

HYDRAULIC CALCULATIONS
for

JOB NAME CHICK FIL A CALCULATION
Location 1025 SW JEFFERSON STREET, LEE'S SUMMIT, MO 64081
Drawing # FP1
Contract # DPC-19533-140
Date 12/09/2025

DESIGN

Remote area # DESIGN AREA-1
Remote area location DINING AND SURROUNDING AREAS
Occupancy classification LIGHT HAZARD
Density 0.1 - Gpm/SqFt
Area of application 1057 - SqFt
Coverage/sprinkler VARIES - SqFt
Type of sprinkler calculated STANDARD COVERAGE QUICK RESPONSE
Sprinklers calculated 11
In-rack demand - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 517.61 - GPM @ 60.7358 - Psi
Type of system WET
Volume of system (dry or pre-action) N/A - Gal

WATER SUPPLY INFORMATION

Test date 11/25/2025
Location SITE
Source of info AEGIS FIRE PROTECTION

CONTRACTOR INFO AEGIS FIRE PROTECTION, LLC
Address 13415 W. 98TH STREET / LENEXA, KS 66215
Phone # 913-825-0343
Name of designer HAVEN FIRE SYSTEMS
Authority having jurisdiction CITY OF LEES SUMMIT

NOTES:

QR REDUCTION PER NFPA 13: 29.5
250 GPM OUTSIDE HOSE TO ACCOMODATE FOR KITCHEN AREA



text1(35) - invisible

Water Supply Curve

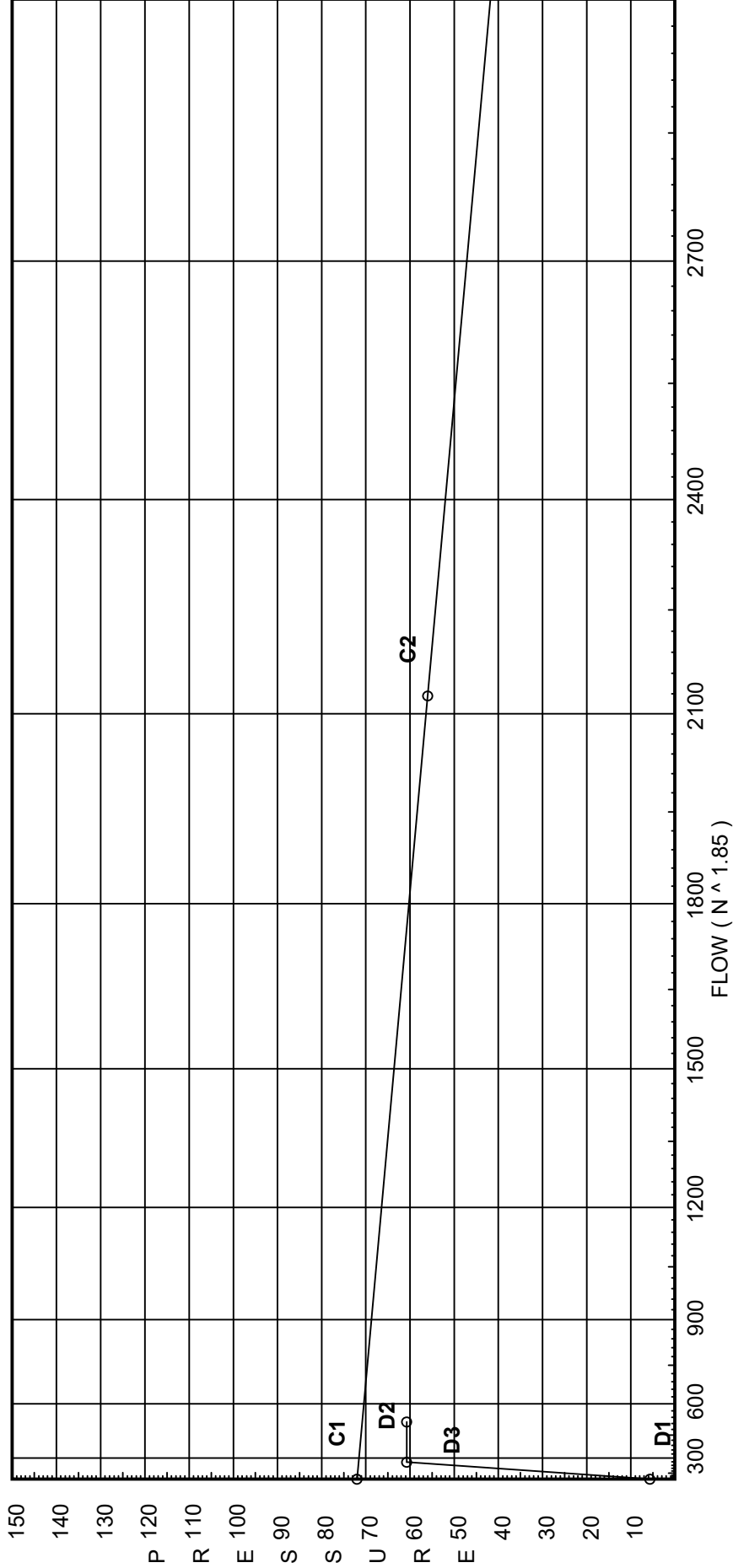
AEGIS FIRE PROTECTION, LLC
CHICK FIL A CALCULATION

City Water Supply:

C1 - Static Pressure : 72
C2 - Residual Pressure: 56
C2 - Residual Flow : 2127

Demand:

D1 - Elevation : 5.704
D2 - System Flow : 267.61
D2 - System Pressure : 60.736
Hose (Demand) : 250
D3 - System Demand : 517.61
Safety Margin : 10.093



Fittings Used Summary

AEGIS FIRE PROTECTION, LLC
CHICK FIL A CALCULATION

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
B NFPA 13 Butterfly Valve	0	0	0	0	0	6	7	10	0	12	9	10	12	19	21	0	0	0	0	0
E NFPA 13 90° Standard Elbow	0	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F NFPA 13 45° Elbow	0	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
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
Zac Ames 2000SS	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.

Flow Summary - NFPA

AEGIS FIRE PROTECTION, LLC
CHICK FIL A CALCULATION

Page 4
Date 12/09/2025

SUPPLY ANALYSIS

<i>Node at Source</i>	<i>Static Pressure</i>	<i>Residual Pressure</i>	<i>Flow</i>	<i>Available Pressure</i>	<i>Total Demand</i>	<i>Required Pressure</i>
TEST	72.0	56	2127.0	70.829	517.61	60.736

NODE ANALYSIS

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>	<i>Notes</i>	
DP02	10.33	5.6	12.76	20.0	0.1	200
EQ02	11.0		17.28			
DP01	12.67	5.6	12.76	20.0	0.1	200
EQ01	13.17		17.35			
DP08	10.0	5.6	12.76	20.0	0.1	200
EQ08	11.0		17.14			
DP07	9.67	5.6	12.76	20.0	0.1	200
EQ07	11.0		16.99			
DP04	9.67	5.6	12.76	20.0	0.1	200
EQ04	11.0		16.99			
DP05	10.33	5.6	12.76	20.0	0.1	200
EQ05	11.0		17.28			
DP06	9.67	5.6	12.76	20.0	0.1	200
EQ06	11.0		16.99			
DP03	10.0	5.6	12.76	20.0	0.1	200
EQ03	11.0		17.14			
100	13.17	4.8	17.35	20.0	K=K @ EQ01	
101	11.0	4.81	18.83	20.88	K=K @ EQ02	
102	11.0	4.81	19.66	21.34	K=K @ EQ02	
103	11.0	4.83	21.63	22.47	K=K @ EQ03	
104	11.0	4.81	24.54	23.83	K=K @ EQ02	
105	11.0		43.85			
106	11.0		43.96			
107	11.0		44.35			
TOR	11.0		51.08			
BOR	-5.0		59.48			
BFP	1.0		59.89			
TEST	0.0		60.74	250.0		
109	11.0	4.85	27.55	25.46	K=K @ EQ06	
110	11.0	4.85	28.19	25.76	K=K @ EQ07	
111	11.0	4.83	29.25	26.13	K=K @ EQ08	
112	11.0	4.85	31.28	27.14	K=K @ EQ04	
113	11.0	4.81	31.34	26.93	K=K @ EQ05	
114	11.0	4.85	32.53	27.67	K=K @ EQ04	

Final Calculations : Hazen-Williams

AEGIS FIRE PROTECTION, LLC
CHICK FIL A CALCULATION

Page 5
Date 12/09/2025

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Eqiv	Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
DP02 to EQ02	10.33 11	5.60	20.00 20.0	1 1.049	T	5.0	32.000 5.000 37.000	120 0.1301	12.755 -0.290 4.815		Vel = 7.42	
EQ02			0.0 20.00						17.280		K Factor = 4.81	
DP01 to EQ01	12.67 13.17	5.60	20.00 20.0	1 1.049	T	5.0	32.000 5.000 37.000	120 0.1301	12.755 -0.217 4.815		Vel = 7.42	
EQ01			0.0 20.00						17.353		K Factor = 4.80	
DP08 to EQ08	10 11	5.60	20.00 20.0	1 1.049	T	5.0	32.000 5.000 37.000	120 0.1301	12.755 -0.433 4.815		Vel = 7.42	
EQ08			0.0 20.00						17.137		K Factor = 4.83	
DP07 to EQ07	9.67 11	5.60	20.00 20.0	1 1.049	T	5.0	32.000 5.000 37.000	120 0.1301	12.755 -0.576 4.815		Vel = 7.42	
EQ07			0.0 20.00						16.994		K Factor = 4.85	
DP04 to EQ04	9.67 11	5.60	20.00 20.0	1 1.049	T	5.0	32.000 5.000 37.000	120 0.1301	12.755 -0.576 4.815		Vel = 7.42	
EQ04			0.0 20.00						16.994		K Factor = 4.85	
DP05 to EQ05	10.33 11	5.60	20.00 20.0	1 1.049	T	5.0	32.000 5.000 37.000	120 0.1301	12.755 -0.290 4.815		Vel = 7.42	
EQ05			0.0 20.00						17.280		K Factor = 4.81	
DP06 to EQ06	9.67 11	5.60	20.00 20.0	1 1.049	T	5.0	32.000 5.000 37.000	120 0.1301	12.755 -0.576 4.815		Vel = 7.42	
EQ06			0.0 20.00						16.994		K Factor = 4.85	
DP03 to EQ03	10 11	5.60	20.00 20.0	1 1.049	T	5.0	32.000 5.000 37.000	120 0.1301	12.755 -0.433 4.815		Vel = 7.42	
EQ03			0.0 20.00						17.137		K Factor = 4.83	
100 to 101	13.17 11	4.8	20.00 20.0	1.25 1.442	2E	7.432	12.170 7.432 19.602	120 0.0277	17.353 0.940 0.542		K = K @ EQ01 Vel = 3.93	
101 to 102	11 11	4.81	20.88 40.88	1.25 1.442			8.000 8.000	120 0.1036	18.835 0.0 0.829		K = K @ EQ02 Vel = 8.03	
102 to 103	11 11	4.81	21.34 62.22	1.25 1.442			8.710 8.710	120 0.2256	19.664 0.0 1.965		K = K @ EQ02 Vel = 12.22	

Final Calculations : Hazen-Williams

AEGIS FIRE PROTECTION, LLC
CHICK FIL A CALCULATION

Page 6
Date 12/09/2025

Node1 to Node2	Elev1 Elev2	K Fact	Qa Qt	Nom Act	Fitting or Equiv Len	Pipe Ftngs Total	CFact Pf/Ft	Pt Pe Pf	*****	Notes	*****
103 to 104	11 11	4.83	22.46 84.68	1.25 1.442		7.300 7.300	120 0.3989	21.629 0.0 2.912		K = K @ EQ03	
104 to 105	11 11	4.81	23.84 108.52	1.25 1.442	T 7.432	23.160 7.432 30.592	120 0.6312	24.541 0.0 19.311		K = K @ EQ02	
105 to 106	11 11		0.0 108.52	3 3.26		9.280 9.280	120 0.0119	43.852 0.0 0.110		Vel = 4.17	
106 to 107	11 11		81.74 190.26	3 3.26		11.460 11.460	120 0.0336	43.962 0.0 0.385		Vel = 7.31	
107 to TOR	11 11		77.35 267.61	3 3.26	T 2E 20.159 18.815	67.620 38.974 106.594	120 0.0631	44.347 0.0 6.728		Vel = 10.29	
TOR to BOR	11 -5		0.0 267.61	3 3.26	B 13.44	10.000 13.440 23.440	120 0.0631	51.075 6.930 1.479		Vel = 10.29	
BOR to BFP	-5 1		0.0 267.61	6 6.16	3E 2F 20.084 Zac 0.0	80.000 80.336 160.336	140 0.0021	59.484 0.063 0.344		* * Fixed Loss = 2.662	
BFP to TEST	1 0		0.0 267.61	6 6.16	3E T 43.037 G 4.304	85.000 107.593 192.593	140 0.0021	59.891 0.433 0.412		Vel = 2.88	
TEST			250.00 517.61					60.736		Qa = 250.00 K Factor = 66.42	
109 to 110	11 11	4.85	25.46 25.46	1.25 1.442		14.870 14.870	120 0.0432	27.546 0.0 0.642		K = K @ EQ06	
110 to 111	11 11	4.85	25.76 51.22	1.25 1.442		6.730 6.730	120 0.1574	28.188 0.0 1.059		K = K @ EQ07	
111 to 107	11 11	4.83	26.13 77.35	1.25 1.442	2E T 7.432 7.432	29.890 14.864 44.754	120 0.3374	29.247 0.0 15.100		K = K @ EQ08	
107			0.0 77.35					44.347		K Factor = 11.62	
112 to 113	11 11	4.85	27.14 27.14	1.25 1.442		1.170 1.170	120 0.0487	31.283 0.0 0.057		K = K @ EQ04	
113 to 114	11 11	4.81	26.93 54.07	1.25 1.442		6.840 6.840	120 0.1740	31.340 0.0 1.190		K = K @ EQ05	
114 to 106	11 11	4.85	27.67 81.74	1.25 1.442	T 7.432	23.160 7.432 30.592	120 0.3737	32.530 0.0 11.432		K = K @ EQ04	
106			0.0 81.74					43.962		K Factor = 12.33	

Final Calculations : Hazen-Williams

AEGIS FIRE PROTECTION, LLC
CHICK FIL A CALCULATION

Node1	Elev1	K	Qa	Nom	Fitting		Pipe	CFact	Pt			
to					or		Ftngs		Pe	*****	Notes	*****
Node2	Elev2	Fact	Qt	Act	Equiv	Len	Total	Pf/Ft	Pf			



**Hydraulic Calculations
For:
CHICK FIL A
1025 SW JEFFERSON STREET
LEE'S SUMMIT, MO 64081**

Hydraulic Calculated Areas

Area #1 Dining and Surrounding Areas

**Aegis Fire Protection, LLC 13415 W 98th St Lenexa, KS 66215
Phone: 913-825-0343**