



MILTON E. REINOSO - PE 91359

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BROTHERS FIRE PROTECTION INC
3781 NE 11 AVENUE
POMPANO BEACH, FL 33064
954-419-9377

Job Name : MIAMI LAKES GARAGE
Drawing :
Location : 16200 NW 57 AVE, MIAMI LAKES, FL 33014
Remote Area : 1
Contract :
Data File : MIAMI LAKES GARAGE Area 1.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME MIAMI LAKES GARAGE
Location 16200 NW 57 AVE, MIAMI LAKES, FL 33014
Drawing #
Contract #
Date 4-16-26

DESIGN

Remote area # 1
Remote area location 6TH FLOOR PARKING
Occupancy classification ORD 2
Density 0.2 - Gpm/SqFt
Area of application 1500 - SqFt
Coverage/sprinkler 98 - SqFt
Type of sprinkler calculated QR PENDENT
Sprinklers calculated 16
In-rack demand - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 603.79 - GPM @ 113.11 - Psi
Type of system WET
Volume of system (dry or pre-action) - Gal

WATER SUPPLY INFORMATION

Test date 3-19-26
Location SITE
Source of info MIAMI-DADE FIRE-RESCUE

CONTRACTOR INFO BROTHERS FIRE PROTECTION INC
Address 3781 NE 11 AVENUE / POMPANO BEACH, FL 33064
Phone # 954-419-9377
Name of designer DAVID SENGSOURLHO
Authority having jurisdiction MIAMI-DADE FIRE
NOTES: 15.16 PSI SAFETY

text1(35) - invisible

Water Supply Curve

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City Water Supply:
C1 - Static Pressure : 55
C2 - Residual Pressure: 53
C2 - Residual Flow : 1356

City Water Adjusted to Pump Inlet
for Pf - Elev - Hose Flow

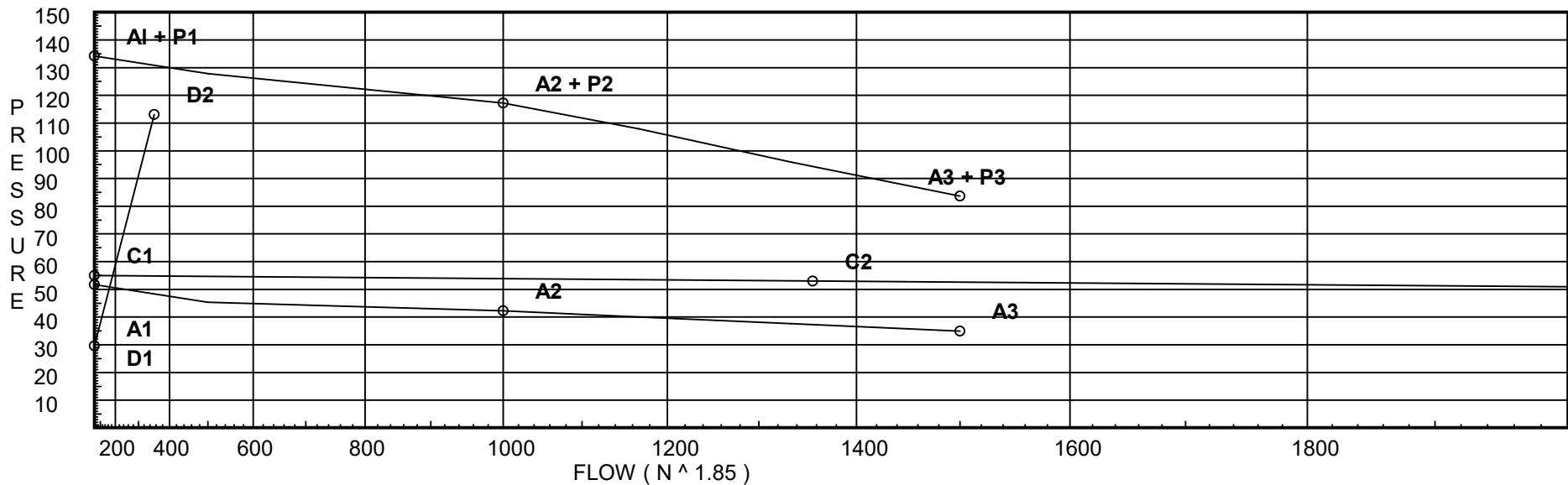
A1 - Adjusted Static: 51.696
A2 - Adj Resid : 42.253 @ 1000
A3 - Adj Resid : 34.894 @ 1500

Pump Data:

P1 - Pump Churn Pressure : 82.5
P2 - Pump Rated Pressure : 75
P2 - Pump Rated Flow : 1000
P3 - Pump Pressure @ Max Flow : 48.75
P3 - Pump Max Flow : 1500
City Residual Flow @ 0 = 8133.50
City Residual Flow @ 20 = 6370.48
City Water @ 150% of Pump = 52.59

Demand:

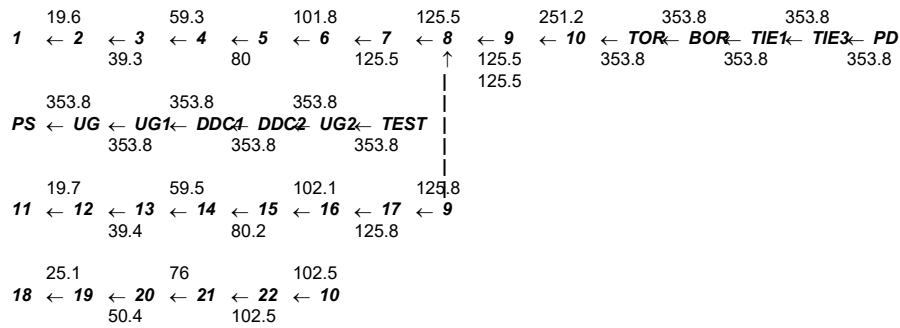
D1 - Elevation : 29.667
D2 - System Flow : 353.79
D2 - System Pressure : 113.110
Hose (Demand) :
D3 - System Demand : 353.79
Hose (Adj City) : 250
Safety Margin : 15.165



Flow Diagram

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Fittings Used Summary

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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
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
S	NFPA 13 Swing Check	0	0	5	7	9	11	14	16	19	22	27	32	45	55	65					
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
Zic	Wilkins 350ADA	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

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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>
PD	See Information on Pump Curve			128.275	353.79	113.11
TEST	55.0	53	1356.0	54.552	603.79	54.552

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>	
1	70.0	5.6	12.25	19.6	0.2	98
2	70.0	5.6	12.36	19.69	0.2	98
3	70.0	5.6	12.78	20.02	0.2	98
4	70.0	5.6	13.66	20.7	0.2	98
5	70.0	5.6	15.2	21.84	0.2	98
6	70.0	5.6	17.78	23.61	0.2	98
7	70.0		25.97			
8	68.67		30.93			
9	68.67		31.08			
10	68.67		31.69			
TOR	68.67		81.22			
BOR	12.0		106.07			
TIE1	12.0		106.78			
TIE3	12.0		108.1			
PD	2.0		113.11			
PS	2.0		45.78			
UG	-3.0		48.35			
UG1	-3.0		48.46			
DDC1	1.5		46.54			
DDC2	1.5		54.42			
UG2	-3.0		56.4			
TEST	1.5		54.55	250.0		
11	70.0	5.6	12.32	19.65	0.2	98
12	70.0	5.6	12.43	19.74	0.2	98
13	70.0	5.6	12.85	20.07	0.2	98
14	70.0	5.6	13.74	20.76	0.2	98
15	70.0	5.6	15.28	21.89	0.2	98
16	70.0	5.6	17.87	23.67	0.2	98
17	70.0		26.1			
18	70.0	5.6	20.13	25.12	0.2	98
19	70.0	5.6	20.31	25.24	0.2	98
20	70.0	5.6	20.96	25.64	0.2	98
21	70.0	5.6	22.46	26.54	0.2	98
22	70.0		28.1			

Final Calculations : Hazen-Williams

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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	*****
1 to 2	70 70	5.60	19.60 19.6	1.5 1.682			9.080 9.080	120 0.0126	12.250 0.0 0.114		Vel = 2.83	
2 to 3	70 70	5.60	19.69 39.29	1.5 1.682			9.080 9.080	120 0.0456	12.364 0.0 0.414		Vel = 5.67	
3 to 4	70 70	5.60	20.02 59.31	1.5 1.682			9.080 9.080	120 0.0975	12.778 0.0 0.885		Vel = 8.56	
4 to 5	70 70	5.60	20.70 80.01	1.5 1.682			9.080 9.080	120 0.1697	13.663 0.0 1.541		Vel = 11.55	
5 to 6	70 70	5.60	21.83 101.84	1.5 1.682			9.710 9.710	120 0.2652	15.204 0.0 2.575		Vel = 14.70	
6 to 7	70 70	5.60	23.62 125.46	1.5 1.682	T	9.9	11.100 9.900 21.000	120 0.3900	17.779 0.0 8.191		Vel = 18.12	
7 to 8	70 68.67		0.0 125.46	1.5 1.682	T	9.9	1.330 9.900 11.230	120 0.3900	25.970 0.576 4.380		Vel = 18.12	
8 to 9	68.67 68.67		0.0 125.46	3 3.26			10.060 10.060	120 0.0155	30.926 0.0 0.156		Vel = 4.82	
9 to 10	68.67 68.67		125.79 251.25	3 3.26			10.870 10.870	120 0.0562	31.082 0.0 0.611		Vel = 9.66	
10 to TOR	68.67 68.670		102.54 353.79	3 3.26	T 3E B S	20.159 28.223 13.44 21.503	384.840 83.325 468.165	120 0.1058	31.693 0.0 49.529		Vel = 13.60	
TOR to BOR	68.670 12		0.0 353.79	6 6.357	E	17.603	56.000 17.603 73.603	120 0.0041	81.222 24.544 0.301		Vel = 3.58	
BOR to TIE1	12 12		0.0 353.79	6 6.357	3E B T	52.808 12.573 37.72	71.583 103.101 174.684	120 0.0041	106.067 0.0 0.715		Vel = 3.58	
TIE1 to TIE3	12 12		0.0 353.79	6 6.357	E T	17.603 37.72	266.583 55.323 321.906	120 0.0041	106.782 0.0 1.317		Vel = 3.58	

Final Calculations : Hazen-Williams

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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	*****
TIE3 to PD	12 2		0.0 353.79	6 6.357	2E B S T	35.205 12.573 40.235 37.72	40.333 125.733 166.066	120 0.0041	108.099 4.331 0.680		Vel = 3.58	
PD			0.0 353.79						113.110		K Factor = 33.27	
System Demand Pressure									113.110			
Safety Margin									15.165			
Continuation Pressure									128.275			
Pressure @ Pump Outlet									128.275			
Pressure From Pump Curve									-82.495			
Pressure @ Pump Inlet									45.780			
PS to UG	2 -3		0.0 353.79	8 8.249	8E G T	169.129 4.698 41.108	138.083 214.935 353.018	120 0.0012	45.780 2.166 0.406		Vel = 2.12	
UG to UG1	-3 -3		0.0 353.79	8 7.68	E	22.555 22.555 102.555	80.000 22.555 102.555	150 0.0011	48.352 0.0 0.110		Vel = 2.45	
UG1 to DDC1	-3 1.500		0.0 353.79	8 8.27	E	28.468 28.468 34.468	6.000 28.468 34.468	140 0.0009	48.462 -1.949 0.030		Vel = 2.11	
DDC1 to DDC2	1.500 1.500		0.0 353.79	8 8.27	Zic E	0.0 28.468	6.000 28.468	140 0.0009	46.543 7.852 0.030		** Fixed Loss = 7.852 Vel = 2.11	
DDC2 to UG2	1.500 -3		0.0 353.79	8 8.27	E	28.468 28.468 34.468	6.000 28.468 34.468	140 0.0008	54.425 1.949 0.029		Vel = 2.11	
UG2 to TEST	-3 1.500		0.0 353.79	8 8.27	E G T	28.468 6.326 55.354	25.000 90.148 115.148	140 0.0009	56.403 -1.949 0.099		Vel = 2.11	
TEST			250.00 603.79						54.553		Qa = 250.00 K Factor = 81.75	
11 to 12	70 70	5.60	19.65	1.5			9.080	120	12.316 0.0		Vel = 2.84	
12 to 13	70 70	5.60	19.75	1.5			9.080	120	12.431 0.0		Vel = 5.69	
13 to 14	70 70	5.60	20.07	1.5			9.080	120	12.847 0.0		Vel = 8.59	

Final Calculations : Hazen-Williams

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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	*****
14 to 15	70 70	5.60	20.75 80.22	1.5 1.682			9.080 9.080	120 0.1705	13.737 0.0 1.548		Vel = 11.58	
15 to 16	70 70	5.60	21.90 102.12	1.5 1.682			9.710 9.710	120 0.2665	15.285 0.0 2.588		Vel = 14.75	
16 to 17	70 70	5.60	23.67 125.79	1.5 1.682	T	9.9	11.100 9.900 21.000	120 0.3920	17.873 0.0 8.231		Vel = 18.16	
17 to 9	70 68.67		0.0 125.79	1.5 1.682	T	9.9	1.330 9.900 11.230	120 0.3920	26.104 0.576 4.402		Vel = 18.16	
9			0.0 125.79						31.082		K Factor = 22.56	
18 to 19	70 70	5.60	25.12 25.12	1.5 1.682			9.080 9.080	120 0.0198	20.128 0.0 0.180		Vel = 3.63	
19 to 20	70 70	5.60	25.24 50.36	1.5 1.682			9.080 9.080	120 0.0721	20.308 0.0 0.655		Vel = 7.27	
20 to 21	70 70	5.60	25.64 76.0	1.5 1.682			9.710 9.710	120 0.1543	20.963 0.0 1.498		Vel = 10.97	
21 to 22	70 70	5.60	26.54 102.54	1.5 1.682	T	9.9	11.100 9.900 21.000	120 0.2686	22.461 0.0 5.640		Vel = 14.81	
22 to 10	70 68.67		0.0 102.54	1.5 1.682	T	9.9	1.330 9.900 11.230	120 0.2686	28.101 0.576 3.016		Vel = 14.81	
10			0.0 102.54						31.693		K Factor = 18.21	