. . . Fire Protection by Computer Design

Crawford Sprinkler Co.
2725 South Saunders Street
Raleigh, NC 27603
919-828-9346

4/21/2020 #29772 FS-1

Job Name	:	LANGLEY BACKFLOW REPLACEMENT
Drawing	:	FP1
Location	:	174 WEST SMITHFIELD
Remote Area	:	1
Contract	:	S20 9002
Data File	:	Langley BFP Replacement - Pipe Schedule.WXF

HYDRAULIC CALCULATIONS
for

Project name: LANGLEY BACKFLOW REPLACEMENT
Location: 174 WEST SMITHFIELD
Drawing no: FP1
Date: 4/15/20

Design

Remote area number: 1
Remote area location: NA
Occupancy classification: WAREHOUSE
Density: .20 - Gpm/SqFt
Area of application: NA - SqFt
Coverage per sprinkler: 130 - SqFt
Type of sprinklers calculated: NA
No. of sprinklers calculated: 0
In-rack demand: - GPM
Hose streams: 850 - GPM
Total water required (including hose streams): 850 - GPM @ 39.9468 - Psi
Type of system: WET
Volume of dry or preaction system: - Gal

Water supply information

Date: 4/2/20
Location: 174 WEST SMITHFIELD
Source: CSCO

Name of contractor: Crawford Sprinkler Co.
Address: 2725 South Saunders Street / / Raleigh, NC 27603
Phone number: 919-828-9346
Name of designer: MPC
Authority having jurisdiction:
Notes: (Include peaking information or gridded systems here.)

Water Supply Curve C

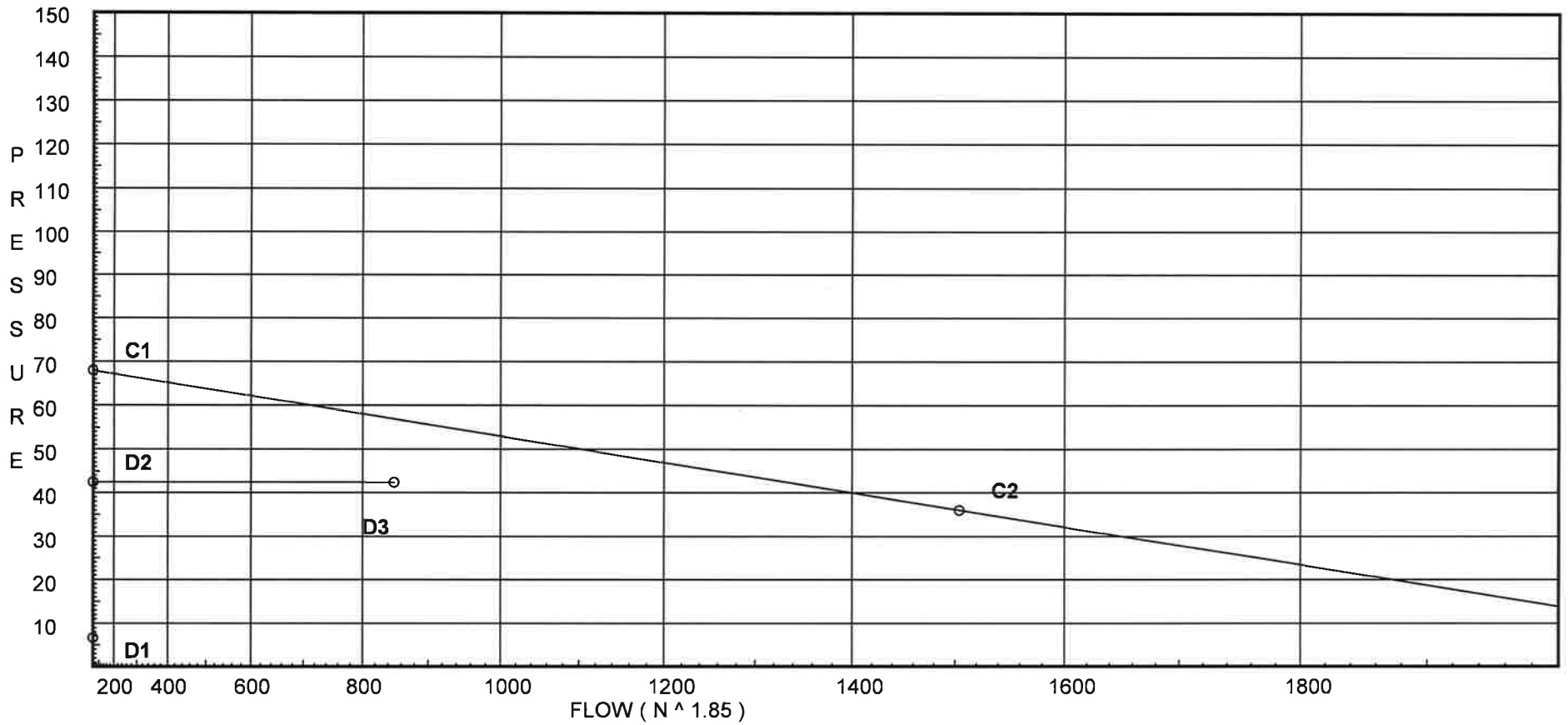
Crawford Sprinkler Co.
LANGLEY BACKFLOW REPLACEMENT

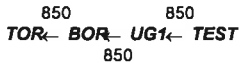
Date 4/15/20

City Water Supply:
- C1 - Static Pressure : 68
- C2 - Residual Pressure: 36
- C2 - Residual Flow : 1504

Demand:

D1 - Elevation	6.605
D2 - System Flow	
D2 - System Pressure	42.437
Hose (Demand)	850
D3 - System Demand	850
Safety Margin	14.428




850
850
TOR
BOR
UG1
TEST
850

Fittings Used Summary

Crawford Sprinkler Co.
LANGLEY BACKFLOW REPLACEMENT

Date 4/15/20

Fitting Legend

Abbrev.	Name	½	¾	1	1¼	1½	2	2½	3	3½	4	5	6	8	10	12	14	16	18	20	24
Avc	Alarm Vic 751	0	0	0	0	3	9	8	17	0	21	0	22	50	0	0	0	0	0	0	0
E	NFPA 13 90' Standard Elbow	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
Fsp	Flow Switch Potter VSR	Fitting generates a Fixed Loss Based on Flow																			
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
T	NFPA 13 90' Flow thru Tee	3	4	5	6	8	10	12	15	17	20	25	30	35	50	60	71	81	91	101	121

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.

SUPPLY ANALYSIS

Node at Source	Static Pressure	Residual Pressure	Flow	Available Pressure	Total Demand	Required Pressure
TEST	68.0	36	1504.0	56.866	850.0	42.437

NODE ANALYSIS

Node Tag	Elevation	Node Type	Pressure at Node	Discharge at Node	Notes
TOR	16.25		20.0	850.0	
BOR	1.0		38.68		
UG1	-1.0		41.17		
TEST	1.0		42.44		

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqv.	Ln.	Pipe Ftng's Total	CFact Pf/Ft	Pt Pe Pf	******* Notes ******
TOR	16.250	H850	850.00	6	Fsp	0.0	10.000	120	20.000	
to					Avc	22.0	108.000		15.605	* * Fixed Loss = 9
BOR	1		850.0	6.065	4E	56.0	118.000	0.0260	3.073	Vel = 9.44
					T	30.0				
BOR	1		-0.01	6	T	32.359	20.000	120	38.678	
to					E	15.101	47.460		0.866	
UG1	-1		849.99	6.16		0.0	67.460	0.0241	1.629	Vel = 9.15
UG1	-1		0.0	8	2E	56.936	374.000	140	41.173	
to					G	6.326	118.616		-0.866	
TEST	1		849.99	8.27	T	55.354	492.616	0.0043	2.130	Vel = 5.08
			0.0							
TEST			849.99						42.437	K Factor = 130.48

Hydrant Flow Test Report

Test Date 4/2/2020 **Test Time** 1:30 pm

Location

174 WEST SMITHFIELD ST.

Tested by

CRAWFORD SPRINKLER CO.
2725 S. SAUNDERS STREET
RALEIGH, NC 27603

Notes

TEST PERFORMED BY MIKE CURLEY AND CONNOR THOMPSON OF CRAWFORD SPRINKLER CO.

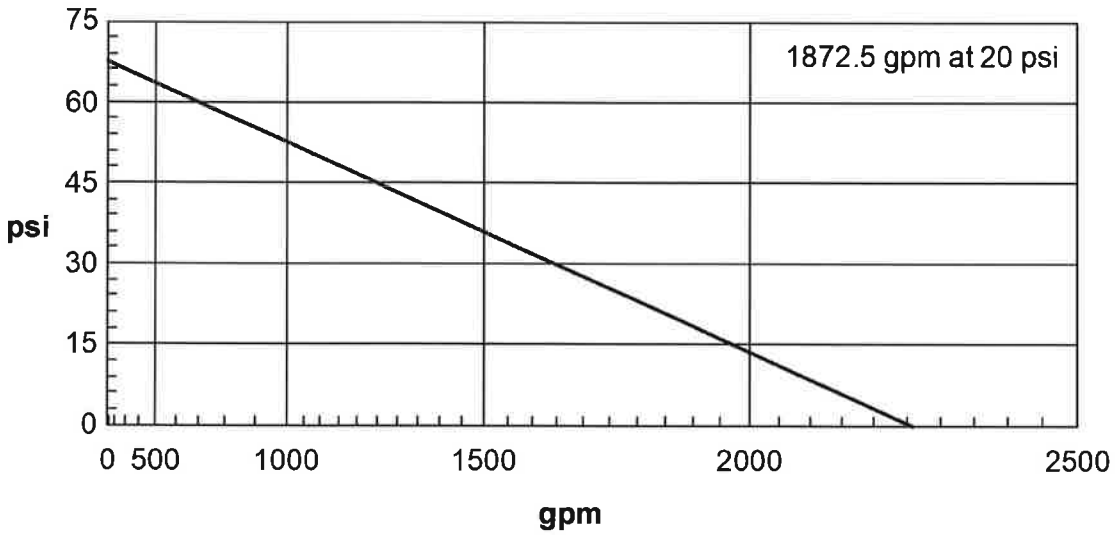
Read Hydrant

68 psi **static pressure**
36 psi **residual pressure**
1 ft **hydrant elevation**

Flow Hydrant(s)

Outlet	Elev	Size	C	Pitot Pressure	Flow
#1	1	3.05	1.34	16	1504 gpm

Flow Graph



Job Name _____ Contractor _____

Job Location _____ Approval _____

Engineer _____ Contractor's P.O. No. _____

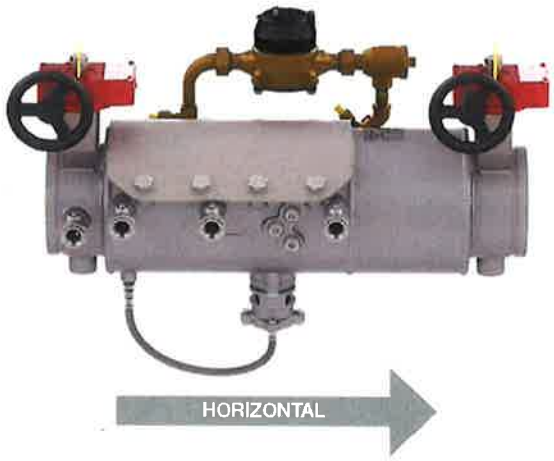
Approval _____ Representative _____

LEAD FREE*

Deringer™ 50X

Low Head Loss Reduced Pressure Detector Assembly

Sizes: 4" and 6"



The Deringer™ 50X Reduced Pressure Detector Assembly (RPDA-II) prevents non-health hazard pollutants and hazardous contaminants entering a potable water supply system when backpressure and/or backsiphonage conditions occur. Used primarily on fire sprinkler systems when monitoring of unauthorized water use is required.

Features

- Oversized checks for extreme performance
- Poppet action first check for more reliable relief valve closure
- Stainless steel braided wire sensing line
- Stem includes tamper switch groove
- Inline serviceable gate valves
- Stainless steel housing
- Tamper-resistant test cocks
- Patented Dual-action™ second check module
  - Poppet action at low flow
  - Swing action at high flow
- Lead Free* bronze bypass components
- CuFt or gallons bypass meter
- Silicone Elastomer
- Silicone Elastomer check discs
- Balanced chamber relief valve
  - No sliding seals
- AWWA C509/UL/FM resilient seated gate valves (OS&Y)
- DCDA-II single check bypass
- Flanged ends ANSI B16.1 Class 125
- Flexible groove coupling UL/FM

***The wetted surface of this product contacted by consumable water contains less than 0.25% of lead by weight.**

Approved for Fire Protection, Waterworks, Plumbing, and Irrigation Applications.

Specifications

The Deringer 50X Reduce Pressure Detector Assembly (RPDA-II) shall utilize two independent check modules contained within a single valve housing constructed of entirely of stainless steel. Dual-action second check module shall operate as a "poppet style" check under low flow conditions, operate as a "swing style" check under high flow conditions and utilize replaceable silicone elastomer sealing discs. Valve assembly shall include two resiliently seated and inline serviceable AWWA C509 gate valves of type outside yoke and stem (OS&Y). Gate valves shall utilize a stainless steel stem with a pre-machined groove for installation of supervisory tamper switches. Assembly test cocks shall be handle-less and operate via a tamper resistant actuator. Assembly shall utilize a single full access service port and a cover with an "inline" replaceable elastomer seal. Relief valve shall operate without the use of sliding seals and shall be constructed entirely of stainless steel. The bypass assembly shall include a meter registering gallons or cubic feet, a single check valve and test cocks. Assembly shall be serviceable without the use of special tools.

NOTICE

The information contained herein is not intended to replace the full product installation and safety information available or the experience of a trained product installer. You are required to thoroughly read all installation instructions and product safety information before beginning the installation of this product.

AMES
FIRE & WATERWORKS
A WATTS Brand

Materials

Valve Housing:	304 Stainless Steel
Valve Cover:	304 Stainless Steel
SOV Disks:	EPDM/304SS
SOV Shafts:	304 Stainless Steel
Bypass Spring:	302 Stainless Steel
RV Spring:	302 Stainless Steel
SOV Bearings:	Teflon® fluoropolymer/Bronze
Non-wetted Bolts:	Grade 8 Zinc Plated
Check Disks:	Silicone (NSF)
Wetted Fasteners:	18-8 Stainless Steel
Bypass Components:	Lead Free Bronze
RV Housing:	304 Stainless Steel
Check Springs:	17-7 Stainless Steel
Check Pins:	17-7/18-8 Stainless Steel
Check Seats:	Noryl® Polymer (NSF)
O-rings:	Buna-N (NSF)
Bypass Internals:	ABS Polymer (NSF)
RV Hose:	Braided Stainless Steel Wire

Pressure — Temperature

Temperature Range: 33°F – 140°F
Working Pressure: 10 – 175psi

Standards

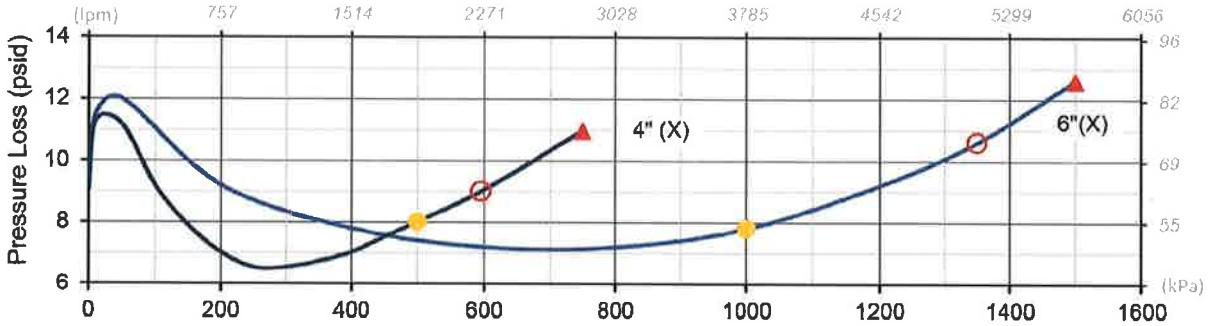
AWWA C511-07 Compliant
NSF/ANSI 372, UL CERTIFIED
LEAD FREE

End Connections

- IPS Groove for Steel Pipe: AWWA C606
- Flange Adapters: ANSI B16.1 Class 125

Flow Performance

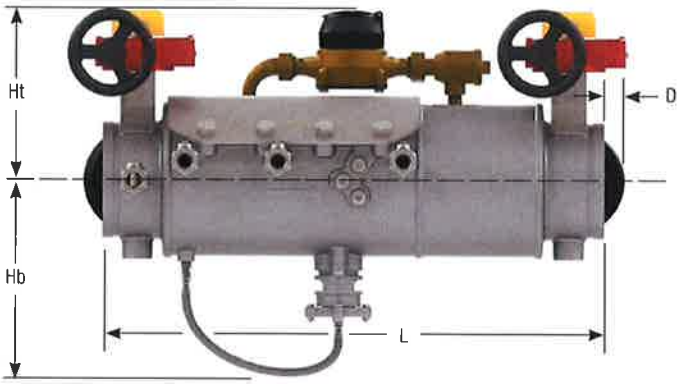
▲ = Rated Flow ▲ = UL Tested ○ = 15 fps

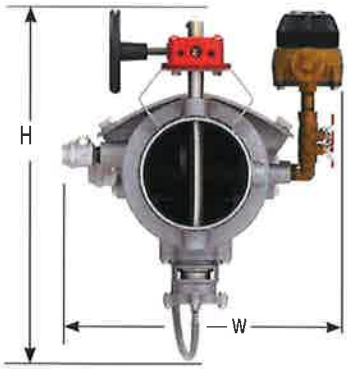


* Specific orientation & agency flow characteristics available on website

Rate of Flow (gpm)

Dimensions — Weights





Size	Model	Ht		Hb		L		D		H		W		Weight	
in.		in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	in.	mm	lbs	kg
4	50X	10.1	257	10.5	267	23.6	599	0.2	5	20.2	513	15.2	387	86	39
6	50X	9.6	244	10.7	272	28.4	721	1.0	25	20.3	516	16.8	427	142	64

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USA: Backflow T: (978) 689-6066 • F: (978) 975-8350 • AmesFireWater.com
USA: Control Valves T: (713) 943-0688 • F: (713) 944-9445 • AmesFireWater.com
Canada: T: (905) 332-4090 • F: (905) 332-7068 • AmesFireWater.ca
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