



THE HIDI GROUP
155 Gordon Baker Rd
#200
North York, ON, M2H 3N5
416-364-2100



Job Name : 2023-0059 UTM-3265 PRINCIPAL'S RD MISSISSAUGA
Drawing : FP-3 &4
Location : 3265 PRINCIPAL'S RD MISSISSAUGA
Remote Area : #1
Contract : 2023-0059
Data File : 2023-0059 UTM-3359 Mississauga Rd -calc.WXF-WELDED.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME 2023-0059 UTM-3265 PRINCIPAL'S RD MISSISSAUGA
Location 3265 PRINCIPAL'S RD MISSISSAUGA
Drawing # FP-3 &4
Contract # 2023-0059
Date SEP 2024

DESIGN

Remote area # #1
Remote area location Dron Research Lab, Multipurpose space
Occupancy classification OH2
Density 0.2 - Gpm/SqFt
Area of application 1562.1 - SqFt
Coverage/sprinkler 130 - SqFt
Type of sprinkler calculated k=5.6
Sprinklers calculated 18
In-rack demand N/A - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 730 - GPM @ 43.1 - Psi
Type of system WET
Volume of system (dry or pre-action) N/A - Gal

WATER SUPPLY INFORMATION

Test date 2024-08-15
Location 3359 MISSISSAUGA RD N
Source of info PRIVATE HYDRANT

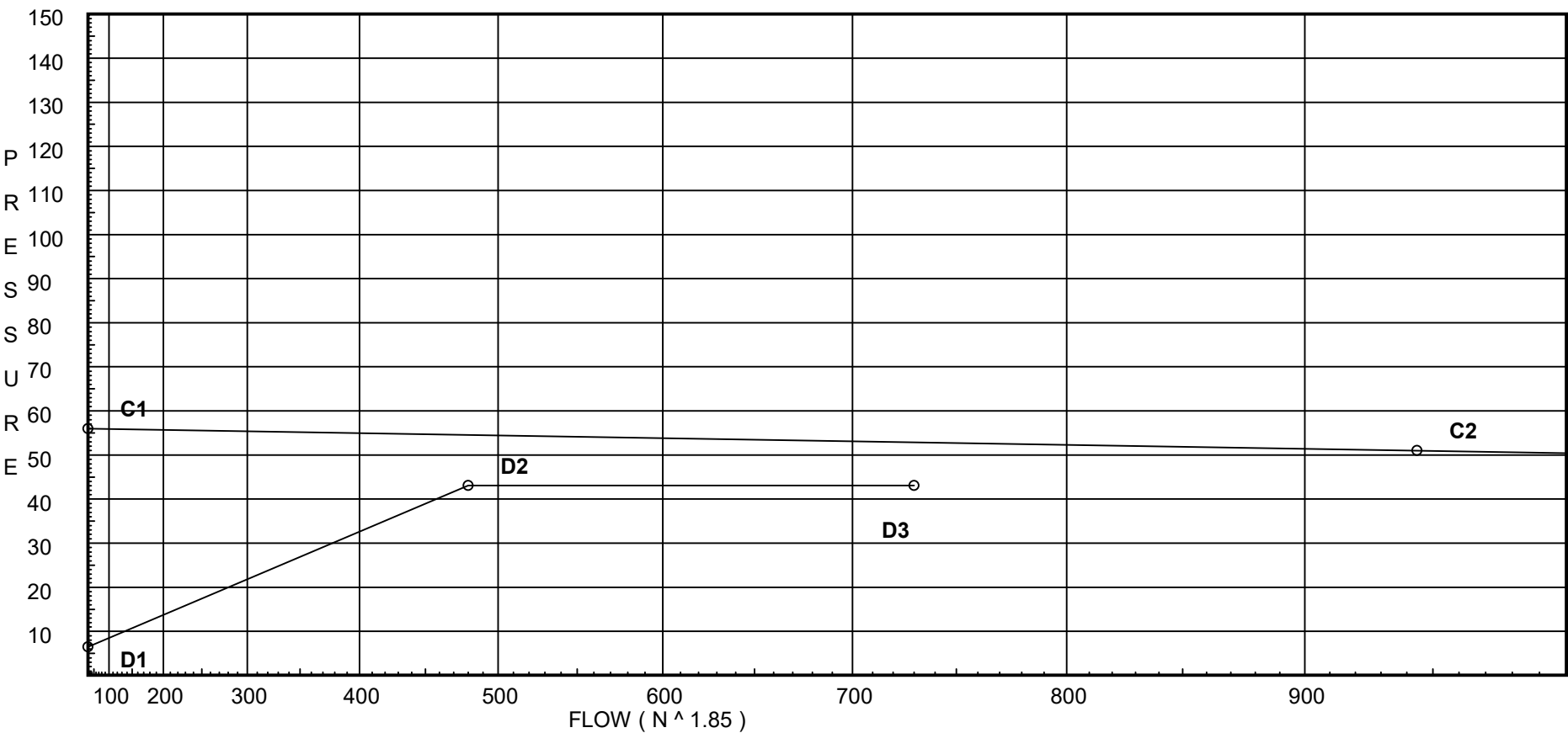
CONTRACTOR INFO THE HIDI GROUP

Address 155 Gordon Baker Rd / #200 / North York, ON, M2H 3N5
Phone # 416-364-2100
Name of designer
Authority having jurisdiction
NOTES:

Water Supply Curve

City Water Supply:
C1 - Static Pressure : 56
C2 - Residual Pressure: 51
C2 - Residual Flow : 944

Demand:
D1 - Elevation : 6.496
D2 - System Flow : 479.989
D2 - System Pressure : 43.093
Hose (Demand) : 250
D3 - System Demand : 729.989
Safety Margin : 9.800



Fittings Used Summary

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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
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	1	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
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
Zia	Wilkins 350	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>
TEST	56.0	51	944.0	52.893	729.99	43.093

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>	
S1	19.0	5.6	22.68	26.67	0.2	130
S2	19.0	5.6	22.69	26.68	0.2	130
S3	19.0	5.6	22.75	26.71	0.2	130
S4	19.0	5.6	22.83	26.76	0.2	130
S5	19.0	5.6	22.84	26.76	0.2	130
B1	19.5		22.75			
S6	19.0	5.6	21.56	26.0	0.2	130
S7	19.0	5.6	21.65	26.06	0.2	130
S8	19.0	5.6	22.0	26.27	0.2	130
S9	19.0	5.6	22.33	26.46	0.2	130
S10	19.0	5.6	22.4	26.5	0.2	130
B2	19.5		22.81			
S11	19.0	5.6	22.93	26.82	0.2	130
S12	19.0	5.6	22.95	26.83	0.2	130
S13	19.0	5.6	23.0	26.86	0.2	130
S14	19.0	5.6	23.09	26.91	0.2	130
S15	19.0	5.6	23.1	26.91	0.2	130
B3	19.5		23.01			
S16	19.0	5.6	23.48	27.14	0.2	130
S17	19.0	5.6	22.91	26.81	0.2	130
S18	19.0	5.6	22.99	26.85	0.2	130
B4	19.5		23.41			
M1	19.5		22.83			
M2	19.5		22.89			
M3	19.5		23.09			
M4	19.5		23.44			
M5	19.5		28.06			
TOR	19.5		30.12	100.0		
BOR	3.0		37.88			
UGEN	3.0		37.92			
UG1	19.5		33.96			
UG2	-15.0		49.47			
TEST	4.0		43.09	150.0		

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	*****
S1 to S2	19 19	5.60	26.67 26.67	3 3.068		12.500 12.500	120 0.0012	22.679 0.015		Vel = 1.16	
S2 to S3	19 19	5.60	26.68 53.35	3 3.068		12.500 12.500	120 0.0042	22.694 0.053		Vel = 2.32	
S3 to B1	19 19.500	5.60	26.70 80.05	3 3.068	E T 7.0 15.0	2.080 22.000 24.080	120 0.0091	22.747 -0.217 0.220		Vel = 3.47	
B1			0.0 80.05					22.750		K Factor = 16.78	
S4 to S5	19 19	5.60	26.76 26.76	3 3.068		8.833 8.833	120 0.0012	22.832 0.011		Vel = 1.16	
S5 to B1	19 19.500	5.60	26.76 53.52	3 3.068	E T 7.0 15.0	6.583 22.000 28.583	120 0.0043	22.843 -0.217 0.124		Vel = 2.32	
B1 to M1	19.500 19.500		80.06 133.58	2 2.067		0.500 0.500	120 0.1600	22.750 0.080		Vel = 12.77	
M1			0.0 133.58					22.830		K Factor = 27.96	
S6 to S7	19 19	5.60	26.00 26.0	2 2.067		12.500 12.500	120 0.0078	21.556 0.097		Vel = 2.49	
S7 to S8	19 19	5.60	26.06 52.06	2 2.067		12.500 12.500	120 0.0281	21.653 0.351		Vel = 4.98	
S8 to B2	19 19.500	5.60	26.27 78.33	2 2.067	E T 5.0 10.0	2.080 15.000 17.080	120 0.0598	22.004 -0.217 1.022		Vel = 7.49	
B2			0.0 78.33					22.809		K Factor = 16.40	
S9 to S10	19 19	5.60	26.46 26.46	2 2.067		8.833 8.833	120 0.0080	22.329 0.071		Vel = 2.53	
S10 to B2	19 19.500	5.60	26.51 52.97	2 2.067	E T 5.0 10.0	6.583 15.000 21.583	120 0.0290	22.400 -0.217 0.626		Vel = 5.06	
B2 to M2	19.500 19.500		78.32 131.29	2 2.067		0.500 0.500	120 0.1560	22.809 0.078		Vel = 12.55	
M2			0.0 131.29					22.887		K Factor = 27.44	
S11 to S12	19 19	5.60	26.82 26.82	3 3.068		12.500 12.500	120 0.0012	22.933 0.015		Vel = 1.16	
S12 to S13	19 19	5.60	26.82 53.64	3 3.068		12.500 12.500	120 0.0043	22.948 0.054		Vel = 2.33	

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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	*****
S13 to B3	19 19.500	5.60	26.86 80.5	3 3.068	E T 7.0 15.0	2.080 22.000 24.080	120 0.0092	23.002 -0.217 0.222		Vel = 3.49	
B3			0.0 80.50					23.007		K Factor = 16.78	
S14 to S15	19 19	5.60	26.91 26.91	3 3.068		8.833 8.833	120 0.0012	23.088 0.0 0.011		Vel = 1.17	
S15 to B3	19 19.500	5.60	26.91 53.82	3 3.068	E T 7.0 15.0	6.583 22.000 28.583	120 0.0044	23.099 -0.217 0.125		Vel = 2.34	
B3 to M3	19.500 19.500		80.50 134.32	2 2.067		0.500 0.500	120 0.1620	23.007 0.0 0.081		Vel = 12.84	
M3			0.0 134.32					23.088		K Factor = 27.95	
S16 to B4	19 19.500	5.60	27.14 27.14	2 2.067	E T 5.0 10.0	2.080 15.000 17.080	120 0.0084	23.484 -0.217 0.144		Vel = 2.59	
B4			0.0 27.14					23.411		K Factor = 5.61	
S17 to S18	19 19	5.60	26.81 26.81	2 2.067		8.833 8.833	120 0.0083	22.914 0.0 0.073		Vel = 2.56	
S18 to B4	19 19.500	5.60	26.85 53.66	2 2.067	E T 5.0 10.0	6.583 15.000 21.583	120 0.0297	22.987 -0.217 0.641		Vel = 5.13	
B4 to M4	19.500 19.500		27.13 80.79	2 2.067		0.500 0.500	120 0.0640	23.411 0.0 0.032		Vel = 7.72	
M4			0.0 80.79					23.443		K Factor = 16.69	
M1 to M2	19.500 19.500		133.58 133.58	4 4.026		9.080 9.080	120 0.0063	22.830 0.0 0.057		Vel = 3.37	
M2 to M3	19.500 19.500		131.29 264.87	4 4.026		9.080 9.080	120 0.0221	22.887 0.0 0.201		Vel = 6.68	
M3 to M4	19.500 19.500		134.33 399.2	4 4.026		7.500 7.500	120 0.0473	23.088 0.0 0.355		Vel = 10.06	
M4 to M5	19.500 19.500		80.79 479.99	4 4.026	T 10.0	49.333 20.000 69.333	120 0.0666	23.443 0.0 4.615		Vel = 12.10	
M5 to TOR	19.500 19.500		0.0 479.99	4 4.026	E 10.0	21.000 10.000 31.000	120 0.0665	28.058 0.0 2.063		Vel = 12.10	

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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	*****
TOR to BOR	19.500 3	H100	100.00 579.99	6 6.065	Avc B	22.0 10.0	16.000 32.000 48.000	120 0.0128	30.121 7.146 0.616		Vel = 6.44	
BOR to UGEN	3 3		0.0 579.99	6 6.065			3.000 3.000	120 0.0130	37.883 0.0 0.039		Vel = 6.44	
UGEN to UG1	3 19.500		0.0 579.99	6 6.065	Zia	0.0	5.000 5.000	120 0.0128	37.922 -4.024 0.064		* * Fixed Loss = 3.122 Vel = 6.44	
UG1 to UG2	19.500 -15		0.0 579.99	6 6.065	2E	28.0	16.000 28.000 44.000	120 0.0128	33.962 14.942 0.565		Vel = 6.44	
UG2 to TEST	-15 4		0.0 579.99	6 6.09	G T E	4.625 46.249 21.583	150.000 72.457 222.457	150 0.0083	49.469 -8.229 1.853		Vel = 6.39	
TEST			150.00 729.99						43.093		Qa = 150.00 K Factor = 111.20	