

JOB: RJJ HOLDINGS
 ADDRESS: 3633 ISLAND CREST WY, MERCER ISLAND (RANKIN RESIDENCE)
 DESIGNER: KENNETH H. ROBINSON-ELMSLE

CALCULATIONS FOR 26 GPM FLOW (2 HEADS) IND. LOSS NET TOTAL

A. WATER PRESSURE IN STREET 58.00

B. SELECT PIPE SIZE: 1"

C. DEDUCT METER & SETTLER LOSS (1") 12.00 46.00
 DEDUCT BACKFLOW DEVICE LOSS 5.00 41.00

D. DEDUCT HEAD LOSS FOR ELEVATION HEIGHT 20 8.68 32.32

E. DEDUCT PRESSURE LOSS FROM MAIN TO SPRINKLER 1-1/4" WATER SERVICE
 ITEM QUANTITY EQUIV. FT. TOTAL FT.
 PIPE: 85 1 85
 ELLS: 2 2 4
 R-TEES: 4 3 12
 B-TEES: 1 2 2
 TOTAL EQUIVALENT FT. X .01 PSIF/FT = 1.03 31.29

F. DEDUCT PRESSURE LOSSES FOR 1-1/2" PIPING FROM CONTROL VALVE TO MOST REMOTE SPRINKLER
 ITEM QUANTITY EQUIV. FT. TOTAL FT.
 PIPE: 0 1 0
 ELLS: 0 9 0
 R-TEES: 0 1 0
 B-TEES: 0 8 0
 TOTAL EQUIVALENT FT. X .0178 PSIF/FT = 0 31.29

F. DEDUCT PRESSURE LOSSES FOR 1-1/4" PIPING FROM CONTROL VALVE TO MOST REMOTE SPRINKLER
 ITEM QUANTITY EQUIV. FT. TOTAL FT.
 PIPE: 47 1 47
 ELLS: 5 8 40
 R-TEES: 3 1 7
 B-TEES: 7 6 18
 TOTAL EQUIVALENT FT. X .0343 PSIF/FT = 3.8416 27.45

F. DEDUCT PRESSURE LOSSES FOR 1" PIPING FROM CONTROL VALVE TO MOST REMOTE SPRINKLER
 ITEM QUANTITY EQUIV. FT. TOTAL FT.
 PIPE: 26 1 26
 ELLS: 2 7 14
 R-TEES: 1 1 1
 B-TEES: 2 5 10
 TOTAL EQUIVALENT FT. X .1067 PSIF/FT = 5.44 22.01

F. DEDUCT PRESSURE LOSSES FOR 3/4" PIPING FROM CONTROL VALVE TO MOST REMOTE SPRINKLER
 ITEM QUANTITY EQUIV. FT. TOTAL FT.
 PIPE: 13 1 13
 ELLS: 1 7 7
 R-TEES: 0 1 0
 B-TEES: 0 3 0
 TOTAL EQUIVALENT FT. X .0893 PSIF/FT = 1.79 20.22

REMAINING PRESSURE FOR SPRINKLER OPERATION CALCULATIONS PER NFPA 13D A.10.4.4 (A) (2016 ED.) 20.22

Hydraulic Design

Hydraulic calculations for the sizing of systems incorporating Spears FlameGuard™ CPVC Fire Sprinkler Products must be calculated using a Hazen-Williams C value of 150. Pipe friction loss calculations must be made according to NFPA Standard 13. The following table shows the allowance for friction loss for fittings, expressed as equivalent length of pipe. For additional information regarding friction loss, contact Spears.

Allowance for Friction Loss in Fittings

Equivalent Feet (meters) of Pipe	
Pipe Size (Nominal inches)	Maximum Support Spacing (feet)
3/4"	5-1/2'
1"	6-1/2'
1-1/4"	7'
1-1/2"	7-1/2'
2"	8-1/2'
2-1/2"	9-1/2'
3"	10-1/2'
3-1/2"	11-1/2'
4"	12-1/2'
4-1/2"	13-1/2'
5"	14-1/2'
5-1/2"	15-1/2'
6"	16-1/2'
6-1/2"	17-1/2'
7"	18-1/2'
7-1/2"	19-1/2'
8"	20-1/2'
8-1/2"	21-1/2'
9"	22-1/2'
9-1/2"	23-1/2'
10"	24-1/2'
10-1/2"	25-1/2'
11"	26-1/2'
11-1/2"	27-1/2'
12"	28-1/2'
12-1/2"	29-1/2'
13"	30-1/2'
13-1/2"	31-1/2'
14"	32-1/2'
14-1/2"	33-1/2'
15"	34-1/2'
15-1/2"	35-1/2'
16"	36-1/2'
16-1/2"	37-1/2'
17"	38-1/2'
17-1/2"	39-1/2'
18"	40-1/2'
18-1/2"	41-1/2'
19"	42-1/2'
19-1/2"	43-1/2'
20"	44-1/2'
20-1/2"	45-1/2'
21"	46-1/2'
21-1/2"	47-1/2'
22"	48-1/2'
22-1/2"	49-1/2'
23"	50-1/2'
23-1/2"	51-1/2'
24"	52-1/2'
24-1/2"	53-1/2'
25"	54-1/2'
25-1/2"	55-1/2'
26"	56-1/2'
26-1/2"	57-1/2'
27"	58-1/2'
27-1/2"	59-1/2'
28"	60-1/2'
28-1/2"	61-1/2'
29"	62-1/2'
29-1/2"	63-1/2'
30"	64-1/2'
30-1/2"	65-1/2'
31"	66-1/2'
31-1/2"	67-1/2'
32"	68-1/2'
32-1/2"	69-1/2'
33"	70-1/2'
33-1/2"	71-1/2'
34"	72-1/2'
34-1/2"	73-1/2'
35"	74-1/2'
35-1/2"	75-1/2'
36"	76-1/2'
36-1/2"	77-1/2'
37"	78-1/2'
37-1/2"	79-1/2'
38"	80-1/2'
38-1/2"	81-1/2'
39"	82-1/2'
39-1/2"	83-1/2'
40"	84-1/2'
40-1/2"	85-1/2'
41"	86-1/2'
41-1/2"	87-1/2'
42"	88-1/2'
42-1/2"	89-1/2'
43"	90-1/2'
43-1/2"	91-1/2'
44"	92-1/2'
44-1/2"	93-1/2'
45"	94-1/2'
45-1/2"	95-1/2'
46"	96-1/2'
46-1/2"	97-1/2'
47"	98-1/2'
47-1/2"	99-1/2'
48"	100-1/2'
48-1/2"	101-1/2'
49"	102-1/2'
49-1/2"	103-1/2'
50"	104-1/2'
50-1/2"	105-1/2'
51"	106-1/2'
51-1/2"	107-1/2'
52"	108-1/2'
52-1/2"	109-1/2'
53"	110-1/2'
53-1/2"	111-1/2'
54"	112-1/2'
54-1/2"	113-1/2'
55"	114-1/2'
55-1/2"	115-1/2'
56"	116-1/2'
56-1/2"	117-1/2'
57"	118-1/2'
57-1/2"	119-1/2'
58"	120-1/2'
58-1/2"	121-1/2'
59"	122-1/2'
59-1/2"	123-1/2'
60"	124-1/2'
60-1/2"	125-1/2'
61"	126-1/2'
61-1/2"	127-1/2'
62"	128-1/2'
62-1/2"	129-1/2'
63"	130-1/2'
63-1/2"	131-1/2'
64"	132-1/2'
64-1/2"	133-1/2'
65"	134-1/2'
65-1/2"	135-1/2'
66"	136-1/2'
66-1/2"	137-1/2'
67"	138-1/2'
67-1/2"	139-1/2'
68"	140-1/2'
68-1/2"	141-1/2'
69"	142-1/2'
69-1/2"	143-1/2'
70"	144-1/2'
70-1/2"	145-1/2'
71"	146-1/2'
71-1/2"	147-1/2'
72"	148-1/2'
72-1/2"	149-1/2'
73"	150-1/2'
73-1/2"	151-1/2'
74"	152-1/2'
74-1/2"	153-1/2'
75"	154-1/2'
75-1/2"	155-1/2'
76"	156-1/2'
76-1/2"	157-1/2'
77"	158-1/2'
77-1/2"	159-1/2'
78"	160-1/2'
78-1/2"	161-1/2'
79"	162-1/2'
79-1/2"	163-1/2'
80"	164-1/2'
80-1/2"	165-1/2'
81"	166-1/2'
81-1/2"	167-1/2'
82"	168-1/2'
82-1/2"	169-1/2'
83"	170-1/2'
83-1/2"	171-1/2'
84"	172-1/2'
84-1/2"	173-1/2'
85"	174-1/2'
85-1/2"	175-1/2'
86"	176-1/2'
86-1/2"	177-1/2'
87"	178-1/2'
87-1/2"	179-1/2'
88"	180-1/2'
88-1/2"	181-1/2'
89"	182-1/2'
89-1/2"	183-1/2'
90"	184-1/2'
90-1/2"	185-1/2'
91"	186-1/2'
91-1/2"	187-1/2'
92"	188-1/2'
92-1/2"	189-1/2'
93"	190-1/2'
93-1/2"	191-1/2'
94"	192-1/2'
94-1/2"	193-1/2'
95"	194-1/2'
95-1/2"	195-1/2'
96"	196-1/2'
96-1/2"	197-1/2'
97"	198-1/2'
97-1/2"	199-1/2'
98"	200-1/2'
98-1/2"	201-1/2'
99"	202-1/2'
99-1/2"	203-1/2'
100"	204-1/2'
100-1/2"	205-1/2'
101"	206-1/2'
101-1/2"	207-1/2'
102"	208-1/2'
102-1/2"	209-1/2'
103"	210-1/2'
103-1/2"	211-1/2'
104"	212-1/2'
104-1/2"	213-1/2'
105"	214-1/2'
105-1/2"	215-1/2'
106"	216-1/2'
106-1/2"	217-1/2'
107"	218-1/2'
107-1/2"	219-1/2'
108"	220-1/2'
108-1/2"	221-1/2'
109"	222-1/2'
109-1/2"	223-1/2'
110"	224-1/2'
110-1/2"	225-1/2'
111"	226-1/2'
111-1/2"	227-1/2'
112"	228-1/2'
112-1/2"	229-1/2'
113"	230-1/2'
113-1/2"	231-1/2'
114"	232-1/2'
114-1/2"	233-1/2'
115"	234-1/2'
115-1/2"	235-1/2'
116"	236-1/2'
116-1/2"	237-1/2'
117"	238-1/2'
117-1/2"	239-1/2'
118"	240-1/2'
118-1/2"	241-1/2'
119"	242-1/2'
119-1/2"	243-1/2'
120"	244-1/2'
120-1/2"	245-1/2'
121"	246-1/2'
121-1/2"	247-1/2'
122"	248-1/2'
122-1/2"	249-1/2'
123"	250-1/2'
123-1/2"	251-1/2'
124"	252-1/2'
124-1/2"	253-1/2'
125"	254-1/2'
125-1/2"	255-1/2'
126"	256-1/2'
126-1/2"	257-1/2'
127"	258-1/2'
127-1/2"	259-1/2'
128"	260-1/2'
128-1/2"	261-1/2'
129"	262-1/2'
129-1/2"	263-1/2'
130"	264-1/2'
130-1/2"	265-1/2'
131"	266-1/2'
131-1/2"	267-1/2'
132"	268-1/2'
132-1/2"	269-1/2'
133"	270-1/2'
133-1/2"	271-1/2'
134"	272-1/2'
134-1/2"	273-1/2'
135"	274-1/2'
135-1/2"	275-1/2'
136"	276-1/2'
136-1/2"	277-1/2'
137"	278-1/2'
137-1/2"	279-1/2'
138"	280-1/2'
138-1/2"	281-1/2'
139"	282-1/2'
139-1/2"	283-1/2'
140"	284-1/2'
140-1/2"	285-1/2'
141"	286-1/2'
141-1/2"	287-1/2'
142"	288-1/2'
142-1/2"	289-1/2'
143"	290-1/2'
143-1/2"	291-1/2'
144"	292-1/2'
144-1/2"	293-1/2'
145"	294-1/2'
145-1/2"	295-1/2'
146"	296-1/2'
146-1/2"	297-1/2'
147"	298-1/2'
147-1/2"	299-1/2'
148"	300-1/2'
148-1/2"	301-1/2'
149"	302-1/2'
149-1/2"	303-1/2'
150"	304-1/2'
150-1/2"	305-1/2'
151"	306-1/2'
151-1/2"	307-1/2'
152"	308-1/2'
152-1/2"	309-1/2'
153"	310-1/2'
153-1/2"	311-1/2'
154"	312-1/2'
154-1/2"	313-1/2'
155"	314-1/2'
155-1/2"	315-1/2'
156"	316-1/2'
156-1/2"	317-1/2'
157"	318-1/2'
157-1/2"	319-1/2'
158"	320-1/2'
158-1/2"	321-1/2'
159"	322-1/2'
159-1/2"	323-1/2'
160"	324-1/2'
160-1/2"	325-1/2'
161"	326-1/2'
161-1/2"	327-1/2'
162"	328-1/2'
162-1/2"	329-1/2'
163"	330-1/2'
163-1/2"	331-1/2'
164"	332-1/2'
164-1/2"	333-1/2'
165"	334-1/2'
165-1/2"	335-1/2'
166"	336-1/2'
166-1/2"	337-1/2'
167"	338-1/2'
167-1/2"	339-1/2'
168"	340-1/2'
168-1/2"	341-1/2'
169"	342-1/2'
169-1/2"	343-1/2'
170"	344-1/2'
170-1/2"	345-1/2'
171"	346-1/2'
171-1/2"	347-1/2'
172"	348-1/2'
172-1/2"	349-1/2'
173"	350-1/2'
173-1/2"	351-1/2'
174"	352-1/2'
174-1/2"	353-1/2'
175"	354-1/2'
175-1/2"	355-1/2'
176"	356-1/2'
176-1/2"	357-1/2'
177"	358-1/2'
177-1/2"	359-1/2'
178"	360-1/2'
178-1/2"	361-1/2'