMES WITH ONE STEP SOLVENT CEMENT  
 225 PSI (MAXIMUM) TEST PRESSURE (SEE NOTE 1)

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"	1 HR.	4 HR.	48 HR.
1"	1.5 HR.	4 HR.	48 HR.
1 1/4"	3 HR.	32 HR.	10 DAYS
1 1/2"	3 HR.	32 HR.	10 DAYS
2"	8 HR.	48 HR.	SEE NOTE 2
2 1/2"	24 HR.	96 HR.	SEE NOTE 2
3"	24 HR.	96 HR.	SEE NOTE 2

NOTE 1: THESE CURE TIMES ARE FOR NEW CONSTRUCTION. IF GLUING INTO EXISTING PIPING, SUCH AS IN THE CASE OF CUT-INS, CURE TIME SHOULD BE A MINIMUM OF 24 HOURS.

NOTE 2: FOR THESE SIZES, THE SOLVENT CEMENT CAN BE APPLIED AT TEMPERATURES BELOW 32°F, HOWEVER, THE SPRINKLER SYSTEM TEMPERATURE MUST BE RAISED TO A TEMPERATURE OF 32°F OR ABOVE AND ALLOWED TO CURE PER THE ABOVE RECOMMENDATIONS PRIOR TO PRESSURE TESTING.

TYPICAL CPVC CURE TIMES

PERMISSIBLE BENDING DEFLECTIONS SDR 13.5 (73°F)  
 (ONE END RESTRAINED)

PIPE SIZE INCHES	LENGTH OF RUN (L) IN FEET							
	2'	5'	7'	10'	12'	15'	17'	20'
3/4"	1.3"	7.8"	15.4"	31.3"	45.1"	70.5"	90.6"	125.4"
1"	1.0"	6.3"	12.3"	25.0"	36.0"	56.3"	72.3"	100.1"
1 1/4"	0.8"	5.0"	9.7"	19.8"	28.5"	44.6"	57.3"	79.3"
1 1/2"	0.7"	4.3"	8.5"	17.3"	24.9"	39.0"	50.1"	69.3"
2"	0.6"	3.5"	6.8"	13.9"	20.0"	31.2"	40.0"	55.4"
2 1/2"	0.5"	2.9"	5.6"	11.4"	16.5"	25.8"	33.1"	45.8"
3"	0.4"	2.4"	4.6"	9.4"	13.5"	21.2"	27.2"	37.6"

PERMISSIBLE BENDING DEFLECTIONS SDR 13.5 (73°F)  
 (BOTH ENDS RESTRAINED)

PIPE SIZE INCHES	LENGTH OF RUN (L) IN FEET							
	2'	5'	7'	10'	12'	15'	17'	20'
3/4"	0.3"	2.0"	3.8"	7.8"	11.3"	17.6"	22.6"	31.3"
1"	0.3"	1.6"	3.1"	6.3"	9.0"	14.1"	18.1"	25.0"
1 1/4"	0.2"	1.2"	2.4"	5.0"	7.1"	11.2"	14.3"	19.8"
1 1/2"	0.2"	1.1"	2.1"	4.3"	6.2"	9.7"	12.5"	17.3"
2"	0.1"	0.9"	1.7"	3.5"	5.0"	7.8"	10.0"	13.9"
2 1/2"	0.1"	0.7"	1.4"	2.9"	4.1"	6.4"	8.3"	11.4"
3"	0.1"	0.6"	1.2"	2.4"	3.4"	5.3"	6.8"	9.4"

TABLE 1 - SPRINKLER SUPPORT SPACING WITH ONE RESTRAINT POINT

NOM. PIPE SIZE	'R' @ LESS THAN 100 PSI	'R' @ GREATER THAN 100 PSI
3/4 INCH	0'-9"	0'-6"
1 INCH	1'-0"	0'-9"
1 1/4 INCH	1'-4"	1'-0"
1 1/2 INCH	1'-0"	1'-0"
>1 1/2 INCH	2'-0"	1'-0"

TABLE 2 - SPRINKLER SUPPORT SPACING WITH TWO RESTRAINT POINTS

NOM. PIPE SIZE	'S' @ LESS THAN 100 PSI	'S' @ GREATER THAN 100 PSI
3/4 INCH	4'-0"	3'-0"
1 INCH	5'-0"	4'-0"
1 1/4 INCH	6'-0"	5'-0"
1 1/2 INCH	7'-0"	7'-0"
>1 1/2 INCH	7'-0"	7'-0"

TABLE 3 - MAXIMUM SUPPORT SPACING

NOM. PIPE SIZE	3/4 INCH	1 INCH	1 1/4 INCH	1 1/2 INCH	2 INCH	2 1/2 INCH	3 INCH
SUPPORT SPACING 'L'	5'-6"	6'-0"	6'-6"	7'-0"	8'-0"	9'-0"	10'-0"

TYPICAL CPVC HANGER/BRACE SPACING

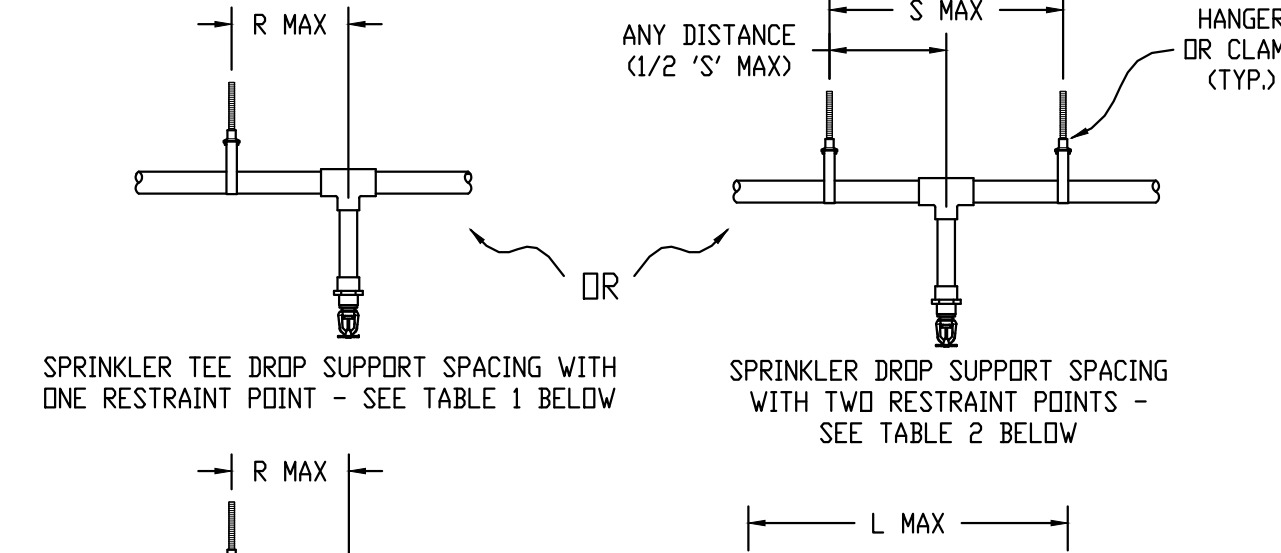


TABLE 1 - SPRINKLER SUPPORT SPACING WITH ONE RESTRAINT POINT

TABLE 2 - SPRINKLER SUPPORT SPACING WITH TWO RESTRAINT POINTS

TABLE 3 - MAXIMUM SUPPORT SPACING

TYPICAL CPVC HANGER/BRACE SPACING

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HilTI Firestop Systems

FIRE CAULK - HILTI SYSTEM No. W-L-2377  
 UP TO 2" CPVC & DRYWALL - 1 TO 2-HOUR

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HilTI Firestop Systems

TYPICAL CPVC HANGER/BRACE SPACING

System No. W-L-2377  
 F Rating - 1 and 2 Hr (See Items 1 and 3)  
 T Rating - 1 and 2 Hr (See Items 1 and 3)  
 L - Rating at Ambient - Less than 1 CFM/Sq Ft  
 L - Rating at 400 F - 4 CFM/Sq Ft

1. WALL ASSEMBLY - THE 1 AND 2 HR FIRE RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

- STUDS - WALL FRAMING SHALL CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN LUMBER SPACED 16 IN OC. STEEL STUDS TO BE MIN 2-1/2 IN WIDE BY 1-3/8 IN DEEP CHANNELS SPACED MAX 24 IN OC.
- GYPSUM BOARD - THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 3 IN.
- THE HOURLY F AND T RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.

2. THROUGH PENETRANT - ONE NONMETALLIC PIPE CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE AND PERIPHERY OF OPENING SHALL BE MIN 0 IN (POINT CONTACT) TO A MAX 1-1/4 IN. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF NONMETALLIC PIPES MAY BE USED:

- CHARLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - NOM 2 IN DIAM (OR SMALLER) FLOWGUARD GOLD® SR115 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
- CHARLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - NOM 2 IN DIAM (OR SMALLER) BLAZEMASTER® SR135 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.

3. FILL, VOID OR CAVITY MATERIAL\* - SEALANT - MIN 5/8 IN AND 1-1/4 IN THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL FOR 1 AND 2 HR RATED ASSEMBLIES, RESPECTIVELY. AT POINT CONTACT LOCATION, A MIN 1/2 IN DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED TO THE WALL/PENETRANT INTERFACE ON BOTH SURFACES OF THE WALL.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS-DNE SEALANT  
 \*BEARING THE UL CLASSIFICATION MARK

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. June 20, 2000

HilTI Firestop Systems

FIRE CAULK - HILTI SYSTEM No. W-L-2377  
 UP TO 2" CPVC & DRYWALL - 1 TO 2-HOUR

Reproduced by HILTI, Inc. Courtesy of Underwriters Laboratories, Inc. June 20, 2000

HilTI Firestop Systems

TYPICAL CPVC HANGER/BRACE SPACING

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HilTI Firestop Systems

TYPICAL CPVC HANGER/BRACE SPACING

TYPICAL CPVC HANGER/BRACE SPACING

IMPORTANT OWNER INFORMATION

CPVC COMPATIBILITY NOTICE

COPYRIGHT

GRAPHICS ELEMENTS NOTE

WATER SUPPLY INFORMATION

DESIGN CRITERIA

SPRINKLERS SPACING

SPRINKLERS

DATE SUBMITTALS BY

NO. DATE REVISIONS BY

MAIN OFFICE - ORLANDO, FLORIDA

JACKSONVILLE, FL TAMPA, FL DEERFIELD BEACH, FL

FT. MYERS, FL CONCORD, NC STATE LICENSE

JUNIPER VILLAGE PARKER LANE LILLINGTON, NORTH CAROLINA

Wynnefield Properties 5614 Riverdale Road Jamesstown, NC 27282

SHEET TITLE: Notes and Details 1  
 DRAWN BY: Donald Hawkins  
 TOTAL A/S: 938  
 DATE: 3-5-2021  
 ANS: Town of Lillington

CONTRACT # 102001  
 CENTER OF TITLE JOB: YES [X] NO [ ] CENTER ON FIXTURES JOB: YES [X] NO [ ]

SHEET # FPD1  
 OCCUPANCY: R-2







# **JUNIPER VILLAGE BUILDING 300**

---

1208 North Main Steet  
Lillington, North Carolina

## **Hydraulic Calculations**

Wayne Automatic Fire Sprinklers Job Number: 1020001



**Wayne Automatic Fire Sprinklers, Inc.**  
4370 Motorsport Drive, Concord NC 28027 - 8977

LOCATION: JUNIPER VILLAGE APTS  
PARKER LANE & NORTH MAIN ST

DATE: 3-20-24

TEST MADE BY: P JAMES

TIME: 8:30 AM

REPRESENTATIVE OF: LILLINGTON FIRE DEPT.

WITNESS: JAMES Jammy Re

STATE PURPOSE OF TEST:

CONSUMPTION RATE DURING TEST:

IF PUMPS AFFECT TEST, INDICATE PUMPS OPERATING:

FLOW HYDRANTS: #224 A1 A2 #225 FLOW A3 A4

Size Nozzle: 2.5"

Pilot Reading: 40 psi

Discharge Coefficient: .9 Total GPM

GPM: 1060

STATIC P 80 psi RESIDUAL B 68 psi

PROJECTED RESULTS: At 20 psi Residual gpm, or At psi Residual gpm

REMARKS:

LOCATION MAP: Show line sizes and distance to next cross connected line. Show valves and Hydrant branch size. Indicate North. Show flowing hydrants - Label A1, A2, A3, A4. Show location of Static and Residual - Label B.

Indicate B. Hydrant: Sprinkler: Other (Identify):



## Hydraulic Calculations

Wayne Automatic  
Fire Sprinklers, Inc.  
4370 Motorsport Drive  
Concord, NC 28027  
704-782-3032

Job Name : Juniper Village- Building 300 - 3rd Floor - Unit C - Common - DA 3.1  
Sheet Number : FP3.3  
Location : Building 300  
Design Area : Design Area 3.1  
Contract : 102001  
Data File : Building 300- 3rd Floor - Unit C - Common DA 3.1.WXF

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**HYDRAULIC CALCULATIONS**  
**for**

**Project name:** Juniper Villiage  
**Location:** Building 300  
**Drawing no:** FP3.3  
**Date:** 4-5-2024

**Design**

**Remote area number:** Design Area 3.1  
**Remote area location:** Building 300 - 3rd Floor - Unit C Common Area  
**Occupancy classification:** NFPA 13R  
**Density:** .05 - Gpm/SqFt  
**Area of application:** 4 Sprinklers - SqFt  
**Coverage per sprinkler:** 256 - SqFt  
**Type of sprinklers calculated:** Reliable Mod. F1 Res 44 Residential HSW  
**No. of sprinklers calculated:** 4  
**In-rack demand:** - GPM  
**Hose streams:** - GPM  
**Total water required (including hose streams):** 212.8 - GPM @ 72.1 - Psi  
**Type of system:** Wet Residential NFPA 13R  
**Volume of dry or preaction system:** - Gal

**Water supply information**

**Date:** 3-20-2024  
**Location:** Parker Lane and North Main Street - Hydrant #224  
**Source:** Lillington Fire Department

**Name of contractor:** Wayne Automatic Fire Sprinklers  
**Address:** 4370 Motorsport Drive / Concord, NC  
**Phone number:** 407-877-5514  
**Name of designer:** Donald Hawkins  
**Authority having jurisdiction:** Town of Lillington

**Notes: (Include peaking information for gridded systems here.)**  
(1) The Finished Floor Elevation is 169'. For clarity the Finished Floor elevation on the hydraulic calculations is shown as 0'-0"  
(2) A domestic demand of 147 was added at node point DD3 as required by NFPA 13R Section 9.6.

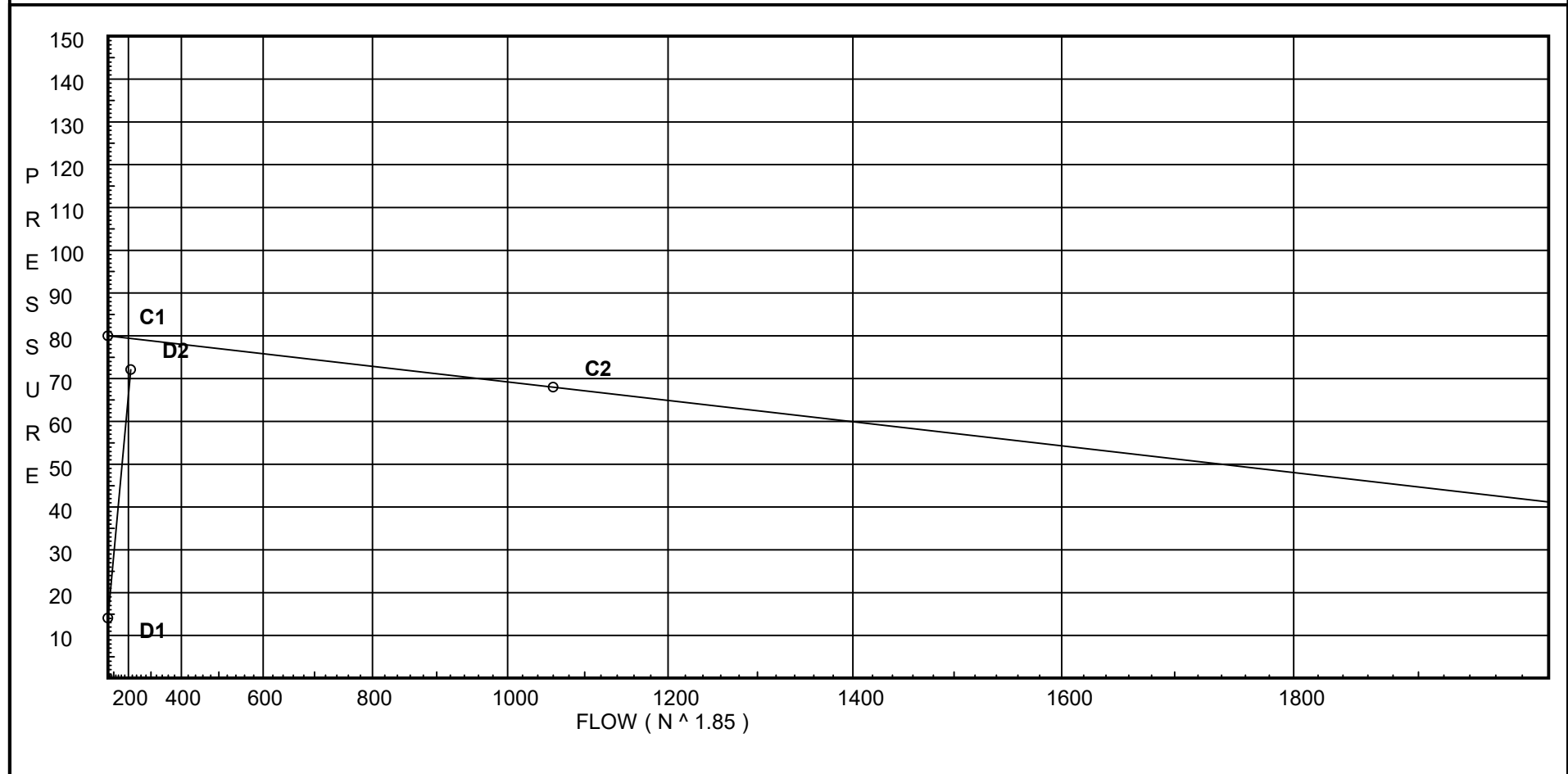
# Water Supply Curve C

Wayne Automatic  
Juniper Village- Building 300 - 3rd Floor - Unit C - Common - DA 3.1

Page 2  
Date 4-5-2024

City Water Supply:  
C1 - Static Pressure : 80  
C2 - Residual Pressure: 68  
C2 - Residual Flow : 1060

Demand:  
D1 - Elevation : 14.076  
D2 - System Flow : 212.751  
D2 - System Pressure : 72.096  
Hose ( Demand ) :  
D3 - System Demand : 212.751  
Safety Margin : 7.289



# Fittings Used Summary

Wayne Automatic  
 Juniper Village- Building 300 - 3rd Floor - Unit C - Common - DA 3.1

Page 3  
 Date 4-5-2024

## Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	NFPA 13 Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	NFPA 13 Tee Branch	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
U*	CPVC 90' Elbow Tyco	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
V*	CPVC Tee Branch Tyco	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zai	Ames 4000SS	Fitting generates a Fixed Loss Based on Flow																			

## Units Summary

Diameter Units           Inches  
 Length Units             Feet  
 Flow Units                US Gallons per Minute  
 Pressure Units           Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with \*. The fittings marked with a \* show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a \* will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

# Pressure / Flow Summary - STANDARD

Wayne Automatic  
 Juniper Village- Building 300 - 3rd Floor - Unit C - Common - DA 3.1

Page 4  
 Date 4-5-2024

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
C1	27.5	4.4	13.3	na	16.05	0.05	256	13.3
C2	27.5	4.4	15.19	na	17.15	0.05	256	13.3
C3	27.5	4.4	13.9	na	16.41	0.05	256	13.3
C4	27.5	4.4	13.47	na	16.15	0.05	256	13.3
31	19.25		18.58	na				
36	19.25		20.14	na				
72	19.25		21.66	na				
32	19.25		20.69	na				
37	19.25		22.12	na				
33	19.25		19.26	na				
34	19.25		18.77	na				
46	19.25		19.48	na				
38	19.25		20.82	na				
73	19.25		22.66	na				
47	19.25		25.16	na				
48	19.25		30.92	na				
203	19.25		33.66	na				
204	19.25		34.53	na				
202	19.25		37.52	na				
102	9.25		44.97	na				
101	9.25		45.32	na				
100	9.25		48.0	na				
103	9.25		52.49	na				
TR	1.0		58.3	na				
BR	-3.0		60.53	na				
UG3	-3.0		60.54	na				
BFS3	2.0		58.44	na				
BFD3	2.0		68.41	na	147.0			
DD3	-3.0		70.65	na				
M1	-3.0		71.08	na				
M2	-3.0		71.07	na				
M3	-3.0		71.08	na				
M4	-3.0		71.08	na				
M5	-3.0		71.08	na				
CC1	-10.0		74.14	na				
CC2	-10.0		74.14	na				
TEST	-5.0		72.1	na				

The maximum velocity is 17.75 and it occurs in the pipe between nodes 37 and 203

# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Village- Building 300 - 3rd Floor - Unit C - Common - DA 3.1

Page 5  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
C1 to 31	16.05 16.05	0.874 150.0 0.1393	U	4.0 0.0 0.0	8.250 4.000 12.250	13.300 3.573 1.707			K Factor = 4.40 Vel = 8.58	
	0.0 16.05						18.580		K Factor = 3.72	
C2 to 32	17.15 17.15	0.874 150.0 0.1576	U	4.0 0.0 0.0	8.250 4.000 12.250	15.189 3.573 1.930			K Factor = 4.40 Vel = 9.17	
	0.0 17.15						20.692		K Factor = 3.77	
C3 to 33	16.41 16.41	0.874 150.0 0.1452	U	4.0 0.0 0.0	8.250 4.000 12.250	13.904 3.573 1.779			K Factor = 4.40 Vel = 8.78	
	0.0 16.41						19.256		K Factor = 3.74	
C4 to 34	16.15 16.15	0.874 150.0 0.1410	U	4.0 0.0 0.0	8.250 4.000 12.250	13.472 3.573 1.727			K Factor = 4.40 Vel = 8.64	
	0.0 16.15						18.772		K Factor = 3.73	
31 to 36	16.05 16.05	0.874 150.0 0.1394	V	3.0 0.0 0.0	8.170 3.000 11.170	18.580 0.0 1.557			Vel = 8.58	
36 to 72	0.0 16.05	0.874 150.0 0.1394		0.0 0.0 0.0	10.920 0.0 10.920	20.137 0.0 1.522			Vel = 8.58	
72 to 37	0.0 16.05	0.874 150.0 0.1393		0.0 0.0 0.0	3.330 0.0 3.330	21.659 0.0 0.464			Vel = 8.58	
	0.0 16.05						22.123		K Factor = 3.41	
32 to 37	17.15 17.15	0.874 150.0 0.1576	U V	4.0 3.0 0.0	2.080 7.000 9.080	20.692 0.0 1.431			Vel = 9.17	
37 to 203	16.04 33.19	0.874 150.0 0.5348	V	3.0 0.0 0.0	18.580 3.000 21.580	22.123 0.0 11.541			Vel = 17.75	
	0.0 33.19						33.664		K Factor = 5.72	
33 to 38	16.41 16.41	0.874 150.0 0.1452	U V	4.0 3.0 0.0	3.750 7.000 10.750	19.256 0.0 1.561			Vel = 8.78	
	0.0 16.41						20.817		K Factor = 3.60	
34 to 46	16.15 16.15	0.874 150.0 0.1412	V	3.0 0.0 0.0	2.000 3.000 5.000	18.772 0.0 0.706			Vel = 8.64	



# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Village- Building 300 - 3rd Floor - Unit C - Common - DA 3.1

Page 6  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
46 to 38	0.0 16.15	0.874 150.0 0.1409	V	3.0 0.0 0.0	6.500 3.000 9.500	19.478 0.0 1.339			Vel = 8.64	
38 to 73	16.41 32.56	0.874 150.0 0.5159		0.0 0.0 0.0	3.580 0.0 3.580	20.817 0.0 1.847			Vel = 17.41	
73 to 47	0.0 32.56	0.874 150.0 0.5159		0.0 0.0 0.0	4.830 0.0 4.830	22.664 0.0 2.492			Vel = 17.41	
47 to 48	0.0 32.56	0.874 150.0 0.5159		0.0 0.0 0.0	11.170 0.0 11.170	25.156 0.0 5.763			Vel = 17.41	
48 to 204	0.0 32.56	0.874 150.0 0.5160	V	3.0 0.0 0.0	4.000 3.000 7.000	30.919 0.0 3.612			Vel = 17.41	
	0.0 32.56					34.531			K Factor = 5.54	
203 to 204	33.19 33.19	1.394 150.0 0.0550		0.0 0.0 0.0	15.750 0.0 15.750	33.664 0.0 0.867			Vel = 6.98	
204 to 202	32.56 65.75	1.394 150.0 0.1949	U	6.0 0.0 0.0	9.330 6.000 15.330	34.531 0.0 2.988			Vel = 13.82	
	0.0 65.75					37.519			K Factor = 10.73	
202 to 102	65.75 65.75	1.394 150.0 0.1950	V	6.0 0.0 0.0	10.000 6.000 16.000	37.519 4.331 3.120			Vel = 13.82	
	0.0 65.75					44.970			K Factor = 9.80	
102 to 101	65.75 65.75	2.003 150.0 0.0334		0.0 0.0 0.0	10.580 0.0 10.580	44.970 0.0 0.353			Vel = 6.69	
101 to 100	0.0 65.75	2.003 150.0 0.0334		0.0 0.0 0.0	80.250 0.0 80.250	45.323 0.0 2.677			Vel = 6.69	
100 to 103	0.0 65.75	2.003 150.0 0.0334		0.0 0.0 0.0	134.500 0.0 134.500	48.000 0.0 4.488			Vel = 6.69	
103 to TR	0.0 65.75	2.003 150.0 0.0334	5U	45.0 0.0 0.0	22.170 45.000 67.170	52.488 3.573 2.241			Vel = 6.69	
	0.0 65.75					58.302			K Factor = 8.61	
TR to BR	65.75 65.75	2.003 150.0 0.0334	Z	6.482 0.0 0.0	8.250 6.482 14.732	58.302 1.732 0.492			Vel = 6.69	
BR to UG3	0.0 65.75	4.28 140.0 0.0009	L	10.75 0.0 0.0	4.000 10.750 14.750	60.526 0.0 0.014			Vel = 1.47	

# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Village- Building 300 - 3rd Floor - Unit C - Common - DA 3.1

Page 7  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 65.75						60.540		K Factor = 8.45	
UG3 to BFS3	65.75	4.24 150.0	2L	23.335 0.0	54.000 23.335	60.540 -2.166				
BFS3 to BFD3	65.75 0.0	0.0009 4.026		0.0	77.335	0.068		Vel = 1.49		
BFS3 to BFD3	0.0	4.026 120.0	Zai	0.0	10.000	58.442			** Fixed Loss = 9.95	
BFD3 to DD3	65.75 147.00	0.0016 4.24		0.0	10.000	0.016		Vel = 1.66		
BFD3 to DD3	147.00	4.24 150.0		0.0	9.420	68.408			Qa = 147.00	
DD3 to M2	212.75 0.0	0.0075 4.24		0.0	9.420	0.071		Vel = 4.83		
DD3 to M2	0.0	4.24 150.0	G T	3.889 38.891	13.670 42.780	70.645 0.0				
M2	212.75	0.0076		0.0	56.450	0.429		Vel = 4.83		
	0.0 212.75						71.074		K Factor = 25.24	
M1 to M2	-179.62	7.98 150.0		0.0	31.580	71.082				
M2 to M3	-179.62	-0.0003		0.0	31.580	-0.008		Vel = 1.15		
M2 to M3	212.75	7.98 150.0	2F	27.183 0.0	193.580 27.182	71.074 0.0				
M3 to M4	33.13	0.0		0.0	220.762	0.003		Vel = 0.21		
M3 to M4	0.0	7.98 150.0	F	13.591 0.0	287.750 13.592	71.077 0.0				
M4 to M5	33.13	0.0		0.0	301.342	0.003		Vel = 0.21		
M4 to M5	0.0	7.98 150.0	T	52.855 0.0	76.670 52.855	71.080 0.0				
M5 to M1	33.13	0.0		0.0	129.525	0.002		Vel = 0.21		
M5 to M1	0.0	11.68 150.0	F	17.661 0.0	422.000 17.661	71.082 0.0				
M1 to CC1	33.13	0.0		0.0	439.661	0.0		Vel = 0.10		
M1 to CC1	179.62	11.68 150.0	T G	81.513 8.151	372.830 89.664	71.082 3.032				
CC1 to CC2	212.75	0.0001		0.0	462.494	0.025		Vel = 0.64		
CC1 to CC2	0.0	19.76 150.0		0.0	321.000	74.139				
CC2 to TEST	212.75	0.0		0.0	321.000	0.002		Vel = 0.22		
CC2 to TEST	0.0	6.08 140.0	G L	4.038 12.115	65.000 16.153	74.141 -2.166				
TEST	212.75	0.0015		0.0	81.153	0.121		Vel = 2.35		
	0.0 212.75						72.096		K Factor = 25.06	



## Hydraulic Calculations

Wayne Automatic  
Fire Sprinklers, Inc.  
4370 Motorsport Drive  
Concord, NC 28027  
704-782-3032

Job Name : Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2  
Sheet Number : FP3.3  
Location : Building 300  
Design Area : Design Area 3.2  
Contract : 102001  
Data File : Building 300 - 3rd Floor - Corridor - DA 3.2.WXF

---

**HYDRAULIC CALCULATIONS**  
**for**

**Project name:** Juniper Villiage  
**Location:** Building 300  
**Drawing no:** FP3.3  
**Date:** 4-5-2024

**Design**

**Remote area number:** Design Area 3.2  
**Remote area location:** Building 300 - 3rd Floor - Corridor  
**Occupancy classification:** NFPA 13R  
**Density:** .10 - Gpm/SqFt  
**Area of application:** 4 Sprinklers - SqFt  
**Coverage per sprinkler:** 122 - SqFt  
**Type of sprinklers calculated:** Reliable Mod. F3QR Quick Response Dry HSW  
**No. of sprinklers calculated:** 4  
**In-rack demand:** - GPM  
**Hose streams:** - GPM  
**Total water required (including hose streams):** 209.3 - GPM @ 49.3 - Psi  
**Type of system:** Wet Residential NFPA 13R  
**Volume of dry or preaction system:** - Gal

**Water supply information**

**Date:** 3-20-2024  
**Location:** Parker Lane and North Main Steet - Hydrant #224  
**Source:** Lillington Fire Department

**Name of contractor:** Wayne Automatic Fire Sprinklers  
**Address:** 4370 Motorsport Drive / Concord, NC  
**Phone number:** 407-877-5514  
**Name of designer:** Donald Hawkins  
**Authority having jurisdiction:** Town of Lillington

**Notes: (Include peaking information for gridded systems here.)**

- (1) The Finished Floor elevation is 169'. For clarity the finished floor elevation on the hydraulic calculations is shown as 0'-0"
- (2) A domestic demand of 147 was added at node point DD3 as required by NFPA 13R Section 9.6.

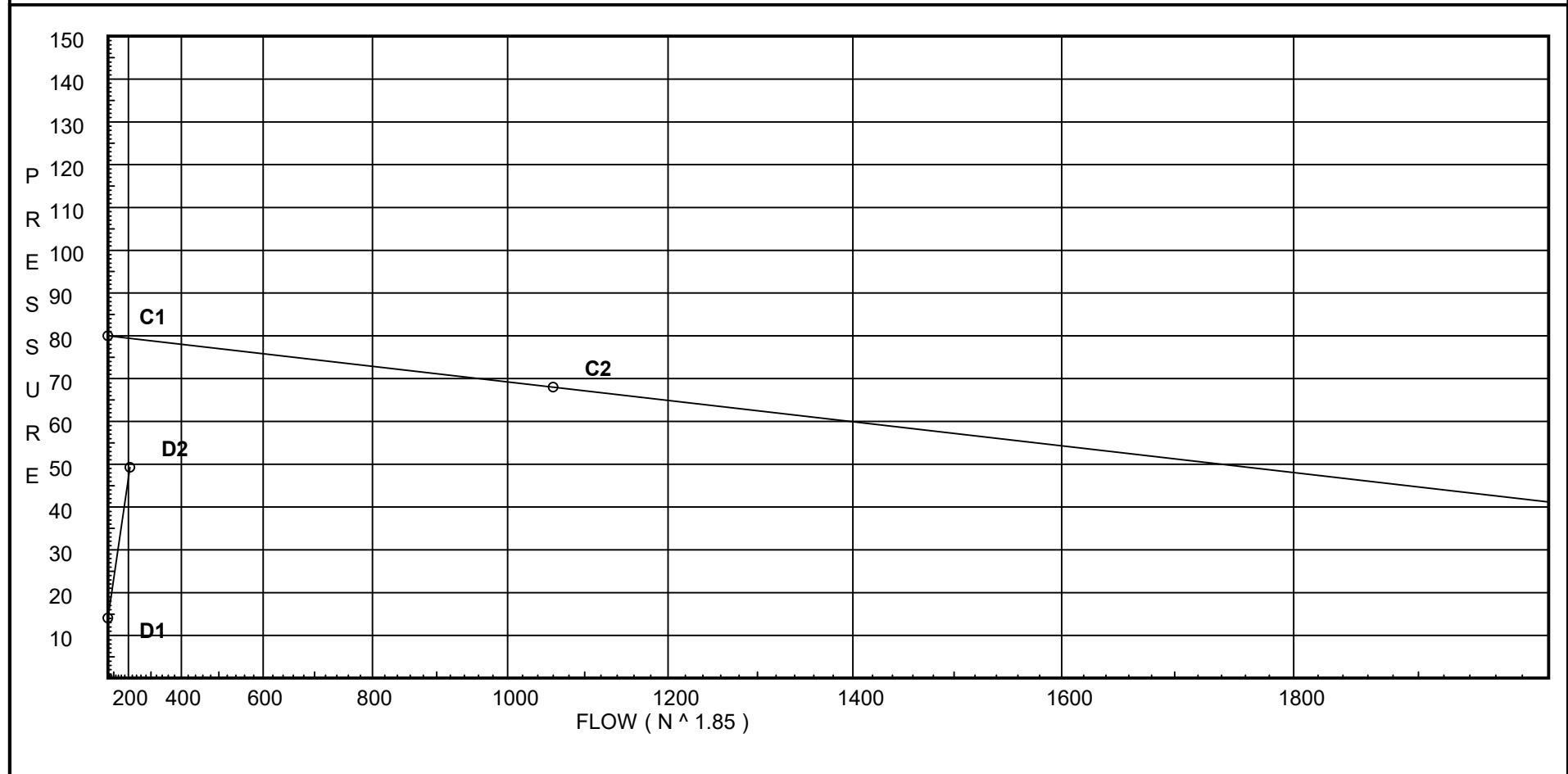
# Water Supply Curve C

Wayne Automatic  
Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2

Page 2  
Date 4-5-2024

City Water Supply:  
C1 - Static Pressure : 80  
C2 - Residual Pressure: 68  
C2 - Residual Flow : 1060

Demand:  
D1 - Elevation : 14.076  
D2 - System Flow : 209.298  
D2 - System Pressure : 49.283  
Hose ( Demand ) :  
D3 - System Demand : 209.298  
Safety Margin : 30.120



# Fittings Used Summary

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2

Page 3  
 Date 4-5-2024

## Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	NFPA 13 Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	NFPA 13 Tee Branch	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
U*	CPVC 90' Elbow Tyco	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
V*	CPVC Tee Branch Tyco	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zai	Ames 4000SS	Fitting generates a Fixed Loss Based on Flow																			

## Units Summary

Diameter Units           Inches  
 Length Units            Feet  
 Flow Units                US Gallons per Minute  
 Pressure Units           Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with \*. The fittings marked with a \* show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a \* will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

# Pressure / Flow Summary - STANDARD

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2

Page 4  
 Date 4-5-2024

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
D1	27.5	5.6	7.0	na	14.82	0.1	122	7.0
D2	27.5	5.6	8.07	na	15.91	0.1	122	7.0
D3	27.5	5.6	7.72	na	15.56	0.1	122	7.0
D4	27.5	5.6	8.18	na	16.01	0.1	122	7.0
41	19.25		12.67	na				
57	19.25		14.1	na				
45	19.25		14.7	na				
42	19.25		13.32	na				
47	19.25		15.64	na				
43	19.25		12.91	na				
44	19.25		13.45	na				
48	19.25		16.35	na				
204	19.25		18.82	na				
201	19.25		19.63	na				
205	19.25		18.52	na				
206	19.25		18.96	na				
207	19.25		19.51	na				
200	19.25		21.33	na				
202	19.25		19.38	na				
102	9.25		24.29	na				
101	9.25		24.36	na				
100	9.25		25.85	na				
103	9.25		29.91	na				
TR	1.0		35.51	na				
BR	-3.0		37.69	na				
UG3	-3.0		37.7	na				
BFS3	2.0		35.59	na				
BFD3	2.0		45.68	na				
DD3	-3.0		47.85	na	147.0			
M1	-3.0		48.27	na				
M2	-3.0		48.27	na				
M3	-3.0		48.27	na				
M4	-3.0		48.27	na				
M5	-3.0		48.27	na				
CC1	-10.0		51.33	na				
CC2	-10.0		51.33	na				
TEST	-5.0		49.28	na				

The maximum velocity is 14.18 and it occurs in the pipe between nodes 48 and 204

# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2

Page 5  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
D1 to 41	14.82 14.82	0.874 150.0 0.1203	U V	4.0 3.0 0.0	10.420 7.000 17.420	7.000 3.573 2.095			K Factor = 5.60	
	0.0 14.82						12.668		K Factor = 4.16	
D2 to 42	15.91 15.91	0.874 150.0 0.1371	U	4.0 0.0 0.0	8.250 4.000 12.250	8.069 3.573 1.680			K Factor = 5.60	
	0.0 15.91						13.322		K Factor = 4.36	
D3 to 43	15.56 15.56	0.874 150.0 0.1318	U	4.0 0.0 0.0	8.250 4.000 12.250	7.723 3.573 1.614			K Factor = 5.60	
	0.0 15.56						12.910		K Factor = 4.33	
D4 to 44	16.01 16.01	0.874 150.0 0.1388	U	4.0 0.0 0.0	8.250 4.000 12.250	8.175 3.573 1.700			K Factor = 5.60	
	0.0 16.01						13.448		K Factor = 4.37	
41 to 57	14.82 14.82	0.874 150.0 0.1202	U	4.0 0.0 0.0	7.920 4.000 11.920	12.668 0.0 1.433				Vel = 7.93
57 to 45	0.0 14.82	0.874 150.0 0.1202	V	3.0 0.0 0.0	2.000 3.000 5.000	14.101 0.0 0.601				Vel = 7.93
45 to 205	0.0 14.82	0.874 150.0 0.1203	V	3.0 0.0 0.0	28.750 3.000 31.750	14.702 0.0 3.818				Vel = 7.93
	0.0 14.82						18.520		K Factor = 3.44	
42 to 47	15.91 15.91	0.874 150.0 0.1372	U V	4.0 3.0 0.0	9.920 7.000 16.920	13.322 0.0 2.321				Vel = 8.51
47 to 205	5.06 20.97	0.874 150.0 0.2287	V	3.0 0.0 0.0	9.580 3.000 12.580	15.643 0.0 2.877				Vel = 11.21
	0.0 20.97						18.520		K Factor = 4.87	
43 to 47	15.56 15.56	0.874 150.0 0.1317	U 2V	4.0 6.0 0.0	10.750 10.000 20.750	12.910 0.0 2.733				Vel = 8.32
47 to 48	-5.06 10.5	0.874 150.0 0.0635		0.0 0.0 0.0	11.170 0.0 11.170	15.643 0.0 0.709				Vel = 5.62
	0.0 10.50						16.352		K Factor = 2.60	



# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2

Page 6  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
44 to 48	16.01	0.874 150.0 0.1388	U 2V 4.0 6.0 0.0	10.920 10.000 20.920	13.448 0.0 2.904		Vel = 8.56		
48 to 204	10.50 26.51	0.874 150.0 0.3527	V 3.0 0.0 0.0	4.000 3.000 7.000	16.352 0.0 2.469		Vel = 14.18		
	0.0 26.51				18.821		K Factor = 6.11		
204 to 202	26.51	1.394 150.0 0.0363	U 6.0 0.0 0.0	9.330 6.000 15.330	18.821 0.0 0.557		Vel = 5.57		
	0.0 26.51				19.378		K Factor = 6.02		
201 to 205	-21.41	1.101 150.0 -0.0772	U 5.0 0.0 0.0	9.420 5.000 14.420	19.633 0.0 -1.113		Vel = 7.21		
205 to 206	35.79 14.38	1.101 150.0 0.0370	0.0 0.0 0.0	12.000 0.0 12.000	18.520 0.0 0.444		Vel = 4.85		
206 to 207	0.0 14.38	1.101 150.0 0.0369	0.0 0.0 0.0	14.750 0.0 14.750	18.964 0.0 0.545		Vel = 4.85		
207 to 200	0.0 14.38	1.101 150.0 0.0370	U 5.0 0.0 0.0	44.250 5.000 49.250	19.509 0.0 1.820		Vel = 4.85		
	0.0 14.38				21.329		K Factor = 3.11		
200 to 100	14.38	1.394 150.0 0.0117	V 6.0 0.0 0.0	10.000 6.000 16.000	21.329 4.331 0.187		Vel = 3.02		
	0.0 14.38				25.847		K Factor = 2.83		
201 to 101	21.41	1.394 150.0 0.0245	V 6.0 0.0 0.0	10.000 6.000 16.000	19.633 4.331 0.392		Vel = 4.50		
	0.0 21.41				24.356		K Factor = 4.34		
202 to 102	26.51	1.394 150.0 0.0363	V 6.0 0.0 0.0	10.000 6.000 16.000	19.378 4.331 0.581		Vel = 5.57		
	0.0 26.51				24.290		K Factor = 5.38		
102 to 101	26.51	2.003 150.0 0.0062	0.0 0.0 0.0	10.580 0.0 10.580	24.290 0.0 0.066		Vel = 2.70		
101 to 100	21.41 47.92	2.003 150.0 0.0186	0.0 0.0 0.0	80.250 0.0 80.250	24.356 0.0 1.491		Vel = 4.88		

# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2

Page 7  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
100 to 103	14.38 62.3	2.003 150.0 0.0302		0.0 0.0 0.0	134.500 0.0 134.500	25.847 0.0 4.061			Vel = 6.34	
103 to TR	0.0 62.3	2.003 150.0 0.0302	5U	45.0 0.0 0.0	22.170 45.000 67.170	29.908 3.573 2.029			Vel = 6.34	
	0.0 62.30					35.510			K Factor = 10.45	
TR to BR	62.30 62.3	2.003 150.0 0.0302	Z	6.482 0.0 0.0	8.250 6.482 14.732	35.510 1.732 0.445			Vel = 6.34	
BR to UG3	0.0 62.3	4.28 140.0 0.0009	L	10.75 0.0 0.0	4.000 10.750 14.750	37.687 0.0 0.013			Vel = 1.39	
	0.0 62.30					37.700			K Factor = 10.15	
UG3 to BFS3	62.30 62.3	4.24 150.0 0.0008	2L	23.335 0.0 0.0	54.000 23.335 77.335	37.700 -2.166 0.061			Vel = 1.42	
BFS3 to BFD3	0.0 62.3	4.026 120.0 0.0015	Zai	0.0 0.0 0.0	10.000 0.0 10.000	35.595 10.067 0.015			** Fixed Loss = 10.067 Vel = 1.57	
BFD3 to DD3	0.0 62.3	4.24 150.0 0.0007		0.0 0.0 0.0	9.420 0.0 9.420	45.677 2.166 0.007			Vel = 1.42	
DD3 to M2	147.00 209.3	4.24 150.0 0.0074	G T	3.889 38.891 0.0	13.670 42.780 56.450	47.850 0.0 0.416			Qa = 147.00 Vel = 4.76	
	0.0 209.30					48.266			K Factor = 30.13	
M1 to M2	-176.71 -176.71	7.98 150.0 -0.0003		0.0 0.0 0.0	31.580 0.0 31.580	48.274 0.0 -0.008			Vel = 1.13	
M2 to M3	209.30 32.59	7.98 150.0 0.0	2F	27.183 0.0 0.0	193.580 27.182 220.762	48.266 0.0 0.002			Vel = 0.21	
M3 to M4	0.0 32.59	7.98 150.0 0.0	F	13.591 0.0 0.0	287.750 13.592 301.342	48.268 0.0 0.003			Vel = 0.21	
M4 to M5	0.0 32.59	7.98 150.0 0.0	T	52.855 0.0 0.0	76.670 52.855 129.525	48.271 0.0 0.002			Vel = 0.21	
M5 to M1	0.0 32.59	11.68 150.0 0.0	F	17.661 0.0 0.0	422.000 17.661 439.661	48.273 0.0 0.001			Vel = 0.10	
M1 to CC1	176.71 209.3	11.68 150.0 0.0001	T G	81.513 8.151 0.0	372.830 89.664 462.494	48.274 3.032 0.024			Vel = 0.63	

# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Corridor - DA 3.2

Page 8  
 Date 4-5-2024

Hyd. Ref. Point	Qa  Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
CC1 to CC2	0.0 209.3	19.76 150.0 0.0	0.0	321.000 0.0 321.000	51.330 0.0 0.001		Vel = 0.22		
CC2 to TEST	0.0 209.3	6.08 140.0 0.0015	G 4.038 L 12.115 0.0	65.000 16.153 81.153	51.331 -2.166 0.118		Vel = 2.31		
	0.0 209.30				49.283		K Factor = 29.81		



## Hydraulic Calculations

Wayne Automatic  
Fire Sprinklers, Inc.  
4370 Motorsport Drive  
Concord, NC 28027  
704-782-3032

Job Name : Juniper Villiage - Building 300 - 3rd Floor - Unit B - Common - DA 3.3  
Sheet Number : FP3.3  
Location : Building 300  
Design Area : Design Area 3.3  
Contract : 102001  
Data File : Building 300- 3rd Floor - Unit B - Common DA 3.3.WXF

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**HYDRAULIC CALCULATIONS**  
**for**

**Project name:** Juniper Village  
**Location:** Building 300  
**Drawing no:** FP3.3  
**Date:** 4-5-2024

**Design**

**Remote area number:** Design Area 3.3  
**Remote area location:** Building 300 - 3rd Floor - Unit B Common Area  
**Occupancy classification:** NFPA 13R  
**Density:** .05 - Gpm/SqFt  
**Area of application:** 4 Sprinklers - SqFt  
**Coverage per sprinkler:** 256 - SqFt  
**Type of sprinklers calculated:** Reliable Mod. F1 Res 44 Residential HSW  
**No. of sprinklers calculated:** 4  
**In-rack demand:** - GPM  
**Hose streams:** - GPM  
**Total water required (including hose streams):** 218.2 - GPM @ 69.8 - Psi  
**Type of system:** Wet Residential NFPA 13R  
**Volume of dry or preaction system:** - Gal

**Water supply information**

**Date:** 3-20-2024  
**Location:** North Main Street (Hydrant 224)  
**Source:** Lillington Fire Department

**Name of contractor:** Wayne Automatic Fire Sprinklers  
**Address:** 4370 Motorsport Drive / Concord, NC  
**Phone number:** 407-877-5514  
**Name of designer:** Donald Hawkins  
**Authority having jurisdiction:** Town of Lillington

**Notes: (Include peaking information for gridded systems here.)**

- (1) The Finished Floor Elevation is 169'. For clarity the Finished Floor elevation on the hydraulic calculations is shown as 0'-0"
- (2) A domestic demand of 147 was added at node point DD3 as required by NFPA 13R Section 9.6.

# Water Supply Curve C

Wayne Automatic  
Juniper Villiage - Building 300 - 3rd Floor - Unit B - Common - DA 3.3

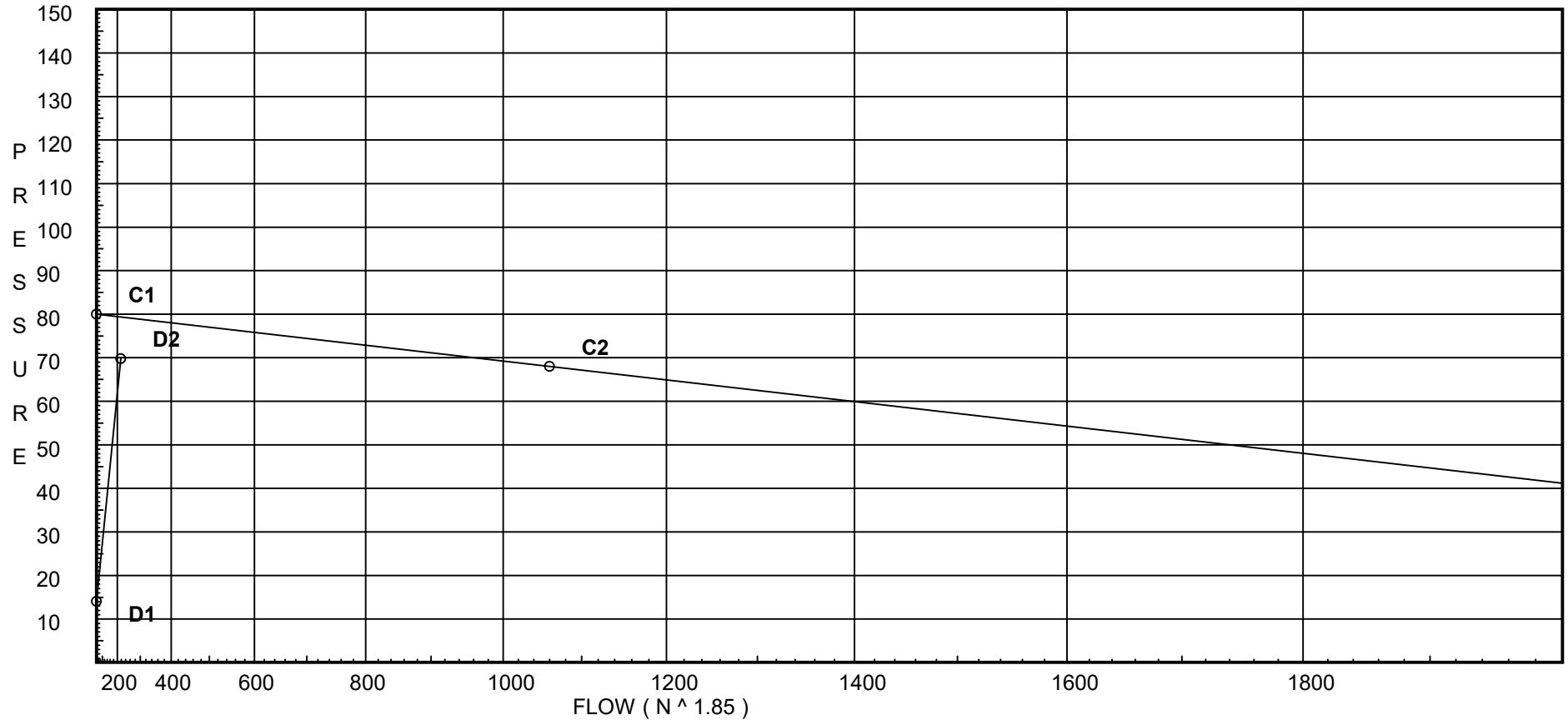
Page 2  
Date 4-5-2024

## City Water Supply:

C1 - Static Pressure : 80  
C2 - Residual Pressure: 68  
C2 - Residual Flow : 1060

## Demand:

D1 - Elevation : 14.076  
D2 - System Flow : 218.219  
D2 - System Pressure : 69.810  
Hose ( Demand ) :  
D3 - System Demand : 218.219  
Safety Margin : 9.545



# Fittings Used Summary

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Unit B - Common - DA 3.3

Page 3  
 Date 4-5-2024

## Fitting Legend

Abbrev.	Name	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	3 1/2	4	5	6	8	10	12	14	16	18	20	24
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	NFPA 13 Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	NFPA 13 Tee Branch	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
U*	CPVC 90' Elbow Tyco	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
V*	CPVC Tee Branch Tyco	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zai	Ames 4000SS	Fitting generates a Fixed Loss Based on Flow																			

## Units Summary

Diameter Units           Inches  
 Length Units             Feet  
 Flow Units                US Gallons per Minute  
 Pressure Units           Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with \*. The fittings marked with a \* show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a \* will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

# Pressure / Flow Summary - STANDARD

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Unit B - Common - DA 3.3

Page 4  
 Date 4-5-2024

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
E1	27.5	4.4	19.16	na	19.26	0.05	256	13.3
E2	27.5	4.4	13.3	na	16.05	0.05	256	13.3
E3	27.5	4.4	15.37	na	17.25	0.05	256	13.3
E4	27.5	4.4	17.99	na	18.66	0.05	256	13.3
51	19.25		25.13	na				
55	19.25		27.2	na				
52	19.25		18.58	na				
53	19.25		20.89	na				
56	19.25		21.81	na				
54	19.25		23.82	na				
57	19.25		24.96	na				
45	19.25		25.88	na				
201	19.25		35.42	na				
205	19.25		31.73	na				
206	19.25		30.73	na				
207	19.25		31.05	na				
200	19.25		38.21	na				
102	9.25		43.61	na				
101	9.25		43.61	na				
100	9.25		44.73	na				
103	9.25		49.93	na				
TR	1.0		56.1	na				
BR	-3.0		58.4	na				
UG3	-3.0		58.42	na				
BFS3	2.0		56.33	na				
BFD3	2.0		66.16	na				
DD3	-3.0		68.33	na	147.0			
M1	-3.0		68.79	na				
M2	-3.0		68.78	na				
M3	-3.0		68.78	na				
M4	-3.0		68.79	na				
M5	-3.0		68.79	na				
CC1	-10.0		71.85	na				
CC2	-10.0		71.85	na				
TEST	-5.0		69.81	na				

The maximum velocity is 17.81 and it occurs in the pipe between nodes 56 and 206



# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Unit B - Common - DA 3.3

Page 5  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
E1 to 51	19.26 19.26	0.874 150.0 0.1953	U	4.0 0.0 0.0	8.250 4.000 12.250	19.162 3.573 2.393			K Factor = 4.40 Vel = 10.30	
	0.0 19.26						25.128		K Factor = 3.84	
E2 to 52	16.05 16.05	0.874 150.0 0.1393	U	4.0 0.0 0.0	8.250 4.000 12.250	13.300 3.573 1.707			K Factor = 4.40 Vel = 8.58	
	0.0 16.05						18.580		K Factor = 3.72	
E3 to 53	17.25 17.25	0.874 150.0 0.1593	U	4.0 0.0 0.0	8.250 4.000 12.250	15.369 3.573 1.951			K Factor = 4.40 Vel = 9.22	
	0.0 17.25						20.893		K Factor = 3.77	
E4 to 54	18.66 18.66	0.874 150.0 0.1843	U	4.0 0.0 0.0	8.250 4.000 12.250	17.991 3.573 2.258			K Factor = 4.40 Vel = 9.98	
	0.0 18.66						23.822		K Factor = 3.82	
51 to 55	19.26 19.26	0.874 150.0 0.1954	V	3.0 0.0 0.0	7.580 3.000 10.580	25.128 0.0 2.067			Vel = 10.30	
55 to 207	0.0 19.26	0.874 150.0 0.1954	V	3.0 0.0 0.0	16.750 3.000 19.750	27.195 0.0 3.859			Vel = 10.30	
	0.0 19.26						31.054		K Factor = 3.46	
52 to 56	16.05 16.05	0.874 150.0 0.1394		0.0 0.0 0.0	23.170 0.0 23.170	18.580 0.0 3.229			Vel = 8.58	
	0.0 16.05						21.809		K Factor = 3.44	
53 to 56	17.25 17.25	0.874 150.0 0.1593	V	3.0 0.0 0.0	2.750 3.000 5.750	20.893 0.0 0.916			Vel = 9.22	
56 to 206	16.05 33.3	0.874 150.0 0.5378	V	3.0 0.0 0.0	13.580 3.000 16.580	21.809 0.0 8.917			Vel = 17.81	
	0.0 33.30						30.726		K Factor = 6.01	
54 to 57	18.66 18.66	0.874 150.0 0.1843	V	3.0 0.0 0.0	3.170 3.000 6.170	23.822 0.0 1.137			Vel = 9.98	
57 to 45	0.0 18.66	0.874 150.0 0.1842	V	3.0 0.0 0.0	2.000 3.000 5.000	24.959 0.0 0.921			Vel = 9.98	

# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Unit B - Common - DA 3.3

Page 6  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
45 to 205	0.0 18.66	0.874 150.0 0.1843	V	3.0 0.0 0.0	28.750 3.000 31.750	25.880 0.0 5.852				Vel = 9.98
	0.0 18.66					31.732				K Factor = 3.31
201 to 205	-41.04 -41.04	1.101 150.0 -0.2572	U	5.0 0.0 0.0	9.330 5.000 14.330	35.418 0.0 -3.686				Vel = 13.83
205 to 206	18.66 -22.38	1.101 150.0 -0.0838		0.0 0.0 0.0	12.000 0.0 12.000	31.732 0.0 -1.006				Vel = 7.54
206 to 207	33.29 10.91	1.101 150.0 0.0222		0.0 0.0 0.0	14.750 0.0 14.750	30.726 0.0 0.328				Vel = 3.68
207 to 200	19.26 30.17	1.101 150.0 0.1456	U	5.0 0.0 0.0	44.170 5.000 49.170	31.054 0.0 7.159				Vel = 10.17
	0.0 30.17					38.213				K Factor = 4.88
201 to 101	41.04 41.04	1.101 150.0 0.2573	V	5.0 0.0 0.0	10.000 5.000 15.000	35.418 4.331 3.860				Vel = 13.83
	0.0 41.04					43.609				K Factor = 6.21
200 to 100	30.17 30.17	1.101 150.0 0.1456	V	5.0 0.0 0.0	10.000 5.000 15.000	38.213 4.331 2.184				Vel = 10.17
	0.0 30.17					44.728				K Factor = 4.51
102 to 101	0.0 0.0	2.003 150.0 0.0		0.0 0.0 0.0	10.580 0.0 10.580	43.609 0.0 0.0				Vel = 0
101 to 100	41.04 41.04	2.003 150.0 0.0139		0.0 0.0 0.0	80.250 0.0 80.250	43.609 0.0 1.119				Vel = 4.18
100 to 103	30.18 71.22	2.003 150.0 0.0387		0.0 0.0 0.0	134.500 0.0 134.500	44.728 0.0 5.203				Vel = 7.25
103 to TR	0.0 71.22	2.003 150.0 0.0387	5U	45.0 0.0 0.0	22.170 45.000 67.170	49.931 3.573 2.598				Vel = 7.25
	0.0 71.22					56.102				K Factor = 9.51
TR to BR	71.22 71.22	2.003 150.0 0.0387	Z	6.482 0.0 0.0	8.250 6.482 14.732	56.102 1.732 0.570				Vel = 7.25
BR to UG3	0.0 71.22	4.28 140.0 0.0011	L	10.75 0.0 0.0	4.000 10.750 14.750	58.404 0.0 0.016				Vel = 1.59

# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Villiage - Building 300 - 3rd Floor - Unit B - Common - DA 3.3

Page 7  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
	0.0 71.22						58.420		K Factor = 9.32	
UG3 to BFS3	71.22	4.24 150.0 0.0010	2L	23.335 0.0 0.0	54.000 23.335 77.335	58.420 -2.166 0.079			Vel = 1.62	
BFS3 to BFD3	0.0 71.22	4.026 120.0 0.0019	Zai	0.0 0.0 0.0	10.000 0.0 10.000	56.333 9.804 0.019			** Fixed Loss = 9.804 Vel = 1.79	
BFD3 to DD3	0.0 71.22	4.24 150.0 0.0010		0.0 0.0 0.0	9.420 0.0 9.420	66.156 2.166 0.009			Vel = 1.62	
DD3 to M2	147.00 218.22	4.24 150.0 0.0080	G T	3.889 38.891 0.0	13.670 42.780 56.450	68.331 0.0 0.450			Qa = 147.00 Vel = 4.96	
	0.0 218.22						68.781		K Factor = 26.31	
M1 to M2	-184.24	7.98 150.0 -0.0003		0.0 0.0 0.0	31.580 0.0 31.580	68.789 0.0 -0.008			Vel = 1.18	
M2 to M3	218.22 33.98	7.98 150.0 0.0	2F	27.183 0.0 0.0	193.580 27.182 220.762	68.781 0.0 0.002			Vel = 0.22	
M3 to M4	0.0 33.98	7.98 150.0 0.0	F	13.591 0.0 0.0	287.750 13.592 301.342	68.783 0.0 0.004			Vel = 0.22	
M4 to M5	0.0 33.98	7.98 150.0 0.0	T	52.855 0.0 0.0	76.670 52.855 129.525	68.787 0.0 0.001			Vel = 0.22	
M5 to M1	0.0 33.98	11.68 150.0 0.0	F	17.661 0.0 0.0	422.000 17.661 439.661	68.788 0.0 0.001			Vel = 0.10	
M1 to CC1	184.24 218.22	11.68 150.0 0.0001	T G	81.513 8.151 0.0	372.830 89.664 462.494	68.789 3.032 0.026			Vel = 0.65	
CC1 to CC2	0.0 218.22	19.76 150.0 0.0		0.0 0.0 0.0	321.000 0.0 321.000	71.847 0.0 0.002			Vel = 0.23	
CC2 to TEST	0.0 218.22	6.08 140.0 0.0016	G L	4.038 12.115 0.0	65.000 16.153 81.153	71.849 -2.166 0.127			Vel = 2.41	
	0.0 218.22						69.810		K Factor = 26.12	



## Hydraulic Calculations

Wayne Automatic  
Fire Sprinklers, Inc.  
4370 Motorsport Drive  
Concord, NC 28027  
704-782-3032

Job Name : Juniper Village- Building 300 - 2nd Floor - Unit C - Common - DA 3.4  
Sheet Number : FP3.3  
Location : Building 300  
Design Area : Design Area 3.4  
Contract : 102001  
Data File : Building 300- 2nd Floor - Unit C - Common DA 3.4.WXF

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**HYDRAULIC CALCULATIONS**  
**for**

**Project name:** Juniper Villiage  
**Location:** Building 300  
**Drawing no:** FP3.3  
**Date:** 4-5-2024

**Design**

**Remote area number:** Design Area 3.4  
**Remote area location:** Building 300 - 2nd Floor - Unit C Common Area  
**Occupancy classification:** NFPA 13R  
**Density:** .05 - Gpm/SqFt  
**Area of application:** 3 Sprinklers - SqFt  
**Coverage per sprinkler:** 256 - SqFt  
**Type of sprinklers calculated:** Reliable Mod. F1FR Res Pendants  
**No. of sprinklers calculated:** 3  
**In-rack demand:** - GPM  
**Hose streams:** - GPM  
**Total water required (including hose streams):** 197.1 - GPM @ 57.7 - Psi  
**Type of system:** Wet Residential NFPA 13R  
**Volume of dry or preaction system:** - Gal

**Water supply information**

**Date:** 3-20-2024  
**Location:** Parker Lane and North Main Street - Hydrant #224  
**Source:** Lillington Fire Department

**Name of contractor:** Wayne Automatic Fire Sprinklers  
**Address:** 4370 Motorsport Drive / Concord, NC  
**Phone number:** 407-877-5514  
**Name of designer:** Donald Hawkins  
**Authority having jurisdiction:** Town of Lillington

**Notes: (Include peaking information for gridded systems here.)**

- (1) The Finished Floor Elevation is 169'. For clarity the Finished Floor elevation on the hydraulic calculations is shown as 0'-0"
- (2) A domestic demand of 147 was added at node point DD3 as required by NFPA 13R Section 9.6.

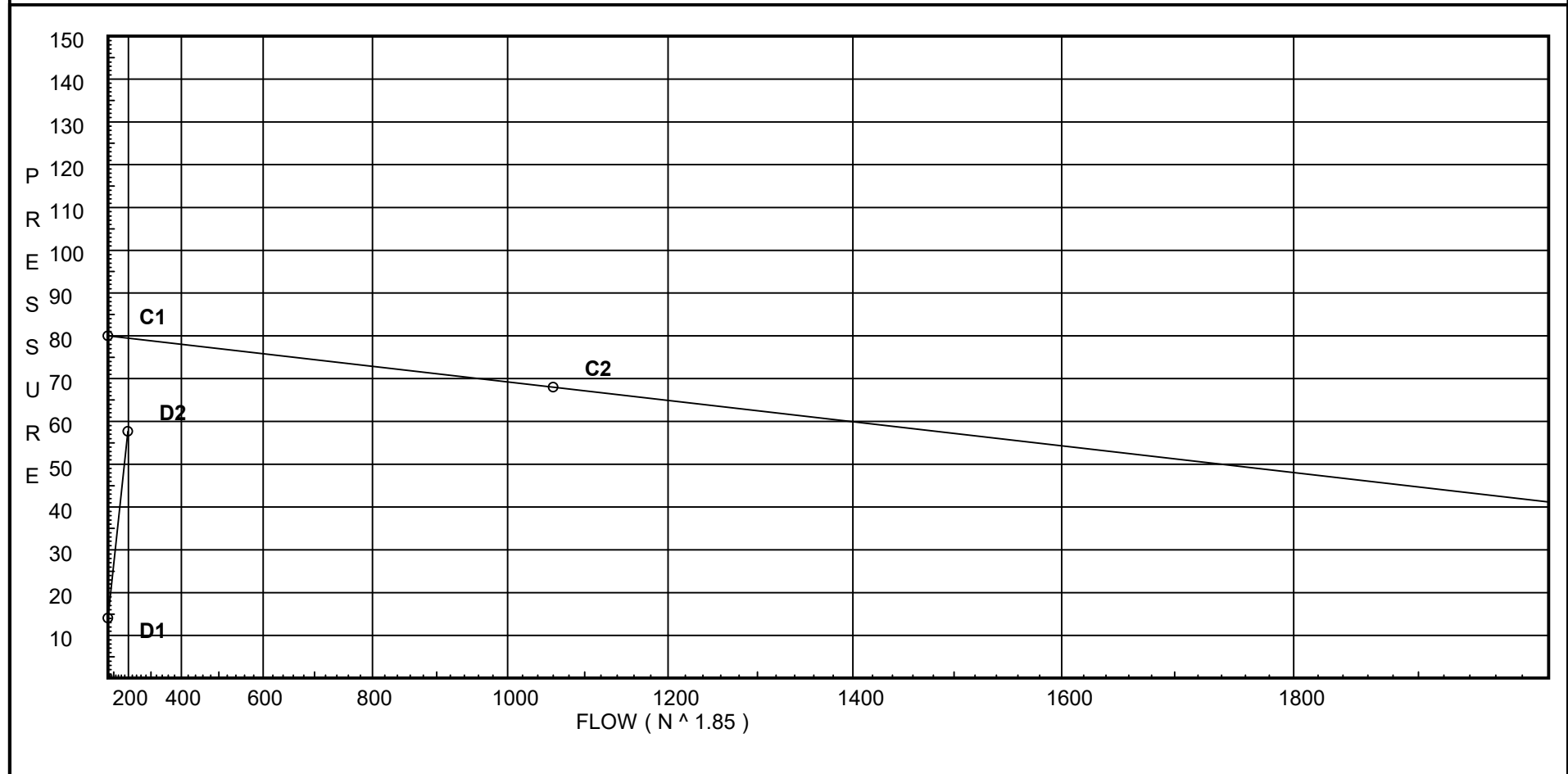
# Water Supply Curve C

Wayne Automatic  
Juniper Village- Building 300 - 2nd Floor - Unit C - Common - DA 3.4

Page 2  
Date 4-5-2024

City Water Supply:  
C1 - Static Pressure : 80  
C2 - Residual Pressure: 68  
C2 - Residual Flow : 1060

Demand:  
D1 - Elevation : 14.076  
D2 - System Flow : 197.081  
D2 - System Pressure : 57.690  
Hose ( Demand ) :  
D3 - System Demand : 197.081  
Safety Margin : 21.776



# Fittings Used Summary

Wayne Automatic  
 Juniper Village- Building 300 - 2nd Floor - Unit C - Common - DA 3.4

Page 3  
 Date 4-5-2024

## Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
F	NFPA 13 45' Elbow	1	1	1	1	2	2	3	3	3	4	5	7	9	11	13	17	19	21	24	28
G	NFPA 13 Gate Valve	0	0	0	0	0	1	1	1	1	2	2	3	4	5	6	7	8	10	11	13
L	NFPA 13 Long Turn Elbow	1	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
T	NFPA 13 Tee Branch	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121
U*	CPVC 90' Elbow Tyco	0	4	5	6	7	9	12	13	0	0	0	0	0	0	0	0	0	0	0	0
V*	CPVC Tee Branch Tyco	0	3	5	6	8	10	12	15	0	0	0	0	0	0	0	0	0	0	0	0
Z	Generic Flow Switch	2	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Zai	Ames 4000SS	Fitting generates a Fixed Loss Based on Flow																			

## Units Summary

Diameter Units                   Inches  
 Length Units                    Feet  
 Flow Units                        US Gallons per Minute  
 Pressure Units                  Pounds per Square Inch

Note: Fitting Legend provides equivalent pipe lengths for fittings types of various diameters. Equivalent lengths shown are standard for actual diameters of Sched 40 pipe and CFactors of 120 except as noted with \*. The fittings marked with a \* show equivalent lengths values supplied by manufacturers based on specific pipe diameters and CFactors and they require no adjustment. All values for fittings not marked with a \* will be adjusted in the calculation for CFactors of other than 120 and diameters other than Sched 40 per NFPA.

# Pressure / Flow Summary - STANDARD

Wayne Automatic  
 Juniper Village- Building 300 - 2nd Floor - Unit C - Common - DA 3.4

Page 4  
 Date 4-5-2024

Node No.	Elevation	K-Fact	Pt Actual	Pn	Flow Actual	Density	Area	Press Req.
G1	27.5	4.9	8.69	na	14.45	0.05	256	7.0
G2	27.5	4.9	10.15	na	15.61	0.05	256	7.0
G3	27.5	4.9	16.7	na	20.02	0.05	400	16.7
71	19.25		12.9	na				
36	19.25		13.2	na				
72	19.25		14.45	na				
37	19.25		15.93	na				
73	19.25		21.43	na				
47	19.25		22.44	na				
48	19.25		24.79	na				
203	19.25		25.53	na				
204	19.25		26.26	na				
202	19.25		28.06	na				
102	9.25		34.28	na				
101	9.25		34.49	na				
100	9.25		36.11	na				
103	9.25		38.82	na				
TR	1.0		43.75	na				
BR	-3.0		45.78	na				
UG3	-3.0		45.79	na				
BFS3	2.0		43.66	na				
BFD3	2.0		54.09	na	147.0			
DD3	-3.0		56.32	na				
M1	-3.0		56.7	na				
M2	-3.0		56.69	na				
M3	-3.0		56.69	na				
M4	-3.0		56.69	na				
M5	-3.0		56.7	na				
CC1	-10.0		59.75	na				
CC2	-10.0		59.75	na				
TEST	-5.0		57.69	na				

The maximum velocity is 16.08 and it occurs in the pipe between nodes 72 and 37



# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Village- Building 300 - 2nd Floor - Unit C - Common - DA 3.4

Page 5  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
G1 to 71	14.45 14.45	0.874 150.0 0.1149	U	4.0 0.0 0.0	1.500 4.000 5.500	8.694 3.573 0.632			K Factor = 4.90	
	0.0 14.45						12.899		K Factor = 4.02	
G2 to 72	15.61 15.61	0.874 150.0 0.1324	U	4.0 0.0 0.0	1.500 4.000 5.500	10.147 3.573 0.728			K Factor = 4.90	
	0.0 15.61						14.448		K Factor = 4.11	
G3 to 73	20.02 20.02	0.874 150.0 0.2100	U	4.0 0.0 0.0	1.500 4.000 5.500	16.700 3.573 1.155			K Factor = 4.90	
	0.0 20.02						21.428		K Factor = 4.32	
71 to 36	14.45 14.45	0.874 150.0 0.1147		0.0 0.0 0.0	2.580 0.0 2.580	12.899 0.0 0.296				Vel = 7.73
36 to 72	0.0 14.45	0.874 150.0 0.1147		0.0 0.0 0.0	10.920 0.0 10.920	13.195 0.0 1.253				Vel = 7.73
72 to 37	15.61 30.06	0.874 150.0 0.4450		0.0 0.0 0.0	3.330 0.0 3.330	14.448 0.0 1.482				Vel = 16.08
37 to 203	0.0 30.06	0.874 150.0 0.4451	V	3.0 0.0 0.0	18.580 3.000 21.580	15.930 0.0 9.605				Vel = 16.08
	0.0 30.06						25.535		K Factor = 5.95	
73 to 47	20.02 20.02	0.874 150.0 0.2099		0.0 0.0 0.0	4.830 0.0 4.830	21.428 0.0 1.014				Vel = 10.71
47 to 48	0.0 20.02	0.874 150.0 0.2099		0.0 0.0 0.0	11.170 0.0 11.170	22.442 0.0 2.345				Vel = 10.71
48 to 204	0.0 20.02	0.874 150.0 0.2099	V	3.0 0.0 0.0	4.000 3.000 7.000	24.787 0.0 1.469				Vel = 10.71
	0.0 20.02						26.256		K Factor = 3.91	
203 to 204	30.06 30.06	1.394 150.0 0.0458		0.0 0.0 0.0	15.750 0.0 15.750	25.535 0.0 0.721				Vel = 6.32
204 to 202	20.02 50.08	1.394 150.0 0.1178	U	6.0 0.0 0.0	9.330 6.000 15.330	26.256 0.0 1.806				Vel = 10.53
	0.0 50.08						28.062		K Factor = 9.45	

# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Village- Building 300 - 2nd Floor - Unit C - Common - DA 3.4

Page 6  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv.	Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
202 to 102	50.08	1.394 150.0 0.1178	V	6.0 0.0 0.0	10.000 6.000 16.000	28.062 4.331 1.885				Vel = 10.53
	0.0 50.08					34.278				K Factor = 8.55
102 to 101	50.08	2.003 150.0 0.0202		0.0 0.0 0.0	10.580 0.0 10.580	34.278 0.0 0.214				Vel = 5.10
101 to 100	0.0 50.08	2.003 150.0 0.0202		0.0 0.0 0.0	80.250 0.0 80.250	34.492 0.0 1.618				Vel = 5.10
100 to 103	0.0 50.08	2.003 150.0 0.0202		0.0 0.0 0.0	134.500 0.0 134.500	36.110 0.0 2.712				Vel = 5.10
103 to TR	0.0 50.08	2.003 150.0 0.0202	5U	45.0 0.0 0.0	22.170 45.000 67.170	38.822 3.573 1.355				Vel = 5.10
	0.0 50.08					43.750				K Factor = 7.57
TR to BR	50.08	2.003 150.0 0.0202	Z	6.482 0.0 0.0	8.250 6.482 14.732	43.750 1.732 0.297				Vel = 5.10
BR to UG3	0.0 50.08	4.28 140.0 0.0005	L	10.75 0.0 0.0	4.000 10.750 14.750	45.779 0.0 0.008				Vel = 1.12
	0.0 50.08					45.787				K Factor = 7.40
UG3 to BFS3	50.08	4.24 150.0 0.0005	2L	23.335 0.0 0.0	54.000 23.335 77.335	45.787 -2.166 0.041				Vel = 1.14
BFS3 to BFD3	0.0 50.08	4.026 120.0 0.0010	Zai	0.0 0.0 0.0	10.000 0.0 10.000	43.662 0.0 10.417 0.010				* * Fixed Loss = 10.417 Vel = 1.26
BFD3 to DD3	147.00 197.08	4.24 150.0 0.0066		0.0 0.0 0.0	9.420 0.0 9.420	54.089 2.166 0.062				Qa = 147.00 Vel = 4.48
DD3 to M2	0.0 197.08	4.24 150.0 0.0066	G T	3.889 38.891 0.0	13.670 42.780 56.450	56.317 0.0 0.372				Vel = 4.48
	0.0 197.08					56.689				K Factor = 26.18
M1 to M2	-166.39	7.98 150.0 -0.0002		0.0 0.0 0.0	31.580 0.0 31.580	56.696 0.0 -0.007				Vel = 1.07
M2 to M3	197.08 30.69	7.98 150.0 0.0	2F	27.183 0.0 0.0	193.580 27.182 220.762	56.689 0.0 0.002				Vel = 0.20

# Final Calculations - Hazen-Williams

Wayne Automatic  
 Juniper Village- Building 300 - 2nd Floor - Unit C - Common - DA 3.4

Page 7  
 Date 4-5-2024

Hyd. Ref. Point	Qa Qt	Dia. "C" Pf/Ft	Fitting or Eqv. Ln.	Pipe Ftng's Total	Pt Pe Pf	Pt Pv Pn	*****	Notes	*****
M3 to M4	0.0 30.69	7.98 150.0 0.0	F	13.591 0.0 0.0	287.750 13.592 301.342	56.691 0.0 0.003		Vel = 0.20	
M4 to M5	0.0 30.69	7.98 150.0 0.0	T	52.855 0.0 0.0	76.670 52.855 129.525	56.694 0.0 0.001		Vel = 0.20	
M5 to M1	0.0 30.69	11.68 150.0 0.0	F	17.661 0.0 0.0	422.000 17.661 439.661	56.695 0.0 0.001		Vel = 0.09	
M1 to CC1	166.39 197.08	11.68 150.0 0.0	T G	81.513 8.151 0.0	372.830 89.664 462.494	56.696 3.032 0.022		Vel = 0.59	
CC1 to CC2	0.0 197.08	19.76 150.0 0.0		0.0 0.0 0.0	321.000 0.0 321.000	59.750 0.0 0.001		Vel = 0.21	
CC2 to TEST	0.0 197.08	6.08 140.0 0.0013	G L	4.038 12.115 0.0	65.000 16.153 81.153	59.751 -2.166 0.105		Vel = 2.18	
	0.0 197.08					57.690		K Factor = 25.95	

# JUNIPER VILLAGE

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1208 North Main Street  
Lillington, North Carolina

## Manufactures Product Data

Wayne Automatic Fire Sprinklers Job Number: 102001



**Wayne Automatic Fire Sprinklers, Inc.**  
4370 Motorsport Drive - Concord, North Carolina 28027

# Important Information with Regards to Your CPVC Fire Sprinkler System

CONGRATULATIONS! This building contains a state-of-the-art FlameGuard® life safety system. Your CPVC fire sprinkler system will enhance the safety and security of your building when properly cared for. CPVC Fire Sprinkler Products resist attack from a wide range of chemicals that are corrosive to metallic piping. As with any piping material, there are certain chemicals that can be detrimental to CPVC. Occasionally, some of these chemicals may be found in some construction products, site preparations and building maintenance. There are certain things that you need to be mindful of in caring for or working around your CPVC fire sprinkler system.

**Keep your system clear from contact with the following products and chemicals unless product labels state materials are compatible with CPVC:**

NOTICE	
Ordinary Considerations	Property Maintenance Services
Cleaning Products/Detergents Oils/Lubricants/Greases Rubbery Materials	Fungicides Mold Remediation Chemicals/Termiticides/Insecticides
For Hired Contractors & Do-It-Yourselfers	
Corrosion Inhibitors Glycol-based antifreezes Solder Flux Thread Sealants Flexible Cable/Wiring (especially communications cabling) Caulks/Mastics Adhesive Vinyl/Electrical Tape Non-Water Based Paint Paint Thinners Wood Finishes/Varnishes	

**You should also avoid the following:**

- Sitting, standing, hanging, leaning, or resting anything on the pipe, fittings, and sprinkler heads
- Grounding electrical wiring to the pipe or fittings
- Ambient temperatures below 40°F/4°C where your fire sprinkler system is located. (Unless an approved compatible antifreeze or insulation method is installed.)
- Hot work around the pipe, i.e. blow torches, soldering, etc.

Be certain this document is reviewed and understood by anyone working on or around your CPVC life safety system. If you have any questions or need assistance on chemical compatibility with your CPVC fire sprinkler system, contact the manufacturer listed on the pipe.

Proper care will help your CPVC fire sprinkler system provide protection for years to come.



FOR ADDITIONAL  
INFORMATION CONTACT  
SPEARS® MANUFACTURING  
COMPANY AT 1-800-862-1499

# Notice

**This building contains a CPVC fire sprinkler system. This CPVC fire sprinkler system is a Life Safety Assembly and must be treated carefully. Please read the following before any activity which could contact this system:**

**CPVC piping components may be damaged by certain substances and construction practices.**

- DO NOT stack, support, hang equipment, or hang flexible wire/cable, especially communications cable, or other material on the fire sprinkler system.
- ONLY system compatible materials including, but not limited to solvent cements, caulks, sealants, cutting oils and thread pastes as noted by the CPVC fire sprinkler piping system manufacturer's installation instructions should be used in contact with this system.
- DO NOT expose CPVC products to incompatible substances, such as cutting oils, non-water based paints, packing oils, traditional pipe thread paste and dope, fungicides, termiticides, insecticides, detergents, building caulks, adhesive tape, solder flux, flexible wire/cable (with special consideration for communications cabling), and non-approved spray foam insulation materials.
- DO NOT expose CPVC products to edible oils, solvents, or glycol-based anti-freeze fluids.
- DO NOT expose CPVC products to open flame, solder, and soldering flux.
- DO NOT handle CPVC products with gloves contaminated with oils (hydrocarbons) or other incompatible materials.

**Failure to follow this notice may cause cracks or fractures to develop in CPVC products resulting in property damage due to leaks or flooding. The presence of any visible cracks may require partial or full system replacement. For additional information contact the general contractor or the fire sprinkler system installer.**



**FOR ADDITIONAL INFORMATION CONTACT  
SPEARS® MANUFACTURING COMPANY AT 1-800-862-1499**

Rev. 3.0 Jan 2008

# Reliable®

## Model F3QR Quick Response Dry Sprinklers

### Features

- The Model F3QR sprinkler utilizes Belleville Spring Closure Technology. Reliable is the first in the industry to produce a Quick Response Dry Concealed sprinkler utilizing this technology.
- Styles available
  - Pendent
  - Recessed FP Pendent
  - Recessed F1 Pendent
  - Concealed
  - Horizontal Sidewall
  - Recessed FP Horizontal Sidewall
  - Recessed F1 Horizontal Sidewall
- 1½" (38mm) escutcheon adjustment on pendent sprinkler.
- ½" (13mm) escutcheon adjustment on recessed sprinkler with push-on/ thread-off FP Model Escutcheon ring.
- 3/8" (9.5mm) cover plate adjustment on concealed sprinkler with push-on/ thread-off CCP Cover Plate.
- 3/4" (19mm) escutcheon adjustment on recessed sprinkler with F1 Escutcheon.
- Attractive appearance. Employs 3mm frangible glass bulb and galvanized nipple.
- Lengths available to accommodate installation dimensions from 2" - to - 48" (51mm - to - 1219mm), in ¼" (6mm) increments. See specific styles for correct "A" dimension range.
- Available in a variety of plated and painted finishes.
- Polyester Coated Corrosion Resistant Sprinklers.

**US Patent Numbers 5,775,431 and 5,967,240.**

Other US Patents pending.

### Approvals

- Listed by Underwriters Laboratories Inc. and UL Certified for Canada (cULus)

Style	Response	Sprinkler System Type	Hazard
Pendent Recessed Pendent Recessed F1 Pendent CCP Concealed (R5714)	Quick	Wet Pipe Dry Pipe All Preaction	Light Ordinary
Horizontal Sidewall Recessed Horizontal Sidewall (R5734)	Quick	Wet Pipe Dry Pipe All Preaction	Light

- Certified by FM Approvals

Style	Response	Sprinkler System Type	Hazard
Pendent Recessed F1 Pendent (R5714)	Quick	Wet Pipe Dry Pipe All Preaction	Light Ordinary, Groups 1&2
Horizontal Sidewall Recessed F1 Horizontal Sidewall (R5734)	Quick	Wet Pipe Dry Pipe All Preaction	Light

- NYC MEA 258-93-E

**The Reliable Automatic Sprinkler Co., Inc.,** 103 Fairview Park Drive, Elmsford, New York 10523



Pendent  
(See Fig. 1)



Pendent / HB  
(See Fig. 2)



Recessed FP Pendent  
(See Fig. 3)



Concealed  
(See Fig. 4)



Recessed F1 Pendent  
(See Fig. 5)



Horizontal Sidewall  
(See Fig. 6)



Horizontal Sidewall / HB  
(See Fig. 7)



Recessed FP  
Horizontal Sidewall  
(See Fig. 8)



Recessed F1  
Horizontal Sidewall  
(See Fig. 9)

## Model F3QR Dry Pendent Sprinkler

"A" Dim. 2" to 48" (51mm to 1219mm) in 1/4" (6mm) increments

### Finishes<sup>(1)</sup>

Sprinkler	Escutcheon
Bronze	Brass <sup>(3)</sup>
Chrome Plated	Chrome Plated
White Polyester <sup>(2)</sup>	White

<sup>(1)</sup> Other finishes and colors are available on special order.

Consult factory for details.

<sup>(2)</sup> cULus Listed as a Corrosion Resistant sprinkler in standard Black or White.

<sup>(3)</sup> Not available for HB escutcheons.

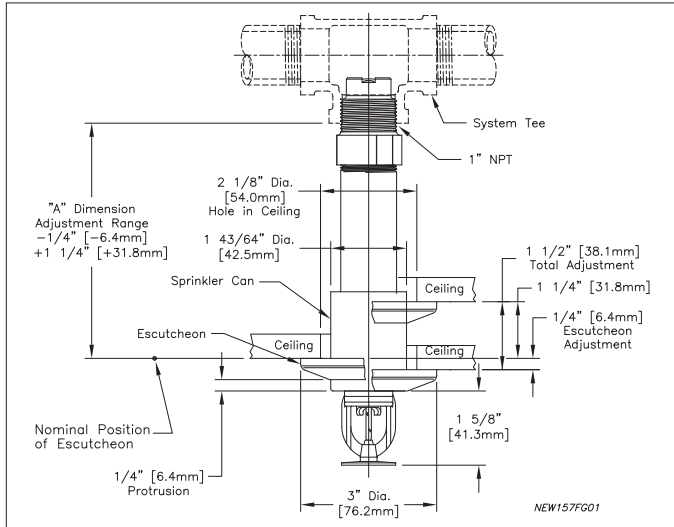


Fig. 1

**Note:** The sprinkler can protrudes 1/4" when escutcheon is in nominal position. Escutcheon adjustment provides -1/4" (-6mm) to +1 1/4" (+32mm) "A" dimension adjustment range.

**Sprinkler Guard:** Model C-2

**Sprinkler Installation Wrench:** Model G3 Sprinkler Wrench

**Sprinkler Identification Number (SIN): R5714**

## Model F3QR Dry Recessed FP Pendent Sprinkler

"A" Dim. 3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments

### Finishes<sup>(1)</sup>

Sprinkler	Escutcheon
Bronze	Brass
Chrome Plated	Chrome Plated
White Polyester <sup>(2)</sup>	White

<sup>(1)</sup> Other finishes and colors are available on special order.

Consult factory for details. Cup remains unfinished.

Only the escutcheon will contain desired finish.

<sup>(2)</sup> cULus Listed as a Corrosion Resistant sprinkler in standard Black or White.

### Standard Temperature Ratings

Classification	Sprinkler Temperature Rating	Max. Ambient Temp.	Bulb Color
Ordinary	135°F (57°C)	100°F (38°C)	Orange
Ordinary	155°F (68°C)	100°F (38°C)	Red
Intermediate <sup>(1)</sup>	175°F (79°C)	150°F (66°C)	Yellow
Intermediate	200°F (93°C)	150°F (66°C)	Green
High <sup>(1)</sup>	286°F (141°C)	225°F (107°C)	Blue

Sprinkler cup and FP Escutcheon fabricated of steel and recommended for interior applications.

<sup>(1)</sup> Listed and Certified only by cULus.

**Sprinkler Installation Wrench:** Model G3 R/C Sprinkler Wrench

**Sprinkler Identification Number (SIN): R5714**

## Model F3QR Dry Pendent w/HB Escutcheon

"A" Dim. 3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments

### Standard Temperature Ratings

Classification	Sprinkler Temperature Rating	Max. Ambient Temp.	Bulb Color
Ordinary	135°F (57°C)	100°F (38°C)	Orange
Ordinary	155°F (68°C)	100°F (38°C)	Red
Intermediate <sup>(1)</sup>	175°F (79°C)	150°F (66°C)	Yellow
Intermediate	200°F (93°C)	150°F (66°C)	Green
High <sup>(1)</sup>	286°F (141°C)	225°F (107°C)	Blue

Sprinkler can and escutcheon fabricated of brass for better weather resistance in exterior applications.

<sup>(1)</sup> Listed and Certified only by cULus.

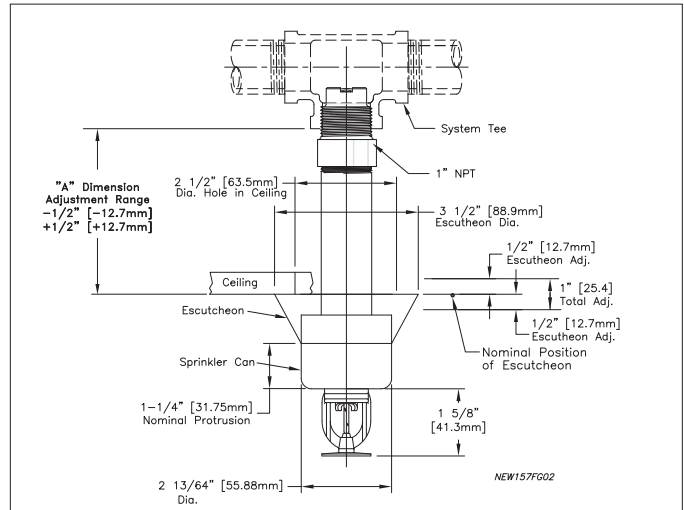


Fig. 2

**Note:** The sprinkler can protrudes 1 1/4" when escutcheon is in nominal position. Escutcheon adjustment provides -1/2" (-12.7mm) to +1/2" (+12.7mm) "A" dimension adjustment range.

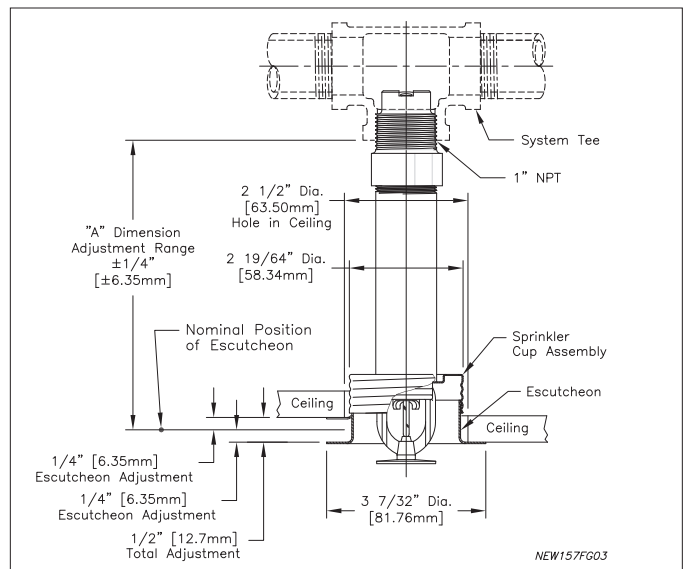


Fig. 3

**Note:** Do not install the Model F3QR Dry Recessed FP Pendent Sprinkler in ceilings which have positive pressure in space above.



## Model F3QR Dry Pendent Concealed Sprinkler

**"A" Dim.** 3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments

### CCP Cover Plate <sup>(1)</sup> Finishes <sup>(2)</sup>

Standard Finishes	Special Application Finishes
Chrome Plated White	Bright Brass Plated Black Plated Black Paint Off White Satin Chrome

- <sup>(1)</sup> Utilizes the 1/2" cover plate with 3/8" total adjustment.  
<sup>(2)</sup> Other finishes and colors are available on special order. Consult factory for details.

### Standard Temperature Ratings

Classification	Sprinkler Temperature Rating	Cover Plate Temp. Rating	Max. Ambient Temp.
Ordinary	135°F (57°C)	135°F (57°C)	100°F (38°C)
Ordinary	155°F (68°C)	135°F (57°C)	100°F (38°C)
Intermediate <sup>(1)</sup>	175°F (79°C)	165°F (74°C)	150°F (66°C)
Intermediate	200°F (93°C)	165°F (74°C)	150°F (66°C)
High <sup>(1)</sup>	286°F (141°C)	165°F (74°C)	150°F (66°C)

Sprinkler cup fabricated of steel and CCP Cover Plate fabricated of brass and recommended for interior applications.

<sup>(1)</sup> Listed and Certified only by cULus.

### Sprinkler Installation Wrench:

Model G3 R/C Sprinkler Wrench

**Sprinkler Identification Number (SIN): R5714**

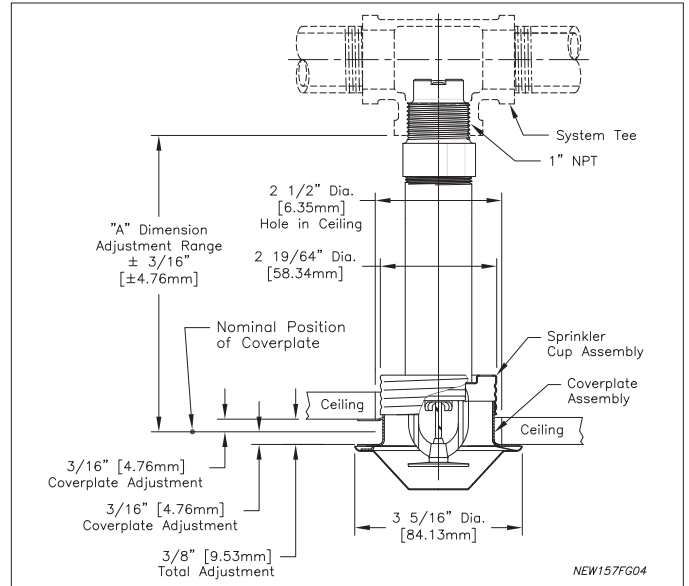


Fig. 4

**Note:** Do not install the Model F3QR Dry Concealed Pendent Sprinkler in ceilings which have positive pressure in the space above.

## Model F3QR Dry Recessed F1 Pendent Sprinkler

**"A" Dim.** 3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments

### Finishes <sup>(1)</sup>

Sprinkler	Escutcheon	Collar
Chrome Plated White Polyester <sup>(2)</sup>	Chrome Plated White	Chrome Plated White

- <sup>(1)</sup> Other finishes and colors are available on special order. Consult factory for details.  
<sup>(2)</sup> cULus Listed as a Corrosion Resistant sprinkler in standard Black or White.

### Standard Temperature Ratings

Classification	Sprinkler Temperature Rating	Max. Ambient Temp.	Bulb Color
Ordinary	135°F (57°C)	100°F (38°C)	Orange
Ordinary	155°F (68°C)	100°F (38°C)	Red
Intermediate <sup>(1)</sup>	175°F (79°C)	150°F (66°C)	Yellow
Intermediate	200°F (93°C)	150°F (66°C)	Green
High <sup>(1)</sup>	286°F (141°C)	225°F (107°C)	Blue

<sup>(1)</sup> Listed and Certified only by cULus.

### Sprinkler Installation Wrench:

Model G3 R/C Sprinkler Wrench

**Sprinkler Identification Number (SIN): R5714**

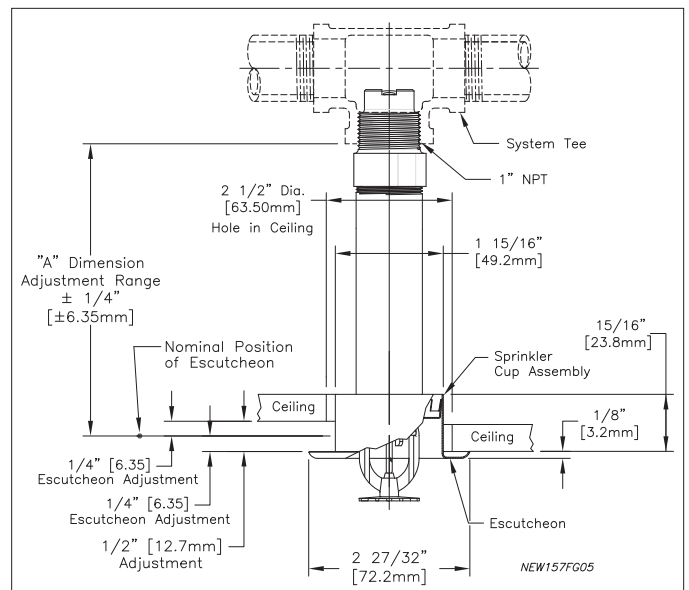


Fig. 5

## Model F3QR Dry Horizontal Sidewall Sprinkler

"A" Dim. 2" to 48" (51mm to 1219mm) in 1/4" (6mm) increments

### Finishes<sup>(1)</sup>

Sprinkler	Escutcheon
Bronze	Brass <sup>(3)</sup>
Chrome Plated	Chrome Plated
White Polyester <sup>(2)</sup>	White

(1) Other finishes and colors are available on special order. Consult factory for details.

(2) cULus Listed as a Corrosion Resistant sprinkler in standard Black or White.

(3) Not available for HB escutcheons.

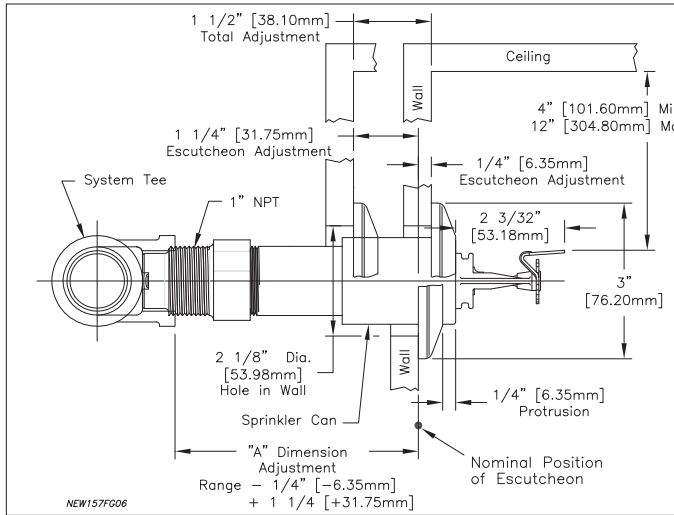


Fig. 6

**Note:** The sprinkler can protrudes 1/4" when escutcheon is in nominal position. Escutcheon adjustment provides -1/4" (-6mm) to +1 1/4" (+32mm) "A" dimension adjustment range.

(1) Listed and Certified only by cULus.

**Sprinkler Installation Wrench:** Model G3 Sprinkler Wrench  
**Sprinkler Identification Number (SIN):** R5734

## Model F3QR Dry HSW w/HB Escutcheon

"A" Dim. 2" to 48" (51mm to 1219mm) in 1/4" (6mm) increments

### Standard Temperature Ratings

Classification	Sprinkler Temperature Rating	Max. Ambient Temp.	Bulb Color
Ordinary	135°F (57°C)	100°F (38°C)	Orange
Ordinary	155°F (68°C)	100°F (38°C)	Red
Intermediate <sup>(1)</sup>	175°F (79°C)	150°F (66°C)	Yellow
Intermediate	200°F (93°C)	150°F (66°C)	Green
High	286°F (141°C)	225°F (107°C)	Blue

Sprinkler can and escutcheon fabricated of brass for better weather resistance in exterior applications.

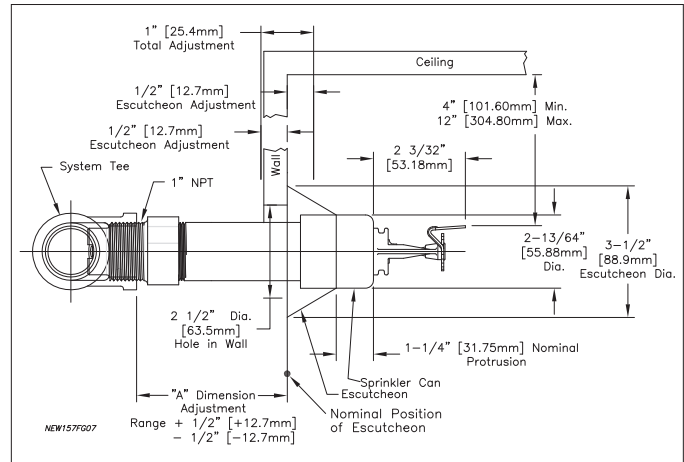


Fig. 7

**Note:** The sprinkler can protrudes 1/4" when escutcheon is in nominal position. Escutcheon adjustment provides -1/2" (-12.7mm) to +1/2" (+12.7mm) "A" dimension adjustment range.

## Model F3QR Dry Recessed FP Horizontal Sidewall Sprinkler

"A" Dim. 3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments

### Finishes<sup>(1)</sup>

Sprinkler	Escutcheon
Bronze	Brass
Chrome Plated	Chrome Plated
White Polyester <sup>(2)</sup>	White

(1) Other finishes and colors are available on special order. Consult factory for details. Cup remains unfinished. "See page 2"

(2) cULus Listed as a Corrosion Resistant sprinkler in standard Black or White.

### Standard Temperature Ratings

Classification	Sprinkler Temperature Rating	Max. Ambient Temp.	Bulb Color
Ordinary	135°F (57°C)	100°F (38°C)	Orange
Ordinary	155°F (68°C)	100°F (38°C)	Red
Intermediate <sup>(1)</sup>	175°F (79°C)	150°F (66°C)	Yellow
Intermediate	200°F (93°C)	150°F (66°C)	Green
High <sup>(1)</sup>	286°F (141°C)	225°F (107°C)	Blue

(1) Listed and Certified only by cULus.

**Sprinkler Installation Wrench:**  
Model G3 R/C Sprinkler Wrench  
**Sprinkler Identification Number (SIN):** R5734

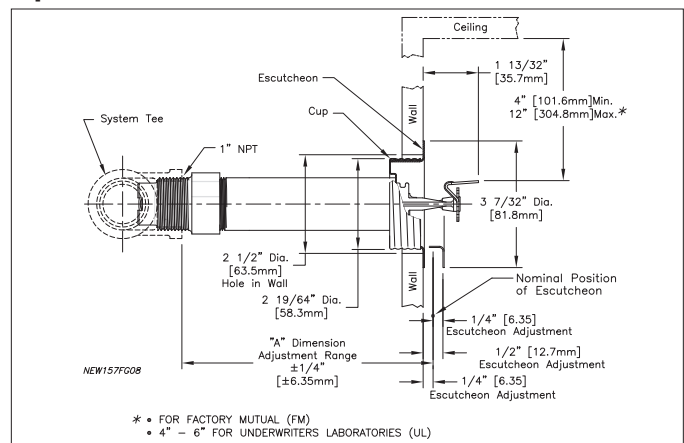


Fig. 8

**Notes:** Do not install the Model F3QR Dry Recessed FP Horizontal Sidewall Sprinkler in walls which have positive pressure in their side space.

- Listed by cULus for Quick Response. Approved by FM for Standard Response.
- Recessed Horizontal sidewall sprinklers are listed with cULus for installation of min. 4" (100mm) - to - max. 6" (150mm) below ceiling and approved by FM for installation of min. 4" (100mm) - to - max. 12" (300mm) below ceiling.

## Model F3QR Dry Recessed F1 Horizontal Sidewall Sprinkler

<b>"A" Dim.</b>	3 1/2" to 48" (89mm to 1219mm) in 1/4" (6mm) increments
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### Finishes <sup>(1)</sup>

Sprinkler	Escutcheon	Collar
Chrome Plated	Chrome Plated	Chrome Plated
White Polyester <sup>(2)</sup>	White	White

<sup>(1)</sup> Other finishes and colors are available on special order. Consult factory for details.

<sup>(2)</sup> cULus Listed as a Corrosion Resistant sprinkler in standard Black or White.

### Standard Temperature Ratings

Classification	Sprinkler Temperature Rating	Max. Ambient Temp.	Bulb Color
Ordinary	135°F (57°C)	100°F (38°C)	Orange
Ordinary	155°F (68°C)	100°F (38°C)	Red
Intermediate <sup>(1)</sup>	175°F (79°C)	150°F (66°C)	Yellow
Intermediate	200°F (93°C)	150°F (66°C)	Green
High <sup>(1)</sup>	286°F (141°C)	225°F (107°C)	Blue

<sup>(1)</sup> Listed and Certified only by cULus.

### Sprinkler Installation Wrench:

Model G3 R/C Sprinkler Wrench

**Sprinkler Identification Number (SIN): R5734**

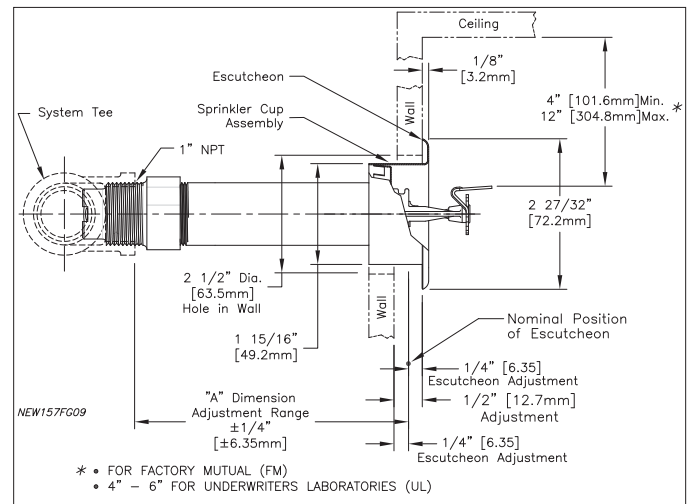


Fig. 9

- Listed by cULus for Quick Response. Approved by FM for Standard Response.
- Recessed Horizontal sidewall sprinklers are listed with cULus for installation of min. 4" (100mm) - to - max. 6" (150mm) below ceiling and approved by FM for installation of min. 4" (100mm) - to - max. 12" (300mm) below ceiling.

### Technical Data:

Orifice Size: 1/2" (15mm)

Thread Size: 1" NPT per ANSI B2.1

Working Pressure: 175 psi (12 bar)

Nominal K Factor - US / (Metric): 5.6 / (80)

### Product Description

Reliable Model F3QR Dry Sprinklers are quick response sprinklers utilizing a durable 3mm frangible glass bulb. This quick response enables these sprinklers to apply water to a fire much sooner than standard response sprinklers of the similar temperature rating.

Model F3QR Dry Sprinklers are intended for use in dry and preaction systems and in areas subjected to freezing temperatures, such as freezers and unheated portions inside and outside buildings.

Environments wherein dry sprinklers are employed can be corrosive. For this reason, Model F3 Sprinklers have a special wax fillet placed in the gap between the cup that supports the bulb and the wrenching boss. This wax will not interfere with the operation of the sprinkler, and it prevents contaminants from entering the internal portion of the drop nipple. The wax must not be removed.

### Operation

The glass bulb consists of an accurately controlled amount of special fluid hermetically sealed inside a precisely manufactured glass capsule. This glass bulb is specially constructed to provide fast thermal response. When the temperature increases sufficiently, due to a fire, the bulb shatters allowing operating parts to clear the waterway. This enables the inlet seal to release air or water and subsequently, cause water flow over the deflector in a uniform spray pattern, controlling or extinguishing the fire.

### Ordering Information

Specify:

1. Sprinkler Type (select one):
  - (a) Model F3QR Dry Pendant
  - (b) Model F3QR Dry Pendant/HB
  - (c) Model F3QR Dry Recessed FP Pendant
  - (d) Model F3QR Dry Recessed F1 Pendant
  - (e) Model F3QR Dry Concealed Pendant
  - (f) Model F3QR Dry Horizontal Sidewall
  - (g) Model F3QR Dry Horizontal Sidewall/HB
  - (h) Model F3QR Dry Recessed FP Horizontal Sidewall
  - (i) Model F3QR Dry Recessed F1 Horizontal Sidewall
2. Sprinkler Temperature Rating.
3. Sprinkler Finish.
4. Escutcheon type (F1 or FP).
5. Cover Plate/Escutcheon Finish.
6. Length:
 

"A" Dimension (face of tee to face of ceiling or wall) in 1/4" (6mm) increments.
7. Model F3QR Dry Pendant (a) is available without sprinkler can and escutcheon.

### Note:

1. The "A" dimension is based on a nominally gauged pipe thread "make-up" of 0.600" (15mm) per ANSI B2.1 [7 1/2 threads approximately].
2. All platings and paintings are decorative and intended for interior use.

## General Installation Instructions

Model F3QR dry sprinklers must be installed only in standard (ANSI B 16.3 class 150 and ANSI B 16.4 class 125) pipe tees in the horizontal position, even at branch line ends. They should not be installed into elbows or pipe couplings located on drop nipples to the sprinklers. For these and other fittings including CPVC\*, the dry sprinkler should be installed into a fitting to allow protrusion into the fitting in accordance with the diagrams. The "A" dimension of the dry sprinkler, which extends into the freezers or a freezing zone from wet pipe systems, should be selected to provide, as a minimum, the specified lengths in inches shown in Fig. 10.

### **Caution:**

Do not install Model F3QR Dry sprinklers into CPVC adapter fittings or tees that have an internal obstruction. This will damage the sprinkler and /or the fitting. Refer to Fig. 11.

During installation, the following steps must be followed:

1. Cut the specified size hole (see illustrations) for the sprinkler in the ceiling or wall directly in line with the tee.
2. Apply pipe joint compound to the 1" (25mm) pipe threads and install sprinkler using the Model G3 or G3 R/C Sprinkler Wrench as specified.
3. Install the Model FP push-on / thread-off escutcheon or CCP cover plate if required.

**Note:** Installation of the Model F3QR Sprinklers is not recommended in copper pipe systems, as this may reduce the life expectancy of the sprinklers.

## Model F3QR Concealed and Recessed Installation Instructions

- The Model G3 R/C wrench (Fig. 12) is designed to locate on the wrenching pads of the recessed sprinkler while centering in the cup. A standard ½" drive ratchet may be used to drive this wrench. Fig. 13 and Fig. 14 show sequentially the insertion of the wrench. First the wrench, with its jaws above the sprinkler deflector, is moved laterally until centered with the cup. Then raise the wrench inside of the cup until its jaws engage the sprinkler's square wrenching pads (Fig. 14). To remove the wrench, follow this procedure in reverse order. Care should be taken to avoid striking the deflector, with the wrench.
- Model G3 Wrench (Fig. 15) is used for installation of Pendent and Horizontal Sidewall sprinklers.
- Glass bulb sprinklers have orange bulb protectors to minimize bulb damage during shipping, handling and installation. REMOVE THIS PROTECTION AT THE TIME THE SPRINKLER SYSTEM IS PLACED IN SERVICE FOR FIRE PROTECTION. Removal of the protectors before this time may leave the bulb vulnerable to damage. RASCO wrenches are designed to install sprinklers when covers are in place. REMOVE PROTECTORS BY UNDOING THE CLASP BY HAND. DO NOT USE TOOLS TO REMOVE THE PROTECTORS.

## Maintenance

The Model F3QR Quick Response Dry Sprinklers should be inspected quarterly and the sprinkler system maintained in accordance with NFPA 25. Do not remove the factory applied thermally sensitive wax fillet between the bulb supporting cup and the wrenching boss. Do not replace this wax with a substitute substance. An Alternate substance may interfere with proper operation of the sprinkler. Do not clean sprinklers with soap and water, ammonia or any other cleaning fluids. Remove dust by using a soft brush or gently vacuuming. Remove any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should be maintained in the original cartons and packaging until used to minimize the potential for damage to sprinklers that would cause improper operation or non-operation.

### **Caution:**

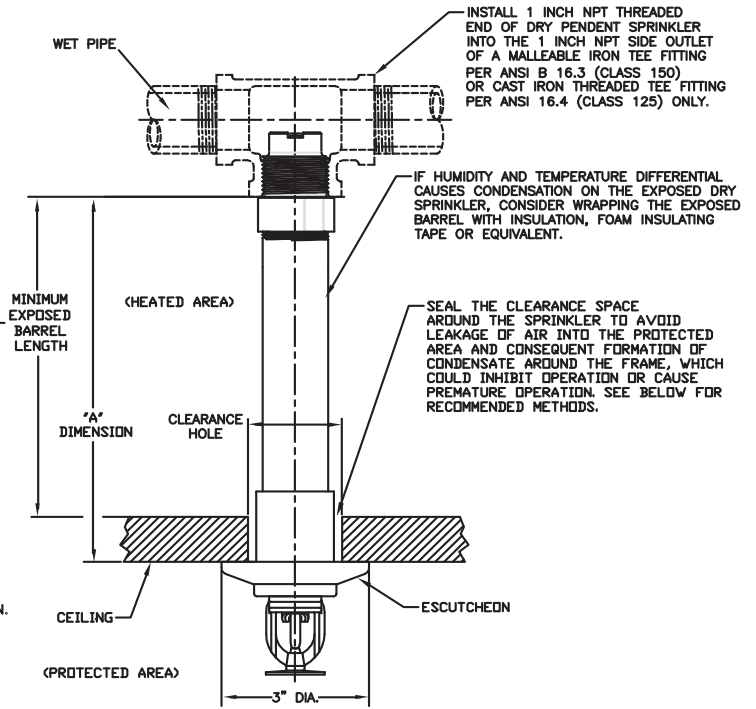
Use specified by RASCO wrenches only, which are designed to engage sprinkler's wrenching pad. (Fig. 15, page 9)

**RECOMMENDED EXPOSED MINIMUM BARREL LENGTH BASED ON AMBIENT TEMPERATURE IN THE PROTECTED AREA  
(STANDARD DRY PENDENT SPRINKLER SHOWN)**

AMBIENT TEMPERATURE OF PROTECTED AREA* AT THE DISCHARGE END OF THE SPRINKLER	EXPOSED BARREL AMBIENT TEMPERATURE		
	40°F/4°C	50°F/10°C	60°F/16°C
	EXPOSED MINIMUM BARREL LENGTH** (FACE OF TEE TO TOP OF CEILING)		
	IN. (MM)	IN. (MM)	IN. (MM)
40°F (4°C)	0	0	0
30°F (-1°C)	0	0	0
20°F (-7°C)	4 (101)	0	0
10°F (-12°C)	8 (203)	1 (25.1)	0
0°F (-18°C)	12 (305)	3 (75)	0
-10°F (-23°C)	14 (356)	4 (101)	1 (25.1)
-20°F (-29°C)	14 (356)	6 (152)	3 (75)
-30°F (-34°C)	16 (406)	8 (203)	4 (101)
-40°F (-40°C)	18 (457)	8 (203)	4 (101)
-50°F (-46°C)	20 (508)	10 (254)	6 (152)
-60°F (-51°C)	20 (508)	10 (254)	6 (152)

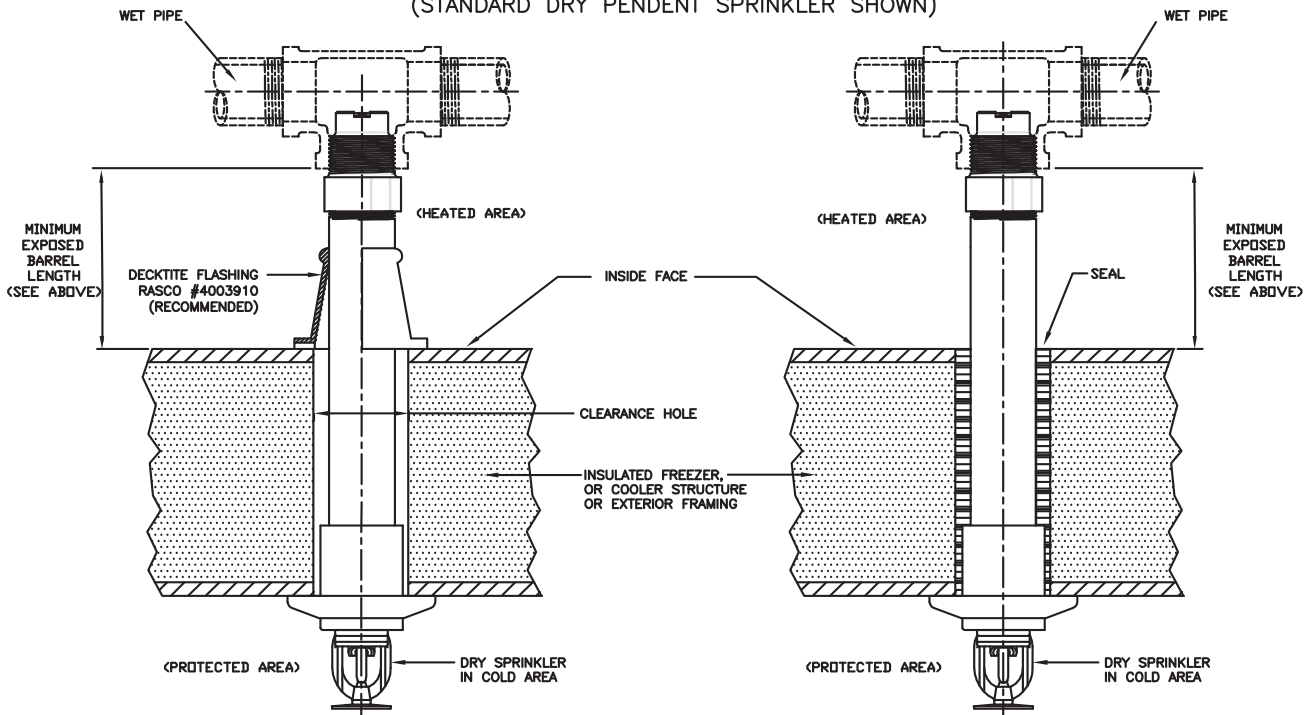
\* THE PROTECTED AREA REFERS TO THE AREA BELOW THE CEILING. THE AMBIENT TEMPERATURE IS THE TEMPERATURE AT THE DISCHARGE END OF THE SPRINKLER. FOR PROTECTED AREA TEMPERATURES THAT OCCUR BETWEEN THE VALUES LISTED, USE THE NEXT COOLER TEMPERATURE.

\*\*THE MIN. REQUIRED BARREL LENGTH IS NOT THE SAME AS THE 'A' DIMENSION. NOTE: EXPOSED MINIMUM BARREL LENGTHS ARE INCLUSIVE UP TO 30MPH WIND VELOCITIES IN THE PROTECTED AREA.



\*RECOMMENDED EXPOSED MINIMUM BARREL LENGTHS ALSO APPLY TO HORIZONTAL SIDEWALL DRY SPRINKLERS\*

**RECOMMENDED DRY SPRINKLER SEAL ARRANGEMENTS  
(STANDARD DRY PENDENT SPRINKLER SHOWN)**

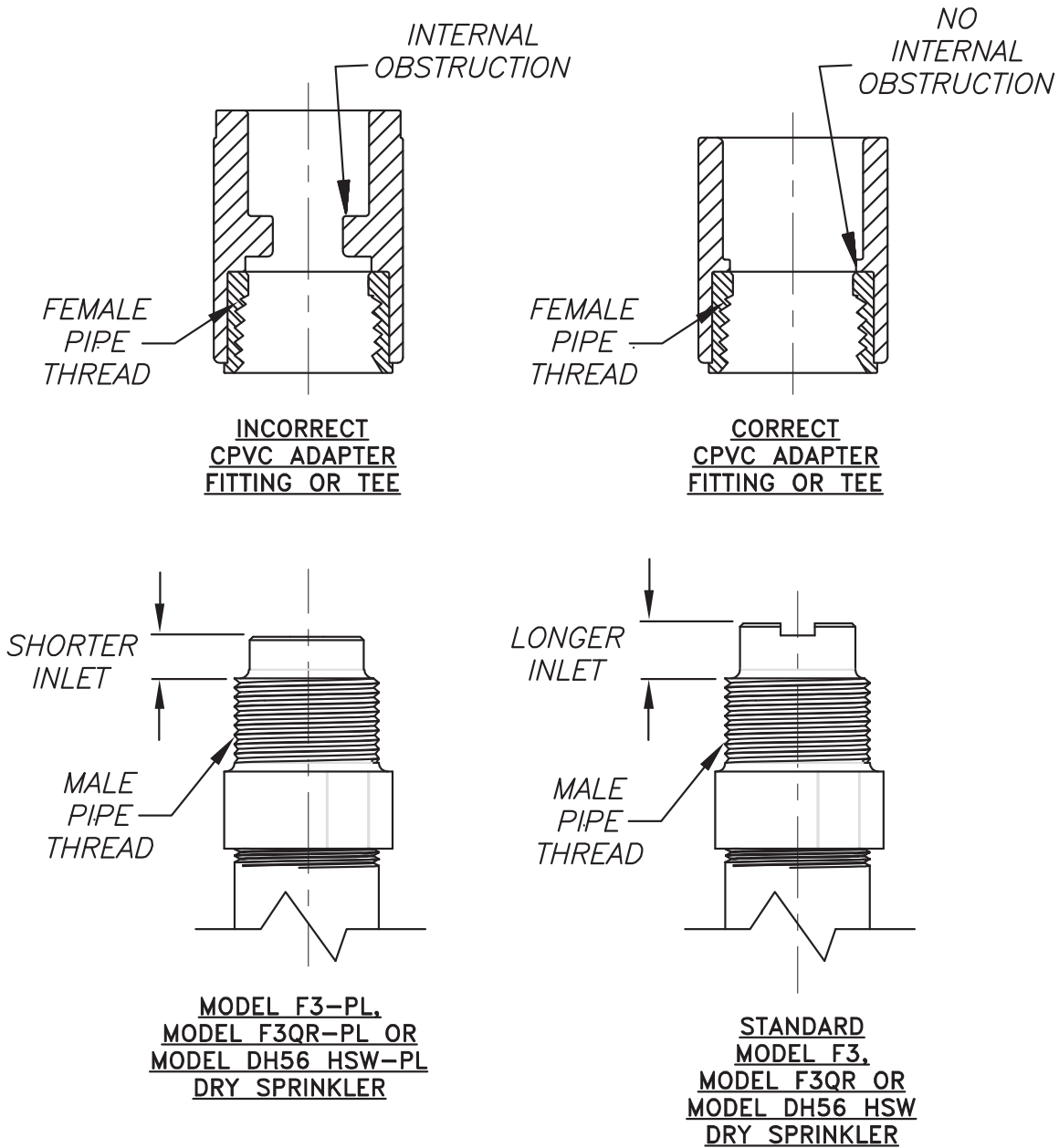


NEW157FG10

Fig. 10

**\*CAUTION\***

DO NOT INSTALL MODEL F3, MODEL F3QR OR MODEL DH56 HSW DRY SPRINKLERS INTO CPVC ADAPTER FITTINGS OR TEES THAT HAVE AN INTERNAL OBSTRUCTION. THIS WILL DAMAGE THE SPRINKLER AND/OR THE FITTING.  
CPVC ADAPTER FITTINGS AND TEES WITH INTERNAL OBSTRUCTIONS ARE ALSO COMMONLY FOUND DURING THE RETROFITTING PROCESS OF RELIABLE'S OLDER MODEL G3 DRY SPRINKLERS.



BE SURE TO ORDER THE CORRECT SPRINKLERS FOR YOUR APPLICATION

016fg08A

Fig. 11



Fig. 12 - G3 R/C Wrench

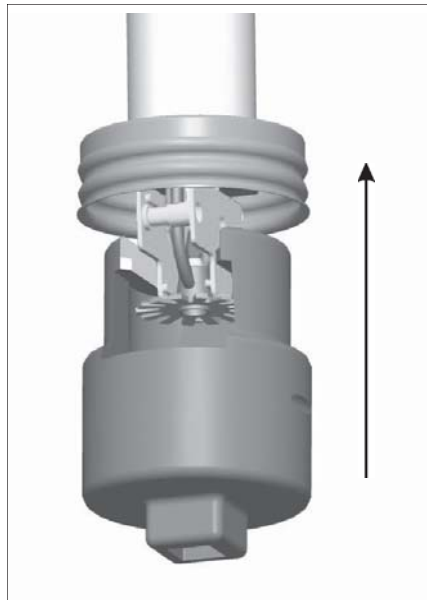


Fig. 13 - G3 R/C Wrench

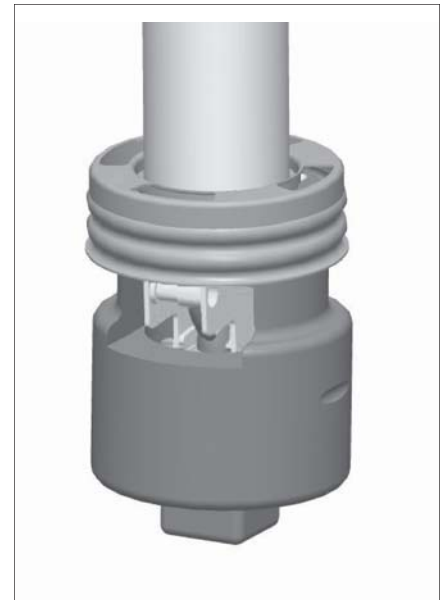


Fig. 14 - G3 R/C Wrench

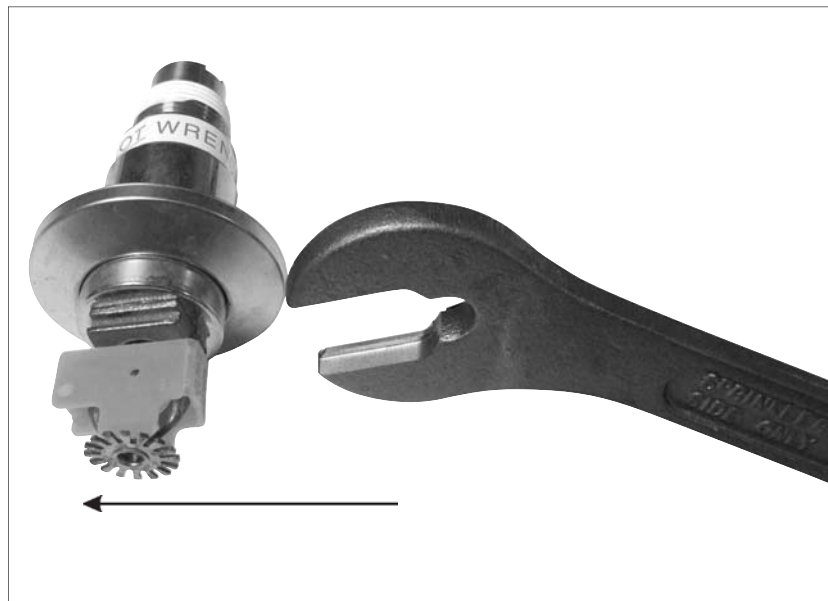


Fig. 15 - G3 Wrench

# Reliable...For Complete Protection

Reliable offers a wide selection of sprinkler components. Following are some of the many precision-made Reliable products that guard life and property from fire around the clock.

- Automatic sprinklers
- Flush automatic sprinklers
- Recessed automatic sprinklers
- Concealed automatic sprinklers
- Adjustable automatic sprinklers
- Dry automatic sprinklers
- Intermediate level sprinklers
- Open sprinklers
- Spray nozzles
- Alarm valves
- Retarding chambers
- Dry pipe valves
- Accelerators for dry pipe valves
- Mechanical sprinkler alarms
- Electrical sprinkler alarm switches
- Water flow detectors
- Deluge valves
- Detector check valves
- Check valves
- Electrical system
- Sprinkler emergency cabinets
- Sprinkler wrenches
- Sprinkler escutcheons and guards
- Inspectors test connections
- Sight drains
- Ball drips and drum drips
- Control valve seals
- Air maintenance devices
- Air compressors
- Pressure gauges
- Identification signs
- Fire department connection

---

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for over 90 years, and are installed and serviced by the most highly qualified and reputable sprinkler contractors located throughout the United States, Canada and foreign countries.

---

Manufactured by

**Reliable**<sup>®</sup>

**The Reliable Automatic Sprinkler Co., Inc.**

(800) 431-1588

(800) 848-6051

(914) 829-2042

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EG. Printed in U.S.A. 05/12 P/N 9999970175



# Reliable®

## Model F1 Residential Sprinklers for Design Density of .05 gpm/ft<sup>2</sup>

**Model F1 Res Sprinklers engineered for the lowest flows  
to meet the minimum design density of .05 gpm/ft<sup>2</sup>**

### Types:

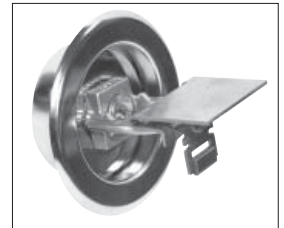
1. F1 Res 30 Pendent
2. F1 Res 30 Recessed Pendent/F2
3. F1 Res 30 Recessed Pendent/FP
4. F1 Res 49 Pendent
5. F1 Res 49 Recessed Pendent/F1
6. F1 Res 49 Recessed Pendent/FP
7. F1 Res 58 Pendent
8. F1 Res 58 Recessed Pendent/F1
9. F1 Res 58 Recessed Pendent/FP
10. F1 Res 76 Pendent
11. F1 Res 76 Recessed Pendent/F1
12. F1 Res 76 Recessed Pendent/FP
13. F1 Res 30 CCP Pendent
14. F1 Res 49 CCP Pendent
15. F1 Res 58 CCP Pendent
16. F1 Res 76 CCP Pendent
17. F1 Res 44 HSW
18. F1 Res 44 Recessed HSW/F2
19. F1 Res 58 HSW
20. F1 Res 58 HSWX
21. KRes58 HSWX
22. F1 Res 58 HSW Recessed HSW/F2
23. F1 Res 44 SWC



F1 Res 30, 49, 58 & 76  
Recessed Pendent / F1



F1 Res 30, 49, 58 & 76  
Recessed Pendent / FP



F1 Res 58 HSWX



F1 Res 30, 49, 58 & 76  
CCP Pendent



F1 Res 44 & 58  
Recessed HSW/F2



F1 Res 44 SWC

### Listings & Approvals

1. Listed by Underwriters Laboratories Inc. and UL Certified for Canada (cULus)
2. NYC MEA 258-93-E

**Slope Ceiling Approvals: Refer to Bulletin 035  
Sprinklers for .10 Density: Refer to Bulletin 176**

### UL Listing Category

Residential Automatic Sprinkler

### UL Guide Number

VKKW

### Patents

US Patent No. 6,516,893 applies to the Model F1 Res 49 & 58 Pendent Sprinklers

US Patent No. 7,353,882 applies to Model F1 Res 44 & 58 HSW Sprinklers

US Patent No. 7,784,555 applies to Model F1 Res 44 SWC Sprinklers

### Product Description

Model F1 Res Pendent sprinklers (Figs. 1, 2, 3, & 4) are fast response sprinklers combining excellent durability, high sensitiv-

ity glass-bulb and low profile decorative design. The F1 Res Horizontal Sidewall sprinklers (Figs. 5, 6 & 7) are equally attractive when above ceiling piping cannot be used.

The 3mm glass-bulb pendent sprinklers permit the efficient use of residential water supplies for sprinkler coverage in residential fire protection design.

The low flow F1 Res sprinklers are specially engineered for fast thermal response to meet the sensitive fire protection application needs of the latest residential market standards (UL 1626 Standard). Upon fire conditions, rising heat causes a sprinkler's heat-sensitive element, glass bulb or link to actuate, releasing the waterway for water flow onto the deflector, evenly distributing the discharged water to control a fire.

### Technical Data:

- Thermal Sensor: Soldered Element (Link) or Nominal 3mm glass-bulb
- Sprinkler Frame : Brass Casting
- Sprinklers' Pressure Rating : 175 psi  
Factory Hydrostatically Tested to 500 psi
- Thread Size: ½" NPT (R½)
- K-Factor: 3.0 (Actual) - F1 Res 30 Pendent Sprinkler  
4.9 (Actual) - F1 Res 49 Pendent Sprinkler  
5.8 (Actual) - F1 Res 58 Pendent & HSW Sprinkler  
7.6 (Actual) - F1 Res 76 Pendent Sprinkler  
4.4 (Actual) - F1 Res 44 HSW Sprinkler
- Density: Minimum 0.05 gpm/ft<sup>2</sup>

**The Reliable Automatic Sprinkler Co., Inc.,** 103 Fairview Park Drive, Elmsford, New York 10523

## Application

Model F1 Res Sprinklers are used for Residential Fire Protection according to UL 1626 Standard\*. Be sure that orifice size, temperature rating, deflector style and sprinkler type are in accordance with the latest published standards of The National Fire Protection Association or the approving authority having jurisdiction.

## Installation

Models F1 Res sprinklers are to be installed as shown. Model F1, F2 and FP Escutcheons, illustrated herewith, are the only recessed escutcheons to be used with Model F1 Res sprinklers. Use of any other recessed escutcheon will void all approvals and warranties. For installing Model F1 Res Pendent sprinklers use only the Model D sprinkler Wrench; for installing Models F1 Res Recessed Pendent, CCP & SWC sprinklers use only the Model GFR2 sprinkler

wrench; for installing Model F1 Res Recessed HSW sprinklers use only the Model GFR2 Sprinkler Wrench. Use of wrenches other than those specified may damage these sprinklers. Install F1 Res 44 with a ceiling to deflector distance of 4" - 12". Flow arrow on deflector must point away from near wall and "Top" marking must face ceiling.

### Escutcheon\*, F1 or F2, Data:

Type	Adjustment Inch (mm)	"A" Inch (mm)	Face of fitting to ceiling Inch (mm)
F1	3/4 (19.0)	Min.=3/4" (19.1) Max.=1 1/2" (38.1)	3/16 - 15/16 (4.7 - 24.0)
F2	1/2 (12.7)	Min.=15/16" (23.8) Max.=1 1/2" (38.1)	3/16 - 11/16 (4.7 - 17.4)

\* Note: Escutcheons F1 or F2 may be used with Model F1 Res 49, 58 & 76 Recessed Pendent Sprinkler

- **Model F1 Res 30, 49, 58 & 76 Pendent**



- **Model F1 Res 30 Recessed Pendent / F2**

- **Model F1 Res 49, 58 & 76 Recessed Pendent / F1**



F1 escutcheon, 3/4" (19mm) adjustment

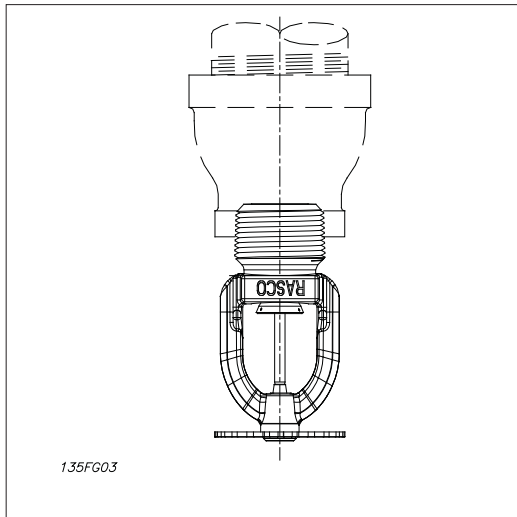


Fig. 1

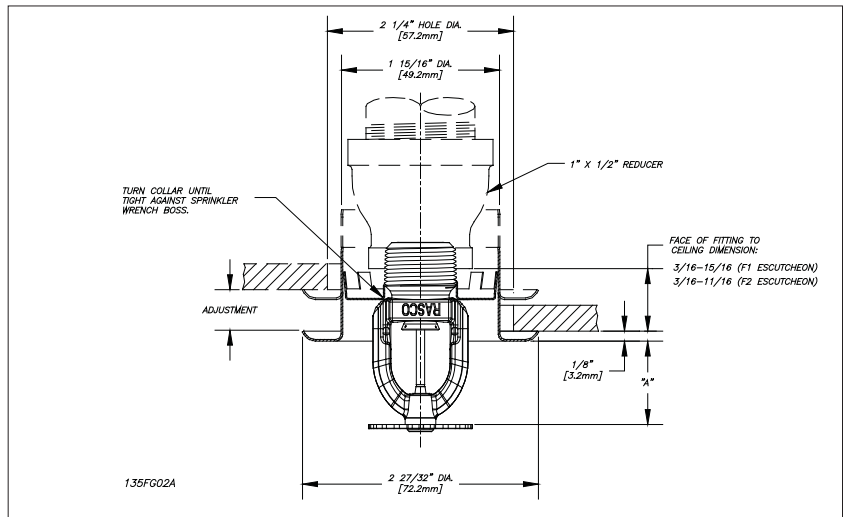


Fig. 2

### Technical Data: F1Res 30 Pendent and Recessed Pendent (SIN R3511)

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	Sprinkler Temp. Rating		Max. Ambient Temp.		Actual K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
1/2" NPT (R1/2)	21/64" (8.2)	175 (12)	155 175	68 79	100	38	3.0	2.25 (57)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Intermediate Temp. Rating (175°F/79°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)	Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	8 (30,3)	7.0 (0,48)	8 (30,3)	7.0 (0,48)	1 to 4 (25 to 100); 1/2 recessed using F2 escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	10 (37,8)	11 (0,76)	10 (37,8)	11 (0,76)		

For Ceiling types refer to NFPA 13, 13R or 13D

**Technical Data: F1Res 49 Pendant and Recessed Pendant (SIN R3516)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	Sprinkler Temp. Rating		Max. Ambient Temp.		Actual K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
½" NPT (R½)	7/16" (11)	175 (12)	155 175	68 79	100 150	38 66	4.9	2.25 (57)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Intermediate Temp. Rating (175°F/79°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)	Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	13 (49)	7.0 (0,48)	13 (49)	7.0 (0,48)	1 to 4 (25 to 100); ½ (13) recessed using F2 escutcheon, ¾ (19) recessed using F1 escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	13 (49)	7.0 (0,48)	13 (49)	7.0 (0,48)		
16 x 16 (4,9 x 4,9)	16 (4,9)	13 (49)	7.0 (0,48)	13 (49)	7.0 (0,48)		
18 x 18 (5,5 x 5,5)	18 (5,5)	17 (64,3)	12 (0,83)	17 (64,3)	12 (0,83)		
20 x 20 (6,1 x 6,1)	20 (6,1)	20 (75,7)	16.7 (1,14)	20 (75,7)	16,7 (1,14)		

For Ceiling types refer to NFPA 13, 13R or 13D

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Intermediate Temp. Rating (175°F/79°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)	Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	15 (57)	9.4 (0,65)	15 (57)	9.4 (0,65)	4 to 8 (100 to 203); ½ (13) recessed using F2 escutcheon, ¾ (19) recessed using F1 escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	16 (60,5)	10.6 (0,73)	16 (60,5)	10.6 (0,73)		
16 x 16 (4,9 x 4,9)	16 (4,9)	17 (64,3)	12.0 (0,83)	17 (64,3)	12.0 (0,83)		
18 x 18 (5,5 x 5,5)	18 (5,5)	19 (72)	15.0 (1,0)	19 (72)	15.0 (1,0)		
20 x 20 (6,1 x 6,1)	20 (6,1)	22 (83,2)	20.2 (1,4)	22 (83,2)	20.2 (1,4)		

**\*Note:** The F1 Res 49 pendant and recessed pendant residential sprinklers can be installed per NFPA 13, NFPA 13R and NFPA 13D in beamed ceilings meeting the following criteria:

1. Maximum beam depth = 7" (178mm)
2. Beam spacing at or greater than 7.5 ft. (2.3m) on center.

**Technical Data: F1Res 58 Pendant and Recessed Pendant (SIN R3513)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	Sprinkler Temp. Rating		Max. Ambient Temp.		Actual K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
½" NPT (R½)	½" (13)	175 (12)	155 175	68 79	100 150	38 66	5.8	2.25 (57)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Intermediate Temp. Rating (175°F/79°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)	Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	16 (61)	7.6 (0,53)	16 (61)	7.6 (0,53)	1 to 4 (25 to 100); ½ (13) recessed using F2 escutcheon, ¾ (19) recessed using F1 escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	16 (61)	7.6 (0,53)	16 (61)	7.6 (0,53)		
16 x 16 (4,9 x 4,9)	16 (4,9)	16 (61)	7.6 (0,53)	16 (61)	7.6 (0,53)		
18 x 18 (5,5 x 5,5)	18 (5,5)	19 (72)	10.8 (0,75)	19 (72)	10.8 (0,75)		
20 x 20 (6,1 x 6,1)	20 (6,1)	22 (83,3)	14.4 (1,0)	22 (83,3)	14.4 (1,0)		

For Ceiling types refer to NFPA 13, 13R or 13D

**Technical Data: F1 Res 76 Pendant and Recessed Pendant (SIN R7618)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	Sprinkler Temp. Rating		Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
3/4" NPT (R1/2)	17/32" (13.5)	175 (12)	155 175	68 79	100 150	38 66	7.6	2.25 (57)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Intermediate Temp. Rating (175°F/79°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)	Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	21 (79,5)	7.6 (0,53)	21 (79,5)	7.6 (0,53)	1 to 4 (25 to 100); 1/2 (13) recessed using F2 escutcheon, 3/4 (19) recessed using F1 escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	21 (79,5)	7.6 (0,53)	21 (79,5)	7.6 (0,53)		
16 x 16 (4,9 x 4,9)	16 (4,9)	21 (79,5)	7.6 (0,53)	21 (79,5)	7.6 (0,53)		
18 x 18 (5,5 x 5,5)	18 (5,5)	21 (79,5)	7.6 (0,53)	21 (79,5)	7.6 (0,53)		
20 x 20 (6,1 x 6,1)	20 (6,1)	23 (87,1)	9.2 (0,63)	23 (87,1)	9.2 (0,63)		

For Ceiling types refer to NFPA 13, 13R or 13D

• **Model F1 Res 30, 49, 58 & 76 CCP Pendant**



• **Model F1 Res 30, 49, 58 & 76 Recessed Pendant / FP**



FP push-on/thread-off escutcheon

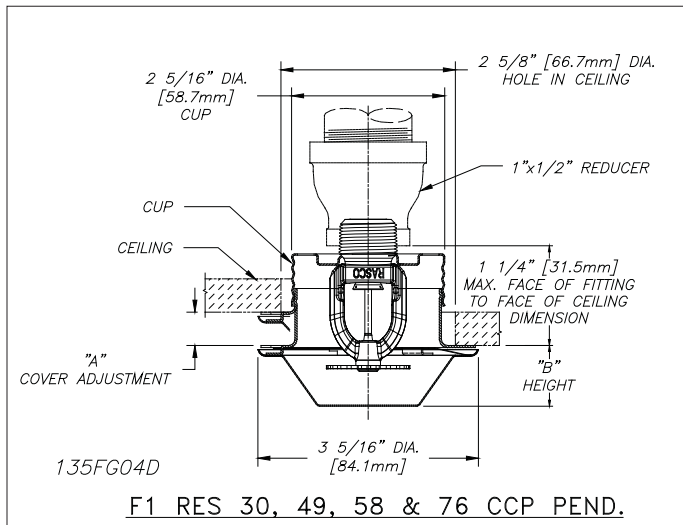


Fig. 3

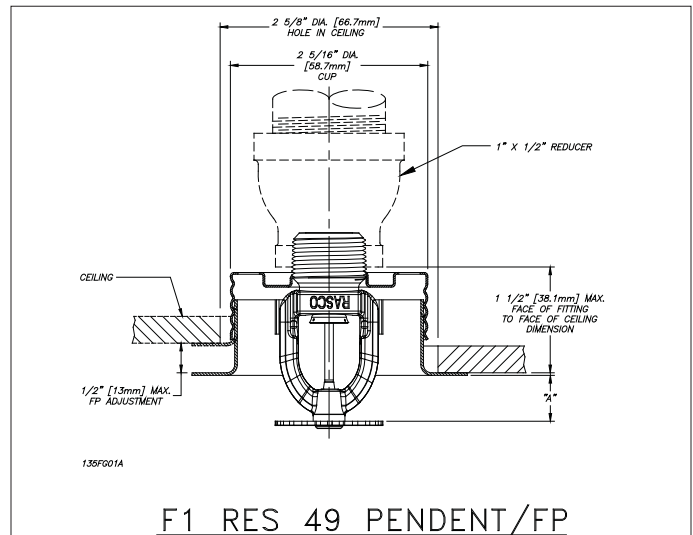


Fig. 4

**Note:** The F1 Res 76 will use a 1" x 3/4" reducer.

**Technical Data: F1Res 30 CCP Pendant and Recessed Pendant/FP (SIN R3511)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	CCP Assembly Temp. Rating		Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
½" NPT (R½)	21/64" (8.2)	175 (12)	135	57	100	38	3.0	2.25 (57)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	8 (30,3)	7.0 (0,48)	1 to 4 (25 to 100); ½ (13mm) recessed using FP escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	11 (37,8)	13.4 (0,92)		

For Ceiling types refer to NFPA 13, 13R or 13D

**Technical Data: F1Res 49 CCP Pendant and Recessed Pendant/FP (SIN 3516)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	CCP Assembly Temp. Rating		Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
½" NPT (R½)	7/16" (11)	175 (12)	135	57	100	38	4.9	2.25 (57)

**CCP Options Data:**

"A" Cover Adjustment Inch (mm)	"B" CCP Height Inch (mm)
1/2 (12.7)	15/16 (24)
5/16 (7.9)	3/4 (19)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	13 (49)	7.0 (0,48)	1 to 4 (25 to 100); ½ (13) recessed using FP escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	13 (49)	7.0 (0,48)		
16 x 16 (4,9 x 4,9)	16 (4,9)	14 (53)	8.2 (0,56)		
18 x 18 (5,5 x 5,5)	18 (5,5)	18 (68,1)	13.5 (0,93)		
20 x 20 (6,1 x 6,1)	20 (6,1)	20 (75,7)	16.7 (1,14)		

**FP Data "A":**

FP Position	"A" Inch (mm)
Max. Recessed	7/16 (11)
Min. Recessed	15/16 (24)

**Note:** Sprinklers shown in Fig. 3 and Fig. 4 are not suitable for installation in ceilings which have positive pressure in the space above.

For Ceiling types refer to NFPA 13, 13R or 13D

**Technical Data: F1Res 58 CCP Pendant and Recessed Pendant/FP (SIN R3513)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	CCP Assembly Temp. Rating		Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
½" NPT (R½)	1/2" (13)	175 (12)	135	57	100	38	5.8	2.25 (57)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	16 (61)	7.6 (0,53)	1 to 4 (25 to 100); ½ (13) recessed using FP escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	16 (61)	7.6 (0,53)		
16 x 16 (4,9 x 4,9)	16 (4,9)	16 (61)	7.6 (0,53)		
18 x 18 (5,5 x 5,5)	18 (5,5)	19 (72)	10.8 (0,75)		
20 x 20 (6,1 x 6,1)	20 (6,1)	22 (83,3)	14.4 (1,0)		

For Ceiling types refer to NFPA 13, 13R or 13D

**Technical Data: F1Res 76 CCP Pendent and Recessed Pendent/FP (SIN R7618)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	CCP Assembly Temp. Rating		Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
3/4" NPT (R3/4)	17/32" (13.5)	175 (12)	135	57	100 150	38 66	7.6	2.25 (57)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	21 (79,5)	7.6 (0,53)	1 to 4 (25 to 100); 1/2 (13) recessed using FP escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	21 (79,5)	7.6 (0,53)		
16 x 16 (4,9 x 4,9)	16 (4,9)	21 (79,5)	7.6 (0,53)		
18 x 18 (5,5 x 5,5)	18 (5,5)	22 (83,3)	8.4 (0,58)		
20 x 20 (6,1 x 6,1)	20 (6,1)	25 (94,6)	10.8 (0,74)		

For Ceiling types refer to NFPA 13, 13R or 13D

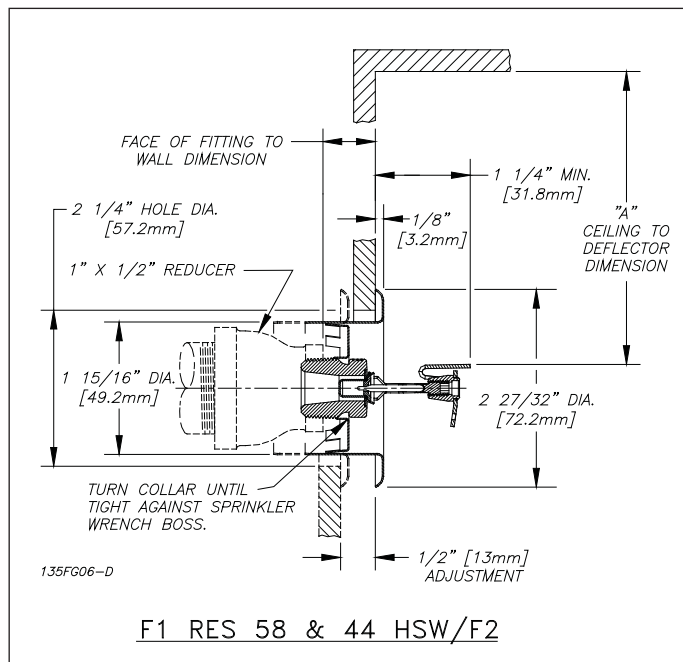
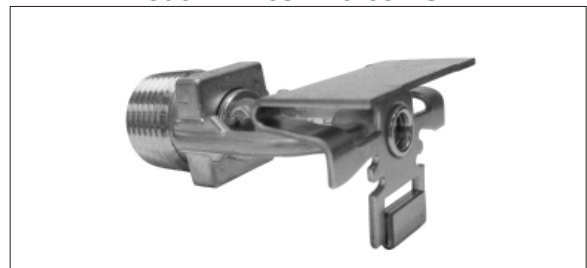


Fig. 5

• Model F1 Res 44 & 58 HSW



• Model F1 Res 44 & 58 Recessed HSW/F2



F2 escutcheon, 1/2" (13mm) adjustment

**Technical Data: F1Res 44 HSW & HSW/F2 (SIN R3531)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	Sprinkler Temp. Rating		Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
1/2" NPT (R1/2)	3/8" (10)	175 (12)	155 175	68 79	100 150	38 66	4.4	2.45 (62)

**Escutcheon, F2, Data:**

Type	Adjustment Inch (mm)	Face of Fitting to wall Inch (mm)
F2	1/2 (13)	3/16 - 11/16 (4.7 - 17.4)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Intermediate Temp. Rating (175°F/79°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)	Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	12 (45,4)	7.5 (0,52)	12 (45,4)	7.5 (0,52)	4 to 6 (100 to 152); ½ (13) recessed using F2 escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	14 (53,0)	10.2 (0,71)	14 (53,0)	10.2 (0,71)		
16 x 16 (4,9 x 4,9)	16 (4,9)	16 (60,6)	13.3 (0,92)	16 (60,6)	13.3 (0,92)		
16 x 18 (4,9 x 5,5)	16 (4,9)	18 (68,1)	16.8 (0,53)	18 (68,1)	16.8 (0,53)		
18 x 18 (5,5 x 5,5)	18 (5,5)	19 (72,0)	18.7 (1,29)	19 (72,0)	18.7 (1,29)		
16 x 20 (4,9 x 6,1)	16 (4,9)	23 (87,1)	27.4 (1,89)	23 (87,1)	27.4 (1,89)		
12 x 12 (3,6 x 3,6)	12 (3,6)	14 (53,0)	10.2 (0,71)	14 (53,0)	10.2 (0,71)	6 to 12 (152 to 305); ½ (13) recessed using F2 escutcheon	
14 x 14 (4,3 x 4,3)	14 (4,3)	16 (60,6)	13.3 (0,92)	16 (60,6)	13.3 (0,92)		
16 x 16 (4,9 x 4,9)	16 (4,9)	17 (64,4)	15.0 (1,04)	17 (64,4)	15.0 (1,04)		
16 x 18 (4,9 x 5,5)	16 (4,9)	20 (75,7)	20.7 (1,43)	20 (75,7)	20.7 (1,43)		
16 x 20 (4,9 x 6,1)	16 (4,9)	23 (87,1)	27.4 (1,89)	23 (87,1)	27.4 (1,89)		

For Ceiling types refer to NFPA 13, 13R or 13D

**Technical Data: F1Res 58 HSW & HSW/F2 (SIN R3533)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	Sprinkler Temp. Rating		Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
½" NPT (R½)	½" (13)	175 (12)	155 175	68 79	100 150	38 66	5.8	2.45 (62)

**Escutcheon, F2, Data:**

Type	Adjustment Inch (mm)	Face of Fitting to wall Inch (mm)
F2	½ (13)	¾ <sub>16</sub> - 11 <sub>16</sub> (4.7 - 17.4)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Intermediate Temp. Rating (175°F/79°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)	Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	16 (60,6)	7.6 (0,53)	16 (60,6)	7.6 (0,53)	4 to 6 (100 to 152); ½ (13) recessed using F2 escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	18 (68,2)	9.7 (0,69)	18 (68,2)	9.7 (0,69)		
16 x 16 (4,9 x 4,9)	16 (4,9)	21 (79,5)	13.2 (0,91)	21 (79,5)	13.2 (0,91)		
16 x 18 (4,9 x 5,5)	16 (4,9)	25 (94,7)	18.6 (1,28)	25 (94,7)	18.6 (1,28)		
16 x 20 (4,9 x 6,1)	16 (4,9)	29 (109,8)	25.0 (1,73)	29 (109,8)	25.0 (1,73)		
12 x 12 (3,6 x 3,6)	12 (3,6)	22 (83,3)	14.4 (1,0)	22 (83,3)	14.4 (1,0)	6 to 12 (152 to 305); ½ (13) recessed using F2 escutcheon	
14 x 14 (4,3 x 4,3)	14 (4,3)	22 (83,3)	14.4 (1,0)	22 (83,3)	14.4 (1,0)		
16 x 16 (4,9 x 4,9)	16 (4,9)	26 (98,4)	20.1 (1,39)	26 (98,4)	20.1 (1,39)		
16 x 18 (4,9 x 5,5)	16 (4,9)	31 (117,4)	28.6 (1,97)	31 (117,4)	28.6 (1,97)		

For Ceiling types refer to NFPA 13, 13R or 13D

• **Model F1 Res 44 SWC**

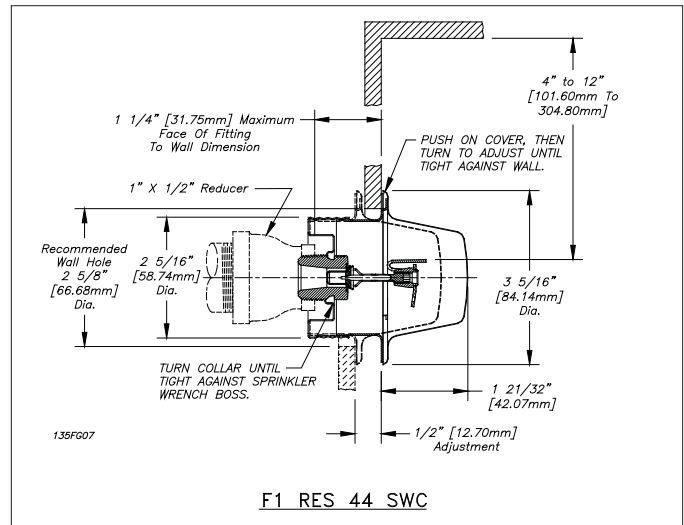


Fig. 6

**Technical Data: F1Res 44 SWC (SIN R3531)**

Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	Cover Temp. Rating		Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)
			°F	°C	°F	°C		
1/2" NPT (R1/2)	3/8" (10)	175 (12)	135	57	100	38	4.4	2.45 (62)

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)		
12 x 12 (3,6 x 3,6)	12 (3,6)	13 (49,2)	8.7 (0,60)	4 to 6 (100 to 152); 1/2 (13) recessed using F2 escutcheon	8 (2,4)
14 x 14 (4,3 x 4,3)	14 (4,3)	14 (53,0)	10.2 (0,71)		
16 x 16 (4,9 x 4,9)	16 (4,9)	17 (64,3)	15.0 (1,1)		
16 x 18 (4,9 x 5,5)	16 (4,9)	19 (71,8)	18.7 (1,13)		
16 x 20 (4,9 x 6,1)	16 (4,9)	23 (87,1)	27.4 (1,89)		
12 x 12 (3,6 x 3,6)	12 (3,6)	14 (52,9)	10.2 (0,71)	6 to 12 (152 to 305); 1/2 (13) recessed using F2 escutcheon	
14 x 14 (4,3 x 4,3)	14 (4,3)	15 (56,7)	11.7 (0,81)		
16 x 16 (4,9 x 4,9)	16 (4,9)	18 (68,1)	16.8 (1,16)		
16 x 18 (4,9 x 5,5)	16 (4,9)	20 (75,6)	20.7 (1,43)		

For Ceiling types refer to NFPA 13, 13R or 13D



## Technical Data: F1Res 58 HSWX (SIN RA3533)

	Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	Sprinkler Temp. Rating		Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)	Sprinkler Identification Number (SIN)
				°F	°C	°F	°C			
<b>Bulb</b>	1/2" NPT (R1/2)	1/2" (13)	175 (12)	155 175	68 79	100 150	38 66	5.8	2.45 (62)	RA3533

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (155°F/68°C)		Intermediate Temp. Rating (175°F/79°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)	Flow GPM (L/min)	Pressure PSI (bar)		
18 x 20 (5,5 x 6,1)	18 (5,5)	30 (114)	26.8 (1,85)	30 (114)	26.8 (1,85)	4 to 6 (100 to 152); 1/2 (13) recessed using F2 escutcheon	8 (2,4)
20 x 20 (6,1 x 6,1)	20 (6,1)	30 (114)	26.8 (1,85)	30 (114)	26.8 (1,85)		
16 x 22 (4,9 x 7,3)	16 (4,9)	33 (125)	32.4 (2,23)	33 (125)	32.4 (2,23)		
16 x 24 (4,9 x 7,3)	16 (4,9)	38 (144)	42.9 (2,96)	38 (144)	42.9 (2,96)		
14 x 26 (4,3 x 7,9)	14 (4,3)	42 (160)	52.4 (3,75)	42 (160)	52.4 (3,75)		
18 x 20 (5,5 x 6,1)	18 (5,5)	35 (133)	36.4 (2,5)	35 (133)	36.4 (2,5)	6 to 12 (152 to 305); 1/2 (13) recessed using F2 escutcheon	
16 x 22 (4,9 x 6,7)	16 (4,9)	38 (144)	42.9 (2,96)	38 (144)	42.9 (2,96)		
16 x 24 (4,9 x 7,3)	16 (4,9)	42 (160)	52.4 (3,6)	42 (160)	52.4 (3,6)		
14 x 26 (4,3 x 7,9)	14 (4,3)	46 (174)	62.9 (4,34)	46 (174)	62.9 (4,34)		

For Ceiling types refer to NFPA 13, 13R or 13D

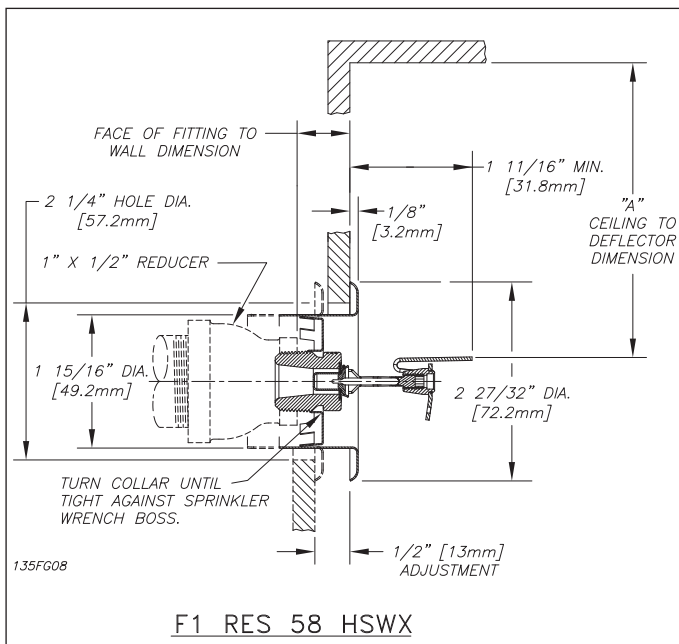
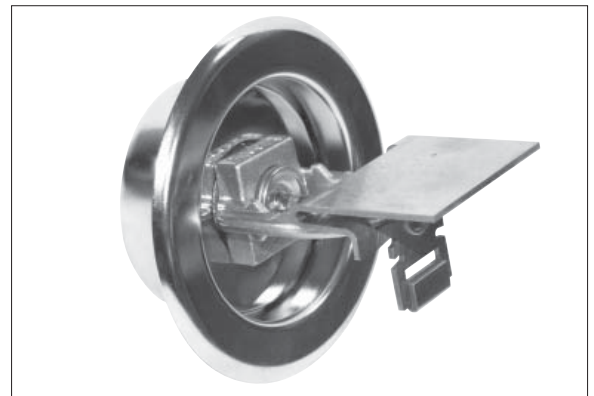
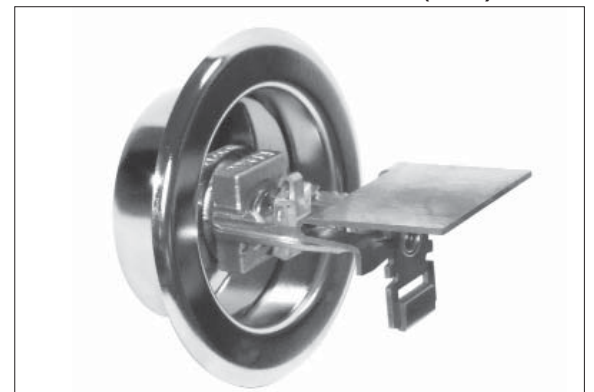


Fig. 7

- **Model F1 Res 58 HSWX (Bulb)**



- **Model KRes58 HSWX (Link)**



## Technical Data: KRes58 HSWX (RA3593)

Link	Thread Size	Nominal Orifice Inch (mm)	Max. Pressure psi (bar)	Max. Ambient Temp.		K Factor	Sprinkler Length Inch (mm)	Sprinkler Identification Number (SIN)
				°F	°C			
	½" NPT (R½)	½" (13)	175 (12)	100	38	5.8	2.45 (62)	RA3593

Max. Coverage area Ft x Ft (m x m)	Max. Spacing Ft (m)	Ordinary Temp. Rating (165°F/74°C)		Top of Deflector to Ceiling Inch (mm)	Minimum Spacing Ft (m)
		Flow GPM (L/min)	Pressure PSI (bar)		
18 x 20 (5,5 x 6,1)	18 (5,5)	29 (109)	25 (1,72)	4 to 6 (100 to 152); ½ (13) recessed using F2 escutcheon	8 (2,4)
20 x 20 (6,1 x 6,1)	20 (6,1)	30 (114)	26.8 (1,85)		
16 x 22 (4,9 x 7,3)	16 (4,9)	33 (125)	32.4 (2,23)		
16 x 24 (4,9 x 7,3)	16 (4,9)	38 (144)	42.9 (2,96)		
14 x 26 (4,3 x 7,9)	14 (4,3)	42 (160)	52.4 (3,75)		
18 x 20 (5,5 x 6,1)	18 (5,5)	35 (133)	36.4 (2,5)	6 to 12 (152 to 305); ½ (13) Recessed using F2 escutcheon	
16 x 22 (4,9 x 6,7)	16 (4,9)	38 (144)	42.9 (2,96)		
16 x 24 (4,9 x 7,3)	16 (4,9)	42 (160)	52.4 (3,6)		
14 x 26 (4,3 x 7,9)	14 (4,3)	46 (174)	62.9 (4,34)		

For Ceiling types refer to NFPA 13, 13R or 13D

## Maintenance

Model F1 Res 30, 49, F1 Res 58, F1 Res 76 and F1 Res 44 Sprinklers should be inspected quarterly, and the sprinkler system maintained in accordance with NFPA 25, 13, 13D, and 13R. Do not clean sprinkler with soap and water, Ammonia or any other cleaning fluids. Remove dust by using a soft brush or gentle vacuuming. Remove any sprinkler which has been painted (other than factory applied) or damaged in any way. A stock of spare sprinklers should be maintained to allow quick replacement of damaged or operated sprinklers. Prior to installation, sprinklers should remain in the original cartons and packaging until used. This will minimize the potential for damage to sprinklers that could cause improper operation or non-operation.

### Model F1 Res 30, 49 & 58 Pendent Sprinkler Specifications

Sprinklers shall be [cULus Listed] [New York City MEA Approved (258-93-E)] low flow residential pendent sprinklers engineered to provide a minimum design density of 0.05 gpm/ft<sup>2</sup> over the listed coverage area. Listed flows as specified by the manufacturer's technical data sheets are to be used. Residential sprinklers shall be installed in conformance with the manufacturer's installation guidelines and the applicable installation standard. Where pendent residential sprinklers are installed under sloped ceilings having a pitch from [4/12] to [8/12], the sprinklers

shall be listed for such use. Deflector-to-ceiling distance listing shall be 1" to 8" maximum. Sprinkler frame and deflector shall be of bronze frame construction having a ½" NPT thread. Water seal assembly shall consist of a Teflon-coated Belleville spring washer with top-loaded extruded or cold head cup with 3 mm glass bulb containing no plastic parts, and having a temperature rating of [155°F (68°C)] [175°F (79°C)]. Sprinklers shall have a nominal K-factor of 3.0, 4.9 and 5.8. Standard finish: [Bronze] [Chrome-plated] [White Polyester] [Special finish- specify]. Residential pendent sprinklers shall be Reliable Model F1 Res 30, 49 & 58, SIN R3511, R3516 & R3513 (Bulletin 135).

### Model F1 Res 49 & 58 Recessed Pendent/F1, Model F1 Res 30, 49 & 58 Recessed Pendent/F2,

### Model F1 Res 30, 49 & 58 Recessed Pendent/FP

Sprinklers shall be [cULus Listed] [New York City MEA Approved (258-93-E)] low flow residential recessed pendent sprinklers engineered to provide a minimum design density of 0.05 gpm/ft<sup>2</sup> over the listed coverage area. Listed flows as specified by the manufacturer's technical data sheets are to be used. Residential sprinklers shall be installed in conformance with the manufacturer's installation guidelines and the applicable installation standard.

Where pendent residential sprinklers are installed under sloped ceilings having a pitch from [4/12] to [8/12], the sprinklers shall be listed for such use. Deflector-to-ceiling distance listing shall be 1" to 8" maximum. Sprinkler frame and deflector shall be of bronze frame construction having a 1/2" NPT thread. Water seal assembly shall consist of a Teflon-coated Belleville spring washer with top-loaded extruded or cold head cup with 3 mm glass bulb containing no plastic parts, and having a temperature rating of [155°F (68°C)] [175°F (79°C)]. Sprinklers shall have a nominal K-factor of 3.0, 4.9 & 5.8. Standard finish: [Bronze] [Chrome-plated] [White Polyester] [Special finish– specify]. Recessed escutcheon assembly shall be a steel, two-piece escutcheon [with 1/2" adjustment (Model F2)] [with 3/4" adjustment (Model F1)] [of push-on and thread off design with 1/2" adjustment (Model FP)]. Standard finish shall be [brass][bright chrome] [white painted]. Residential recessed pendent sprinklers shall be Reliable [Model F1 Res 30, 49 & 58 Recessed Pendent/F1] [Model F1 Res 30, 49 & 58 Recessed Pendent/F2] [Model F1 Res 30, 49 & 58 Recessed Pendent/FP] SIN R3511, R3516 & R3513 (Bulletin 135).

### **Model F1 Res 30, 49 & 58 CCP Pendent (Concealed)**

Sprinklers shall be [cULus Listed] [New York City MEA Approved (258-93-E)] low flow residential concealed sprinklers engineered to provide a minimum design density of 0.05 gpm/ft<sup>2</sup> over the listed coverage area. Listed flows as specified by the manufacturer's technical data sheets are to be used. Residential sprinklers shall be installed in conformance with the manufacturer's installation guidelines and the applicable installation standard. Where pendent residential sprinklers are installed under sloped ceilings having a pitch from [4/12] to [8/12], the sprinklers shall be listed for such use. Sprinkler frame and deflector shall be of bronze frame construction having a 1/2" NPT thread. Water seal assembly shall consist of a Teflon-coated Belleville spring washer with top-loaded extruded or cold head cup with 3 mm glass bulb containing no plastic parts, and having a temperature rating of 155°F (68°C). Cover plate assembly shall consist of a brass cover plate and copper alloy retainer flange. Method of attaching the cover plate to the sprinkler cup shall be a push-on and thread-off design allowing a 1/2" cover plate adjustment. Cover plate temperature rating shall be 135°F (57°C). A plastic protective cap shall be provided and factory installed inside the sprinkler cup to protect the sprinkler from damage, which could occur during construction before the cover plate is installed. Standard cover plate finish: [White] [Custom Color– specify]. Concealed pendent sprinklers shall be Reliable Model F1 Res 30, 49 & 58 CCP, SIN R3511, R3516 & R3513 (Bulletin 135).

### **Model F1 Res 44, F1 Res 58 Horizontal Sidewall, F1 Res 58 HSWX & KRes58 HSWX Residential Sprinkler Specifications**

Sprinklers shall be [cULus Listed] low flow residential horizontal sidewall sprinklers engineered to provide a minimum design density of 0.05 gpm/ft<sup>2</sup> over the listed coverage area. Listed flows as specified by the manufacturer's technical data sheets are to be used. Residential sprinklers shall be installed in conformance with the manufacturer's installation guidelines and the applicable installation standard. Where horizontal sidewall residential sprinklers are installed under sloped ceilings having a pitch from [4/12] to [8/12], the sprinklers shall be listed for such use. Sprinkler frame and deflector shall be of bronze frame construction having a 1/2" NPT thread. Water seal assembly shall consist of a Teflon-coated Belleville spring washer with top-loaded extruded or cold head cup with 3 mm glass bulb containing no plastic parts, and having a temperature rating of [155°F (68°C)] [175°F (79°C)]. The solder element (Link) version, the water seal consist of a cap with a bellville spring washer and a temperature rating of 165°F (74°C). The recessed assembly for the HSWX (Bulb & Link) should be a steel two pieces escutcheon with 1/2" adjustment (Model F2) standard finish should be Bright Chrome and white painted. The F1 Res 58 HSW is also available with low lead frame. F1 Res 58 HSW and HSWX sprinklers shall have a nominal K Factor of 5.8 and F1 Res 44 a nominal K factor of 4.4. Standard finish: [Bronze] [Chrome-plated] [White Polyester] [Special finish– specify]. Residential horizontal sidewall sprinklers shall be Reliable Model F1 Res 44, F1 Res 58, F1 Res 58 HSWX & Model KRes58 HSWX, SIN R3531, RA3533 & RA3593 (Bulletin 135).

### **Model F1 Res 44 Recessed Horizontal Sidewall Sprinkler**

Use description for the Model F1 Res 44 horizontal sidewall sprinkler with the following modifications: Replace "horizontal sidewall sprinkler" with "recessed horizontal sprinkler." Add: Recessed escutcheon assembly shall be a steel, two-piece escutcheon with 1/2" adjustment (Model F2). Standard finish shall be [brass][bright chrome] [white painted] [Special finish– specify]. Residential recessed horizontal sidewall sprinklers shall be Reliable Model F1 Res 44/F2, SIN R3531 (Bulletin 135).

## Model F1 Res 76 Pendent

Sprinklers shall be [cULus Listed] low flow residential pendent sprinklers engineered to provide a minimum design density of 0.05 gpm/ft<sup>2</sup> over the listed coverage area. Listed flows as specified by the manufacturer's technical data sheets are to be used. Residential sprinklers shall be installed in conformance with the manufacturer's installation guidelines and the applicable installation standard. Sprinkler frame and deflector shall be of bronze frame construction having a ¾" NPT thread. Water seal assembly shall consist of a Teflon-coated Belleville spring washer with machined or cold head cup with 3 mm glass bulb containing no plastic parts, and having a temperature rating of [155°F (68°C)] [175°F (79°C)]. Sprinklers shall have a nominal K-factor of 7.6. Standard finish: [Bronze] [Chrome-plated] [White Polyester] [Special finish— specify]. Residential pendent sprinklers shall be Reliable Model F1 Res 76, SIN R7618 (Bulletin 135).

## Model F1 Res 76 Recessed Pendent/F1, Model F1 Res 76 Recessed Pendent/F2, Model F1 Res 76 Recessed Pendent/FP

Sprinklers shall be [cULus Listed] low flow residential recessed pendent sprinklers engineered to provide a minimum design density of 0.05 gpm/ft<sup>2</sup> over the listed coverage area. Listed flows as specified by the manufacturer's technical data sheets are to be used. Residential sprinklers shall be installed in conformance with the manufacturer's installation guidelines and the applicable installation standard. Sprinkler frame and deflector shall be of bronze frame construction having a ¾" NPT thread. Water seal assembly shall consist of a Teflon-coated Belleville spring washer with machined or cold head cup with 3 mm glass bulb containing no plastic parts, and having a temperature rating of [155°F (68°C)] [175°F (79°C)]. Sprinklers shall have a nominal K-factor of 7.6. Standard finish: [Bronze] [Chrome-plated] [White Polyester] [Special finish— specify]. Recessed escutcheon assembly shall be a steel, two-piece escutcheon [with ½" adjustment (Model F2)] [with ¾" adjustment (Model F1)] [of push-on and thread off design with ½" adjustment (Model FP)]. Standard finish shall be [brass][bright chrome] [white painted]. Residential recessed pendent sprinklers shall be Reliable [Model F1 Res 76 Recessed Pendent/F1] [Model F1 Res 76 Recessed Pendent/F2] [Model F1 Res 76 Recessed Pendent/FP] SIN R7618 (Bulletin 135).

## Model F1 Res 76 CCP Pendent (Concealed)

Sprinklers shall be [cULus Listed] low flow residential concealed sprinklers engineered to provide a minimum design density of 0.05 gpm/ft<sup>2</sup> over the listed coverage area. Listed flows as specified by the manufacturer's

technical data sheets are to be used. Residential sprinklers shall be installed in conformance with the manufacturer's installation guidelines and the applicable installation standard. Sprinkler frame and deflector shall be of bronze frame construction having a ¾" NPT thread. Water seal assembly shall consist of a Teflon-coated Belleville spring washer with machined or cold head cup with 3 mm glass bulb containing no plastic parts, and having a temperature rating of 155°F (68°C). Cover plate assembly shall consist of a brass cover plate and copper alloy retainer flange. Method of attaching the cover plate to the sprinkler cup shall be a push-on and thread-off design allowing a ½" cover plate adjustment. Cover plate temperature rating shall be 135°F (57°C). A plastic protective cap shall be provided and factory installed inside the sprinkler cup to protect the sprinkler from damage, which could occur during construction before the cover plate is installed. Standard cover plate finish: [White] [Custom Color— specify]. Concealed pendent sprinklers shall be Reliable Model F1 Res 76 CCP, SIN R7618 (Bulletin 135).

## Finishes <sup>(1)</sup>

Standard Finishes		
Sprinkler	F1, F2, FP Escutcheons	Cover Plates
Bronze Chrome Plated White and Black Polyester Coated	Brass Bright Chrome Plated White Painted	White Painted Chrome
Special Application Finishes		
Sprinkler	F1, F2, Escutcheons	Cover Plates
Bright Brass Black Plated Black Paint Off White Satin Chrome	Bright Brass Black Plated Black Paint Off White Satin Chrome	Bright Brass Black Plated Black Paint Off White Satin Chrome

<sup>(1)</sup> Other finishes and colors are available on special order. Consult factory for details.

**Note:** Paint or any other coating applied over the factory finish will void all approvals and warranties.

## Ordering Information

### Specify:

1. Sprinkler Model
2. Sprinkler Type
3. Temperature Rating
4. Sprinkler Finish
5. Escutcheon Finish
6. Cover Plate Finish

The equipment presented in this bulletin is to be installed in accordance with the latest published Standards of the National Fire Protection Association, Factory Mutual Research Corporation, or other similar organizations and also with the provisions of governmental codes or ordinances whenever applicable.

Products manufactured and distributed by Reliable have been protecting life and property for over 90 years, and are installed and serviced by the most highly qualified and reputable sprinkler contractors located throughout the United States, Canada and foreign countries.

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Revision lines indicate updated or new data.

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# VicFlex™ Style VS1 Dry Sprinkler

## Models V3505, V3506, V3509, V3510, V3517, V3518



### 1.0 PRODUCT DESCRIPTION

**Style:** Pendent, Concealed Pendent, Horizontal Sidewall

**K Factor:** 5.6 Imp./8.1 S.I.

**Nominal Orifice Size:** ½"/13 mm

**Maximum Working Pressure:** 175 psi/1200 kPa

**Factory Hydrostatic Test:** 100% @ 500 psi/3450 kPa

**Minimum Operating Pressure:** 7 psi/48 kPa

**Connections:** To branch line (inlet) via 1"/25 mm NPT or 1" BSPT

**Minimum Bend Radius:**

- 2"/51 mm

**Hazard Classifications:** Light and Ordinary Hazard

**Maximum Number of Bends:**

4

### 2.0 CERTIFICATION/LISTINGS



APPROVALS/LISTINGS	Model					
	V3505	V3506	V3509	V3510	V3517	V3518
Orifice Size (inches)	½"	½"	½"	½"	½"	½"
Orifice Size (mm)	13	13	13	13	13	13
Nominal K Factor Imperial	5.6	5.6	5.6	5.6	5.6	5.6
Nominal K Factor S.I. <sup>6</sup>	8.1	8.1	8.1	8.1	8.1	8.1
Response	Standard	Quick	Standard	Quick	Standard	Quick
Deflector Type	Pendent	Pendent	Hor. SW	Hor. SW	Conc Pen	Conc Pen
<b>Approved Temperature Ratings F°/C°</b>						
	135/57	135/57	135/57	135/57	135/57	135/57
	155/68	155/68	155/68	155/68	155/68	155/68
	175/79	175/79	175/79	175/79	175/79	175/79
	200/93	200/93	200/93	200/93	200/93	200/93
	286/141	286/141	286/141	286/141	–	–

ALWAYS REFER TO ANY NOTIFICATIONS AT THE END OF THIS DOCUMENT REGARDING PRODUCT INSTALLATION, MAINTENANCE OR SUPPORT.

System No.		Location	
Submitted By		Date	

Spec Section		Paragraph	
Approved		Date	

### 3.0 MATERIAL SPECIFICATIONS

---

**Deflector:** Brass

**Bulb:** Glass with glycerin solution

**Bulb Nominal Diameter:**

**Quick Response:** 3.0 mm

**Standard Response:** 5.0 mm

**Split spacer:** Stainless Steel

**Load screw:** Brass

**Pip Cap:** Stainless Steel

**Spring Seal Assembly:** PTFE-coated Beryllium Nickel and Stainless Steel

**Frame:** Die cast brass 65-30

**Flexible Hose:** 300-Series Stainless Steel

**Collar/Weld Fitting:** 300-Series Stainless Steel

**Gasket Seal:** Victaulic EPDM

**Isolation Ring:** Nylon

**Hose Fittings:** Carbon Steel, Zinc-Plated

**Inlet Fitting:** Brass

**Outer tube:** 300-Series Stainless Steel

**Concealed cup:** Carbon Steel, Zinc-plated

**Brackets:** Carbon Steel, Zinc-plated

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### 3.1 ACCESSORIES SPECIFICATIONS

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**Sprinkler Finishes:**

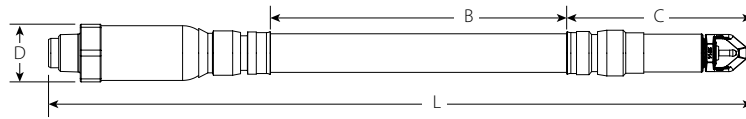
**Standard:** VC-250

**White painted:** RAL 9010

## 4.0 DIMENSIONS

### Product Details and Optional Components

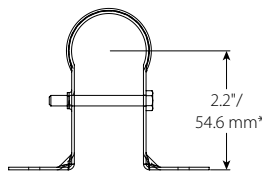
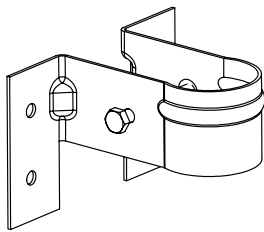
#### Style VS1 Dry Sprinkler



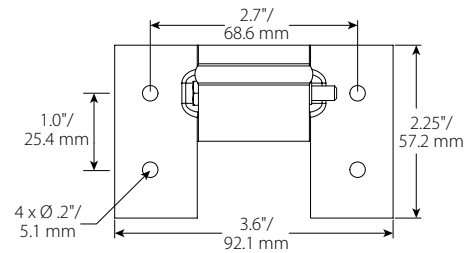
Sprinkler Length inches mm	Overall Length (pendent) L inches mm	Live Length B inches mm	Outlet End Length C inches mm	Maximum OD D inches mm
38 965	39.2 995	25.1 638	6.5 165	2.2 56
50 1270	51.2 1300	37.1 943	65 165	2.2 56
58 1475	59.2 1505	45.1 1145	65 165	2.2 56

1 Add 1/2" to Overall Length and Outlet End Length for increased length of sidewall deflector

#### Style VB1 Bracket



\*Note: Theoretical center point of sprinkler in bracket.



#### Style VB2 Bracket

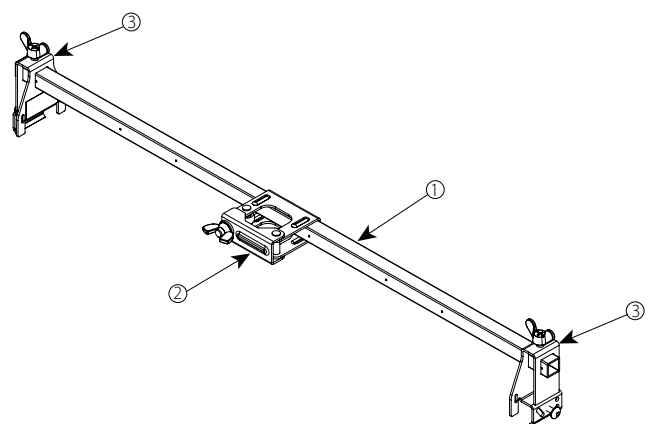
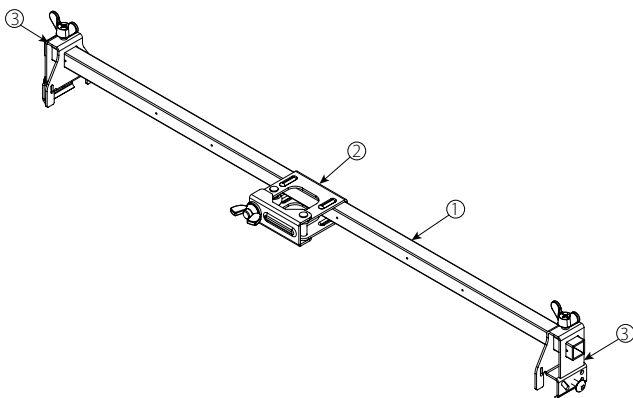
##### Recessed Pendent, Suspended Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented 1-Bee Center Bracket
3	End Bracket

#### Style VB3 Bracket

##### Concealed Pendent, Suspended Ceilings

Item	Description
1	24"/610 mm or 48"/1220 mm Square Bar
2	Patented 1-Bee Center Bracket
3	End Bracket



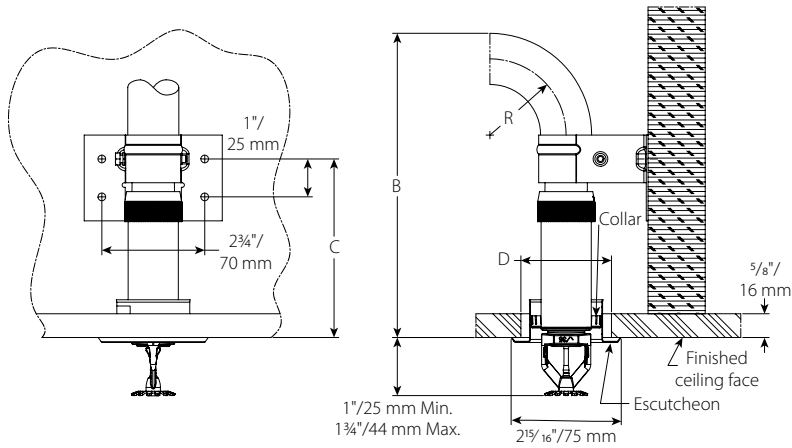
## 4.1 DIMENSIONS

### Sprinkler Finishes: Dimensions and Mounting Conditions:

NOTE:

Drawings are shown with 5/8" finished ceiling thickness. Adjustments to "B" and "C" dimensions will be required if finished ceiling thickness deviate from drawing.

#### Recessed Pendant:



Take-out Chart						
Dimension	inches/mm					
<b>Bend Radius "R"</b>	2/50	3/75	4/100	5/125	6/150	7/175
<b>B</b>	7 5/8/193	8 5/8/218	9 5/8/244	10 5/8/269	11 5/8/295	12 5/8/320
<b>C</b>	4 3/4/119					
<b>Ceiling Hole Diameter "D"</b>	2 - 2 3/8"/50 - 60mm					

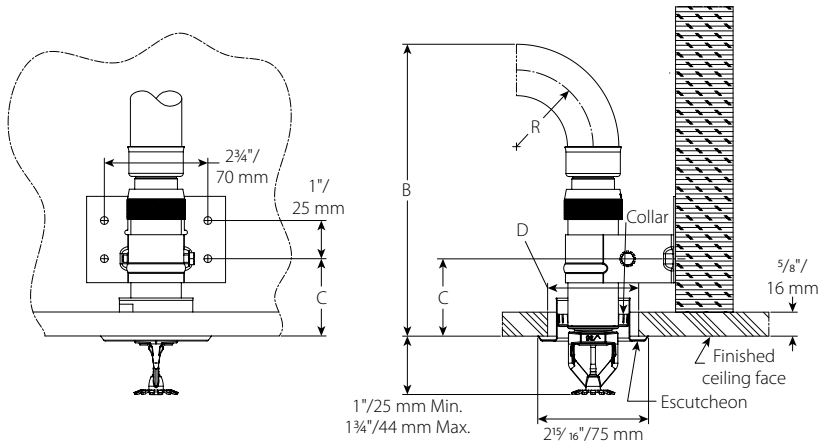
NOTE:

Dimensions are shown with 3/4" escutcheon at middle of height adjustment range.



## 4.2 DIMENSIONS

### Recessed Pendant Alternative Bracket Location:



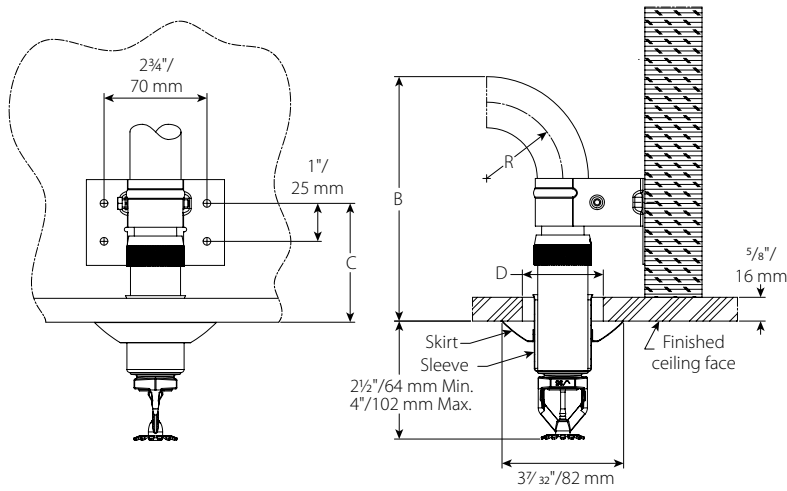
Take-out Chart						
Dimension	inches/mm					
Bend Radius "R"	2/50	3/75	4/100	5/125	6/150	7/175
B	7 5/8/193	8 5/8/218	9 5/8/244	10 5/8/269	11 5/8/295	12 5/8/320
C	2/50					
Ceiling Hole Diameter "D"	2 - 2 3/8/50 - 60					

NOTE:

Dimensions are shown with 3/4" escutcheon at middle of height adjustment range.

### 4.3 DIMENSIONS

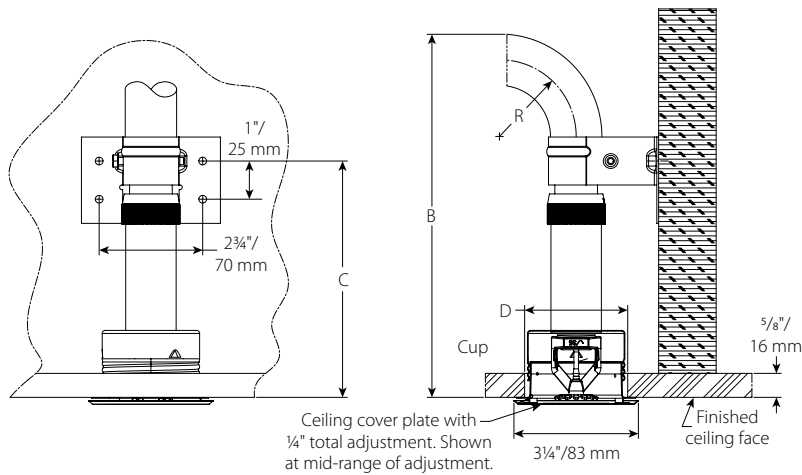
#### Sleeve and Skirt Pendant:



Hose Clearance Chart						
Dimension	inches/mm					
Bend Radius "R"	2/50	3/75	4/100	5/125	6/150	7/175
B	6 1/2/163	7 1/2/188	8 1/2/213	9 1/2/239	10 1/2/264	11 1/2/290
C	3 1/8/79					
Ceiling Hole Diameter "D"	1 3/4/44 - 2 1/8/54					

### 4.4 DIMENSIONS

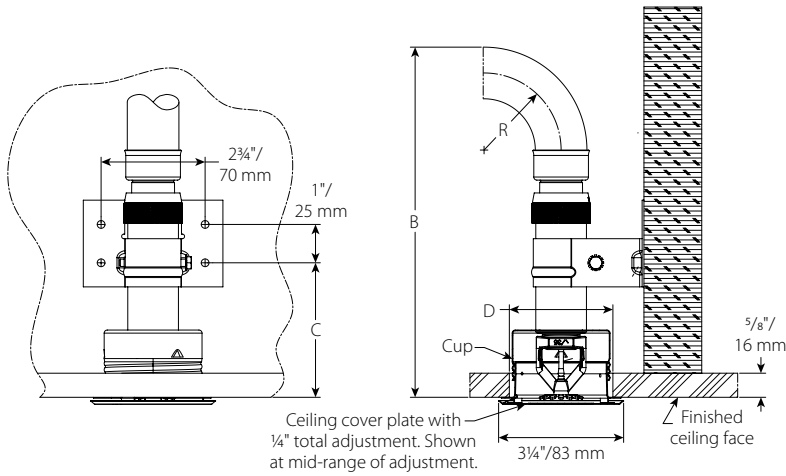
#### Concealed Pendant:



Hose Clearance Chart						
Dimension	inches/mm					
Minimum Bend Radius "R"	2/50	3/75	4/100	5/125	6/150	7/175
B	9 1/2/241	10 1/2/267	11 1/2/292	12 1/2/318	13 1/2/343	14 1/2/368
C	6 1/4 /157					
Ceiling Hole Diameter "D"	2 5/8/67 - 2 3/4 /70					

## 4.5 DIMENSIONS

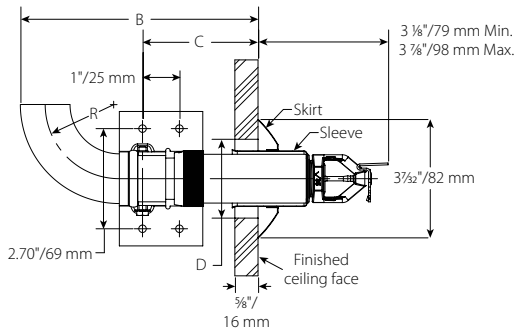
### Concealed Pendent Alternative Bracket Location:



Hose Clearance Chart						
Dimension	inches/mm					
<b>Bend Radius "R"</b>	2/50	3/75	4/100	5/125	6/150	7/175
<b>B</b>	9 1/8/231	10 1/8/257	11 1/8/282	12 1/8/307	13 1/8/333	14 1/8/358
<b>C</b>	3 1/2/89					
<b>Ceiling Hole Diameter "D"</b>	2 5/8/67 - 2 3/4/70					

## 4.6 DIMENSIONS

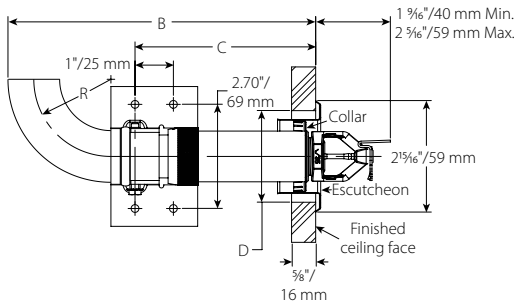
### Sleeve and Skirt Sidewall:



Hose Clearance Chart						
Dimension	inches/mm					
<b>Minimum Bend Radius "R"</b>	2/50	3/75	4/100	5/125	6/150	7/175
<b>B</b>	6 1/2/163	7 1/2/188	8 1/2/213	9 1/2/239	10 1/2/264	11 1/2/290
<b>C</b>	3 1/8/79					
<b>Ceiling Hole Diameter "D"</b>	1 3/4/44 - 2 1/8/54					

## 4.7 DIMENSIONS

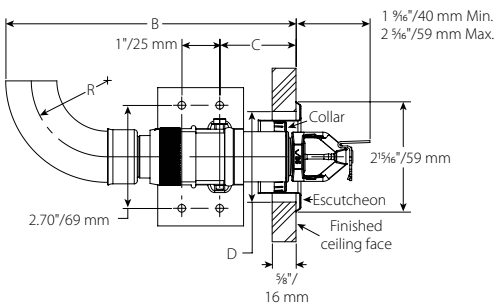
### Recessed Sidewall:



Hose Clearance Chart						
Dimension	inches/mm					
Minimum Bend Radius "R"	2/50	3/75	4/100	5/125	6/150	7/175
B	8/203	9/229	10/254	11/279	12/305	13/330
C	4 3/4/119					
Ceiling Hole Diameter "D"	2/51 - 2 3/8/600					

## 4.8 DIMENSIONS

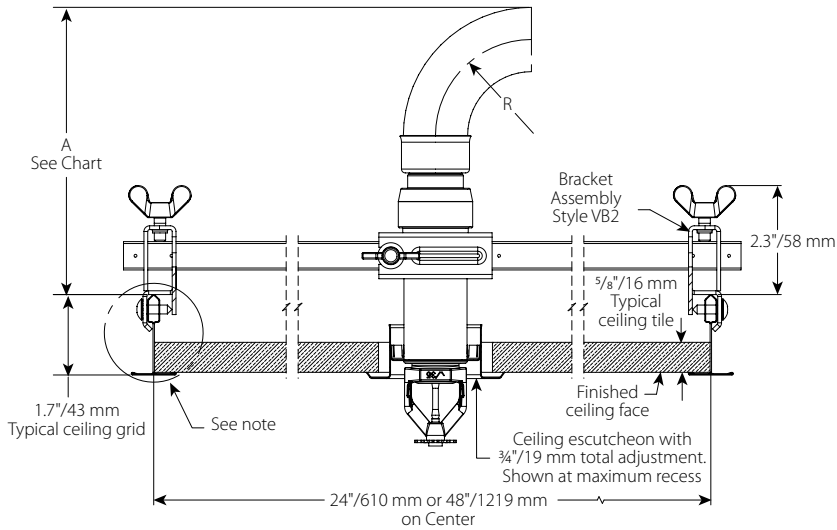
### Recessed Sidewall Alternative Bracket Location:



Hose Clearance Chart						
Dimension	inches/mm					
Bend Radius "R"	2/50	3/75	4/100	5/125	6/150	7/175
B	8/203	9/229	10/254	11/279	12/305	13/330
C	2/51					
Ceiling Hole Diameter "D"	2/51 - 2 3/8/600					

## 4.9 DIMENSIONS

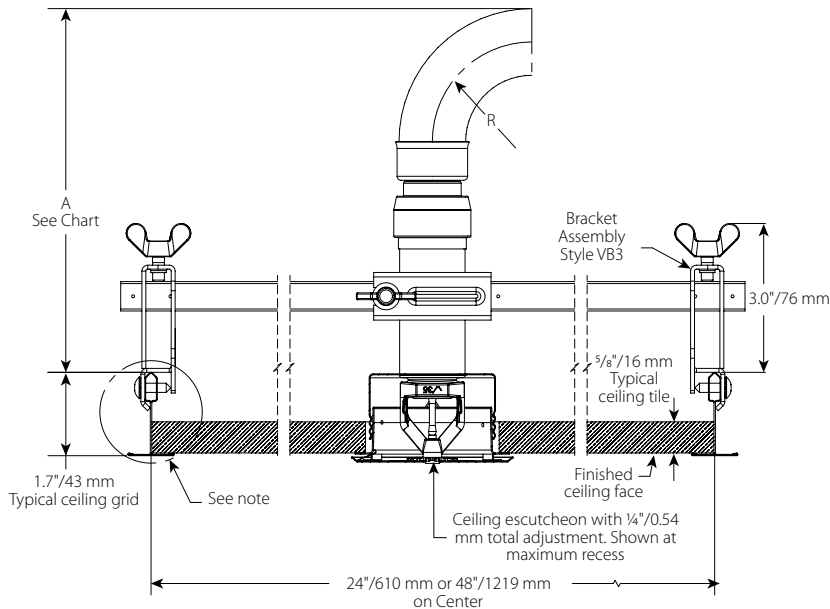
### VB2 Recessed Pendant:



Hose Clearance Chart						
Dimension	inches/mm					
Bend Radius "R"	2/50	3/75	4/100	5/125	6/150	7/175
A	6½/163	7½/188	8½/213	9½/239	10½/264	11½/290

## 4.10 DIMENSIONS

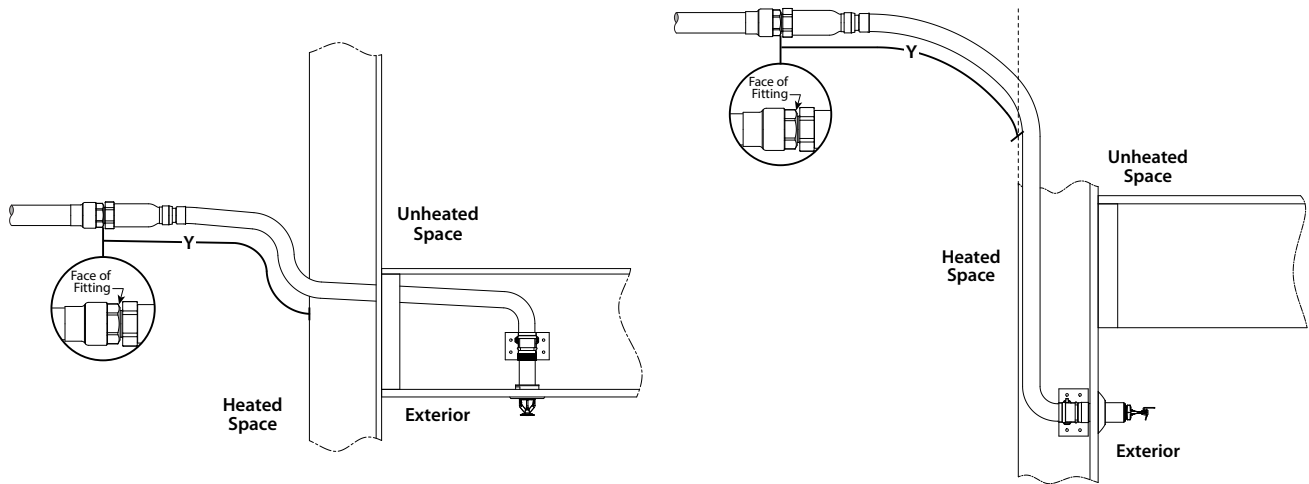
### VB3 Concealed Pendant:



Hose Clearance Chart						
Dimension	inches/mm					
Bend Radius "R"	2/50	3/75	4/100	5/125	6/150	7/175
A	7⅝/193	8⅝/218	9⅝/244	10⅝/269	11⅝/295	12⅝/320

## 5.0 PERFORMANCE

### Freeze Protection



Ambient Temperature Exposed to Discharge End of Sprinkler °F °C	Exposed Minimum Barrel Length "Y"		
	inches mm		
	40°F/4°C	50°F/10°C	60°F/16°C
40	0	0	0
4	0	0	0
30	0	0	0
-1	0	0	0
20	4	0	0
-7	100	0	0
10	8	1	0
-12	200	25	0
0	12	3	0
-18	300	75	0
-10	14	4	1
-23	350	100	25
-20	14	6	3
-29	350	150	75
-30	16	8	4
-34	400	200	100
-40	18	8	4
-40	450	200	100
-50	20	10	6
-46	500	250	150
-60	20	10	6
-51	500	250	150

**NOTE**

- Exposed minimum barrel lengths are inclusive up to 30-mph/48-kph wind velocities.

### Maximum Allowable Number of Bends

Sprinkler Length inches mm	Maximum Allowable Number of 90 Bends at 2"/51mm Bend Radius
38 965	4
50 1270	4
58 1475	4

## 6.0 NOTIFICATIONS

### WARNING

- It is the responsibility of the system designer to verify suitability of 300-Series stainless steel flexible hose for use with the intended fluid media.
- The effect of chemical composition, pH level, operating temperature, chloride level, oxygen level, and flow rate on 300-Series stainless steel flexible hose must be evaluated by the material specifier to confirm system life will be acceptable for the intended service.

Failure to follow these instructions could cause product failure, resulting in serious personal injury and/or property damage.

#### Important Installation Notes:

1. Should be installed only in accordance with NFPA 13 Standard for the the Installation of Sprinkler Systems.
2. Install and tighten hexagonal boss at inlet of sprinkler fitting only.
3. DO NOT install the Victaulic® VicFlex™ Style VS1 Dry Sprinkler's inlet into any fitting that interferes with thread penetration. Use a sample fitting to confirm proper engagement.  
To ensure unobstructed flow during operation, the Victaulic® VicFlex™ Style VS1 Dry Sprinkler must be installed into a fitting that will prevent water and debris from accumulating at the dry sprinkler's inlet.
4. Do not remove deflector or inlet end of sprinkler.

#### FOR DRY SYSTEMS ONLY:

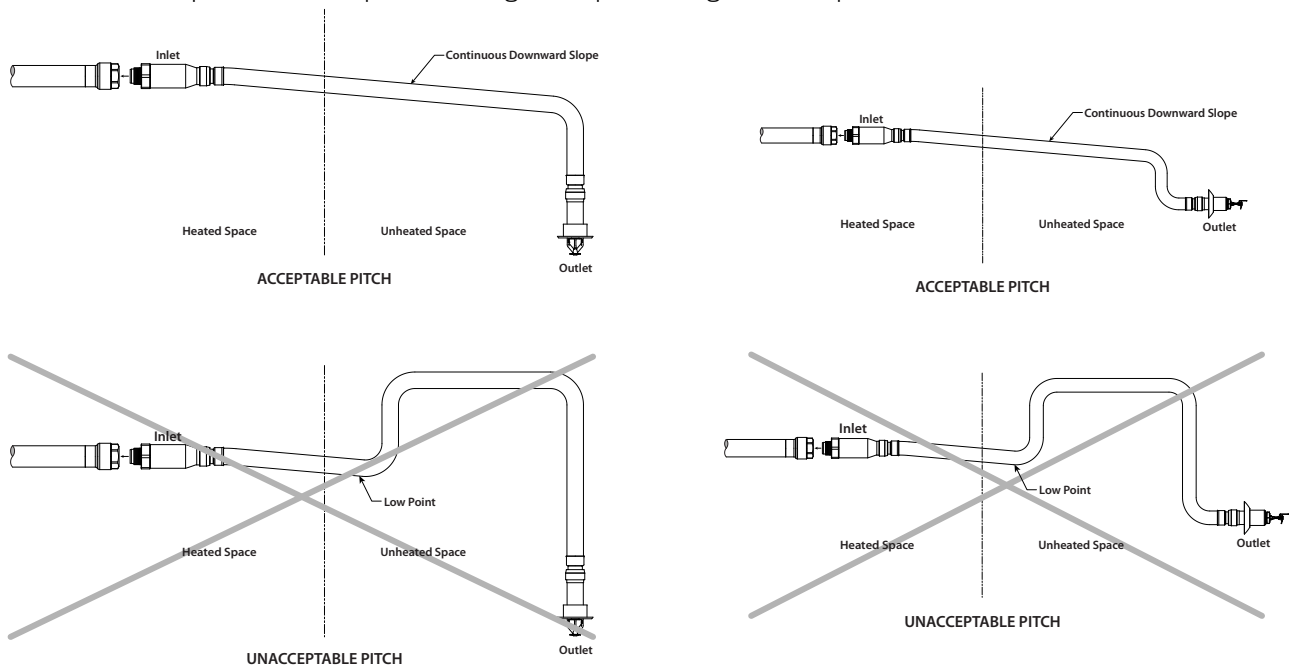
The Style VS1 Dry Sprinkler's inlet MUST be installed only into the outlet of a cast or malleable iron tee that meets the dimensional requirements of ANSI B16.3 and ANSI B16.4, Class 125 and Class 150. Use a sample fitting to confirm proper engagement.

Style VS1 Dry Sprinklers in dry systems must be installed with a continuous downward slope along its entire length from the branch line fitting to the sprinkler. No localized low points shall be present along the length of the Style VS1 Dry Sprinkler.

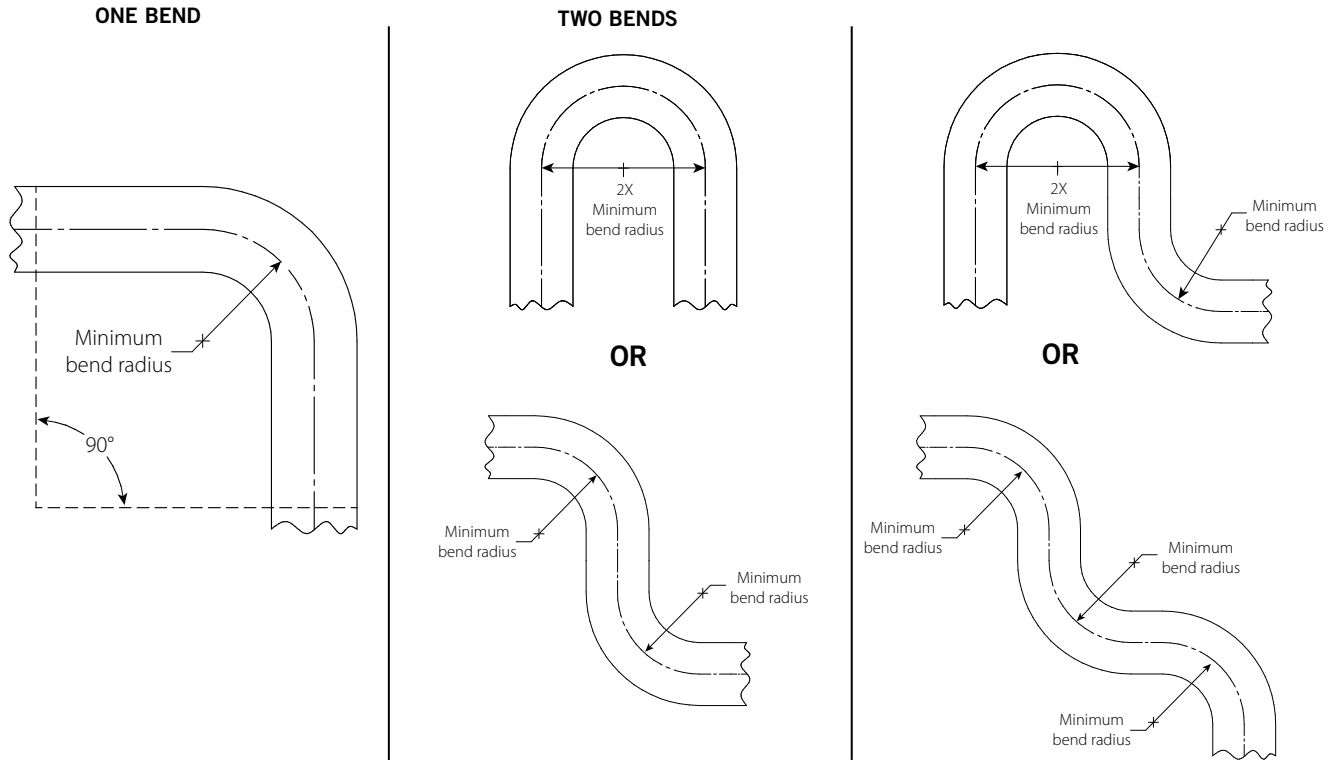
Style VS1 Dry Sprinklers are not permitted to be installed into the top of the branch line piping. Style VS1 Dry Sprinklers must be installed into the side or from the bottom of the branch line piping.

#### FOR WET SYSTEMS ONLY:

Style VS1 Dry Sprinklers in wet systems, installed where a portion extends into an unconditioned space, must be installed with a continuous downward slope along the entire exposed length from the inside wall to the sprinkler. No localized low points shall be present along the exposed length of the sprinkler.



## 7.0 REFERENCE MATERIALS



**NOTE**

- For out-of-plane (three-dimensional) bends, care must be taken to avoid imparting torsional stress on the sprinkler.

**User Responsibility for Product Selection and Suitability**

Each user bears final responsibility for making a determination as to the suitability of Victaulic products for a particular end-use application, in accordance with industry standards and project specifications, and the applicable building codes and related regulations as well as Victaulic performance, maintenance, safety, and warning instructions. Nothing in this or any other document, nor any verbal recommendation, advice, or opinion from any Victaulic employee, shall be deemed to alter, vary, supersede, or waive any provision of Victaulic Company's standard conditions of sale, installation guide, or this disclaimer.

**Intellectual Property Rights**

No statement contained herein concerning a possible or suggested use of any material, product, service, or design is intended, or should be construed, to grant any license under any patent or other intellectual property right of Victaulic or any of its subsidiaries or affiliates covering such use or design, or as a recommendation for the use of such material, product, service, or design in the infringement of any patent or other intellectual property right. The terms "Patented" or "Patent Pending" refer to design or utility patents or patent applications for articles and/or methods of use in the United States and/or other countries.

**Note**

This product shall be manufactured by Victaulic or to Victaulic specifications. All products to be installed in accordance with current Victaulic installation/assembly instructions. Victaulic reserves the right to change product specifications, designs and standard equipment without notice and without incurring obligations.

**Installation**

Reference should always be made to the Victaulic installation handbook or installation instructions of the product you are installing. Handbooks are included with each shipment of Victaulic products, providing complete installation and assembly data, and are available in PDF format on our website at [www.victaulic.com](http://www.victaulic.com).

**Warranty**

Refer to the Warranty section of the current Price List or contact Victaulic for details.

**Trademarks**

*Victaulic* and all other Victaulic marks are the trademarks or registered trademarks of Victaulic Company, and/or its affiliated entities, in the U.S. and/or other countries.





# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

The information contained in this section is based on current information and Product design at the time of publication and is subject to change without notification. Our ongoing commitment to product improvement may result in some variation. No representations, guarantees or warranties of any kind are made as to its accuracy, suitability for particular applications or results to be obtained therefrom. For verification of technical data or additional information not contained herein, please contact Spears® Technical Services Department [West Coast: (818) 364-1611—East Coast: (678) 985-1263].

## General Information

### RECOMMENDATIONS FOR INSTALLERS AND USERS:

Plastic piping systems should be **ENGINEERED, INSTALLED** and **OPERATED** in accordance with **ESTABLISHED DESIGN AND ENGINEERING STANDARDS AND PROCEDURES** for plastic piping systems. Suitability for the intended service application should be determined by the installer and/or user prior to installation of a plastic piping system. All Installation and maintenance personnel should be trained in the proper handling and installation requirements and precautions of plastic piping systems. **PRIOR TO ASSEMBLY, all piping system components should be inspected for damage or irregularities. Mating components should be checked to assure that tolerances and engagements are compatible. Do not use any components that appear irregular or do not fit properly. Contact the appropriate manufacturer of the component product in question to determine usability. Consult all applicable codes and regulations for compliance prior to installation.**

**Installation must be made in accordance with Spears® Manufacturing Company  
FlameGuard® CPVC Fire Sprinkler Piping Products Installation Instructions - FG-3**

**NOTE** — Individual or group instruction in correct solvent welding procedures is available by contacting your local distributor or your servicing Spears® Regional Distribution Center.

**SOLVENT CEMENT CONNECTIONS** — Spears® Manufacturing Company recommends the use of Spears® FS-5 One Step solvent cement for joining Spears® products. Use of solvent cementing products not approved for CPVC fire sprinkler systems, or failure to follow installation instructions will automatically void the warranty.

**THREADED CONNECTION** — Spears® Manufacturing Company recommends the use of Spears® **BLUE 75™** Thread Sealant. This product has been tested by Spears® and the sealant manufacturer for compatibility with the Spears® CPVC fire sprinkler products. Consult the sprinkler head manufacturer before using this product. **WARNING: OTHER PIPE JOINT COMPOUNDS OR PASTES MAY CONTAIN SUBSTANCES THAT COULD CAUSE STRESS CRACKING IN THE CPVC OR OTHER FITTING COMPONENTS.** Care must be taken to avoid over torquing - generally 1 to 2 turns beyond finger tight is all that is required to make up a threaded connection. Factory testing has indicated 10-25 ft. lbs. of torque is adequate to obtain a leak free seal.

**GASKET SEALED THREAD CONNECTIONS** — This type of connection can only be made with Spears® TorqueSafe™, SofTorque™ or QuickTorque™ style Gasket Sealed Female Sprinkler Adapters. **DO NOT USE ANY TYPE OF THREAD SEALANT WHEN INSTALLING THIS TYPE OF ADAPTER.** Tape or paste may impair proper sealing and function. Testing has shown that hand tight until snug for the TorqueSafe™ adapter and finger tight plus 1-turn is all that is needed to seal this special connection. Sprinkler heads in these specialty fittings can then be additionally tightened clockwise to bring sprinkler frames into desired alignment without stressing the fitting. See specific adapter instructions in package for details.

**GripLoc™ CONNECTIONS** — This type of connection can only be made with Spears® GripLoc™ Couplings or Repair Couplings. **DO NOT USE ANY TYPE OF SOLVENT CEMENT OR SEALANT WHEN INSTALLING THIS TYPE OF CONNECTION.** Uses an internal stainless steel gripper ring with an internal elastomer gasket seal. Connection allows immediate system use. See specific instructions in package for details.

Installation Training Available - Contact Spears® Technical Services for Details

**FlameGuard®** Products must be installed in accordance with Spears® FlameGuard® CPVC Fire Sprinkler Piping Products Installation Instructions, National Fire Protection Association Standards 13, 13R, 13D, and in accordance with local codes. Code requirements and field conditions may differ. It is the responsibility of the installing contractor to insure that the product is suitable to meet these requirements.

### Dimension Reference

**G** = (LAYING LENGTH) Intersection of center lines to bottom of socket/thread; 90° elbows, tees, crosses; ± 1/32 inch.

**H** = Intersection of center lines to face of fitting; 90° elbows tees, crosses; ± 1/32 inch.

**J** = Intersection of center lines to bottom of socket/thread; 45° elbows; ± 1/32 inch

**L** = Overall length of fittings; ± 1/16 inch.

**M** = Outside diameter of socket/thread hub; ± 1/16 inch.

**N** = Socket bottom to socket bottom; couplings; ± 1/16 inch.

**Q** = Width of flats; ± 1/16 inch.

**W** = Height of cap; ± 1/16 inch.

<b>CPVC FIRE SPRINKLER PIPE SDR 13.5 (ASTM F 442)</b>							
Part Number	Nominal Size		Average O.D.		Average I.D.		Approx. Weight Lbs./Ft.
	Inches	(mm)	Inches	(mm)	Inches	(mm)	
CP-007	3/4	(19.1)	1.050	(26.7)	.874	(22.5)	0.168
CP-010	1	(25.4)	1.315	(33.4)	1.101	(28.2)	0.262
CP-012	1-1/4	(31.8)	1.660	(42.2)	1.394	(35.6)	0.418
CP-015	1-1/2	(38.1)	1.900	(48.3)	1.598	(40.7)	0.548
CP-020	2	(50.8)	2.375	(60.3)	2.003	(50.9)	0.859
CP-025	2-1/2	(63.5)	2.875	(73.0)	2.423	(61.5)	1.257
CP-030	3	(76.2)	3.500	(88.9)	2.950	(75.0)	1.867

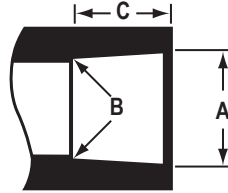
"Lead Free" low lead certification – unless other wise specified, all Spears® FlameGuard® fittings specified here-in are certified by NSF International to ANSI/NSF® Standard 61, Annex G and is in compliance with California's Health & Safety Code Section 116825 (commonly known as AB1953) and Vermont Act 193. Weighted average lead content <=0.25%. Spears® PVC and CPVC Pipe, Fittings and Valves have always been lead-free and Certified by NSF International for use in potable water systems. Spears® offers a wide range of lead-free specialty fittings and transition adapters for plumbing applications. However, certain brass threaded adapter fittings for applications that are not intended to convey water for human consumption through drinking or cooking are still produced and available.

# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS



## SOCKET DIMENSIONS

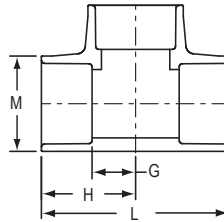
SCH 40 - ASTM F438  
SCH 80 - ASTM F439



Size	Socket Entrance A	Socket Bottom B	Tolerance	SCH 40 Minimum Socket Length C	SCH 80 Minimum Socket Length C
3/4	1.058	1.046	± .004	.719	1.000
1	1.325	1.130	± .005	.875	1.125
1-1/4	1.670	1.655	± .005	.938	1.250
1-1/2	1.912	1.894	± .006	1.094	1.375
2	2.387	2.369	± .005	1.156	1.500
2-1/2	2.889	2.868	± .007	1.750	1.750
3	3.516	3.492	± .008	1.875	1.875

## TEE

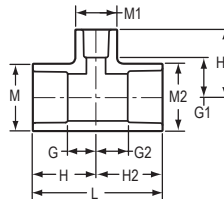
Socket x Socket x Socket



Part Number	Size	G	H	L	M	Approx. Wt. (Lbs.)
4201-007	3/4	9/16	1-1/2	2-31/32	1-5/16	.11
4201-010	1	7/8	1-13/16	3-5/8	1-5/8	.20
4201-012	1-1/4	15/32	2-3/32	4-7/32	2	.29
4201-015	1-1/2	1-5/32	2-9/16	5-3/32	2-11/32	.54
4201-020	2	1-13/32	2-15/16	5-7/8	2-7/8	.86
4201-025	2-1/2	1-23/32	3-1/2	7	3-15/32	1.62
4201-030	3	2-1/16	3-31/32	7-15/16	4-5/32	2.53

## REDUCING TEE

Socket x Socket x Socket



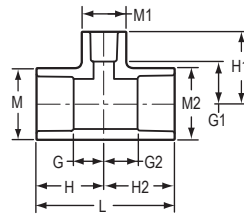
Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4201-102	3/4x3/4x1	3/4	3/4	3/4	1-11/16	1-25/32	1-11/16	3-13/32	1-5/16	1-21/32	1-5/16	.13
4201-125	1x3/4x3/4	23/32	7/8	23/32	1-25/32	1-13/16	1-21/32	3-7/16	1-19/32	1-11/32	1-5/16	.16
4201-126	1x3/4x1	23/32	23/32	3/4	1-27/32	1-27/32	1-3/4	3-19/32	1-5/8	1-5/8	1-5/16	.17
4201-131	1x1x3/4	11/16	13/16	11/16	1-13/16	1-13/16	1-13/16	3-5/8	1-5/8	1-5/16	1-5/8	.17
4201-157	1-1/4x1x3/4	11/16	1-1/32	11/16	1-15/16	2-1/32	1-13/16	3-25/32	2-3/32	1-13/32	1-23/32	.32



# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## REDUCING TEE (continued)

Socket x Socket x Socket



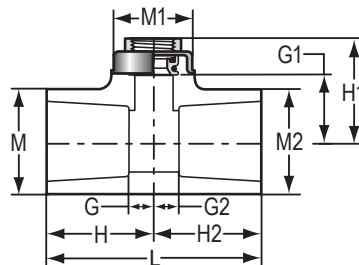
Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4201-158	1-1/4x1x1	27/32	29/32	25/32	2-1/16	2-1/32	1-29/32	3-15/16	1-31/32	1-5/8	1-5/8	.24
4201-159	1-1/4x1x1-1/4	31/32	31/32	31/32	2-7/32	2-7/32	2-3/32	4-11/32	2-1/8	2-1/8	1-23/32	.36
4201-167	1-1/4x1-1/4x3/4	21/32	1	21/32	1-29/32	2	1-29/32	3-13/16	2	1-5/16	2	.22
4201-168	1-1/4x1-1/4x1	13/16	1	13/16	2-1/16	2-1/8	2-1/16	4-1/8	1-31/32	1-21/32	1-31/32	.24
4201-169	1-1/4x1-1/4x1-1/2	1-1/8	15/16	1-1/8	2-3/8	2-11/32	2-3/8	4-3/4	2-3/32	2-11/32	2-3/32	.51
4201-201	1-1/2x1-1/4x3/4	11/16	1	1/4	2-1/16	2	1-15/16	4	2-5/16	1-3/8	2-1/16	.41
4201-202	1-1/2x1-1/4x1	27/32	1-1/32	1	2-7/32	2-5/32	2-1/4	4-15/32	2-5/16	1-11/16	2-1/16	.42
4201-210	1-1/2x1-1/2x3/4	11/16	1-1/32	11/16	2-1/16	2-1/32	2-1/16	4-5/32	2-11/32	1-13/32	2-11/32	.39
4201-211	1-1/2x1-1/2x1	13/16	1-3/32	13/16	2-3/16	2-1/4	2-3/16	4-3/8	2-11/32	1-3/4	2-11/32	.41
4201-212	1-1/2x1-1/2x1-1/4	1-1/32	1-3/32	1-1/32	2-13/32	2-11/32	2-13/32	4-13/16	2-11/32	2-1/8	2-11/32	.49
4201-213	1-1/2x1-1/2x2	1-9/32	1-5/32	1-9/32	2-21/32	2-21/32	2-21/32	5-11/32	2-11/32	2-29/32	2-11/32	.64
4201-248	2x2x3/4	11/16	1-13/32	11/16	2-7/32	2-7/16	2-7/32	4-7/16	2-27/32	1-3/8	2-27/32	.52
4201-249	2x2x1	27/32	1-13/32	27/32	2-11/32	2-9/16	2-11/32	4-23/32	2-7/8	1-3/4	2-7/8	.58
4201-250	2x2x1-1/4	1-1/32	1-11/32	1-1/32	2-17/32	2-19/32	2-17/32	5-3/32	2-7/8	2-3/32	2-7/8	.65
4201-251	2x2x1-1/2	1-5/32	1-7/16	1-5/32	2-11/16	2-13/32	2-11/16	5-3/8	2-7/8	2-13/32	2-7/8	.79
4201-289	2-1/2x2-1/2x1	27/32	1-23/32	27/32	2-5/8	2-27/32	2-5/8	5-1/4	3-17/32	1-23/32	3-17/32	1.01
4201-290	2-1/2x2-1/2x1-1/4	1-3/32	1-23/32	1-1/32	2-13/16	2-31/32	2-13/16	5-21/32	3-9/16	2-3/32	3-9/16	1.13
4201-291	2-1/2x2-1/2x1-1/2	1-3/16	1/2	1-3/16	2-15/16	1-7/8	2-15/16	5-7/8	3-15/32	2-11/32	3-15/32	1.26
4201-292	2-1/2x2-1/2x2	1-13/32	1-5/8	1-13/32	3-3/16	3-1/8	3-3/16	6-3/8	3-1/2	2-7/8	3-1/2	1.37
4201-335	3x3x1	7/8	1-15/16	7/8	2-3/4	3-1/16	2-3/4	5-15/32	4-3/16	1-23/32	4-3/16	1.26
4201-336*	3x3x1-1/4	1-3/8	1-3/4	1-3/8	3-5/16	3-1/2	3-5/16	6-5/8	4-1/8	2-7/8	4-1/8	1.94
4201-337	3x3x1-1/2	1-5/32	2-1/16	1-5/32	3-1/32	3-7/16	3-1/32	6-3/32	4-3/16	2-3/8	4-3/16	1.46
4201-338	3x3x2	1-7/16	1-13/16	1-7/16	3-5/16	3-5/16	3-5/16	6-19/32	4-3/16	2-7/8	4-3/16	1.69
4201-339	3x3x2-1/2	1-3/4	1-31/32	1-3/4	3-5/8	3-23/32	3-5/8	7-1/4	4-3/16	3-17/32	4-3/16	2.11

\* Branch Outlet Sized with Bushing

## TorqueSafe™ SPRINKLER HEAD TEE

Gasket Sealed Brass  
Thread Insert Style

Socket x Socket x Gasket Fipt  
With Elastomer Seal - Use NO Thread Sealant



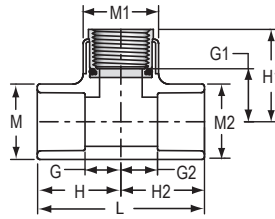
Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-101 G	3/4x3/4x1/2	7/16	1-3/16	7/16	1-7/16	1-7/16	1-17/32	2-29/32	1-3/8	1-3/8	1-3/8	.22
4202-124 G	1x3/4x1/2	7/16	1-11/32	9/16	1-9/16	1-11/16	1-9/16	3-1/8	1-11/16	1-3/8	1-3/8	.26
4202-130 G	1x1x1/2	7/16	1-11/32	7/16	1-9/16	1-11/16	1-9/16	3-1/8	1-23/32	1-3/8	1-23/32	.28
4202-131 G	1x1x3/4	17/32	15/16	17/32	1-11/16	1-5/8	1-11/16	3-11/32	1-23/32	1-9/16	1-23/32	.31
4202-166 G	1-1/4x1-1/4x1/2	7/16	1-5/8	7/16	1-11/16	1-15/16	1-11/16	3-3/8	2-1/16	1-3/8	2-1/16	.34
4202-209 G	1-1/2x1-1/2x1/2	1/2	1-13/16	1/2	1-7/8	2-3/32	1-7/8	3-3/4	2-11/32	1-3/8	2-11/32	.41
4202-247 G	2x2x1/2	1/2	2-1/16	1/2	2	2-11/32	2	4-1/32	2-27/32	1-3/8	2-27/32	.54

Not intended to convey or dispense water for human consumption through drinking or cooking



## SPRINKLER HEAD TEE Brass Thread Insert Style

Socket x Socket x Fipt



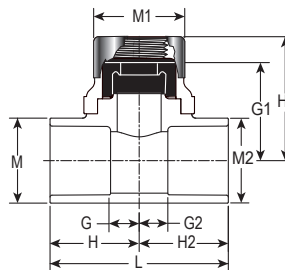
Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-010	1x1x1	21/31	1-1/8	21/31	1-25/32	1-29/32	1-25/32	3-19/32	1-23/32	1-23/32	1-23/32	.37

Not intended to convey or dispense water for human consumption through drinking or cooking

## SofTorque™ SR REDUCING TEE Gasket Sealed Special Reinforced Plastic Thread Style

Socket x Socket x SR Fipt

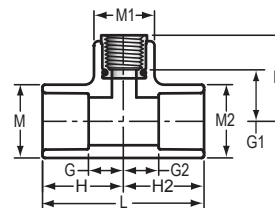
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-101GSR	3/4x3/4x1/2	7/16	1-1/2	7/16	1-3/8	1-7/8	1-3/8	2-3/4	1-5/16	1-3/8	1-5/16	.16
4202-130GSR	1x1x1/2	7/16	1-5/8	7/16	1-1/2	2	1-1/2	3	1-5/8	1-3/8	1-5/8	.20

## SPRINKLER REDUCING HEAD TEE Brass Thread Insert Style

Socket x Socket x Fipt



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-101	3/4x3/4x1/2	7/16	1-1/16	7/16	1-15/32	1-5/8	1-15/32	2-29/32	1-13/32	1-3/16	1-13/32	.20
4202-124	1x3/4x1/2	7/16	1-11/32	9/16	1-9/16	1-11/16	1-9/16	3-1/8	1-11/16	1-3/8	1-3/8	.26
4202-130	1x1x1/2	7/16	1-7/32	7/16	1-9/16	1-25/32	1-9/16	3-1/8	1-3/4	1-3/16	1-3/4	.26
4202-156	1-1/4x1x1/2	7/16	1-7/16	9/16	1-11/16	2-1/32	1-11/16	3-3/8	2-3/32	1-3/16	1-23/32	.30
4202-166	1-1/4x1-1/4x1/2	7/16	1-15/32	7/16	1-11/16	2-1/32	1-11/16	3-3/8	2-3/32	1-3/16	2-3/32	.31
4202-199	1-1/2x1-1/4x1/2	1/2	1-5/8	9/16	1-7/8	2-3/16	1-13/16	3-11/16	2-11/32	1-3/16	2-1/16	.37
4202-209	1-1/2x1-1/2x1/2	1/2	1-5/8	1/2	1-7/8	2-3/16	1-7/8	3-3/4	2-11/32	1-3/16	2-11/32	.38
4202-237	2x1-1/2x1/2	1/2	1-27/32	17/32	2	2-7/16	1-29/32	3-15/16	2-7/8	1-3/16	2-11/32	.47
4202-247	2x2x1/2	1/2	1-7/8	1/2	2	2-7/16	2	4-1/32	2-27/32	1-3/16	2-27/32	.50

Not intended to convey or dispense water for human consumption through drinking or cooking

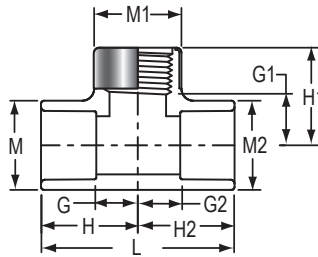


# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## SPRINKLER HEAD TEE

**Special Reinforced  
Plastic Thread Style**

Socket x Socket x SR Fipt

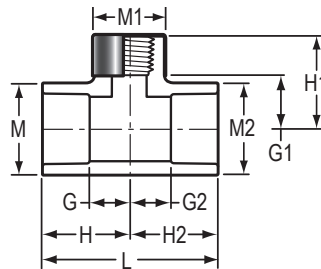


Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-010SR	1x1x1	21/32	3/4	21/32	1-25/32	1-5/8	1-25/32	3-19/32	1-23/32	1-11/16	1-23/32	.26

## SPRINKLER REDUCING HEAD TEE

**Special Reinforced  
Plastic Thread Style**

Socket x Socket x SR Fipt



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4202-101SR	3/4x3/4x1/2	19/32	25/32	19/32	1-19/32	1-7/16	1-19/32	3-7/32	1-13/32	1-3/16	1-13/32	.15
4202-124SR	1x3/4x1/2	7/16	29/32	9/16	1-19/32	1-5/8	1-9/16	3-5/32	1-23/32	1-3/16	1-17/32	.19
4202-130SR	1x1x1/2	7/16	29/32	7/16	1-9/16	1-5/8	1-9/16	3-1/8	1-23/32	1-3/16	1-23/32	.20
4202-156SR	1-1/4x1x1/2	15/32	1-5/32	19/32	1-23/32	1-7/8	1-23/32	3-13/32	2-3/32	1-3/16	1-23/32	.26
4202-166SR	1-1/4x1-1/4x1/2	7/16	1-1/8	7/16	1-11/16	1-27/32	1-11/16	3-3/8	2-3/32	1-3/16	2-3/32	.26
4202-168SR	1-1/4x1-1/4x1	27/32	1-1/32	27/32	2-3/32	1-29/32	2-3/32	4-7/32	2-3/32	1-11/16	2-3/32	.34
4202-199SR	1-1/2x1-1/4x1/2	9/16	1-9/32	17/32	1-15/16	2	1-25/32	3-23/32	2-11/32	1-3/16	2-3/32	.33
4202-209SR	1-1/2x1-1/2x1/2	1/2	1-1/4	1/2	1-7/8	1-31/32	1-7/8	3-3/4	2-11/32	1-3/16	2-11/32	.35
4202-211SR	1-1/2x1-1/2x1	27/32	1-7/32	27/32	2-7/32	2-1/8	2-7/32	4-15/32	2-11/32	1-23/32	2-11/32	.44
4202-237SR	2x1-1/2x1/2	23/32	1-9/16	3/8	2-7/32	2-9/32	1-3/4	3-31/32	2-7/8	1-3/16	2-11/32	.45
4202-247SR	2x2x1/2	1/2	31/32	1/2	2	1-11/16	19/32	4	2-7/8	1-3/16	2-7/8	.48
4202-287SR	2-1/2x2-1/2x1/2	17/32	1-3/4	17/32	2-9/32	2-1/2	2-9/32	4-19/32	3-1/2	1-7/32	3-1/2	.78

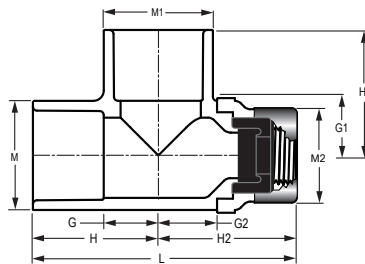
## SOFTORQUE™

**SR SPRINKLER HEAD TEE**

**Gasket Sealed Special  
Reinforced Plastic Thread Style**

Socket x SR Fipt x Socket

Stainless Steel Collar With Elastomer Seal - Use  
NO Thread Sealant



Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4203-122GSR	1x1/2x1	13/16	13/16	1-1/2	1-27/32	1-27/32	1-31/32	3-13/16	1-5/8	1-5/8	1-3/8	.22



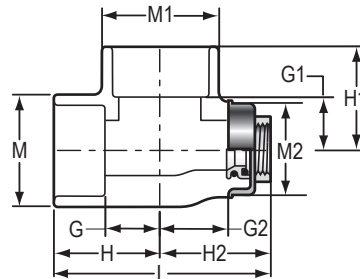
## TorqueSafe™ SPRINKLER HEAD TEE

**Gasket Sealed**

**Brass Thread Insert Style**

Socket x Gasket Fipt x Socket

With Elastomer Seal - Use NO Thread Sealant

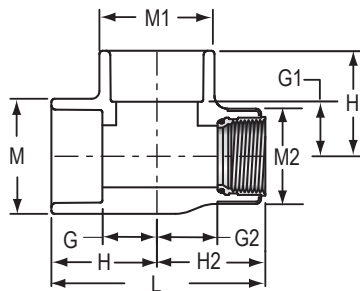


Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4203-122 G	1x1/2x1	19/32	13/16	1-13/32	1-19/32	1-27/32	1-3/4	3-11/32	1-5/8	1-5/8	1-3/8	.25

Not intended to convey or dispense water for human consumption through drinking or cooking

## SPRINKLER HEAD TEE Brass Thread Insert Style

Socket x Fipt x Socket

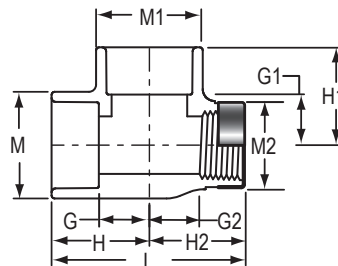


Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4203-122	1x1/2x1	23/32	3/4	1-1/4	1-5/8	1-5/8	1-15/16	3-1/2	1-23/32	1-23/32	1-3/16	.25

Not intended to convey or dispense water for human consumption through drinking or cooking

## SPRINKLER HEAD TEE Special Reinforced Plastic Thread Style

Socket x SR Fipt x Socket



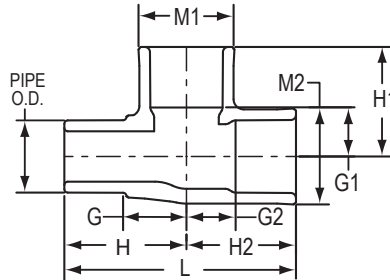
Part Number	Size	G	G1	G2	H	H1	H2	L	M	M1	M2	Approx. Wt. (Lbs.)
4203-122SR	1x1/2x1	27/32	23/32	1-3/32	1-23/32	1-5/8	1-25/32	3-13/32	1-3/4	1-3/4	1-3/16	.21



# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## STREET TEE

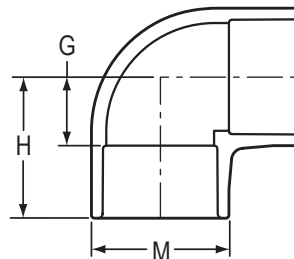
Spigot x Socket x Socket



Part Number	Size	G	G1	G2	H	H1	H2	L	M1	M2	Approx. Wt. (Lbs.)
4244-007	3/4	13/16	27/32	27/32	1-13/16	1-7/8	1-7/8	3-5/8	1-13/32	1-13/32	.16
4244-010	1	1-5/32	1-1/32	1-1/32	2-1/8	1-29/32	1-29/32	4-3/16	1-3/4	1-3/4	.27
4244-012	1-1/4	1-1/4	1	1	2-7/16	2-9/32	2-9/32	4-27/32	2-3/32	2-3/32	.42
4244-015	1-1/2	1-13/16	1-1/8	1-1/8	2-7/8	2-9/16	2-9/16	5-11/32	2-11/32	2-11/32	.56
4244-020	2	1-23/32	1-7/16	1-13/32	3-1/4	2-15/16	2-15/16	6-5/32	2-7/8	2-7/8	.84

## 90° ELBOW

Socket x Socket

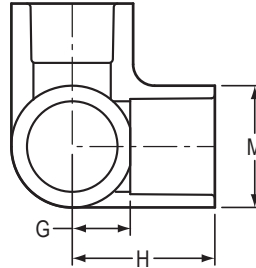


Part Number	Size	G	H	M	Approx. Wt. (Lbs.)
4206-007	3/4	9/16	1-1/2	1-5/16	.07
4206-010	1	3/4	1-5/8	1-5/8	.11
4206-012	1-1/4	15/16	2-3/16	2	.22
4206-015	1-1/2	1-5/32	2-17/32	2-3/8	.41
4206-020	2	1-13/32	2-29/32	2-7/8	.62
4206-025	2-1/2	1-15/32	3-3/8	3-1/2	1.15
4206-030	3	1-5/32	3-3/32	4-3/16	1.83



## SIDE OUTLET ELBOW

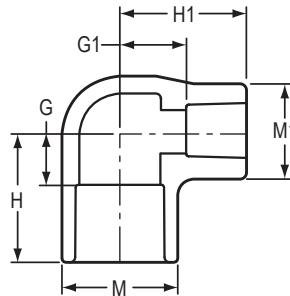
Socket x Socket x Socket



Part Number	Size	G	H	M	Approx. Wt. (Lbs.)
4213-007	3/4	27/32	1-19/32	1-5/16	.09
4213-010	1	13/16	1-7/8	1-5/8	.18

## REDUCING 90° ELBOW

Socket x Socket



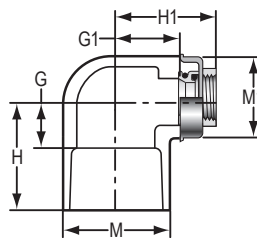
Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4206-131	1x3/4	21/32	13/16	1-25/32	1-13/16	1-19/32	1-5/16	.11

## TorqueSafe™ 90° SPRINKLER HEAD ELBOW

### Gasket Sealed Brass Thread Insert Style

Socket x Gasket Fipt

With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4207-101 G	3/4x1/2	9/16	1-7/32	1-13/32	1-17/32	1-13/32	1-3/8	.19
4207-130 G	1x1/2	7/16	1-3/16	1-9/16	1-11/16	1-23/32	1-3/8	.23
4207-166 G	1-1/4x1/2	15/32	1-19/32	1-15/16	1-11/16	2-3/32	1-3/8	.25

Not intended to convey or dispense water for human consumption through drinking or cooking



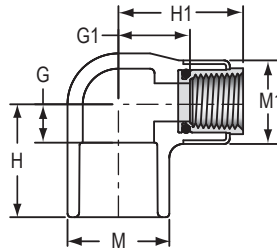


# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## SPRINKLER HEAD 90° ELBOW

### Brass Thread Insert Style

Socket x Fipt



Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4207-101	3/4x1/2	1/2	1-3/32	1-1/2	1-5/8	1-13/32	1-3/16	.17
4207-130	1x1/2	7/16	1-7/32	1-19/32	1-25/32	1-23/32	1-3/16	.21
4207-131	1x3/4	17/32	1-11/32	1-21/32	1-31/32	1-23/32	1-3/8	.25
4207-166	1-1/4x1/2	15/32	1-17/32	1-11/16	1-15/16	2-3/32	1-17/32	.33

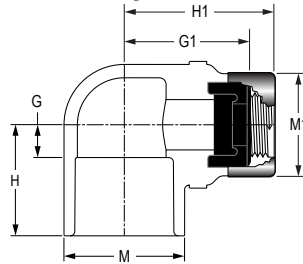
Not intended to convey or dispense water for human consumption through drinking or cooking

## SofTorque™ SR 90° ELBOW SPRINKLER HEAD ADAPTER

### Gasket Sealed Special Reinforced Plastic Thread Style

Socket x SR Fipt

With Elastomer Seal - Use NO Thread Sealant

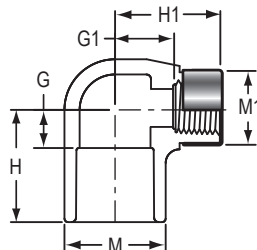


Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4207-101GSR	3/4x1/2	7/16	1-17/32	1-3/8	1-27/32	1-11/32	1-3/8	.17
4207-130GSR	1x1/2	7/16	1-11/16	1-1/2	2	1-21/32	1-3/8	.19
4207-166GSR	1-1/4x1/2	7/16	1-7/8	1-11/16	2-7/32	2	1-3/8	.22

## SPRINKLER HEAD 90° ELBOW

### Special Reinforced Plastic Thread Style

Socket x SR Fipt

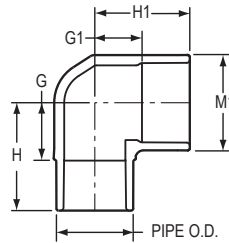


Part Number	Size	G	G1	H	H1	M	M1	Approx. Wt. (Lbs.)
4207-101SR	3/4x1/2	11/32	13/16	1-15/32	1-1/2	1-13/32	1-3/16	.14
4207-130SR	1x1/2	7/16	7/8	1-9/16	1-5/8	1-23/32	1-3/8	.20
4207-131SR	1x3/4	1/2	7/8	1-5/8	1-9/16	1-23/32	1-3/8	.16
4207-166SR	1-1/4x1/2	13/32	1-1/32	1-21/32	1-23/32	2-3/32	1-7/32	.19



## 90° STREET ELBOW

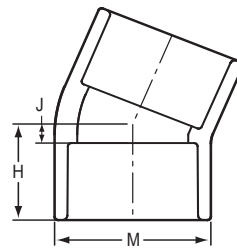
Spigot x Socket



Part Number	Size	G	G1	H	H1	M1	Approx. Wt. (Lbs.)
4209-007	3/4	29/32	19/32	1-15/16	1-11/16	1-13/32	.12
4209-010	1	1-9/32	23/32	2-13/32	1-27/32	1-3/4	.21
4209-012	1-1/4	1-9/16	27/32	2-13/16	2-3/32	2-3/32	.32
4209-015	1-1/2	1-15/32	1-3/16	2-27/32	2-9/16	2-11/32	.42
4209-020	2	1-23/32	1-3/8	3-7/32	2-15/16	2-27/32	.65

## 22-1/2° ELBOW

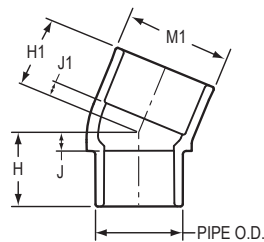
Socket x Socket



Part Number	Size	H	J	M	Approx. Wt. (Lbs.)
4216-007	3/4	1-3/16	7/32	1-13/32	.09
4216-010	1	1-3/8	9/32	1-25/32	.14
4216-012	1-1/4	1-1/2	5/16	2-3/32	.20
4216-015	1-1/2	1-7/16	13/32	1-3/8	.19
4216-020	2	1-7/8	3/8	2-27/32	.43
4216-030	3	2-3/8	1/2	4-5/32	1.00

## 22-1/2° STREET ELBOW

Spigot x Socket



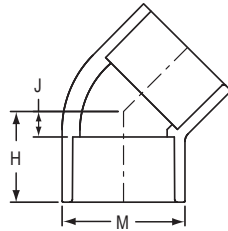
Part Number	Size	H	H1	J	J1	M1	Approx. Wt. (Lbs.)
4242-007	3/4	1-1/4	1-1/2	1/4	1/2	1-3/8	.08
4242-010	1	1-7/16	1-11/32	5/16	7/32	1-23/32	.14
4242-012	1-1/4	1-9/16	1-25/32	17/32	11/16	2-1/16	.21
4242-015	1-1/2	1-13/32	1-23/32	1/2	11/32	2-11/32	.28
4242-020	2	1-29/32	2-1/8	7/32	5/8	2-7/8	.42
4242-025	2-1/2	2-1/8	2-1/4	13/32	1/2	3-1/2	.68
4242-030	3	2-13/32	2-13/32	9/16	17/32	4-5/32	.99



# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## 45° ELBOW

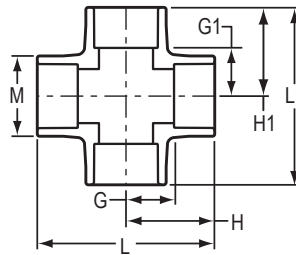
Socket x Socket



Part Number	Size	H	J	M	Approx. Wt. (Lbs.)
4217-007	3/4	1-5/16	5/16	1-5/16	.07
4217-010	1	1-13/32	3/8	1-5/8	.11
4217-012	1-1/4	1-5/8	3/8	2-5/32	.21
4217-015	1-1/2	1-27/32	15/32	2-11/32	.32
4217-020	2	2-1/8	21/32	2-7/8	.48
4217-025	2-1/2	2-17/32	3/4	3-1/2	.88
4217-030	3	2-29/32	29/32	4-5/32	1.17

## CROSS

Socket x Socket x Socket x Socket

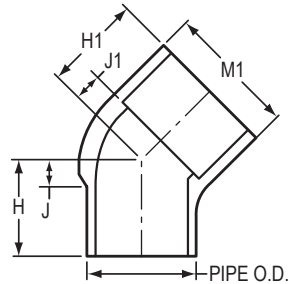


Part Number	Size	G	G1	H	H1	L	L1	M	Approx. Wt. (Lbs.)
4220-007	3/4	5/8	5/8	1-21/32	1-21/32	3-5/16	3-5/16	1-13/32	.22
4220-010	1	3/4	3/4	1-5/8	1-5/8	3-1/4	3-1/4	1-23/32	.20
4220-012	1-1/4	1-1/8	1-1/8	2-3/8	2-3/8	4-3/4	4-3/4	2-3/32	.63
4220-015	1-1/2	1-7/32	1-7/32	2-5/8	2-5/8	5-7/32	5-7/32	2-3/8	.80
4220-020	2	1-1/2	1-1/2	3	3	6	6	3	1.43
4220-025	2-1/2	1-11/16	1-11/16	3-7/16	3-7/16	6-7/8	6-7/8	3-17/32	2.16
4220-030	3	2-3/32	2-3/32	3-31/32	3-31/32	7-15/16	7-15/16	4-7/16	3.37



## 45° STREET ELBOW

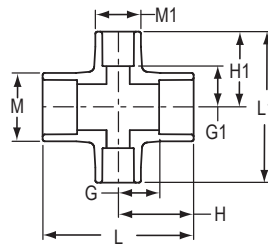
Spigot x Socket



Part Number	Size	H	H1	J	J1	M1	Approx. Wt. (Lbs.)
4227-010	1	1-1/2	1-5/16	1/2	1/4	1-5/8	.10
4227-012	1-1/4	1-25/32	1-9/16	9/16	11/32	1-31/32	.15
4227-015	1-1/2	2-1/32	2-1/8	19/32	25/32	2-11/32	.29
4227-020	2	2-5/16	1-15/16	25/32	13/32	2-7/8	.44

## REDUCING CROSS

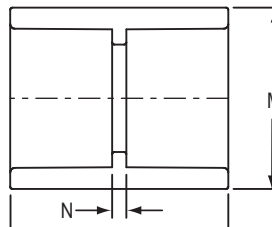
Socket x Socket x Socket x Socket



Part Number	Size	G	G1	H	H1	L	L1	M	M1	Approx. Wt. (Lbs.)
4220-131	1x3/4	23/32	5/8	1-5/8	1-5/8	3-1/4	3-1/4	1-7/8	1-1/2	.31
4220-167	1-1/4x3/4	1-1/16	23/32	2-1/16	1-31/32	4-3/32	3-31/32	2-1/16	1-13/32	.35
4220-210	1-1/2x3/4	11/16	1-5/32	2-3/32	2-3/16	4-3/16	4-11/32	2-3/8	1-13/32	.42
4220-248	2x3/4	11/16	1-7/16	2-7/32	2-7/16	4-13/32	4-7/8	2-29/32	1-13/32	.56
4220-289	2-1/2x1	29/32	1-3/4	2-11/16	2-7/8	5-11/32	5-3/4	3-1/2	1-3/4	.98

## COUPLING

Socket x Socket



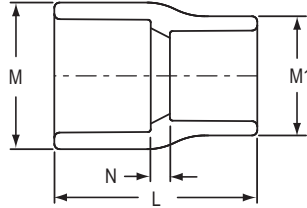
Part Number	Size	L	M	N	Approx. Wt. (Lbs.)
4229-007	3/4	2-1/8	1-5/16	3/16	.05
4229-010	1	2-3/16	1-5/8	3/32	.08
4229-012	1-1/4	2-19/32	2	3/32	.13
4229-015	1-1/2	2-7/8	2-11/32	3/32	.22
4229-020	2	3-1/8	2-7/8	1/8	.33
4229-025	2-1/2	3-11/16	3-15/32	3/16	.48
4229-030	3	4	4-3/16	1/4	.89



# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## REDUCER COUPLING

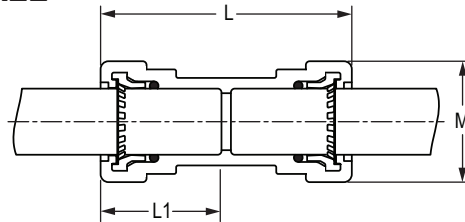
Socket x Socket



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4229-131	1x3/4	2-3/8	1-23/32	1-13/32	7/32	.10
4229-167	1-1/4x3/4	2-19/32	2-3/32	1-5/8	11/32	.17
4229-168	1-1/4x1	2-11/16	2-3/32	1-23/32	5/16	.18
4229-210	1-1/2x3/4	2-13/16	2-11/32	1-13/32	15/32	.19
4229-211	1-1/2x1	2-7/8	2-11/32	1-15/16	3/8	.24
4229-212	1-1/2x1-1/4	2-13/16	2-13/32	2-1/8	5/32	.23
4229-248	2x3/4	3-3/16	2-7/8	1-7/16	23/32	.32
4229-249	2x1	3-1/8	2-7/8	1-23/32	1/2	.31
4229-250	2x1-1/4	3-3/16	2-7/8	2-1/8	17/32	.33
4229-251	2x1-1/2	3-3/16	2-27/32	2-11/32	9/32	.31
4229-291	2-1/2x1-1/2	3-23/32	3-15/32	2-11/32	21/32	.51
4229-292	2-1/2x2	3-21/32	3-1/2	2-7/8	13/32	.52
4229-337	3x1-1/2	3-1/2	4-3/16	2-3/8	7/32	.71
4229-339	3x2-1/2	3-27/32	4-3/16	3-1/2	3/16	.80

## GripLoc™ COUPLING - LEAD FREE

w/EPDM O-Ring Seals



**175 psi Maximum  
Internal Pressure @ 150°F**

**WARNING: DO NOT INSERT FINGERS.**

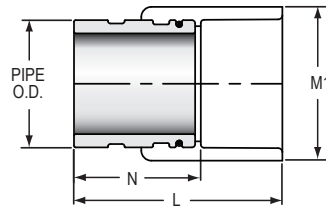
Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
GL4229-007	3/4	4	1-15/16	1-29/32	.25
GL4229-010	1	4-5/32	2	2-1/4	.34

# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS



## GROOVED COUPLING ADAPTER

Groove x Socket



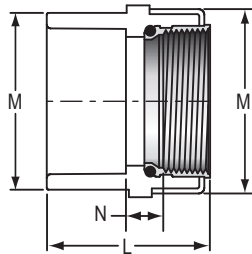
Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4233-012	1-1/4	3-5/8	2-3/32	2-11/32	.72
4233-015	1-1/2	3-3/4	2-11/32	2-11/32	.83
4233-020	2	3-27/32	2-27/32	2-11/32	1.27
4233-025	2-1/2	4-3/16	3-15/32	2-7/16	2.02
4233-030	3	4-5/16	4-1/8	2-7/16	2.76

Not intended to convey or dispense water for human consumption through drinking or cooking

## FEMALE ADAPTER

Brass Thread Insert Style

Socket x Fipt



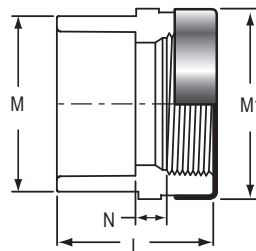
Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-007	3/4	2	1-13/32	1-3/8	5/16	.23
4235-010	1	2-3/16	1-3/4	1-11/16	11/32	.25
4235-012	1-1/4	2-3/8	2-3/32	2-1/16	3/8	.36
4235-015	1-1/2	2-17/32	2-3/8	2-7/16	3/8	.47
4235-020	2	2-25/32	2-27/32	3-3/16	7/16	1.05

Not intended to convey or dispense water for human consumption through drinking or cooking

## FEMALE ADAPTER

Special Reinforced Plastic Thread Style

Socket x SR Fipt



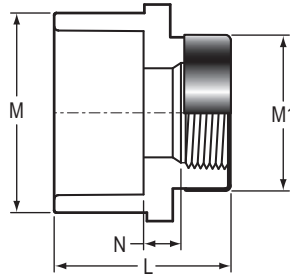
Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-007SR	3/4	1-7/8	1-13/32	1-3/8	3/32	.08
4235-010SR	1	2-5/32	1-23/32	1-7/8	3/32	.22
4235-012SR	1-1/4	2-5/16	2-1/8	2-1/16	3/16	.20



# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## FEMALE SPRINKLER HEAD ADAPTER Special Reinforced Plastic Thread Style

Socket x SR Fipt

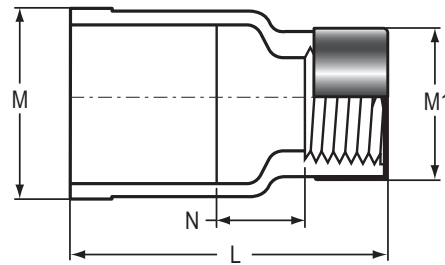


Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101SR	3/4x1/2	1-29/32	1-13/32	1-3/16	1/8	.08
4235-130SR	1x1/2	1-31/32	1-23/32	1-3/8	3/32	.16
4235-131SR	1x3/4	2-3/32	1-3/4	1-3/8	1/4	.13

## FEMALE SPRINKLER HEAD ADAPTER Special Reinforced Plastic Thread Style with Socket Wrench Flats

Socket x SR Fipt

M = Flat-to-Flat Dimension



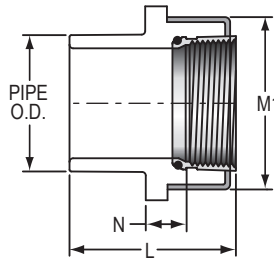
Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
W4235-101SR	3/4x1/2	2-9/32	1-13/32	1-3/16	17/32	.09
W4235-130SR	1x1/2	2-9/32	1-3/4	1-3/16	13/32	.12



## SPIGOT FEMALE ADAPTER

### Brass Thread Insert Style

Spigot x Fipt



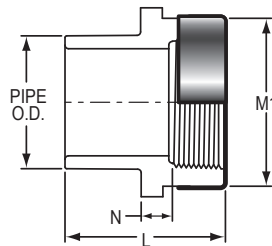
Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4278-007	3/4	2-5/32	1-3/8	17/32	.15
4278-010	1	2-9/32	1-11/16	7/16	.22

Not intended to convey or dispense water for human consumption through drinking or cooking

## SPIGOT FEMALE ADAPTER

### Special Reinforced Plastic Thread Style

Spigot x SR Fipt



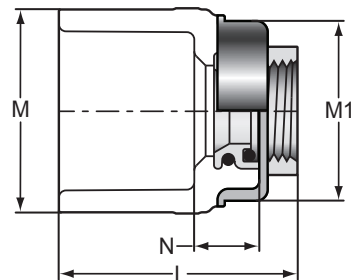
Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4278-007SR	3/4	1-15/16	1-3/8	11/32	.08
4278-010SR	1	2-1/4	1-23/32	13/32	.13

## TorqueSafe™ FEMALE SPRINKLER HEAD ADAPTER

### Gasket Sealed Brass Thread Insert Style

Socket x Gasket Fipt

With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101 G	3/4x1/2	1-7/8	1-13/32	1-3/8	9/16	.15
4235-130GS	1x1/2	2-1/32	1-11/16	1-3/8	17/32	.17
4235-131 G	1x3/4	2	1-11/16	1-9/16	9/16	.18

Not intended to convey or dispense water for human consumption through drinking or cooking



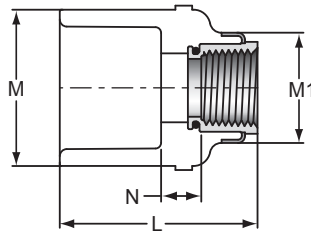


# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## FEMALE SPRINKLER HEAD ADAPTER

### Brass Thread Insert Style

Socket x Fipt



Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101	3/4x1/2	1-7/8	1-13/32	1-17/32	15/32	.19
4235-130	1x1/2	2-11/32	1-11/16	1-3/16	5/8	.16
4235-131	1x3/4	2-5/16	1-11/16	1-3/8	17/32	.18

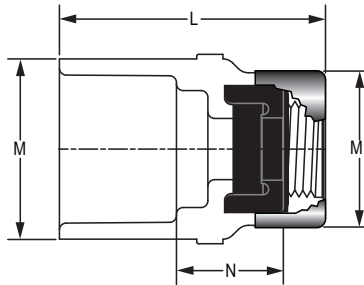
Not intended to convey or dispense water for human consumption through drinking or cooking

## SofTorque™ SR FEMALE SPRINKLER HEAD ADAPTER

### Gasket Sealed Special Reinforced Plastic Thread Style

Socket x SR Fipt

With Elastomer Seal - Use NO Thread Sealant



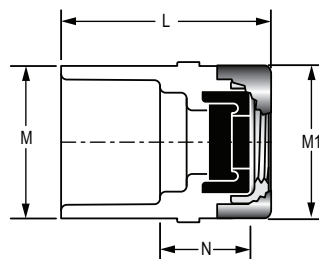
Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101GSR	3/4x1/2	2-5/16	1-5/16	1-3/8	31/32	.11
4235-130GSR	1x1/2	2-13/32	1-19/32	1-3/8	31/32	.13
4235-131GSR	1x3/4	2-13/32	1-5/8	1-23/32	1	.16

## QuickTorque™ SR FEMALE SPRINKLER HEAD ADAPTER

### Gasket Sealed Special Reinforced Plastic Thread Style

Socket x SR Metal Fipt

With Elastomer Seal - Use NO Thread Sealant

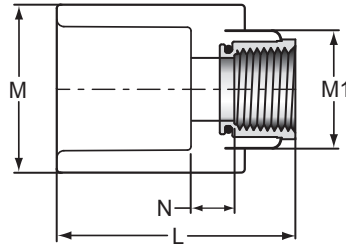


Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
4235-101GMR	3/4x1/2	1-15/16	1-5/16	1-9/16	13/16	.17
4235-130GMR	1x1/2	2-3/16	1-19/32	1-9/16	15/16	.19



## FEMALE SPRINKLER HEAD ADAPTER Brass Thread Insert Style with Long Body

Socket x Fipt

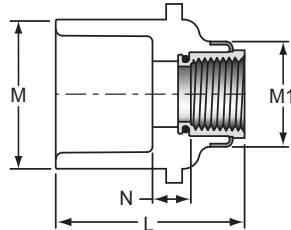


Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
L4235-130	1x1/2	2-3/16	1-23/32	1-7/32	1/2	.19

Not intended to convey or dispense water for human consumption through drinking or cooking

## FEMALE SPRINKLER HEAD ADAPTER Brass Thread Insert Style with Positioning Ring

Socket x Fipt

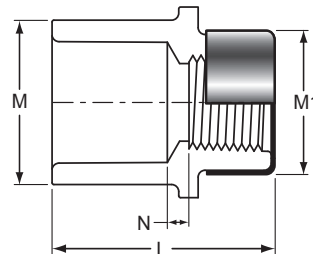


Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
R4235-101	3/4x1/2	2-1/32	1-7/16	1-3/16	15/32	.15

Not intended to convey or dispense water for human consumption through drinking or cooking

## FEMALE SPRINKLER HEAD ADAPTER Special Reinforced Plastic Thread Style with Positioning Ring

Socket x SR Fipt

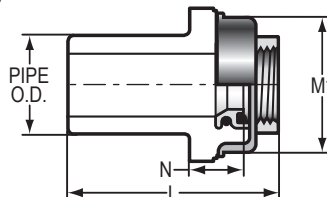


Part Number	Size	L	M	M1	N	Approx. Wt. (Lbs.)
R4235-101SR	3/4x1/2	1-15/16	1-7/16	1-7/32	7/32	.09

## TorqueSafe™ FEMALE SPIGOT SPRINKLER HEAD ADAPTER Gasket Sealed Brass Thread Insert Style

Spigot x Gasket Fipt

With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	L	M	N	Approx. Wt. (Lbs.)
4238-101 G	3/4x1/2	1-15/16	1-3/8	21/32	.14
4238-130 G	1x1/2	2-1/16	1-3/8	19/32	.15

Not intended to convey or dispense water for human consumption through drinking or cooking

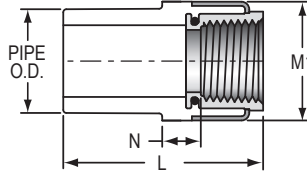


# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## SPIGOT FEMALE SPRINKLER HEAD ADAPTER

### Brass Thread Insert Style

Spigot x Fipt



Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4238-101	3/4x1/2	1-15/16	1-17/32	17/32	.18
4238-130	1x1/2	2-1/4	1-3/16	11/32	.19

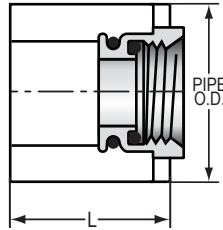
Not intended to convey or dispense water for human consumption through drinking or cooking

## TorqueSafe™ BUSHING - GASKET SEALED

### Brass Thread Insert Style

Spigot x Gasket FIPT

With Elastomer Seal - Use NO Thread Sealant

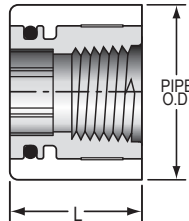


Part Number	Size	L	Approx. Wt. (Lbs.)
4238-130BR G	1x1/2	1-7/32	.10

Not intended to convey or dispense water for human consumption through drinking or cooking

## BUSHING with BRASS THREAD INSERT

Spigot x Fipt



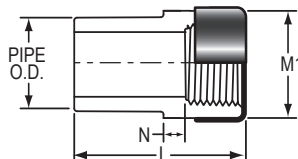
Part Number	Size	L	Approx. Wt. (Lbs.)
4238-130BR	1x1/2	1	.13

Not intended to convey or dispense water for human consumption through drinking or cooking

## SPIGOT FEMALE SPRINKLER HEAD ADAPTER

### Special Reinforced Plastic Thread Style

Spigot x SR Fipt



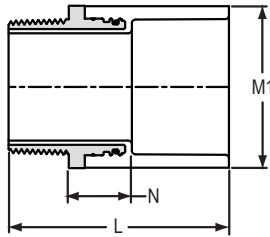
Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4238-101SR	3/4x1/2	1-29/32	1-7/32	1/8	.07
4238-130SR	1x1/2	2-1/32	1-7/32	7/32	.09

# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS



## MALE ADAPTER

With CPVC Lined Thread Brass Insert  
Mipt x Socket

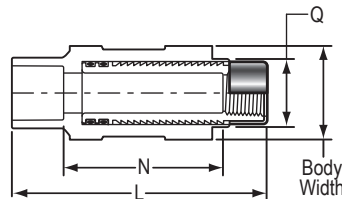


Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4236-007	3/4	2-17/32	1-13/32	13/16	.26
4236-010	1	2-15/16	1-23/32	29/32	.43
4236-012	1-1/4	3-1/8	2-3/32	31/32	.66
4236-015	1-1/2	3-9/32	2-11/32	31/32	.80
4236-020	2	3-7/16	2-27/32	31/32	1.00

## ADJUSTABLE SPRINKLER HEAD ADAPTER

Special Reinforced Plastic Thread Style

Socket x SR Fipt

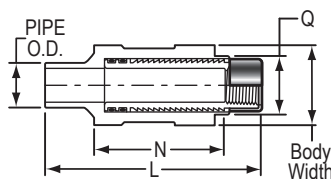


Part Number	Size	L		N		Q	Body Width	Approx. Wt. (Lbs.)
		Min	Max	Min	Max			
42001SR	3/4x1/2	6-9/32	8	4-7/16	6-1/4	1-7/16	2-3/16	.66
42011SR	1x1/2	6-13/32	8	4-1/2	6-1/8	1-7/16	2-1/8	.68

## ADJUSTABLE SPRINKLER HEAD ADAPTER

Special Reinforced Plastic Thread Style

Spigot x SR Fipt



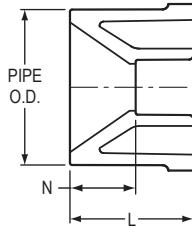
Part Number	Size	L		N		Q	Body Width	Approx. Wt. (Lbs.)
		Min	Max	Min	Max			
42004SR	3/4x1/2	5-1/32	6-5/16	3-3/16	4-15/32	1-5/16	2-1/8	.36
42014SR	1x1/2	6-7/16	8-1/8	4-7/16	6-1/4	1-7/16	2-3/16	.67



# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## REDUCER BUSHING

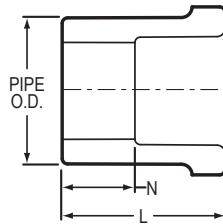
**Flush Style**  
Spigot x Socket



Part Number	Size	L	N	Approx. Wt. (Lbs.)
4237-131	1x3/4	1-1/4	1/4	.04
4237-167	1-1/4x3/4	1-7/16	7/16	.10
4237-168	1-1/4x1	1-13/32	9/32	.06
4237-210	1-1/2x3/4	1-5/8	5/8	.19
4237-211	1-1/2x1	1-17/32	13/32	.13
4237-212	1-1/2x1-1/4	1-9/16	5/16	.07
4237-248	2x3/4	1-29/32	29/32	.28
4237-249	2x1	1-23/32	9/16	.23
4237-250	2x1-1/4	1-11/16	7/16	.21
4237-251	2x1-1/2	1-11/16	5/16	.15
4237-290	2-1/2x1-1/4	2-5/32	7/8	.41
4237-291	2-1/2x1-1/2	2-5/32	3/4	.39
4237-292	2-1/2x2	2-9/32	3/4	.28
4237-338	3x2	2-7/32	11/16	.63
4237-339	3x2-1/2	2-5/16	1/4	.42

## TRANSITION BUSHING

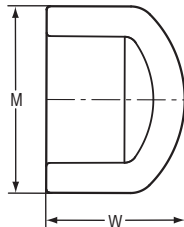
IPS Spigot x CTS Socket



Part Number	Size	L	N	Approx. Wt. (Lbs.)
4240-101	3/4x1/2	1-1/8	5/8	.03
4240-130	1x1/2	1-1/4	23/32	.05

## CAP

Socket

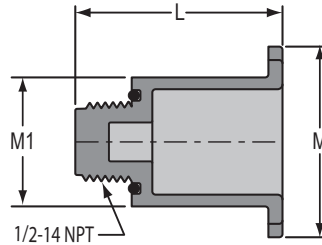


Part Number	Size	M	W	Approx. Wt. (Lbs.)
4247-007	3/4	1-5/16	1-5/16	.04
4247-010	1	1-5/8	1-9/16	.06
4247-012	1-1/4	2-3/32	1-27/32	.13
4247-015	1-1/2	2-11/32	2	.17
4247-020	2	2-27/32	2-9/32	.39
4247-025	2-1/2	3-17/32	2-5/8	.50
4247-030	3	4-3/8	3	.92



## TEST PLUG - O-ring Sealed

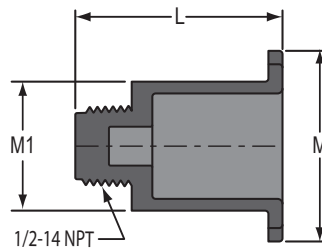
Mipt - For Pressure Testing Only,  
Not For use with Z4235 Series Adapters



Part Number	Size	L	M	M1	Approx. Wt. (Lbs.)
FTP-005	1/2	1-27/32	1-15/16	1-7/32	.03

## TEST PLUG for TorqueSafe™ Gasket Sealed Head Adapters

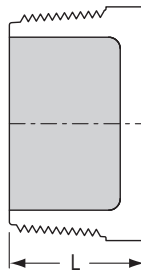
Mipt - For Pressure Testing Only.  
Use ONLY with Gasket Sealed Head Adapters



Part Number	Size	L	M	M1	Approx. Wt. (Lbs.)
FTP-005GS	1/2	1-25/32	2-1/32	1-1/4	.05

## TEST PLUG

(PVC White) Not UL Listed; For Pressure Testing Only,  
Mipt



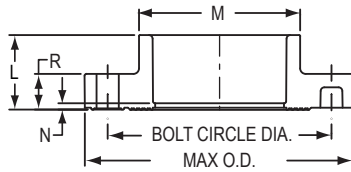
Part Number	Size	L	Approx. Wt. (Lbs.)
4250-005	1/2	27/32	.02



# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## FLANGE - ONE PIECE

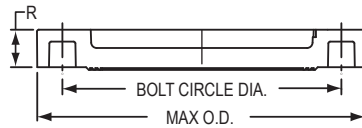
4 Bolt Holes, 175 psi  
Socket



Part Number	Size	L	M	N	R	No. of Bolt Holes	Bolt Circle Dia.	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
4251-007	3/4	1-5/32	1-1/2	1/8	17/32	4	2-3/4	1/2	2	3-29/32	.31
4251-010	1	1-5/16	1-13/16	1/8	11/16	4	3-1/8	1/2	2-1/4	4-9/32	.35
4251-012	1-1/4	1-13/32	2-7/32	5/32	11/16	4	3-1/2	1/2	2-1/4	4-5/8	.44
4251-015	1-1/2	1-19/32	2-1/2	3/16	23/32	4	3-27/32	1/2	2-1/2	5-1/16	.61
4251-020	2	1-27/32	3	5/16	27/32	4	4-3/4	5/8	3	5-31/32	.95
4251-025	2-1/2	2-7/32	3-1/2	7/16	1-1/32	4	5-1/2	5/8	3-1/4	7	1.50

## BLIND FLANGE

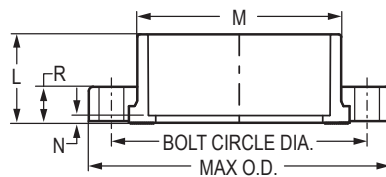
4 Bolt Holes, 175 psi



Part Number	Size	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
4253-007	3/4	17/32	2-3/4	4	1/2	2	3-27/32	.30
4253-010	1	23/32	3-1/8	4	1/2	2-1/4	4-1/4	.35
4253-012	1-1/4	21/32	3-1/2	4	1/2	2-1/4	4-5/8	.40
4253-015	1-1/2	23/32	3-27/32	4	1/2	2-1/2	5-1/16	.52
4253-020	2	27/32	4-3/4	4	5/8	3	5-31/32	.86
4253-025	2-1/2	1-1/32	5-1/2	4	5/8	3-1/4	6-15/16	1.70
4253-030	3	1-5/16	6	4	5/8	3-1/4	7-5/8	1.72

## FLANGE - TWO PIECE

Van Stone Style, 4 Bolt Holes, 175 psi  
Socket



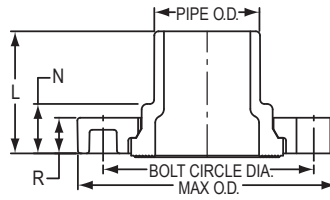
Part Number	Size	L	M	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
4254-030	3	2-1/8	4-1/4	9/32	1-1/32	6	4	5/8	3-1/4	7-15/32	1.75

# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS



## FLANGE - TWO PIECE

Van Stone Style, 4 Bolt Holes, 175 psi  
Spigot

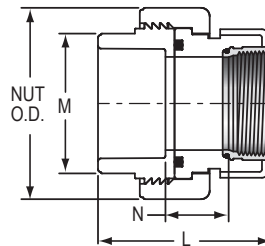


Part Number	Size	L	N	R	Bolt Circle Dia.	No. of Bolt Holes	Bolt Size	Min. Bolt Length	Max. O.D.	Approx. Wt. (Lbs.)
4256-007	3/4	1-15/16	13/16	17/32	2-3/4	4	1/2	2	3-27/32	.30
4256-010	1	2-7/32	1-1/32	11/16	3-1/8	4	1/2	2-1/4	4-1/4	.41
4256-012	1-1/4	2-3/8	1	11/16	3-1/2	4	1/2	2-1/4	4-5/8	.50
4256-015	1-1/2	2-7/16	1-3/32	23/32	3-7/8	4	1/2	2-1/2	4-31/32	.65
4256-020	2	2-3/4	1-5/32	25/32	4-3/4	4	5/8	3	5-15/16	1.00
4256-025	2-1/2	3-1/16	1-9/32	1-1/32	5-1/2	4	5/8	3-1/4	6-15/16	1.62
4256-030	3	3-3/8	1-13/32	1-1/32	6	4	5/8	3-1/4	7-9/16	1.76

## TRANSITION UNION

Brass Thread Insert Style

Socket x Fipt



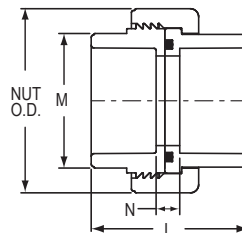
175 psi

Part Number	Size	L	M	N	Nut O.D.	Approx. Wt. (Lbs.)
4259-010BR	1	2-13/16	1-7/8	1-1/32	2-7/8	.52
4259-012BR	1-1/4	3	2-3/16	1-1/8	3-9/32	.98
4259-015BR	1-1/2	3-3/4	2-1/2	1-9/16	3-17/32	.93
4259-020BR	2	3-5/8	2-7/8	1-1/4	4-5/16	1.64

Not intended to convey or dispense water for human consumption through drinking or cooking

## UNION

Socket x Socket



175 psi

Part Number	Size	L	M	N	Nut O.D.	Approx. Wt. (Lbs.)
4257-007	3/4	2-3/8	1-17/32	3/8	2-1/2	.38
4257-010	1	2-9/16	1-27/32	3/8	2-7/8	.41
4257-012	1-1/4	2-27/32	2-7/32	11/32	3-5/16	.52
4257-015	1-1/2	3-1/8	2-1/2	3/8	3-17/32	.63
4257-020	2	3-5/8	3-1/32	9/16	4-3/16	1.09



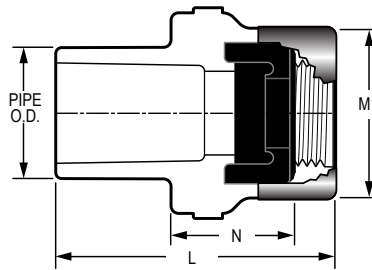


# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## SofTorque™ SR FEMALE SPIGOT SPRINKLER HEAD ADAPTER

### Gasket Sealed Special Reinforced Plastic Thread Style

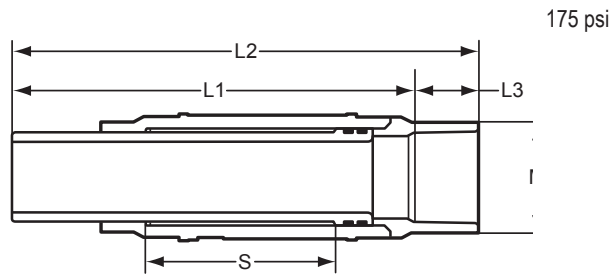
Spigot x SR Fipt  
With Elastomer Seal - Use NO Thread Sealant



Part Number	Size	L	M1	N	Approx. Wt. (Lbs.)
4278-101GSR	3/4x1/2	2-1/4	1-3/8	1	.11

## SHORT REPAIR COUPLING

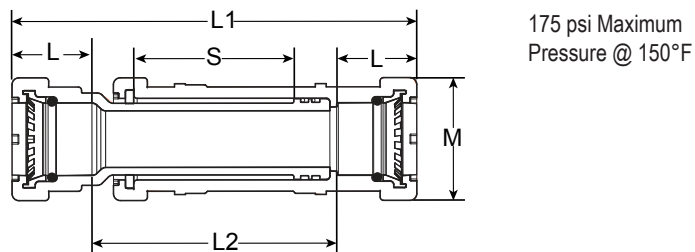
Spigot x Socket



Part Number	Size	L1	L2	L3	M	S	Approx. Wt. (Lbs.)
SH118-07CO	3/4	4-13/16	5-17/32	3/4	1-3/4	2-3/16	.31
SH118-10CO	1	4-3/4	5-5/8	31/32	2-1/16	2-5/32	.40

## GripLoc™ REPAIR COUPLING – LEAD FREE

w/EPDM O-Ring Seals



**WARNING: DO NOT INSERT FINGERS.**

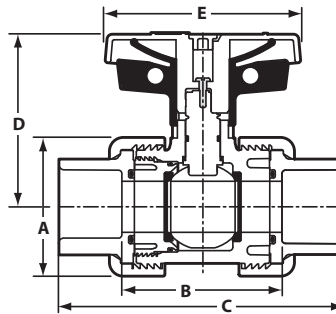
Part Number	Size	L	L1	L2	M	S	Approx. Wt. (Lbs.)
SG118-10CO	1	1-17/32	7-17/32	4-1/4	2-1/4	2-27/32	.73



## FlameGuard® CPVC Drain & Swing Check Valves for NFPA 13D Applications Only

**Application:** FlameGuard® CPVC Orange Swing Check Valves and PVC/CPVC True Union Drain Valves are for use in configuring CPVC Fire Sprinkler System connection to water supply (riser/drain assembly) in NFPA 13D installations only. These valves are not UL Listed and NOT for use in any other locations within the fire sprinkler system.

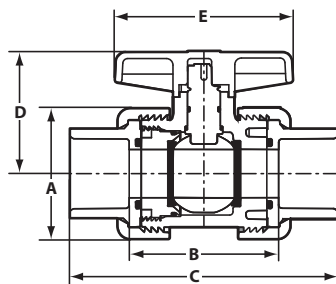
### TRUE UNION INDUSTRIAL DRAIN VALVES CPVC Gray Valve with CPVC Orange End Connector Socket x Socket



Part Number	Size	A	B	C	D	E
1822-007CFG	3/4	2-1/4	2-3/4	4-3/4	2-7/8	3-3/8
1822-010CFG	1	2-1/2	2-7/8	5-1/8	3-1/8	3-7/16
1822-012CFG	1-1/4	3-1/16	3-1/4	5-3/4	3-5/8	3-7/8
1822-015CFG	1-1/2	3-1/2	3-1/2	6-1/4	4	4-3/16
1822-020CFG	2	4-1/4	4-3/4	7-3/4	4-1/2	5-1/8

Not UL Listed

### TRUE UNION DRAIN VALVES PVC Valve with CPVC End Connector Socket x Socket



Part Number	Size	A	B	C	D	E
3622-007FG	3/4	2-1/4	2-3/4	4-3/4	2	3
3622-010FG	1	2-1/2	2-7/8	5-1/8	2-5/16	3-7/16

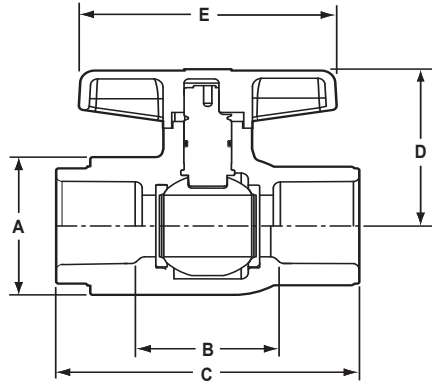
Not UL Listed



# FlameGuard® CPVC FIRE SPRINKLER PIPING PRODUCTS

## COMPACT 2000 DRAIN VALVE

Socket x Socket

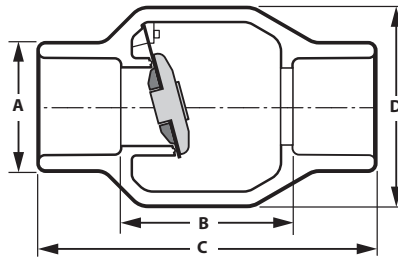


Part Number	Size	A	B	C	D	E
6622-007CO	3/4	1-13/16	1-1/2	3-9/16	2	3
6622-010CO	1	2-1/16	1-3/4	4	2-5/16	3-7/16

Not UL Listed

## CPVC SWING CHECK VALVES

Socket x Socket

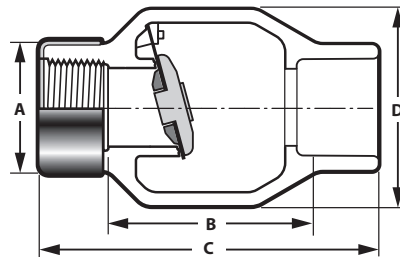


Part Number	Size	A	B	C	D	Approx. Wt. (Lbs)
S1520-10CO	1	1-11/16	2-5/16	4-9/16	2-5/8	.33
S1520-12CO	1-1/4	2-1/16	2-15/16	5-1/2	3-3/8	.42
S1520-15CO	1-1/2	2-7/16	3	5-5/8	3-3/8	.89

Not UL Listed

## CPVC SPECIAL REINFORCED THREAD INLET SWING CHECK VALVES

SR Fipt x Socket



Part Number	Size	A	B	C	D	Approx. Wt. (Lbs)
S1520-10FSRSCO	1	1-11/16	2-15/16	4-9/16	2-5/8	.33
S1520-12FSRSCO	1-1/4	2-1/16	3-5/8	5-1/2	3-3/8	.42
S1520-15FSRSCO	1-1/2	2-7/16	3-11/16	5-5/8	3-3/8	.89

Not UL Listed

# PRODUCT LIMITED LIFETIME WARRANTY



Except as otherwise specified for certain products, mandated by law or herein provided, Spears® Manufacturing Company ("Company") warrants Standard Catalog Products ("Products") which have been directly manufactured by them to be free from defects in material and workmanship for as long as the original intended end user of the Products ("End User") retains ownership and possession of the Products and complies with this Warranty ("Warranty Period"). Each other person or entity acquiring or employing the Products, including buyers, contractors and installers ("Buyer") and End Users ("Buyer/End User") agrees that this Warranty shall be effective only during the Warranty Period so long as the Products are used solely for the normal purposes for which they are intended and in conformance with industry established standards, engineering, installation, operating, and maintenance specifications, recommendations and instructions including explicit instructions by the Company; the Products are properly installed, operated and used, and have not been modified; and all the other terms of this Warranty are complied with. Any violation thereof shall void this Warranty and relieve Company from all obligations arising from this Warranty and the Products.

Upon receipt or discovery of any Products that appear questionable or defective each Buyer/End User shall promptly inspect and return any such Product to the Company at 15853 Olden Street, Sylmar, California 91342, accompanied by a letter stating the nature of any problems. If the Products are determined by Company to be defective in materials or workmanship directly provided by Company, Company, at its sole option, may either repair or replace the defective Products, or reimburse applicable Buyer/End User for the cost of such Products. The applicable Buyer/End User shall bear all applicable shipping costs. THIS SHALL BE BUYERS/END USERS' SOLE REMEDY. EACH BUYER/END USER AGREES THAT COMPANY WILL NOT BE RESPONSIBLE FOR ANY OTHER OBLIGATIONS RELATING TO THE PRODUCTS, INCLUDING ANY OTHER MATERIALS OR LABOR COSTS, LOSS OF USE OR ANY OTHER ITEM OR FOR ANY DELAYS IN COMPLYING WITH THIS WARRANTY BEYOND COMPANY'S REASONABLE CONTROL.

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# Three-way Bronze Valve

1/4" IPS UL/ULC Listed\*  
300 psi



## Description

The 1/4" IPS three-way female threaded valve is used to facilitate the installation of sprinkler system pressure gauges. The valve provides for one inlet and two outlets. This design allows for replacement of the system gauge without shutting down the water supply to the sprinkler system. This design also allows Authority's Having Jurisdiction to test system pressure with an additional gauge through the second outlet. (The second outlet is normally plugged during installation with a 1/4" IPS pipe plug.)

## Installation

Installation of the three-way valve can be accomplished with normal field installation tools. Make sure the valve is installed according to the flow indication arrow that has been cast into the valve body. The most common installation allows for a 1/4" IPS nipple between the valve and the water supply being measured. This assures there will be adequate spacing for the sprinkler system gauge from the riser. Use either PTFE Pipe

Thread Sealing Tape or a suitable pipe thread sealant such as **PipeFit® Thread Sealant Paste with PTFE** when installing the valve. **DO NOT OVERTIGHTEN THREADS. OVERTIGHTENING MAY CAUSE VALVE FAILURE.**

\*UL/ULC Listed 2R97

## Specifications

### Materials:

Body - Bronze  
Seat - Brass  
Handwheel - Iron

### Sizes:

1/4" IPS

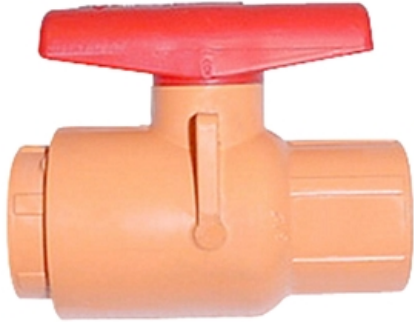
### Working Pressure:

400 WOG



# FlameGuard™ CPVC Drain & Check Valves For NFPA 13D Applications Only

**Application:** FlameGuard™ CPVC Orange Drain Valves and Check Valves are for use in configuring CPVC Fire Sprinkler System connection to water supply (riser/drain assembly) in NFPA 13D installations only. These valves are NOT for use in any other locations within the fire sprinkler system.



Drain Valve

### CPVC Drain Valves

Part Number	Size	Disc Code	Price Each
<b>Socket x Socket</b>			
6622-007CO	3/4	004	22.68
6622-010CO	1	004	28.36

### CPVC Check Valves

Part Number	Size	Disc Code	Price Each
<b>Socket x Socket</b>			
S1520-10CO	1	004	22.56
S1520-12CO	1-1/4	004	25.22
S1520-15CO	1-1/2	004	28.36



Check Valve

### CPVC Special Reinforced Thread Inlet Check Valves

Part Number	Size	Disc Code	Price Each
<b>SR Fipt x Socket</b>			
S1520-10FSRSCO	1	004	24.44
S1520-12FSRSCO	1-1/4	004	28.22
S1520-15FSRSCO	1-1/2	004	33.47



Special Reinforced (SR) Threaded Inlet Check Valve

**General Installation Information:** Socket end connections should be installed using Spears® FS-5 One-Step Cement for use with Spears® CPVC Fire Sprinkler Products. Threaded connections should be made using Spears® **BLUE 75™** Thread Sealant tested for compatibility with CPVC materials. Swing check valves are designed for horizontal installations, but may be installed in up-flow only vertical position. Check valves **MUST** be installed with the valve's FLOW arrow pointing in the direction of the flow. Do not install valve upside down.

NOT FOR USE WITH COMPRESSED AIR OR GAS

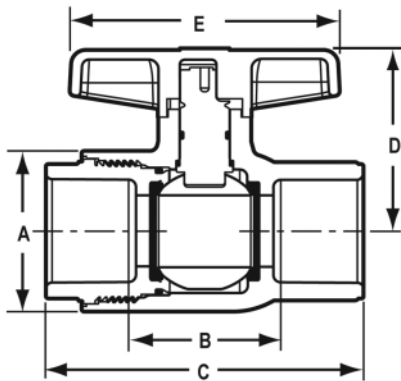
# FlameGuard™ CPVC Drain & Check Valves For NFPA 13D Applications Only



## Specifications

### Drain Valve:

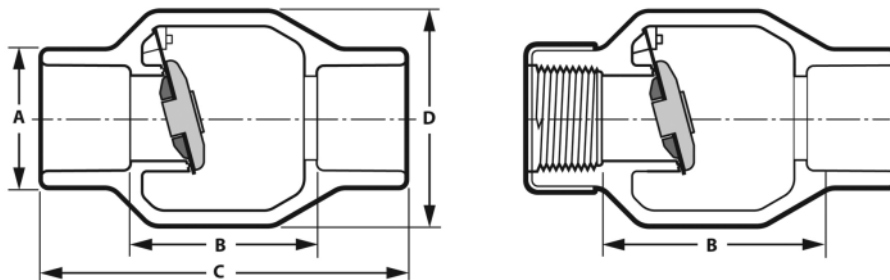
Nominal Size Range	3/4", 1"
Type	1/4-Turn Ball Valve, Maintenance-free Sealed Unit
Material	CPVC, Orange
Seats	PTFE/HDPE
Seals	EPDM
Handle	Polypropylene, Red
End Connections	Socket x Socket



Socket x Socket Part Number	Nominal Size	Dimension Reference (inches, ± 1/16)				
		A	B	C	D	E
6622-007CO	3/4	1-13/16	1-1/2	3-9/16	2	2
6622-010CO	1	2-1/16	1-3/4	4	2-5/16	2-5/16

### Check Valve:

Nominal Size Range	1", 1-1/4", 1-1/2"
Type	Swing Check, Maintenance-free Sealed Unit
Material	CPVC, Orange
Seat	EPDM
End Connections	Socket x Socket Socket x Special Reinforced (SR) Female Plastic Thread



Socket x Socket Part Number	SR Thread x Socket Part Number	Nominal Size	Dimension Reference (inches, ± 1/16)				C <sub>v</sub> (GPM)	
			A	B		C		D
				Socket	SR Thread			
S1520-10CO	S1520-10FSRSCO	1	1-11/16	2-5/16	2-15/16	4-9/16	2-5/8	33
S1520-12CO	S1520-12FSRSCO	1-1/4	2-1/16	2-15/16	3-5/8	5-1/2	3-3/8	42
S1520-15CO	S1520-15FSRSCO	1-1/2	2-7/16	3	3-11/16	5-5/8	3-3/8	89

NOT FOR USE WITH COMPRESSED AIR OR GAS

## Fig. 22 - Hanger for CPVC Plastic Pipe Single Fastener Strap Type



**Size Range** — 3/4" thru 2" CPVC pipe

**Material** — Pre-Galvanized Steel

**Function** — Intended to perform as a hanger to support CPVC piping used in automatic fire sprinkler systems. The product acts as a hanger when tab is upward and the fastener screw is in the horizontal position. Figure 22 can be installed on the top of a beam, but in this situation acts as a guide to the piping which is supported by the beam itself. It is not intended to support CPVC pipe from under a flat horizontal surface, such as a ceiling. For this type of installation, use the TOLCO® Fig. 23, Double Fastener Strap for CPVC Piping. Fig. 22, when inverted, with the hanger tab downward, can function as a restrainer to prevent the upward movement of the sprinkler head during activation.

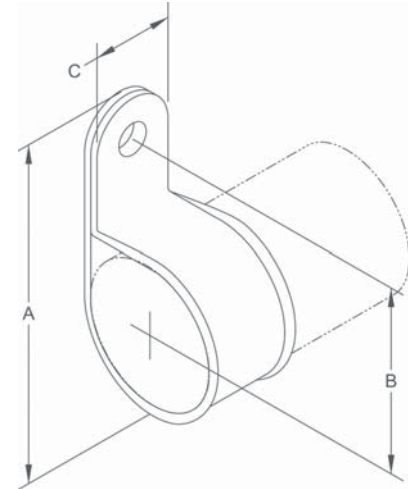
**Approvals** — Underwriters' Laboratories Listed in the USA (**UL**) and Canada (**cUL**) to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge steel using (1) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features** — Fig. 22 incorporates features which protect the pipe and ease installation. The flared edge design protects CPVC pipe from any rough surface. It is easily attached to the building structure using the special UL Listed hex head self threading screw\* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment to be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish** — Pre-Galvanized

**Order By** — Figure number and CPVC pipe size.

\* **Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.**



### Dimensions • Weights

CPVC Pipe Size	A	B	C	Max. Hanger Spacing (Ft.)	Fastener Hex Head Size	Approx. Wt./100
3/4	27/16	15/16	13/16	5½	5/16	9
1	211/16	17/16	13/16	6	5/16	9
1¼	31/16	15/8	13/16	6½	5/16	11
1½	35/16	1¾	13/16	7	5/16	12
2	3¾	21/8	13/16	8	5/16	15



## Fig. 24 - Hanger for CPVC Plastic Pipe Double Fastener Strap Type - Side Mount



**Size Range** — 3/4" thru 2" CPVC pipe

**Material** — Pre-Galvanized Steel

**Function** — Intended to perform as a hanger/restrainer to support CPVC piping used in automatic fire sprinkler systems. Can be installed on the top or on the bottom of a beam. The Fig. 24 can also function as a restrainer to prevent the upward movement of the sprinkler head during activation.

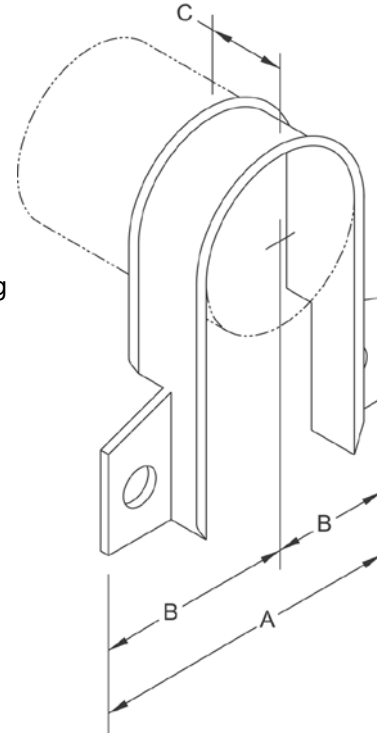
**Approvals** — Underwriters' Laboratories Listed in the USA (**UL**) and Canada (**cUL**) to support fire sprinkler piping. May be installed in wood using fasteners supplied with product, or into minimum 20 gauge steel using (2) 1/4" x 1" tek type screw. Meets and exceeds the requirements of NFPA 13, 13R and 13D.

**Features** — Fig. 24 incorporates features which protect the pipe and ease installation. The flared edge design protects the CPVC pipe from any rough surface. Easily attaches to the building structure using the two UL Listed hex head self threading screws\* furnished with the product. It is recommended that rechargeable electric drills fitted with a hex socket attachment be used as installation tools. No impact tools (such as a hammer) are allowed. Damage has been known to result from installations using impact type tools. No pre-drilling of a pilot hole in wood is required.

**Finish** — Pre-Galvanized

**Order By** — Figure number and pipe size

\* **Hardened hex head self threading screw is furnished with the product and is the minimum fastener size acceptable.**



### Dimensions • Weights

CPVC Pipe Size	A	B	C	Max. Hanger Spacing (Ft.)	Fastener Hex Head Size	Approx. Wt./100
3/4	2 <sup>5</sup> / <sub>16</sub>	1 <sup>5</sup> / <sub>32</sub>	1 <sup>3</sup> / <sub>16</sub>	5 <sup>1</sup> / <sub>2</sub>	5/16	9
1	2 <sup>5</sup> / <sub>8</sub>	1 <sup>5</sup> / <sub>16</sub>	1 <sup>3</sup> / <sub>16</sub>	6	5/16	9
1 <sup>1</sup> / <sub>4</sub>	3	1 <sup>1</sup> / <sub>2</sub>	1 <sup>3</sup> / <sub>16</sub>	6 <sup>1</sup> / <sub>2</sub>	5/16	11
1 <sup>1</sup> / <sub>2</sub>	3 <sup>1</sup> / <sub>4</sub>	1 <sup>5</sup> / <sub>8</sub>	1 <sup>3</sup> / <sub>16</sub>	7	5/16	12
2	3 <sup>11</sup> / <sub>16</sub>	1 <sup>27</sup> / <sub>32</sub>	1 <sup>3</sup> / <sub>16</sub>	8	5/16	15

## Fig. 28M - Offset Hanger and Restrainer for CPVC Plastic Pipe and IPS Pipe



**Size Range** — 3/4" thru 1-1/4"

**Material** — Carbon Steel, Pre-Galvanized

**Function** — Designed to be used as a hanger and restrainer for CPVC piping or steel piping where the "stand-off" design will ease installation by eliminating the need for wood blocking.

**Features** —

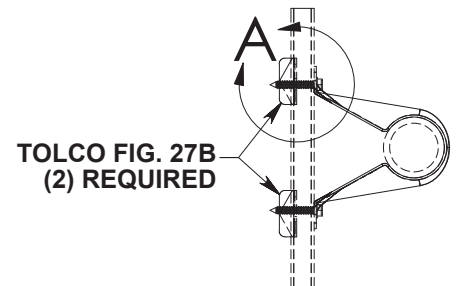
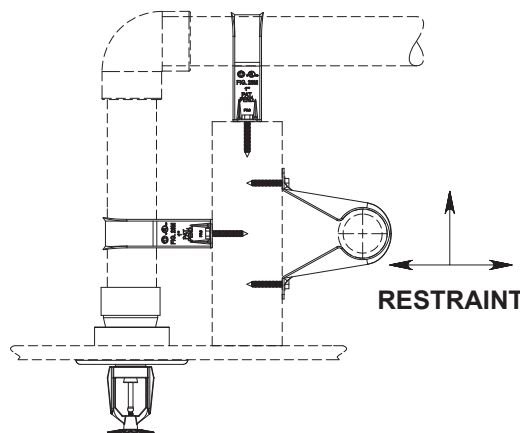
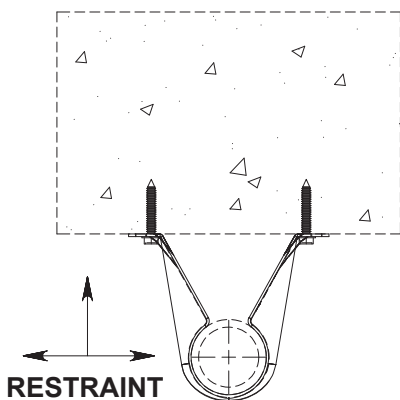
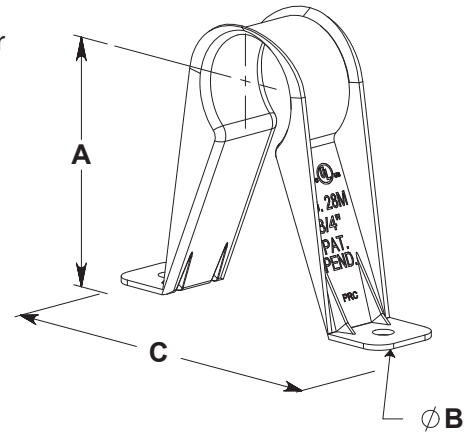
- Flared edge design protects CPVC pipe from any rough or abrasive surfaces
- Unique snap-on design holds pipe firmly in place and allows retrofit type of installation
- The "Stand-Off" design eliminates the need for wood block extension
- Can be installed on horizontal or vertical piping regardless of mounting surface orientation
- Attaches easily to wood structure with two hex head self-threading screws furnished with product
- Installs easily using rechargeable electrical driver with 5/16" extension socket eliminating impact tool damage to pipe
- Attaches easily to steel, minimum 18 gauge with (2) 1/4" x 1" tek type self drilling tapping screws
- cULus Listed as a hanger and a restrainer for fire sprinkler piping

**Installation Note** — When installed in wood structural member and threads from the #10 x 1" screws are exposed, use FIG. 27B speed nut to secure

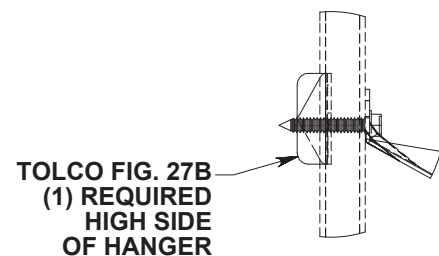
**Approvals** — Underwriters' Laboratory Listed in the USA (UL) and Canada (cUL) to support automatic fire sprinkler systems. May be installed into wood using fasteners screws. Meets and exceeds the requirements of NFPA 13, 13R and 13D. Fig. 28M satisfies the UL vertical restraint requirements where needed.

**Order By** — Figure number and pipe size

Patent #7,744,042



HANGER AND RESTRAINT APPLICATION



DETAIL A HANGER APPLICATION

### Dimensions • Weights

Pipe Size	A	B	C	Max. Spacing required per NFPA 13 for CPVC plastic pipe	Approx Wt./100
3/4	2	3/16	3-5/16	5'-6"	9
1	2-1/8	3/16	3-1/2	6'-0"	12
1-1/4	2-5/16	3/16	3-1/2	6'-6"	13

# Steel Hinged Wall Plates w/springs



## Description

Fire Protection Products' plated steel hinged wall plate has been designed to offer aesthetically pleasing concealment of pipe penetrations through walls. Utilizing a two piece construction allows for easy installation and closure around pipe diameters from 1/2" IPS to 10" IPS. Centering springs are used for "automatic" alignment and a secure installation on the pipe. A simple clasp allows for the wall plate to stay in place. Available in chrome finish.

**Caution: May not provide proper sealing to provide fire wall or smoke penetration ratings. An approved fire stop material should be used for this purpose.**

## Installation

Installation of the wall plate occurs after installation of piping materials and appropriate fire stop materials (if required) has occurred. Simply open the wall plate, install around piping and close, making sure to secure the two halves with the clasp. The wall plate will "automatically" center itself on the pipe. No tools are required for proper installation.



## Specs:

Type:

Steel hinged w/  
springs

Sizes:

1/2" thru 10" IPS

Material :

.046" colded rolled  
steel

Standard finish:

Chrome

For questions:

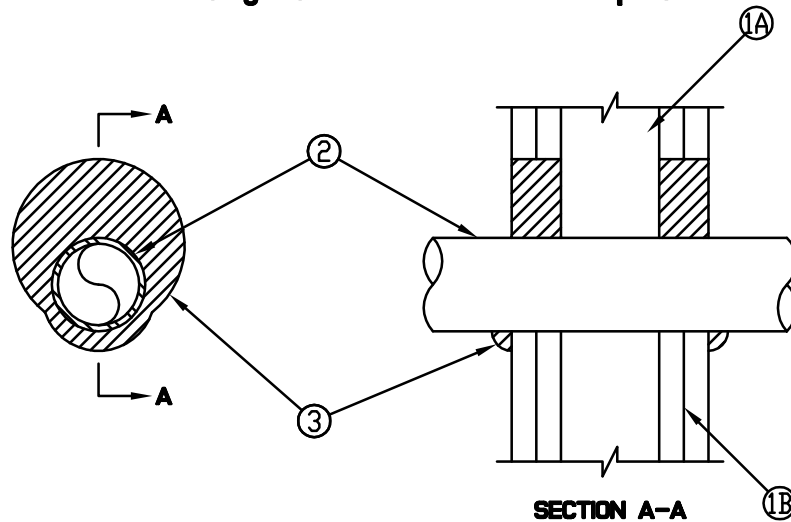
1 800 344-1822 or fax

1 800 344-3775

<http://www.fppi.com>

## System No. W-L-2377

- F Ratings - 1 and 2 Hr (See Items 1 and 3)**  
**T Ratings - 1 and 2 Hr (See Items 1 and 3)**  
**L - Rating at Ambient - Less than 1 CFM/Sq Ft**  
**L - Rating at 400 F - 4 CFM/Sq Ft**



1. WALL ASSEMBLY - THE 1 AND 2 HR FIRE RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:
  - A. STUDS - WALL FRAMING SHALL CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC. STEEL STUDS TO BE MIN 2-1/2 IN. WIDE BY 1-3/8 IN. DEEP CHANNELS SPACED MAX 24 IN. OC.
  - B. GYPSUM BOARD\* - THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 3 IN.
 THE HOURLY F AND T RATING OF THE FIRESTOP SYSTEM IS EQUAL TO THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED.
2. THROUGH PENETRANT - ONE NONMETALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE AND PERIPHERY OF OPENING SHALL BE MIN OF 0 IN. (POINT CONTACT) TO A MAX 1-1/4 IN. PIPE TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF NONMETALLIC PIPES MAY BE USED:
  - A. CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - NOM 2 IN. DIAM (OR SMALLER) FLOWGUARD GOLD® SDR11 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
  - B. CHLORINATED POLYVINYL CHLORIDE (CPVC) PIPE - NOM 2 IN. DIAM (OR SMALLER) BLAZEMASTER® SDR13.5 CPVC PIPE FOR USE IN CLOSED (PROCESS OR SUPPLY) PIPING SYSTEMS.
3. FILL, VOID OR CAVITY MATERIAL\* - SEALANT - MIN 5/8 IN. AND 1-1/4 IN. THICKNESS OF FILL MATERIAL APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL FOR 1 AND 2 HR RATED ASSEMBLIES, RESPECTIVELY. AT POINT CONTACT LOCATION, A MIN 1/2 IN. DIAM BEAD OF FILL MATERIAL SHALL BE APPLIED TO THE WALL/PENETRANT INTERFACE ON BOTH SURFACES OF THE WALL.

HILTI CONSTRUCTION CHEMICALS, DIV OF HILTI INC - FS-ONE SEALANT  
 \*BEARING THE UL CLASSIFICATION MARK



**Hilti Firestop Systems**

Reproduced by HILTI, Inc. Courtesy  
 of Underwriters Laboratories, Inc.  
 June 20, 2000



**FIRE CAULK - HILTI SYSTEM No. W-L-2377**  
**UP TO 2" CPVC & DRYWALL - 1 TO 2-HOUR**



SCALE: NONE

# Back Box (patent pend)

## for Fire Alarm Bell, ABS



### Description

FPPI's Back Box for Fire Alarm Bells is made from high impact ABS thermoplastic. ABS is known for its strength and rigidity and has superior electrical insulation properties as compared to PVC, Styrene or other plastics. ABS can also be used in a wide range of temperatures from -13 °F (-25° C) and 140 °F (60°). ABS is resistant to the elements that would normally cause corrosion in a similar back box made from cast aluminum with a painted finish. The back box design includes two tabs for easy surface mounting with two 1/2" NPT threaded inlets/outlets for through wiring. Each back box is supplied with four screws for mounting a compatible bell and an extra 1/2" NPT plug for plugging an unused NPT inlet or outlet.

### Installation

Install in accordance with usual and customary installation techniques for electrical apparatus. The ABS back box can be attached to most flat even surfaces in either horizontal or vertical positioning. Mounting to an uneven surface may cause the back box to become deformed, compromise weather resistance and prevent proper installation of the alarm bell. In order to maintain its' weather resistant properties install the supplied 1/2" NPT plug when not "through" wiring the bell to another appliance. Prolonged exposure to direct sunlight may cause the surface of the backbox to appear slightly discolored. This appearance does not change the performance characteristics of the product. Do not mount any electrical appliance in areas that are expected to be exposed to direct streams of water or directly exposed to inclement weather. The back box weather resistant prop-

erties are dependent on all installed components (NPT plugs, conduit connections, alarm bells, etc.) being installed in a weather resistant fashion and having weather resistant properties of their own. When installed correctly, the final assembly of all components should provide a reasonable amount of resistance to moisture.

### Maintenance

No regular maintenance is required. As with all fire sprinkler system components, regularly inspect the back box for damage to insure expected performance.

### Related Products

- 6" Alarm Bell
- 10" Alarm Bell
- Alarm Bell Cage (Guard)
- Alarm Bell Signs

### Specifications

**Materials:**  
Acrylonitrile butadiene styrene (ABS)

**Sizes:**  
4" Back box with two 1/2" NPT threaded outlets/inlets. Includes for bell mounting screws and one 1/2" NPT plug.

**Color:**  
Dark Gray





## Alarm Bells and Bell Accessories

Part No.	Description	Box Qty.
02-450	Alarm Bell, 10" 120VAC	10
02-452	Alarm Bell, 6" 120VAC	20
02-455	Alarm Bell Back Box	48
02-457	Bell Guard	20



## Break Shackle Locks

FPPI offers break shackle locks to prevent tampering with controlled valves. Locks are keyed alike to allow easy access to secured valves by authorized personnel.

Part No.	Description	Box Qty.
02-410	Break Shackle Lock #764-40	250
02-411	Master Break Lock #500KABRK197	72



## Sign Chain

Zinc plated for corrosion resistance. Suitable for use in exposed areas.

Part No.	Description	Box Qty.
02-200	#16 Sign Chain, 100' Box	20
02-201	#16 Sign Chain, 250' Reel	1

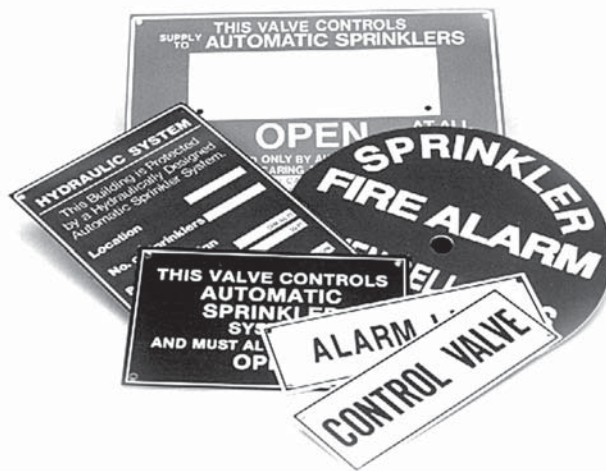


## Spare Sprinkler Head Cabinets

All Spare Sprinkler Head Cabinets are equipped with "knockouts" to accommodate 1/2" or 3/4" sprinkler heads. ESFR head box will accommodate 3/4" or 1" IPS sprinklers. Finish: Red Enamel

Part No.	Description	Box Qty.
02-400	Spare Head Box, 12 Head	20
02-401	Spare Head Box, 6 Head	25
02-402	Spare Head Box, 3 Head	20
02-403	ESFR Spare Head Box, 6 Head	20

# Identification Signs



## Description

Manufactured from .020" white coated aluminum. All sign types are screen printed with a fade resistant red ink. Each sign is shipped with a clear protective plastic coating which can be removed at time of installation. Each sign type meets or exceeds NFPA13 requirements. All signs (except 7" round) are drilled in four corners to allow for easy installation. All signs (except 7" round) may be installed with sign chain or with any fastener that is suitable for the material that the sign is being attached. The 7" round bell signs are center drilled to allow for installation directly to the bell gong assembly. Type "A" 9" x 7" Control valve signs are drilled with the same four hole pattern as Type "B" 6" x 2" signs to allow for attachment of Type "B" to Type "A".

## Installation

Installation of aluminum signs is accomplished by several methods. The most common installation procedure is to use #16 Single Jack chain to hang the sign on the area being identified. Since all of the above mentioned signs are predrilled at all four corners, the last link of the chain can be opened and hooked

through the top holes on the signs and hung on the appropriate valve or piping. The signs may also be fastened to a flat surface with fasteners appropriate to the base material. (The 9" x 7" Fire Alarm Bell sign must be drilled if it is to be attached directly to the bell gong.)

## Specifications

### Material:

.020" aluminum with removable plastic protective coating

### Sizes:

6" x 2"  
4" x 6"  
5" x 7"  
9" x 7"  
12" x 10"  
8.5" x 11"

See current catalog for a full listing of all available signs.



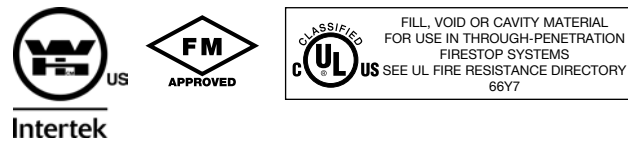
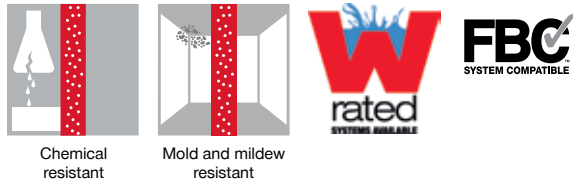
## High-performance intumescent firestop sealant FS-ONE MAX

### Applications

- For effectively sealing most common through penetrations in a variety of base materials
- For use on concrete, masonry and drywall
- Mixed and multiple penetrations
- Metal pipe penetrations: copper, steel and EMT
- Insulated metal pipe penetrations: steel and copper
- Plastic pipe penetrations: closed or vented

### Advantages

- US-produced: "Buy American" compliant
- One product for a variety of common through penetrations
- Cost-effective, easy-to-use solution
- Water-based and paintable
- Industry-leading VOC results
- Ethylene glycol-free



Technical data	
Chemical basis	Water-based acrylic dispersion
Approx. Density	84.3 lb/ft <sup>3</sup>
Color	Red
Application temperature range	41 - 104 °F
Approx. cure time <sup>1)</sup>	4 mm/3 days
Temperature resistance range	-4 to 212 °F
Mold and mildew performance	Class 0 (ASTM G21-96)
Mold and mildew resistance	Yes
Surface burning characteristics UL 723 (ASTM E84)	Flame spread: 0 Smoke development: 10
Tested in accordance with	UL 1479, ASTM E814, ASTM E84, CAN/ ULC-S115, ASTM G21, ASTM E90
California State fire marshal approval	CSFM Listing 4485-1200:0108 for FS-ONE MAX Intumescent Firestop Sealant
Expansion ratio (unrestricted, up to)	1:5

<sup>1)</sup> at 75°F/24°C, 50% relative humidity



Order Designation	Package Content	Item number
FS-ONE MAX 20oz foil (3 case + disp)	1x Foil pack dispenser manual CS 270-P1, 75x Firestop sealant FS-ONE MAX 20 oz foil	3530252
FS-ONE MAX 10oz tube (1 case)	12x Firestop sealant FS-ONE MAX 10 oz cartridge	3530249
FS-ONE MAX 5 gallon (18 pails)	18x Firestop sealant FS-ONE MAX 5 gallon pail	3530263
FS-ONE MAX 20oz foil (1 case)	25x Firestop sealant FS-ONE MAX 20 oz foil	3530250
FS-ONE MAX 20oz foil (3 cases)	75x Firestop sealant FS-ONE MAX 20 oz foil	3530251
FS-ONE MAX 20oz Foil-Pallet	600x FSONE-MAX 20 oz foil, 290x Bulk Shipping Condition	3534713
FS-ONE MAX 10 oz cartridge		2101531
FS-ONE MAX 5 gallon pail		2101533





Specifications subject to change without notice.

**Stock Number:** 1144460

**Optional:** Cover Tamper Switch Kit, stock no. 0090148

**Replaceable Components:** Retard/Switch Assembly, stock no. 1029030

**UL, CUL and CSFM Listed**

**Service Pressure:** Up to 175 PSI (12,07 BAR)

**Flow Sensitivity Range for Signal:** 4-10 GPM (15-38 LPM) - UL

**Maximum Surge:** 18 FPS (5.5 m/s)

**Contact Ratings:** Two sets of SPDT (Form C)  
10.0 Amps at 125/250VAC  
2.0 Amps at 30VDC Resistive  
10 mAmps min. at 24VDC

**Conduit Entrances:** Two openings provided for 1/2" conduit.  
Individual switch compartments suitable for dissimilar voltages.

**Environmental Specifications:**

- NEMA 4/IP54 Rated Enclosure suitable for indoor or outdoor use with factory installed gasket and die-cast housing when used with appropriate conduit fitting.
- Temperature Range: 40°F - 120°F, (4.5°C - 49°C) - UL

**Service Use:**

Automatic Sprinkler	NFPA-13
One or two family dwelling	NFPA-13D
Residential occupancy up to four stories	NFPA-13R
National Fire Alarm Code	NFPA-72

**⚠ WARNING**

- Installation must be performed by qualified personnel and in accordance with all national and local codes and ordinances.
- Shock hazard. Disconnect power source before servicing. Serious injury or death could result.
- Risk of explosion. Not for use in hazardous locations. Serious injury or death could result.

**CAUTION**

Waterflow switches that are monitoring wet pipe sprinkler systems shall not be used as the sole initiating device to discharge AFFF, deluge, or chemical suppression systems. Waterflow switches used for this application may result in unintended discharges caused by surges, trapped air, or short retard times.

**General Information**

The Model VSR-SG is a vane type waterflow switch for use on wet sprinkler systems using CPVC plastic fittings (manufactured by Tyco, Nibco, Victaulic, Ipex, and Spears Manufacturing Company) that use 1", 1 ¼", 1 ½", or 2" pipe sizes. It is equipped with a union to accommodate installation in confined spaces.

The VSR-SG contains two single pole, double throw, snap action switches and an adjustable, instantly recycling pneumatic retard. The switches are actuated when a flow of 10 GPM (38 LPM) or more occurs downstream of the device. The flow condition must exist for a period of time necessary to overcome the selected retard period.

**Enclosure**

The VSR-SG switches and retard device are enclosed in a general purpose, die-cast housing. The cover is held in place with two tamper resistant screws which require a special key for removal. A field installable cover tamper switch is available as an option which may be used to indicate unauthorized removal of the cover. See bulletin number 5401103 for installation instructions of this switch.

**Installation** (see Fig. 1, 2, and 3)

These devices may be mounted on horizontal or vertical pipe. On horizontal pipe they shall be installed on the top side of the pipe where they will be accessible. The device should not be installed within 6" (15 cm) of a fitting which changes the direction of the waterflow or within 24" (60 cm) of a valve or drain. The unit has a 1" male fitting for gluing into a CPVC plastic tee.

**NOTE:** Do not leave cover off for an extended period of time.

Loosen the union nut and separate the 1" male fitting from the VSR-SG. Glue the 1" male fitting into the TEE following the TEE manufacturer's instructions for preparation and gluing of CPVC piping systems. (Note: The 1" male fitting must bottom out on the stop of the TEE for proper operation of the VSR-SG. See Fig. 1.) Wait 2 to 4 hours to allow the glue to dry before attaching the VSR-SG to the 1" male fitting. Select the proper paddle for the pipe size and type of TEE used. See Fig. 3 for instructions on how to change paddle. Verify that the o-ring is properly positioned in its groove. Hand tighten the nut on the union after orienting the device in the appropriate direction to detect waterflow as shown in Fig. 2.

The vane must not rub the inside of the TEE or bind in any way. The stem should move freely when operated by hand.

**CAUTION**

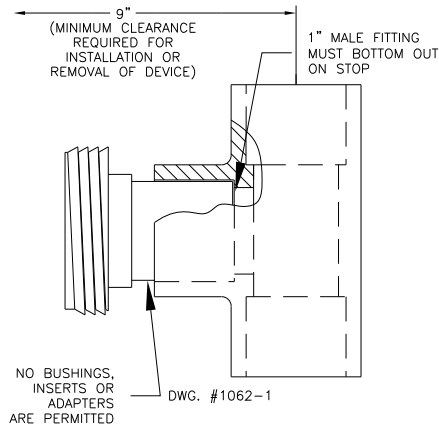
Do not trim the paddle. Failure to follow these instructions may prevent the device from operating and will void the warranty.

**CAUTION**

Do not over-tighten the union nut, hand tighten only.

**Fig. 1**

Glue the 1" male fitting into the TEE following the TEE manufacturer's instructions for preparation and gluing of CPVC piping systems. Wait 2 to 4 hours to allow the glue to dry before attaching the VSR-SG to the 1" male fitting.

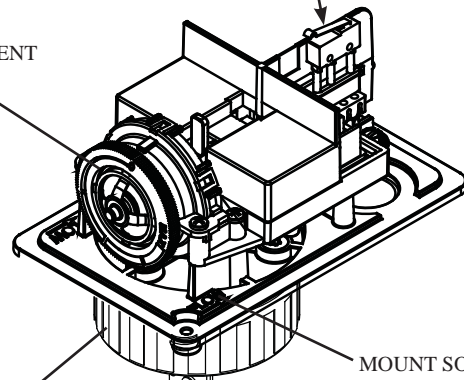


**Fig. 2 Retard Adjustment**

The delay can be adjusted by rotating the retard adjustment knob from 0 to the max setting (60-90 seconds). The time delay should be set at the minimum required to prevent false alarms.

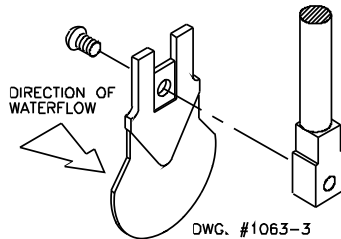
OPTIONAL COVER TAMPER SWITCH  
Do not leave cover off for extended period of time

RETARD ADJUSTMENT KNOB



MOUNT SO ARROW ON BASE POINTS IN DIRECTION OF WATERFLOW

**Fig. 3**



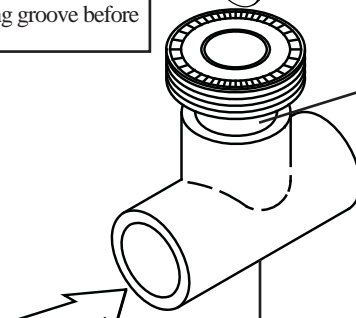
**Important:**

11 paddles are furnished with each unit to accommodate the various sizes and manufacturers of TEES. The paddles have raised lettering that show the pipe size and the TEE manufacturer they are to be used with. The proper paddle must be used. The paddle must be properly attached (see Fig. 3) and the screw that holds the paddle must be securely tightened.

**CAUTION**

Insure that O-ring is in O-ring groove before installing switch.

1" MALE FITTING ON ALL SIZES



Flowing water activates device in one direction only.

RUN OF THE TEE MAY BE 1", 1 1/4", 1 1/2", or 2"

Fig. 4

Break out thin section of cover when wiring both switches from one conduit entrance.

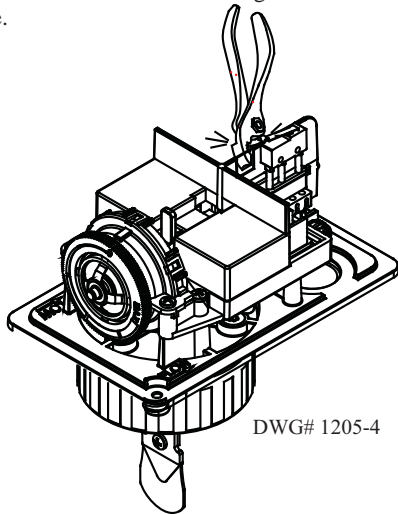
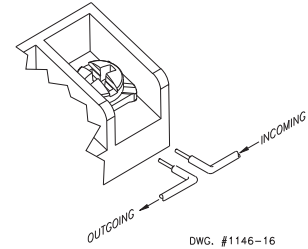


Fig. 5 Switch Terminal Connections Clamping Plate Terminal



**WARNING**

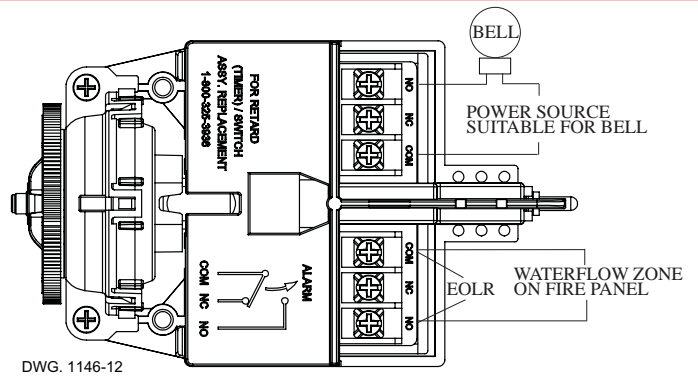
An uninsulated section of a single conductor should not be looped around the terminal and serve as two separate connections. The wire must be severed, thereby providing supervision of the connection in the event that the wire become dislodged from under the terminal. Failure to sever the wire may render the device inoperable risking severe property damage and loss of life.

Do not strip wire beyond 3/8" of length or expose an uninsulated conductor beyond the edge of the terminal block. When using stranded wire, capture all strands under the clamping plate.

Fig. 6 Typical Electrical Connections

Notes:

1. The Model VSR-SG has two switches, one can be used to operate a central station, proprietary or remote signaling unit, while the other contact is used to operate a local audible or visual annunciator.
2. For supervised circuits, see "Switch Terminal Connections" drawing and warning note (Fig. 5).



Testing

The frequency of inspection and testing for the Model VSR-SG and its associated protective monitoring system shall be in accordance with applicable NFPA Codes and Standards and/or the authority having jurisdiction (manufacturer recommends quarterly or more frequently).

If provided, the inspector's test valve shall always be used for test purposes. If there are no provisions for testing the operation of the flow detection device on the system, application of the VSR-SG is not recommended or advisable.

A minimum flow of 10 GPM (38 LPM) is required to activate this device.

**NOTICE** Advise the person responsible for testing of the fire protection system that this system must be tested in accordance with the testing instructions.

Fig. 7 Mounting Dimensions

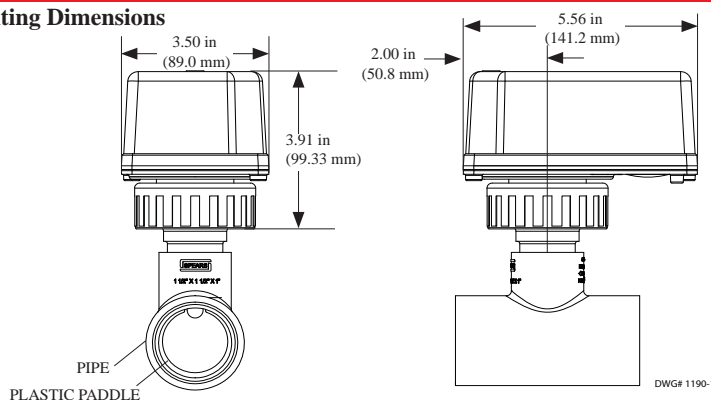
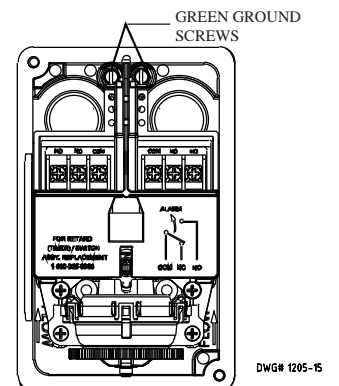


Fig. 8



**Maintenance**

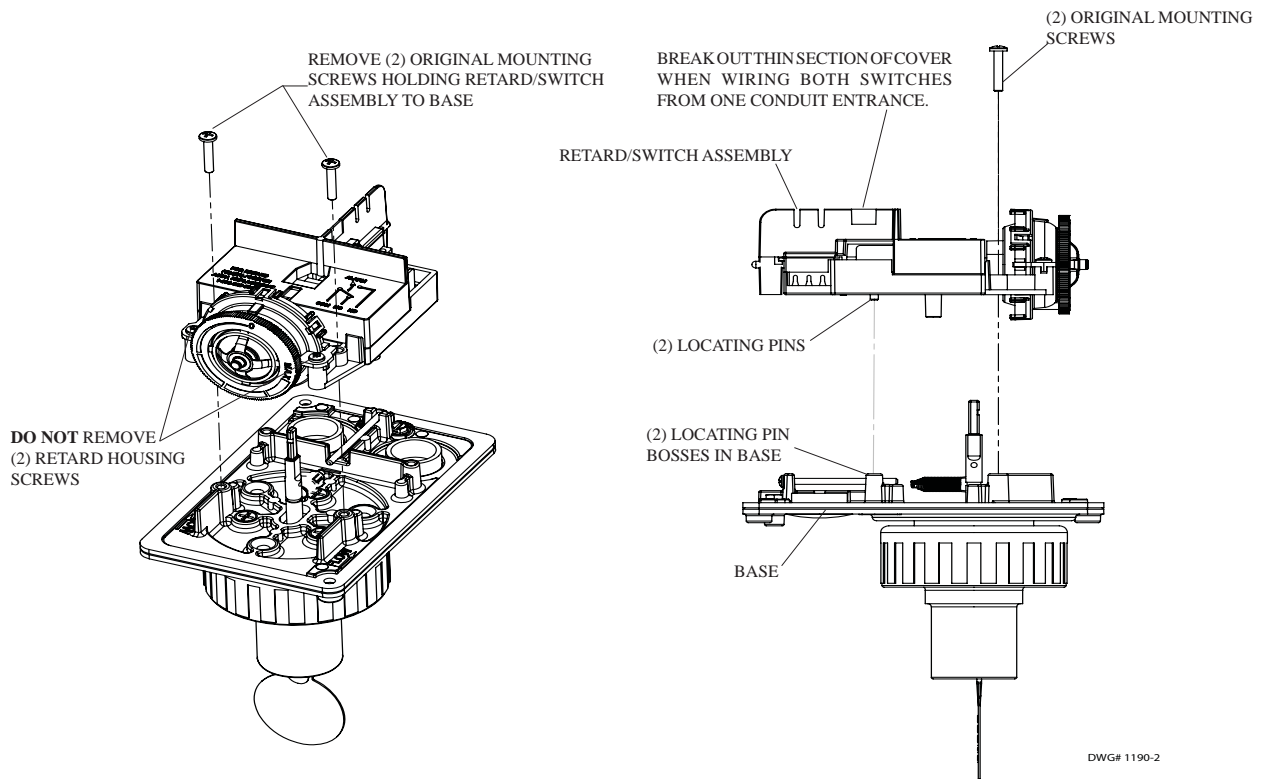
Inspect detectors monthly. If leaks are found, replace the detector. The VSR-SG waterflow switch should provide years of trouble-free service. The retard and switch assembly are easily field replaceable. In the unlikely event that either component does not perform properly, please order replacement retard switch assembly stock #1029030 (see Fig. 6). There is no maintenance required, only periodic testing and inspection.

**Retard/Switch Assembly Replacement (See Fig. 9)**

**NOTICE** The Retard/Switch Assembly is field-replaceable without draining the system or removing the waterflow switch from the pipe

1. Make sure the fire alarm zone or circuit connected to the waterflow switch is bypassed or otherwise taken out of service.
2. Disconnect the power source for local bell (if applicable).
3. Identify and remove all wires from the waterflow switch.
4. Remove the (2) mounting screws holding retard/switch assembly to the base. **Do not** remove the (2) retard housing screws.
5. Remove the retard assembly by lifting it straight up over the tripstem.
6. Install the new retard assembly. Make sure the locating pins on the retard/switch assembly fit into the locating pin bosses on the base.
7. Re-install the (2) original mounting screws.
8. Reconnect all wires. Perform a flow test and place the system back in service.

**Fig. 9**



DWG# 1190-2

**Removal of Waterflow Switch**

- To prevent accidental water damage, all control valves should be shut tight and the system completely drained before waterflow detectors are removed or replaced.
- Turn off electrical power to the detector, then disconnect wiring.
- Loosen nuts and separate unit from the glued-in fittings
- Gently lift the unit far enough to get your fingers under it. With your fingers, roll the vane so it will fit through the hole while continuing to lift the waterflow detector.
- Lift detector clear of pipe.

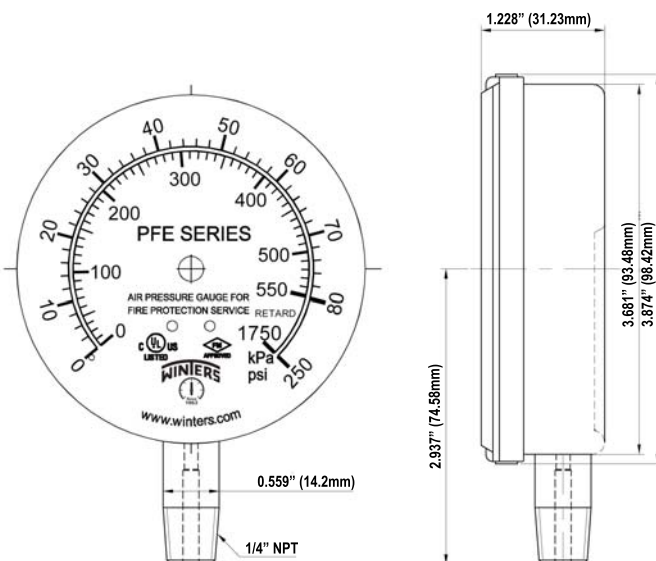


### Description & Features:

- Specially designed for fire sprinkler systems
- Suitable for air and water media
- Corrosion resistant case
- Dual scale (psi/kpa) and single scale (psi) pressure ratings
- Approved by Factory Mutual (FM) and listed by Underwriter Laboratory (UL-393), USA and Canada
- Internal pointer travel over-stop
- CRN registered
- 5 year warranty

### Specifications

<b>Dial</b>	3.5" (90mm), white aluminum with black and red markings
<b>Case</b>	Black plastic
<b>Lens</b>	Polycarbonate, threaded
<b>Socket</b>	Brass
<b>Connection</b>	1/4" NPT standard, bottom
<b>Bourdon Tube</b>	Phosphor bronze
<b>Movement</b>	Brass
<b>Pointer</b>	Aluminum, black
<b>Welding</b>	Silver Alloy
<b>Working Pressure</b>	Maximum 75% of full scale value
<b>Ambient/Process Temperature</b>	-40°F to 150°F (-40°C to 65°C)
<b>Accuracy</b>	3-2-3% ASME Grade B
<b>Enclosure Rating</b>	IP52



### Order Codes (products in bold are normally in stock)

Model	Air	Water	Air/Water
0/80/retard - 250 psi	<b>PFE3932R1</b>	-	-
0 - 300 psi	-	<b>PFE3933R1</b>	<b>PFE3935R1</b>
0/80/retard - 250 psi/kPa	<b>PFE3932</b>	-	-
0 - 300 psi/kPa	-	<b>PFE3933</b>	<b>PFE3935</b>