



Wiginton
FIRE SYSTEMS

WIGINTON FIRE SYSTEMS
6363 GREENLAND RD.
JACKSONVILLE, FL. 32258
904-262-6107

Job Name : USCS PH3
Drawing : FP11
Location : 211 NE MCCLOSKEY AVENUE LAKE CITY, FL
Remote Area : 3
Contract : 1010780
Data File : USCS PH3 AREA 3 revision.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME USCS PH3
Location 211 NE MCCLOSKEY AVENUE LAKE CITY, FL
Drawing # FP11
Contract # 1010780
Date

DESIGN

Remote area # 3
Remote area location
Occupancy classification
Density 0.3 - Gpm/SqFt
Area of application 2605 - SqFt
Coverage/sprinkler 100 - SqFt
Type of sprinkler calculated
Sprinklers calculated 26
In-rack demand - GPM
Hose streams 500 - GPM
Total water required (including hose streams) 1407.21 - GPM @ 170.012 - Psi
Type of system
Volume of system (dry or pre-action) - Gal

WATER SUPPLY INFORMATION

Test date
Location
Source of info

CONTRACTOR INFO WIGINTON FIRE SYSTEMS
Address 6363 GREENLAND RD. / JACKSONVILLE, FL. 32258
Phone # 904-262-6107
Name of designer
Authority having jurisdiction
NOTES:

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Water Supply Curve

WIGINTON FIRE SYSTEMS
USCS PH3

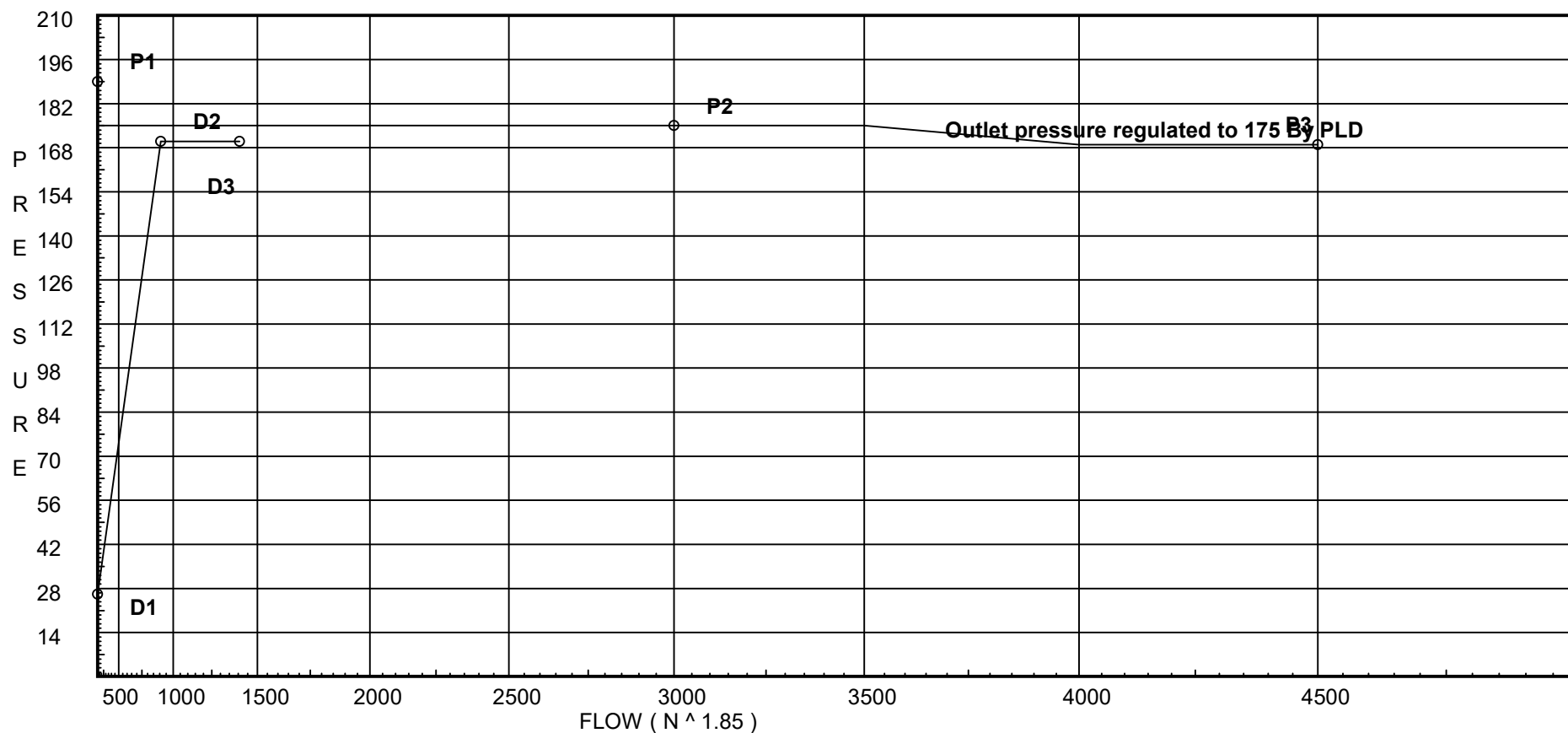
Page 2
Date

Pump Data:

P1 - Pump Churn Pressure : 189
P2 - Pump Rated Pressure : 175
P2 - Pump Rated Flow : 3000
P3 - Pump Pressure @ Max Flow : 169
P3 - Pump Max Flow : 4500

Demand:

D1 - Elevation : 26.155
D2 - System Flow : 907.21
D2 - System Pressure : 170.012
Hose (Demand) : 500
D3 - System Demand : 1407.21
Safety Margin : 4.988



Fittings Used Summary

WIGINTON FIRE SYSTEMS
USCS PH3

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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
F	NFPA 13 45' Elbow	1	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
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	4.5	5.1	0	0	0	0	0
X	90'Tee-BranchFirelock002	0	0	0	0	0	8.5	10.8	13	0	16	21	25	33	9.3	11	0	0	0	0	0

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

WIGINTON FIRE SYSTEMS
USCS PH3

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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>
PUMP	See Information on Pump Curve			188.991	1407.21	170.012

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>	
233	60.39	8	14.06	30.0	0.3	100
234	60.17	8	14.27	30.22	0.3	100
235	59.95	8	14.79	30.76	0.3	100
236	59.74	8	15.78	31.78	0.3	100
237	59.52	8	17.43	33.4	0.3	100
238	59.3	8	19.97	35.75	0.3	100
239	59.09	8	23.63	38.89	0.3	100
240	57.54		64.78			
241	56.5		70.16			
242	56.48		70.36			
243	56.46		71.02			
244	56.44		72.43			
203	56.29		90.33			
202	55.15		92.56			
201A	55.15		110.03			
201	55.0		119.54			
200	23.41		134.54			
TOR4	23.17		141.6			
BOR4	3.0		155.9			
STU2	3.0		156.31			
UG5	-8.0		161.27			
UG4	-8.0		162.27	500.0		
UG2	-8.0		165.88			
UG1	-8.0		168.81			
UG	-8.0		172.5			
STUB	4.0		167.62			
PUMP	0.0		170.01			
247	60.39	8	14.1	30.04	0.3	100
248	60.17	8	14.31	30.26	0.3	100
249	59.95	8	14.83	30.8	0.3	100
250	59.74	8	15.82	31.82	0.3	100
251	59.52	8	17.48	33.45	0.3	100
252	59.3	8	20.02	35.8	0.3	100
253	59.09	8	23.7	38.94	0.3	100
254	57.54		64.94			
255	60.39	8	14.25	30.2	0.3	100
256	60.17	8	14.46	30.42	0.3	100
257	59.95	8	14.98	30.96	0.3	100
258	59.74	8	15.98	31.98	0.3	100
259	59.52	8	17.65	33.61	0.3	100
260	59.3	8	20.22	35.97	0.3	100

Flow Summary - NFPA

WIGINTON FIRE SYSTEMS
USCS PH3

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NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>		<i>Notes</i>
261	59.09	8	23.92	39.13	0.3	100
262	57.54		65.54			
263	59.95	8	26.4	41.11	0.3	100
264	59.74	8	26.7	41.34	0.3	100
265	59.52	8	27.54	41.98	0.3	100
266	59.3	8	29.24	43.26	0.3	100
267	59.09	8	32.11	45.34	0.3	100
268	57.54		67.67			

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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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	*****
233 to 234	60.39 60.17	8.00	30.00 30.0	2 2.157		10.000	100 0.0116	14.062 0.095 0.116		Vel = 2.63	
234 to 235	60.17 59.95	8.00	30.22 60.22	2 2.157		10.000	100 0.0419	14.273 0.095 0.419		Vel = 5.29	
235 to 236	59.95 59.74	8.00	30.77 90.99	2 2.157		10.000	100 0.0898	14.787 0.091 0.898		Vel = 7.99	
236 to 237	59.74 59.52	8.00	31.77 122.76	2 2.157		10.000	100 0.1564	15.776 0.095 1.564		Vel = 10.78	
237 to 238	59.52 59.3	8.00	33.41 156.17	2 2.157		10.000	100 0.2440	17.435 0.095 2.440		Vel = 13.71	
238 to 239	59.3 59.09	8.00	35.75 191.92	2 2.157		10.000	100 0.3573	19.970 0.091 3.573		Vel = 16.85	
239 to 240	59.09 57.54	8.00	38.89 230.81	2 2.157	X 7.466	73.040 7.465 80.505	100 0.5027	23.634 0.671 40.470		Vel = 20.26	
240 to 241	57.54 56.5		0.0 230.81	2 2.157	T 8.783	1.040 8.783 9.823	100 0.5028	64.775 0.450 4.939		Vel = 20.26	
241 to 242	56.5 56.48		0.0 230.81	4 4.26		10.000	100 0.0182	70.164 0.009 0.182		Vel = 5.20	
242 to 243	56.48 56.46		231.12 461.93	4 4.26		10.000	100 0.0660	70.355 0.009 0.660		Vel = 10.40	
243 to 244	56.46 56.44		232.26 694.19	4 4.26		10.000	100 0.1401	71.024 0.009 1.401		Vel = 15.63	
244 to 203	56.44 56.29		213.02 907.21	4 4.26	V 6.39	71.150 6.390 77.540	100 0.2300	72.434 0.065 17.832		Vel = 20.42	
203 to 202	56.29 55.15		0.0 907.21	4 4.26	V 6.39	1.140 6.390 7.530	100 0.2299	90.331 0.494 1.731		Vel = 20.42	
202 to 201A	55.15 55.15		0.0 907.21	4 4.26		76.000	100 0.2300	92.556 0.0 17.478		Vel = 20.42	
201A to 201	55.15 55		0.0 907.21	6 6.357	3V F 26.921 6.282	255.000 33.203 288.203	100 0.0327	110.034 0.065 9.436		Vel = 9.17	
201 to 200	55 23.41		0.0 907.21	6 6.357	V 8.974	31.480 8.974 40.454	100 0.0327	119.535 13.682 1.324		Vel = 9.17	

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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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	*****
200 to TOR4	23.41 23.17		0.0 907.21	6 6.357	4V F 35.894 6.282	170.250 42.177 212.427	100 0.0327	134.541 0.104 6.954		Vel = 9.17	
TOR4 to BOR4	23.17 3		0.0 907.21	6 6.357	T 2B S 26.921 17.947 28.716	20.170 73.583 93.753	100 0.0327	141.599 11.236 3.069		* * Fixed Loss = 2.5 Vel = 9.17	
BOR4 to STU2	3 3		0.0 907.21	8 8.249	T V 29.339 10.897	4.000 40.235 44.235	100 0.0092	155.904 0.0 0.408		Vel = 5.45	
STU2 to UG5	3 -8		0.0 907.21	8 8.27	L 11.033	10.000 11.033 21.033	100 0.0091	156.312 4.764 0.191		Vel = 5.42	
UG5 to UG4	-8 -8		0.0 907.21	8 7.68	T G 38.602 4.412	100.090 43.014 143.104	140 0.0070	161.267 0.0 1.001		Vel = 6.28	
UG4 to UG2	-8 -8	H500	500.00 1407.21	8 7.68	T 43.857	216.330 43.857 260.187	150 0.0139	162.268 0.0 3.609		Vel = 9.75	
UG2 to UG1	-8 -8		0.0 1407.21	8 7.68	T G 43.857 5.012	162.700 48.869 211.569	150 0.0139	165.877 0.0 2.935		Vel = 9.75	
UG1 to UG	-8 -8		0.0 1407.21	8 7.68	L 16.29	249.333 16.290 265.623	150 0.0139	168.812 0.0 3.685		Vel = 9.75	
UG to STUB	-8 4		0.0 1407.21	8 8.27	L 20.56	9.000 20.560 29.560	140 0.0110	172.497 -5.197 0.324		Vel = 8.40	
STUB to PUMP	4 0		0.0 1407.21	10 10.42	B 2L S 34.74 58.509 100.563	15.000 193.811 208.811	150 0.0031	167.624 1.732 0.656		Vel = 5.29	
PUMP			0.0 1407.21					170.012		K Factor = 107.92	
System Demand Pressure								170.012			
Safety Margin								4.988			
Regulated Pressure								175.000		PLD	
247 to 248	60.39 60.17	8.00	30.04	2		10.000	100	14.101 0.095 0.116		Vel = 2.64	
248 to 249	60.17 59.95	8.00	30.27	2		10.000	100	14.312 0.095 0.420		Vel = 5.30	
249 to 250	59.95 59.74	8.00	30.80	2		10.000	100	14.827 0.091 0.900		Vel = 8.00	
250 to 251	59.74 59.52	8.00	31.82	2		10.000	100	15.818 0.095 1.568		Vel = 10.79	
251 to 252	59.52 59.3	8.00	33.45	2		10.000	100	17.481 0.095 2.446		Vel = 13.73	

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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Date

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	*****
252 to 253	59.3 59.09	8.00	35.79 192.17	2 2.157		10.000	100	20.022 0.091			
253 to 254	59.09 57.54	8.00	38.95 231.12	2 2.157	X 7.466	73.040 7.465 80.505	100	23.695 0.671	Vel = 16.87		
254 to 242	57.54 56.48		0.0 231.12	2 2.157	T 8.783	1.060 8.783 9.843	100	64.936 0.459	Vel = 20.29		
242			0.0 231.12					70.355		K Factor = 27.55	
255 to 256	60.39 60.17	8.00	30.20 30.2	2 2.157		10.000	100	14.246 0.095	Vel = 2.65		
256 to 257	60.17 59.95	8.00	30.41 60.61	2 2.157		10.000	100	14.458 0.095	Vel = 5.32		
257 to 258	59.95 59.74	8.00	30.96 91.57	2 2.157		10.000	100	14.977 0.091	Vel = 8.04		
258 to 259	59.74 59.52	8.00	31.98 123.55	2 2.157		10.000	100	15.977 0.095	Vel = 10.85		
259 to 260	59.52 59.3	8.00	33.61 157.16	2 2.157		10.000	100	17.654 0.095	Vel = 13.80		
260 to 261	59.3 59.09	8.00	35.98 193.14	2 2.157		10.000	100	20.219 0.091	Vel = 16.96		
261 to 262	59.09 57.54	8.00	39.13 232.27	2 2.157	X 7.466	73.040 7.465 80.505	100	23.925 0.671	Vel = 20.39		
262 to 243	57.54 56.46		0.0 232.27	2 2.157	T 8.783	1.080 8.783 9.863	100	65.540 0.468	Vel = 20.39		
243			0.0 232.27					71.024		K Factor = 27.56	
263 to 264	59.95 59.74	8.00	41.11 41.11	2 2.157		10.000	100	26.400 0.091	Vel = 3.61		
264 to 265	59.74 59.52	8.00	41.33 82.44	2 2.157		10.000	100	26.698 0.095	Vel = 7.24		
265 to 266	59.52 59.3	8.00	41.98 124.42	2 2.157		10.000	100	27.542 0.095	Vel = 10.92		
266 to 267	59.3 59.09	8.00	43.26 167.68	2 2.157		10.000	100	29.240 0.091	Vel = 14.72		

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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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	*****
267 to 268	59.09 57.54	8.00	45.34 213.02	2 2.157	X	7.466 7.465	100 0.4334	32.114 0.671			
268 to 244	57.54 56.44		0.0 213.02	2 2.157	T	8.783 8.783	100 0.4334	67.675 0.476	Vel = 18.70		
244			0.0 213.02					72.434	K Factor = 25.03		



WIGINTON FIRE SYSTEMS
6363 GREENLAND RD.
JACKSONVILLE, FL. 32258
904-262-6107

Job Name : USCS PH3
Drawing : FP13
Location : 211 NE MCCLOSKEY AVENUE LAKE CITY, FL
Remote Area : 4
Contract : 1010780
Data File : USCS PH3 AREA 4 REV1.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME USCS PH3
Location 211 NE MCCLOSKEY AVENUE LAKE CITY, FL
Drawing # FP13
Contract # 1010780
Date

DESIGN

Remote area # 4
Remote area location
Occupancy classification
Density 0.3 - Gpm/SqFt
Area of application 2684 - SqFt
Coverage/sprinkler 100 - SqFt
Type of sprinkler calculated 8.0
Sprinklers calculated 28
In-rack demand - GPM
Hose streams 500 - GPM
Total water required (including hose streams) 1429.07 - GPM @ 162.154 - Psi
Type of system
Volume of system (dry or pre-action) - Gal

WATER SUPPLY INFORMATION

Test date
Location
Source of info

CONTRACTOR INFO WIGINTON FIRE SYSTEMS
Address 6363 GREENLAND RD. / JACKSONVILLE, FL. 32258
Phone # 904-262-6107
Name of designer
Authority having jurisdiction
NOTES:

text1(35) - invisible

Water Supply Curve

WIGINTON FIRE SYSTEMS
USCS PH3

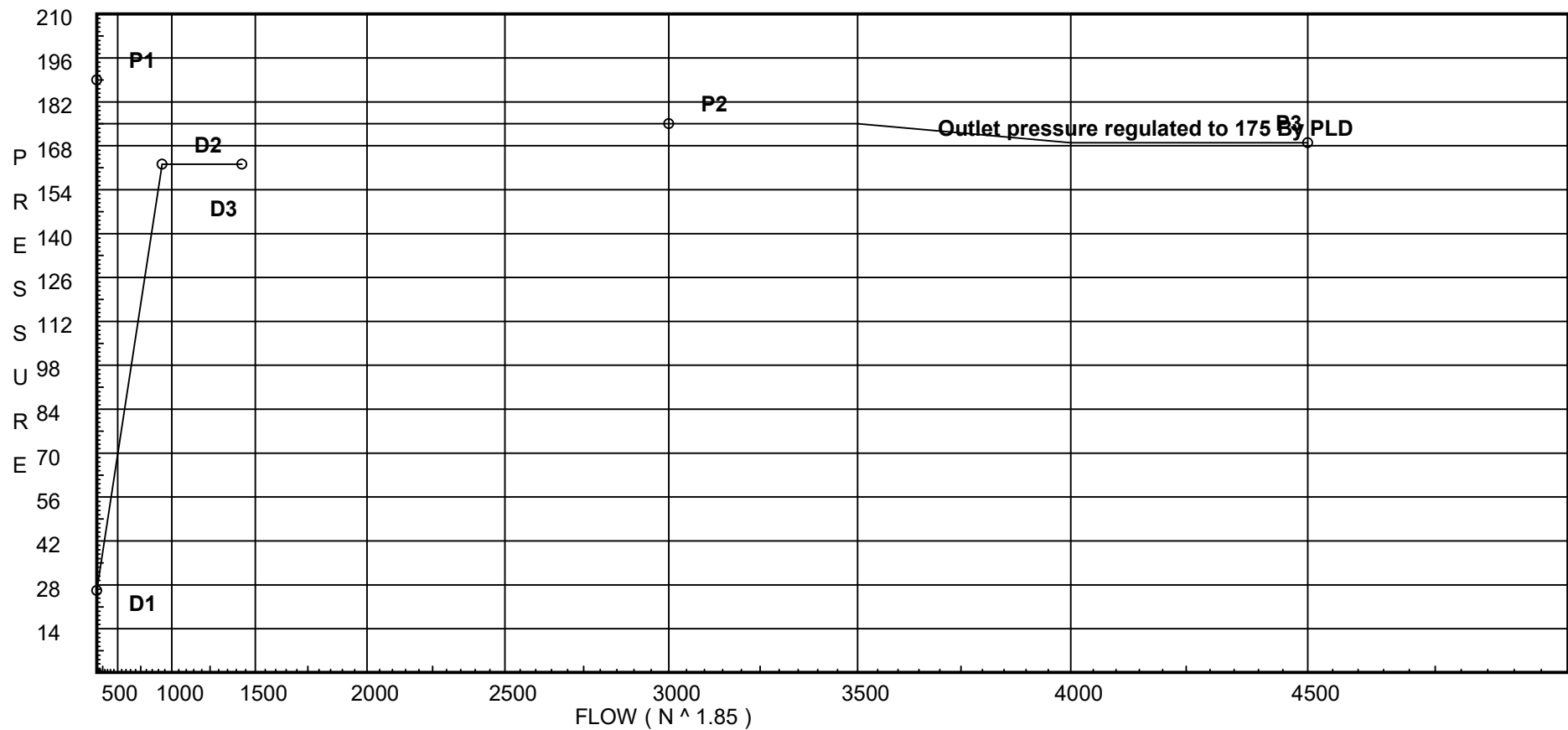
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Date

Pump Data:

P1 - Pump Churn Pressure : 189
P2 - Pump Rated Pressure : 175
P2 - Pump Rated Flow : 3000
P3 - Pump Pressure @ Max Flow : 169
P3 - Pump Max Flow : 4500

Demand:

D1 - Elevation : 26.155
D2 - System Flow : 929.07
D2 - System Pressure : 162.154
Hose (Demand) : 500
D3 - System Demand : 1429.07
Safety Margin : 12.846



Fittings Used Summary

WIGINTON FIRE SYSTEMS
USCS PH3

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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
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
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	4.5	5.1	0	0	0	0	0
X	90'Tee-BranchFirelock002	0	0	0	0	0	8.5	10.8	13	0	16	21	25	33	9.3	11	0	0	0	0	0

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

WIGINTON FIRE SYSTEMS
USCS PH3

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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>
PUMP	See Information on Pump Curve			188.99	1429.07	162.154

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>	
208	60.39	8	14.06	30.0	0.3	100
245	60.17	8	14.27	30.22	0.3	100
246	59.95	8	14.79	30.76	0.3	100
269	59.74	8	15.78	31.78	0.3	100
270	59.52	8	17.43	33.4	0.3	100
271	59.3	8	19.97	35.75	0.3	100
272	59.09	8	23.63	38.89	0.3	100
273	57.54		64.79			
274	54.91		71.67			
275	54.93		71.85			
276	54.95		72.5			
277	54.95		73.9			
303	54.95		90.11			
302	54.95		91.96			
301A	54.95		99.17			
301	54.95		109.84			
300	23.41		124.88			
TOR6	23.12		133.53			
BOR6	3.0		147.95			
STU2	3.0		148.25			
UG5	-8.0		153.22			
UG4	-8.0		154.09	500.0		
UG2	-8.0		157.8			
UG1	-8.0		160.82			
UG	-8.0		164.61			
STUB	4.0		159.75			
PUMP	0.0		162.15			
280	60.39	8	14.1	30.05	0.3	100
281	60.17	8	14.32	30.27	0.3	100
282	59.95	8	14.83	30.81	0.3	100
283	59.74	8	15.82	31.82	0.3	100
284	59.52	8	17.49	33.45	0.3	100
285	59.3	8	20.03	35.8	0.3	100
286	59.09	8	23.7	38.95	0.3	100
287	57.54		64.97			
288	60.39	8	14.25	30.2	0.3	100
289	60.17	8	14.46	30.43	0.3	100
290	59.95	8	14.98	30.97	0.3	100
291	59.74	8	15.98	31.98	0.3	100
292	59.52	8	17.66	33.62	0.3	100
293	59.3	8	20.23	35.98	0.3	100

Flow Summary - NFPA

WIGINTON FIRE SYSTEMS
USCS PH3

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NODE ANALYSIS (cont.)

<i>Node Tag</i>	<i>Elevation</i>	<i>Node Type</i>	<i>Pressure at Node</i>	<i>Discharge at Node</i>		<i>Notes</i>
294	59.09	8	23.94	39.14	0.3	100
295	57.54		65.58			
296	60.39	8	14.57	30.53	0.3	100
297	60.17	8	14.78	30.76	0.3	100
298	59.95	8	15.31	31.3	0.3	100
299	59.74	8	16.33	32.33	0.3	100
307	59.52	8	18.04	33.98	0.3	100
304	59.3	8	20.65	36.35	0.3	100
305	59.09	8	24.43	39.54	0.3	100
306	57.54		66.89			

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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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	*****
208 to 245	60.39 60.17	8.00	30.00 30.0	2 2.157			10.000 10.000	100 0.0116	14.062 0.095 0.116		Vel = 2.63	
245 to 246	60.17 59.95	8.00	30.22 60.22	2 2.157			10.000 10.000	100 0.0419	14.273 0.095 0.419		Vel = 5.29	
246 to 269	59.95 59.74	8.00	30.77 90.99	2 2.157			10.000 10.000	100 0.0898	14.787 0.091 0.898		Vel = 7.99	
269 to 270	59.74 59.52	8.00	31.77 122.76	2 2.157			10.000 10.000	100 0.1564	15.776 0.095 1.564		Vel = 10.78	
270 to 271	59.52 59.3	8.00	33.41 156.17	2 2.157			10.000 10.000	100 0.2440	17.435 0.095 2.440		Vel = 13.71	
271 to 272	59.3 59.09	8.00	35.75 191.92	2 2.157			10.000 10.000	100 0.3573	19.970 0.091 3.573		Vel = 16.85	
272 to 273	59.09 57.54	8.00	38.89 230.81	2 2.157	X	7.466	73.070 7.465 80.535	100 0.5027	23.634 0.671 40.486		Vel = 20.26	
273 to 274	57.54 54.91		0.0 230.81	2 2.157	T	8.783	2.640 8.783 11.423	100 0.5027	64.791 1.139 5.742		Vel = 20.26	
274 to 275	54.91 54.93		0.0 230.81	4 4.26			10.000 10.000	100 0.0183	71.672 -0.009 0.183		Vel = 5.20	
275 to 276	54.93 54.950		231.15 461.96	4 4.26			10.000 10.000	100 0.0660	71.846 -0.009 0.660		Vel = 10.40	
276 to 277	54.950 54.950		232.32 694.28	4 4.26			10.000 10.000	100 0.1402	72.497 0.0 1.402		Vel = 15.63	
277 to 303	54.950 54.950		234.79 929.07	4 4.26	V	6.39	61.050 6.390 67.440	100 0.2403	73.899 0.0 16.208		Vel = 20.91	
303 to 302	54.950 54.950		0.0 929.07	4 4.26	V	6.39	1.333 6.390 7.723	100 0.2403	90.107 0.0 1.856		Vel = 20.91	
302 to 301A	54.950 54.950		0.0 929.07	4 4.26			30.000 30.000	100 0.2403	91.963 0.0 7.210		Vel = 20.91	
301A to 301	54.950 54.950		0.0 929.07	6 6.357	5V	44.868	266.780 44.868 311.648	100 0.0342	99.173 0.0 10.662		Vel = 9.39	
301 to 300	54.950 23.41		0.0 929.07	6 6.357	V	8.974	31.480 8.974 40.454	100 0.0342	109.835 13.660 1.384		Vel = 9.39	

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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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	*****
300 to TOR6	23.41 23.12		0.0 929.07	6 6.357	6V 26.921 17.947 28.716	53.842 195.333 53.842 249.175	100 0.0342	124.879 0.126 8.524	Vel = 9.39		
TOR6 to BOR6	23.12 3		0.0 929.07	6 6.357	T 2B S	20.120 73.583 93.703	100 0.0342	133.529 11.214 3.206	* * Fixed Loss = 2.5 Vel = 9.39		
BOR6 to STU2	3 3		0.0 929.07	8 8.249	T	29.339 2.280 29.338 31.618	100 0.0096	147.949 0.0 0.304	Vel = 5.58		
STU2 to UG5	3 -8		0.0 929.07	8 8.27	V	11.033 10.000 11.033 21.033	100 0.0095	148.253 4.764 0.200	Vel = 5.55		
UG5 to UG4	-8 -8		0.0 929.07	8 7.68	L G	14.338 100.090 4.412 18.750 118.840	140 0.0073	153.217 0.0 0.869	Vel = 6.43		
UG4 to UG2	-8 -8	H500	500.00 1429.07	8 7.68	T	43.857 216.330 43.857 260.187	150 0.0143	154.086 0.0 3.714	Vel = 9.90		
UG2 to UG1	-8 -8		0.0 1429.07	8 7.68	T G	43.857 162.700 5.012 48.869 211.569	150 0.0143	157.800 0.0 3.019	Vel = 9.90		
UG1 to UG	-8 -8		0.0 1429.07	8 7.68	L	16.29 249.333 16.290 265.623	150 0.0143	160.819 0.0 3.792	Vel = 9.90		
UG to STUB	-8 4		0.0 1429.07	8 8.27	L	20.56 9.000 20.560 29.560	140 0.0113	164.611 -5.197 0.334	Vel = 8.54		
STUB to PUMP	4 0		0.0 1429.07	10 10.42	B 2L S	34.74 15.000 58.509 193.811 208.811	150 0.0032	159.748 1.732 0.674	Vel = 5.38		
PUMP			0.0 1429.07					162.154	K Factor = 112.23		
System Demand Pressure								162.154			
Safety Margin								12.846			
Regulated Pressure								175.000	PLD		
280 to 281	60.39 60.17	8.00	30.05 30.05	2 2.157		10.000 10.000	100 0.0116	14.105 0.095 0.116	Vel = 2.64		
281 to 282	60.17 59.95	8.00	30.26 60.31	2 2.157		10.000 10.000	100 0.0420	14.316 0.095 0.420	Vel = 5.30		
282 to 283	59.95 59.74	8.00	30.81 91.12	2 2.157		10.000 10.000	100 0.0901	14.831 0.091 0.901	Vel = 8.00		
283 to 284	59.74 59.52	8.00	31.83 122.95	2 2.157		10.000 10.000	100 0.1568	15.823 0.095 1.568	Vel = 10.79		
284 to 285	59.52 59.3	8.00	33.45 156.4	2 2.157		10.000 10.000	100 0.2447	17.486 0.095 2.447	Vel = 13.73		

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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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	*****
285 to 286	59.3 59.09	8.00	35.80 192.2	2 2.157		10.000	100	20.028 0.091 3.583		Vel = 16.87	
286 to 287	59.09 57.54	8.00	38.95 231.15	2 2.157	X 7.466	73.070 7.465 80.535	100	23.702 0.671 40.595		Vel = 20.29	
287 to 275	57.54 54.93		0.0 231.15	2 2.157	T 8.783	2.620 8.783 11.403	100	64.968 1.130 5.748		Vel = 20.29	
275			0.0 231.15					71.846		K Factor = 27.27	
288 to 289	60.39 60.17	8.00	30.20 30.2	2 2.157		10.000	100	14.253 0.095 0.117		Vel = 2.65	
289 to 290	60.17 59.95	8.00	30.43 60.63	2 2.157		10.000	100	14.465 0.095 0.424		Vel = 5.32	
290 to 291	59.95 59.74	8.00	30.97 91.6	2 2.157		10.000	100	14.984 0.091 0.909		Vel = 8.04	
291 to 292	59.74 59.52	8.00	31.98 123.58	2 2.157		10.000	100	15.984 0.095 1.583		Vel = 10.85	
292 to 293	59.52 59.3	8.00	33.62 157.2	2 2.157		10.000	100	17.662 0.095 2.471		Vel = 13.80	
293 to 294	59.3 59.09	8.00	35.98 193.18	2 2.157		10.000	100	20.228 0.091 3.617		Vel = 16.96	
294 to 295	59.09 57.54	8.00	39.14 232.32	2 2.157	X 7.466	73.070 7.465 80.535	100	23.936 0.671 40.977		Vel = 20.40	
295 to 276	57.54 54.950		0.0 232.32	2 2.157	T 8.783	2.600 8.783 11.383	100	65.584 1.122 5.791		Vel = 20.40	
276			0.0 232.32					72.497		K Factor = 27.29	
296 to 297	60.39 60.17	8.00	30.53 30.53	2 2.157		10.000	100	14.566 0.095 0.119		Vel = 2.68	
297 to 298	60.17 59.95	8.00	30.76 61.29	2 2.157		10.000	100	14.780 0.095 0.433		Vel = 5.38	
298 to 299	59.95 59.74	8.00	31.30 92.59	2 2.157		10.000	100	15.308 0.091 0.928		Vel = 8.13	
299 to 307	59.74 59.52	8.00	32.32 124.91	2 2.157		10.000	100	16.327 0.095 1.614		Vel = 10.97	

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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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	*****
307 to 304	59.52 59.3	8.00	33.98 158.89	2 2.157		10.000	100	18.036 0.095 2.520		Vel = 13.95	
304 to 305	59.3 59.09	8.00	36.35 195.24	2 2.157		10.000	100	20.651 0.091 3.689		Vel = 17.14	
305 to 306	59.09 57.54	8.00	39.55 234.79	2 2.157	X 7.466	73.070 7.465 80.535	100	24.431 0.671 41.785		Vel = 20.61	
306 to 277	57.54 54.950		0.0 234.79	2 2.157	T 8.783	2.570 8.783 11.353	100	66.887 1.122 5.890		Vel = 20.61	
277			0.0 234.79					73.899		K Factor = 27.31	



WIGINTON FIRE SYSTEMS
6363 GREENLAND RD.
JACKSONVILLE, FL. 32258
904-262-6107

Job Name : USCS PH3
Drawing : FP4
Location : 211 NE MCCLOSKEY AVE. LAKE CITY, FLORIDA. 32055
Remote Area : 5
Contract : 1010780
Data File : USCS PH3 AREA 5 REV1.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME USCS PH3
Location 211 NE MCCLOSKEY AVE. LAKE CITY, FLORIDA. 32055
Drawing # FP4
Contract # 1010780
Date 8-17-23

DESIGN

Remote area # 5
Remote area location
Occupancy classification
Density 0.2 - Gpm/SqFt
Area of application - SqFt
Coverage/sprinkler 324 - SqFt
Type of sprinkler calculated
Sprinklers calculated 10
In-rack demand - GPM
Hose streams 250 - GPM
Total water required (including hose streams) 969.556 - GPM @ 161.709 - Psi
Type of system
Volume of system (dry or pre-action) - Gal

WATER SUPPLY INFORMATION

Test date
Location
Source of info

CONTRACTOR INFO WIGINTON FIRE SYSTEMS
Address 6363 GREENLAND RD. / JACKSONVILLE, FL. 32258
Phone # 904-262-6107
Name of designer
Authority having jurisdiction
NOTES:

text1(35) - invisible

Water Supply Curve

WIGINTON FIRE SYSTEMS
USCS PH3

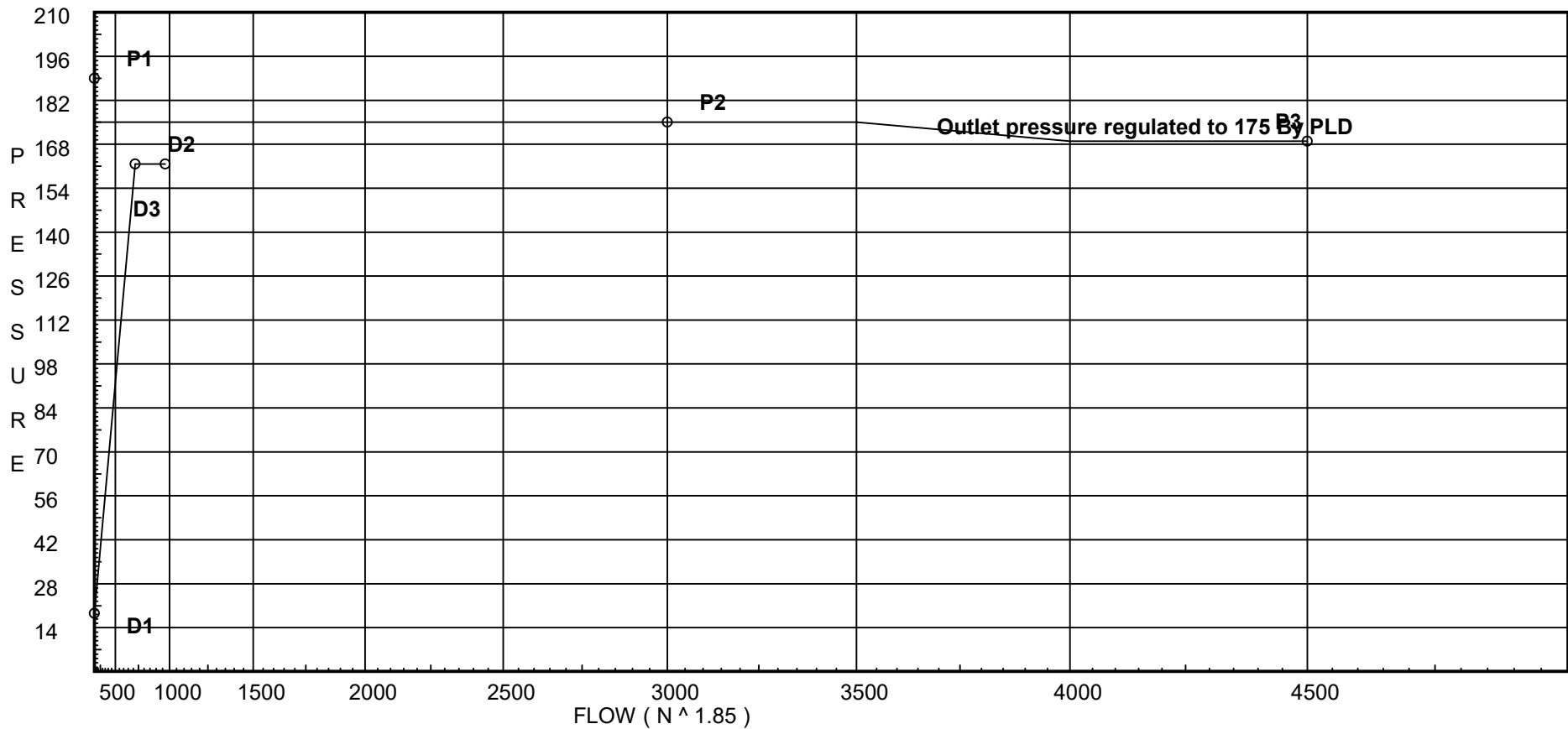
Page 2
Date

Pump Data:

P1 - Pump Churn Pressure : 189
P2 - Pump Rated Pressure : 175
P2 - Pump Rated Flow : 3000
P3 - Pump Pressure @ Max Flow : 169
P3 - Pump Max Flow : 4500

Demand:

D1 - Elevation : 18.593
D2 - System Flow : 719.556
D2 - System Pressure : 161.709
Hose (Demand) : 250
D3 - System Demand : 969.556
Safety Margin : 13.291



Fittings Used Summary

WIGINTON FIRE SYSTEMS
USCS PH3

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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	1	2	2	3	4	5	6	7	8	10	12	14	18	22	27	35	40	45	50	61
F	NFPA 13 45' Elbow	1	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
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	4.5	5.1	0	0	0	0	0

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

WIGINTON FIRE SYSTEMS
USCS PH3

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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>
PUMP	See Information on Pump Curve			189.442	969.56	161.709

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>	
310	42.93	14	23.77	68.26	0.2	324
312	42.69	14	26.53	72.12	0.2	324
314	42.67		33.32			
315	41.75		39.09			
316	41.75		40.38			
317	41.75		44.02			
800	41.75		107.4			
703	41.71		122.4			
702	42.08		126.57			
701	41.78		130.21			
700	25.1		137.98			
TR10	3.0		150.75			
BR10	3.0		153.96			
BOR9	3.0		153.98			
BOR8	3.0		154.0			
BOR7	3.0		154.02			
BOR6	3.0		154.04			
STU2	3.0		154.12			
UG5	-8.0		159.0			
UG4	-8.0		159.55	250.0		
UG2	-8.0		161.36			
UG1	-8.0		162.83			
UG	-8.0		164.68			
STUB	4.0		159.65			
PUMP	0.0		161.71			
320	42.93	14	21.6	65.07	0.2	324
321	42.69	14	24.14	68.78	0.2	324
322	42.67		31.36			
323	41.75		36.67			
324	42.93	14	29.1	75.52	0.2	324
325	42.69	14	32.4	79.7	0.2	324
326	42.67		37.15			
328	42.93	14	23.64	68.07	0.2	324
329	42.69	14	26.39	71.92	0.2	324
330	42.67		29.6			
331	41.75		35.34			
332	42.93	14	27.22	73.04	0.2	324
333	42.69	14	30.33	77.1	0.2	324
334	41.75		34.56			

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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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	*****
310 to 312	42.93 42.69	14.00	68.26	1.5			15.000	100	23.772 0.104			
			68.26	1.682			15.000	0.1772	2.658	Vel =	9.86	
312 to 314	42.69 42.67	14.00	72.12	1.5	2E	7.065	3.010 7.066 10.076	100	26.534 0.009 6.779			
			140.38	1.682			10.076	0.6728	6.779	Vel =	20.27	
314 to 315	42.67 41.75		0.0	1.5	T	7.065	0.920 7.066 7.986	100	33.322 0.398 5.373			
			140.38	1.682			7.986	0.6728	5.373	Vel =	20.27	
315 to 316	41.75 41.75		423.96	3			3.670	100	39.093 0.0			
			564.34	3.26			3.670	0.3515	1.290	Vel =	21.69	
316 to 317	41.75 41.750		0.0	3			10.330	100	40.383 0.0			
			564.34	3.26			10.330	0.3517	3.633	Vel =	21.69	
317 to 800	41.750 41.750		155.22	3			114.990	100	44.016 0.0			
			719.56	3.26			114.990	0.5512	63.387	Vel =	27.66	
800 to 703	41.750 41.71		0.0	4			100.000	100	107.403 0.017			
			719.56	4.26			100.000	0.1498	14.979	Vel =	16.20	
703 to 702	41.71 42.08		0.0	6	T	26.921	176.010 26.921 202.931	100	122.399 -0.160 4.327			
			719.56	6.357			202.931	0.0213	4.327	Vel =	7.27	
702 to 701	42.08 41.78		0.0	6	2V	17.947	146.770 17.947 164.717	100	126.566 0.130 3.512			
			719.56	6.357			164.717	0.0213	3.512	Vel =	7.27	
701 to 700	41.78 25.100		0.0	6	V	8.974	16.670 8.974 25.644	100	130.208 7.224 0.547			
			719.56	6.357			25.644	0.0213	0.547	Vel =	7.27	
700 to TR10	25.100 3		0.0	6	5V F	44.868 6.282	98.667 51.150 149.817	100	137.979 9.572 3.195			
			719.56	6.357			149.817	0.0213	3.195	Vel =	7.27	
TR10 to BR10	3 3		0.0	8	T 2B S 2V	29.339 20.118 37.721 21.794	21.990 98.073 120.063	100	150.746 2.500 0.719		** Fixed Loss = 2.5	
			719.56	8.249			120.063	0.0060	0.719	Vel =	4.32	
BR10 to BOR9	3 3		0.0	8			3.000	100	153.965 0.0			
			719.56	8.249			3.000	0.0060	0.018	Vel =	4.32	
BOR9 to BOR8	3 3		0.0	8			3.000	100	153.983 0.0			
			719.56	8.249			3.000	0.0060	0.018	Vel =	4.32	
BOR8 to BOR7	3 3		0.0	8			3.000	100	154.001 0.0			
			719.56	8.249			3.000	0.0060	0.018	Vel =	4.32	
BOR7 to BOR6	3 3		0.0	8			3.000	100	154.019 0.0			
			719.56	8.249			3.000	0.0060	0.018	Vel =	4.32	

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

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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	*****
BOR6 to STU2	3 3		0.0 719.56	8 8.249	V	10.897	2.290 10.897 13.187	100	154.037 0.0 0.079			
STU2 to UG5	3 -8		0.0 719.56	8 8.27	L	11.033	10.000 11.033 21.033	100	154.116 4.764 0.125	Vel =	4.32	
UG5 to UG4	-8 -8		0.0 719.56	8 7.68	L G	14.338 4.412	100.090 18.750 118.840	140	159.005 0.0 0.542	Vel =	4.30	
UG4 to UG2	-8 -8	H250	250.00 969.56	8 7.68	T	43.857	216.330 43.857 260.187	150	159.547 0.0 1.811	Vel =	4.98	
UG2 to UG1	-8 -8		0.0 969.56	8 7.68	T G	43.857 5.012	162.700 48.869 211.569	150	161.358 0.0 1.474	Vel =	6.71	
UG1 to UG	-8 -8		0.0 969.56	8 7.68	L	16.29	249.333 16.290 265.623	150	162.832 0.0 1.849	Vel =	6.71	
UG to STUB	-8 4		0.0 969.56	8 8.27	L	20.56	9.000 20.560 29.560	140	164.681 -5.197 0.163	Vel =	6.71	
STUB to PUMP	4 0		0.0 969.56	10 10.42	B 2L S	34.74 58.509 100.563	15.000 193.811 208.811	150	159.647 1.732 0.330	Vel =	5.79	
PUMP			0.0 969.56						161.709	K Factor =	76.24	
System Demand Pressure									161.709			
Safety Margin									13.291			
Regulated Pressure									175.000	PLD		
320 to 321	42.93 42.69	14.00	65.07	1.5			15.000	100	21.600 0.104			
321 to 322	42.69 42.67	14.00	65.07	1.682			15.000	0.1622	2.433	Vel =	9.40	
322 to 323	42.67 41.75		133.85	1.682			11.706	0.6160	7.211	Vel =	19.33	
323 to 315	41.75 41.75		290.12	3	T	7.065	0.920 7.066 7.986	100	31.357 0.398 4.920	Vel =	19.33	
315			423.97	3.26			11.670	0.2072	2.418	Vel =	16.30	
315			0.0 423.97						39.093	K Factor =	67.81	
324 to 325	42.93 42.69	14.00	75.52	1.5			15.000	100	29.096 0.104			
325 to 326	42.69 42.67	14.00	75.52	1.682			15.000	0.2137	3.205	Vel =	10.90	
326			79.69	1.5	E	3.533	2.310 3.533 5.843	100	32.405 0.009	Vel =	22.41	

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

Page 7
Date

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	*****
326 to 317	42.67 41.750		0.0 155.21	1.5 1.682	T	7.065	0.920 7.066 7.986	100 0.398 6.471		Vel = 22.41	
317			0.0 155.21					44.016		K Factor = 23.39	
328 to 329	42.930 42.690	14.00	68.07 68.07	1.5 1.682		15.000	100 0.1763	23.638 0.104 2.645		Vel = 9.83	
329 to 330	42.690 42.67	14.00	71.91 139.98	1.5 1.682	E	3.533	1.250 3.533 4.783	100 0.009 3.201		Vel = 20.21	
330 to 331	42.67 41.75		0.0 139.98	1.5 1.682	T	7.065	0.920 7.066 7.986	100 0.398 5.345		Vel = 20.21	
331 to 323	41.75 41.75		150.14 290.12	3 3.26		13.000	100 0.1027	35.340 0.0 1.335		Vel = 11.15	
323			0.0 290.12					36.675		K Factor = 47.91	
332 to 333	42.930 42.690	14.00	73.04 73.04	1.5 1.682		15.000	100 0.2009	27.215 0.104 3.013		Vel = 10.55	
333 to 334	42.690 41.75	14.00	77.10 150.14	1.5 1.682	E	3.533	1.480 3.533 5.013	100 0.407 3.819		Vel = 21.68	
334 to 331	41.75 41.75		0.0 150.14	3 3.26	T	14.388	11.350 14.387 25.737	100 0.0 0.782		Vel = 5.77	
331			0.0 150.14					35.340		K Factor = 25.26	



WIGINTON FIRE SYSTEMS
6363 GREENLAND RD.
JACKSONVILLE, FL. 32258
904-262-6107

Job Name : USCS PH3
Drawing : FP19
Location : 211 NE MCCLOSKEY AVENUE LAKE CITY, FL
Remote Area : 10
Contract : 1010780
Data File : USCS PH3 Area 10 REV1.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME USCS PH3
Location 211 NE MCCLOSKEY AVENUE LAKE CITY, FL
Drawing # FP19
Contract # 1010780
Date

DESIGN

Remote area # 10
Remote area location
Occupancy classification
Density - Gpm/SqFt
Area of application - SqFt
Coverage/sprinkler - SqFt
Type of sprinkler calculated
Sprinklers calculated 10
In-rack demand - GPM
Hose streams 500 - GPM
Total water required (including hose streams) 808.18 - GPM @ 141.265 - Psi
Type of system
Volume of system (dry or pre-action) - Gal

WATER SUPPLY INFORMATION

Test date
Location
Source of info

CONTRACTOR INFO WIGINTON FIRE SYSTEMS
Address 6363 GREENLAND RD. / JACKSONVILLE, FL. 32258
Phone # 904-262-6107
Name of designer
Authority having jurisdiction
NOTES:

text1(35) - invisible

Water Supply Curve

WIGINTON FIRE SYSTEMS
USCS PH3

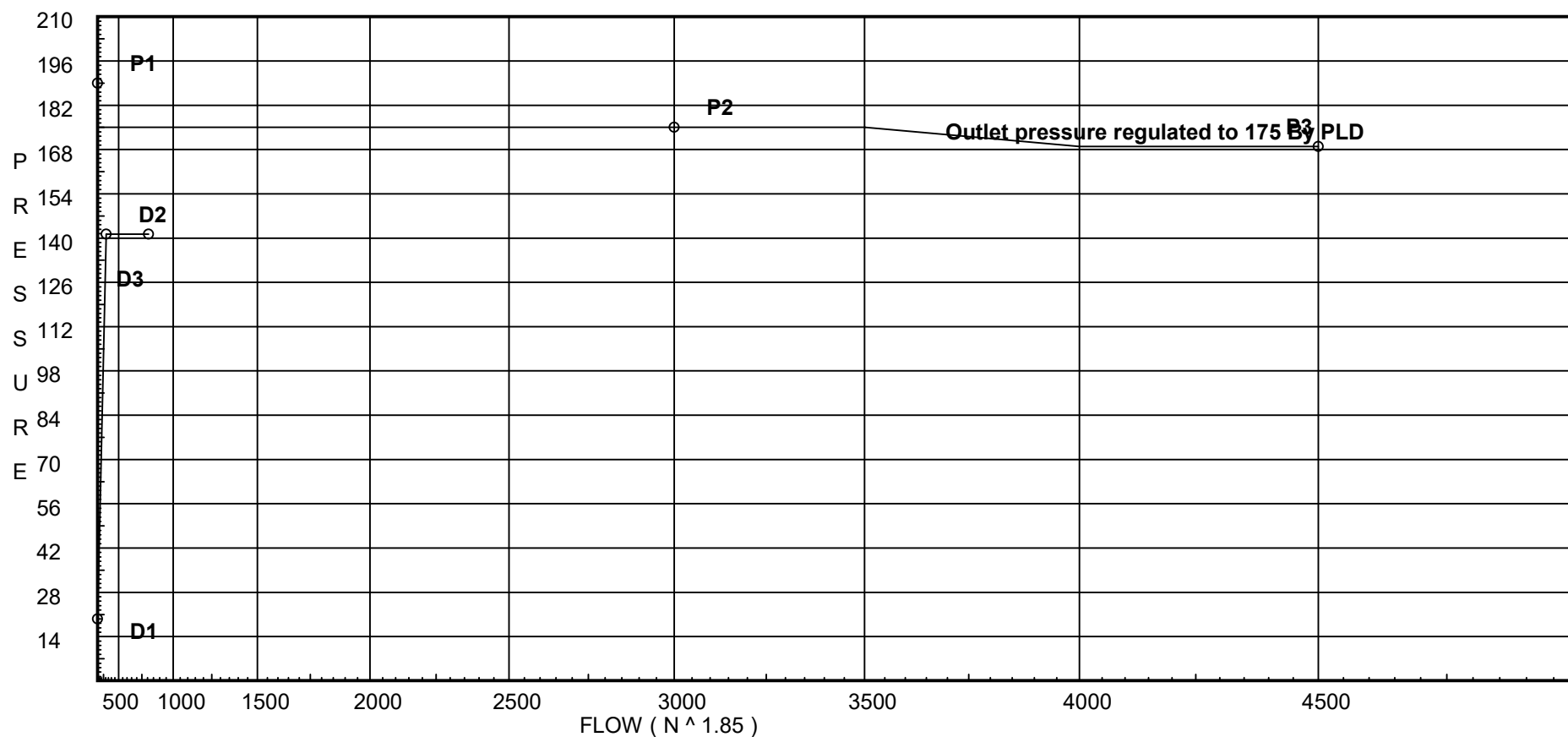
Page 2
Date

Pump Data:

P1 - Pump Churn Pressure : 189
P2 - Pump Rated Pressure : 175
P2 - Pump Rated Flow : 3000
P3 - Pump Pressure @ Max Flow : 169
P3 - Pump Max Flow : 4500

Demand:

D1 - Elevation : 19.632
D2 - System Flow : 308.18
D2 - System Pressure : 141.265
Hose (Demand) : 500
D3 - System Demand : 808.18
Safety Margin : 33.735



Fittings Used Summary

WIGINTON FIRE SYSTEMS
USCS PH3

Page 3
Date

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
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
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	4.5	5.1	0	0	0	0	0

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

WIGINTON FIRE SYSTEMS
USCS PH3

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Date

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>
PUMP	See Information on Pump Curve			189.315	808.18	141.265

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>	
H1	45.33	5.6	28.7	30.0	1.0	1
H2	45.33	5.6	28.77	30.04	1.0	1
H3	45.33	5.6	29.03	30.17	1.0	1
H4	45.33	5.6	29.81	30.58	1.0	1
H5	45.33	5.6	31.15	31.26	1.0	1
278	45.33		83.7			
407	45.33		84.86			
406	54.64		82.14			
404	54.6		84.39			
405A	54.6		88.78			
403	54.6		94.97			
402	54.47		97.14			
401	23.53		114.64			
400A	23.53		117.68			
400	23.44		120.68			
TOR9	23.37		122.05			
BOR9	3.0		135.76			
BOR8	3.0		135.77			
BOR7	3.0		135.77			
BOR6	3.0		135.77			
STU2	3.0		135.79			
UG5	-8.0		140.58			
UG4	-8.0		140.71	500.0		
UG2	-8.0		142.01			
UG1	-8.0		143.06			
UG	-8.0		144.38			
STUB	4.0		139.3			
PUMP	0.0		141.26			
H6	36.58	5.6	30.18	30.76	1.0	1
H7	36.58	5.6	30.28	30.82	1.0	1
H8	36.58	5.6	30.67	31.01	1.0	1
H9	36.58	5.6	31.49	31.42	1.0	1
H10	36.58	5.6	32.89	32.12	1.0	1
309	36.58		87.0			
408	36.58		88.36			
405	0.0		112.43			

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

Page 5
Date

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	*****
H1 to H2	45.33 45.33	5.60	30.00 30.0	2 2.157		8.830 8.830	120 0.0083	28.699 0.0 0.073		Vel = 2.63	
H2 to H3	45.33 45.33	5.60	30.04 60.04	2 2.157		8.830 8.830	120 0.0297	28.772 0.0 0.262		Vel = 5.27	
H3 to H4	45.33 45.33	5.60	30.17 90.21	2 2.157		8.830 8.830	100 0.0884	29.034 0.0 0.781		Vel = 7.92	
H4 to H5	45.33 45.33	5.60	30.58 120.79	2 2.157		8.830 8.830	100 0.1516	29.815 0.0 1.339		Vel = 10.61	
H5 to 278	45.33 45.33	5.60	31.26 152.05	2 2.157	T 8.783	217.480 8.783 226.263	100 0.2322	31.154 0.0 52.549		Vel = 13.35	
278 to 407	45.33 45.33		0.0 152.05	2.5 2.635	T 16.474	2.000 16.474 18.474	120 0.0625	83.703 0.0 1.155		Vel = 8.95	
407 to 406	45.33 54.64		156.13 308.18	3 3.26	V 6.72	9.300 6.720 16.020	120 0.0820	84.858 -4.032 1.313		Vel = 11.85	
406 to 404	54.64 54.6		0.0 308.18	3 3.26	T 14.388	5.083 14.387 19.470	100 0.1148	82.139 0.017 2.236		Vel = 11.85	
404 to 405A	54.6 54.6		0.0 308.18	3 3.26	V T 14.388	19.042 19.182 38.224	100 0.1148	84.392 0.0 4.390		Vel = 11.85	
405A to 403	54.6 54.6		0.0 308.18	3 3.26	V 4.796	49.083 4.795 53.878	100 0.1148	88.782 0.0 6.186		Vel = 11.85	
403 to 402	54.6 54.47		0.0 308.18	3 3.26	V 4.796	13.583 4.795 18.378	100 0.1149	94.968 0.056 2.111		Vel = 11.85	
402 to 401	54.47 23.53		0.0 308.18	3 3.26	V 4.796	30.940 4.795 35.735	100 0.1148	97.135 13.400 4.104		Vel = 11.85	
401 to 400A	23.53 23.53		0.0 308.18	3 3.26	V 4.796	21.708 4.795 26.503	100 0.1148	114.639 0.0 3.043		Vel = 11.85	
400A to 400	23.53 23.44		0.0 308.18	3 3.26	V 4.796	21.000 4.795 25.795	100 0.1148	117.682 0.039 2.962		Vel = 11.85	
400 to TOR9	23.44 23.37		0.0 308.18	4 4.26	2V 12.78	30.084 12.780 42.864	100 0.0312	120.683 0.030 1.338		Vel = 6.94	
TOR9 to BOR9	23.37 3		0.0 308.18	4 4.26	T 2B S 26.334 31.601 28.968	20.370 86.903 107.273	120 0.0223	122.051 11.322 2.389		* * Fixed Loss = 2.5 Vel = 6.94	

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

Page 6
Date

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	*****
BOR9 to BOR8	3 3		0.0 308.18	8 8.249			3.000 3.000	100 0.0013	135.762 0.0 0.004		Vel = 1.85	
BOR8 to BOR7	3 3		0.0 308.18	8 8.249			3.000 3.000	100 0.0013	135.766 0.0 0.004		Vel = 1.85	
BOR7 to BOR6	3 3		0.0 308.18	8 8.249			3.000 3.000	100 0.0010	135.770 0.0 0.003		Vel = 1.85	
BOR6 to STU2	3 3		0.0 308.18	8 8.249	V	10.897	2.280 10.897 13.177	100 0.0013	135.773 0.0 0.017		Vel = 1.85	
STU2 to UG5	3 -8		0.0 308.18	8 8.27	L	15.459	10.000 15.459 25.459	120 0.0009	135.790 4.764 0.022		Vel = 1.84	
UG5 to UG4	-8 -8		0.0 308.18	8 7.68	T G	38.602 4.412	100.090 43.014 143.104	140 0.0010	140.576 0.0 0.136		Vel = 2.13	
UG4 to UG2	-8 -8	H500	500.00 808.18	8 7.68	T	43.857	216.330 43.857 260.187	150 0.0050	140.712 0.0 1.294		Vel = 5.60	
UG2 to UG1	-8 -8		0.0 808.18	8 7.68	T G	43.857 5.012	162.700 48.869 211.569	150 0.0050	142.006 0.0 1.052		Vel = 5.60	
UG1 to UG	-8 -8		0.0 808.18	8 7.68	L	16.29	249.333 16.290 265.623	150 0.0050	143.058 0.0 1.320		Vel = 5.60	
UG to STUB	-8 4		0.0 808.18	8 8.27	L	20.56	9.000 20.560 29.560	140 0.0040	144.378 -5.197 0.117		Vel = 4.83	
STUB to PUMP	4 0		0.0 808.18	10 10.42	B 2L S	34.74 58.509 100.563	15.000 193.811 208.811	150 0.0011	139.298 1.732 0.235		Vel = 3.04	
PUMP			0.0 808.18						141.265		K Factor = 68.00	
System Demand Pressure									141.265			
Safety Margin									33.735			
Regulated Pressure									175.000		PLD	
H6 to H7	36.58 36.58	5.60	30.76	2 2.157			8.830 8.830	100 0.0121	30.176 0.0 0.107		Vel = 2.70	
H7 to H8	36.58 36.58	5.60	30.82	2 2.157			8.830 8.830	100 0.0436	30.283 0.0 0.385		Vel = 5.41	
H8 to H9	36.58 36.58	5.60	31.01	2 2.157			8.830 8.830	100 0.0929	30.668 0.0 0.820		Vel = 8.13	
H9 to H10	36.58 36.58	5.60	31.43	2 2.157			8.830 8.830	100 0.1592	31.488 0.0 1.406		Vel = 10.89	

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

Page 7
Date

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	*****
H10 to 309	36.58 36.58	5.60	32.11 156.13	2 2.157	T	8.783 221.833	100 0.2439	32.894 0.0 54.110		Vel = 13.71	
309 to 408	36.58 36.58		0.0 156.13	2.5 2.635	T	11.758 14.757	100 0.0920	87.004 0.0 1.358		Vel = 9.19	
408 to 407	36.58 45.33		0.0 156.13	3 3.26		8.750 8.750	100 0.0327	88.362 -3.790 0.286		Vel = 6.00	
407			0.0 156.13					84.858		K Factor = 16.95	
405 to 405A	0 54.6		0.0 0.0	3 3.26	T	14.388 19.429	100 0	112.429 -23.647 0.0		Vel = 0	
405A			0.0 0.0					88.782		K Factor = 0	



WIGINTON FIRE SYSTEMS
6363 GREENLAND RD.
JACKSONVILLE, FL. 32258
904-262-6107

Job Name : USCS PH3
Drawing : FP19
Location : 211 NE MCCLOSKEY AVENUE LAKE CITY, FL
Remote Area : 12
Contract : 1010780
Data File : USCS PH3 AREA 12 REV1.WXF

HYDRAULIC CALCULATIONS
for

JOB NAME USCS PH3
Location 211 NE MCCLOSKEY AVENUE LAKE CITY, FL
Drawing # FP19
Contract # 1010780
Date

DESIGN

Remote area # 12
Remote area location AREA 12
Occupancy classification
Density 0.3 - Gpm/SqFt
Area of application - SqFt
Coverage/sprinkler - SqFt
Type of sprinkler calculated
Sprinklers calculated 10
In-rack demand - GPM
Hose streams 500 - GPM
Total water required (including hose streams) 807.131 - GPM @ 133.404 - Psi
Type of system
Volume of system (dry or pre-action) - Gal

WATER SUPPLY INFORMATION

Test date
Location
Source of info

CONTRACTOR INFO WIGINTON FIRE SYSTEMS
Address 6363 GREENLAND RD. / JACKSONVILLE, FL. 32258
Phone # 904-262-6107
Name of designer
Authority having jurisdiction
NOTES:

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Water Supply Curve

WIGINTON FIRE SYSTEMS
USCS PH3

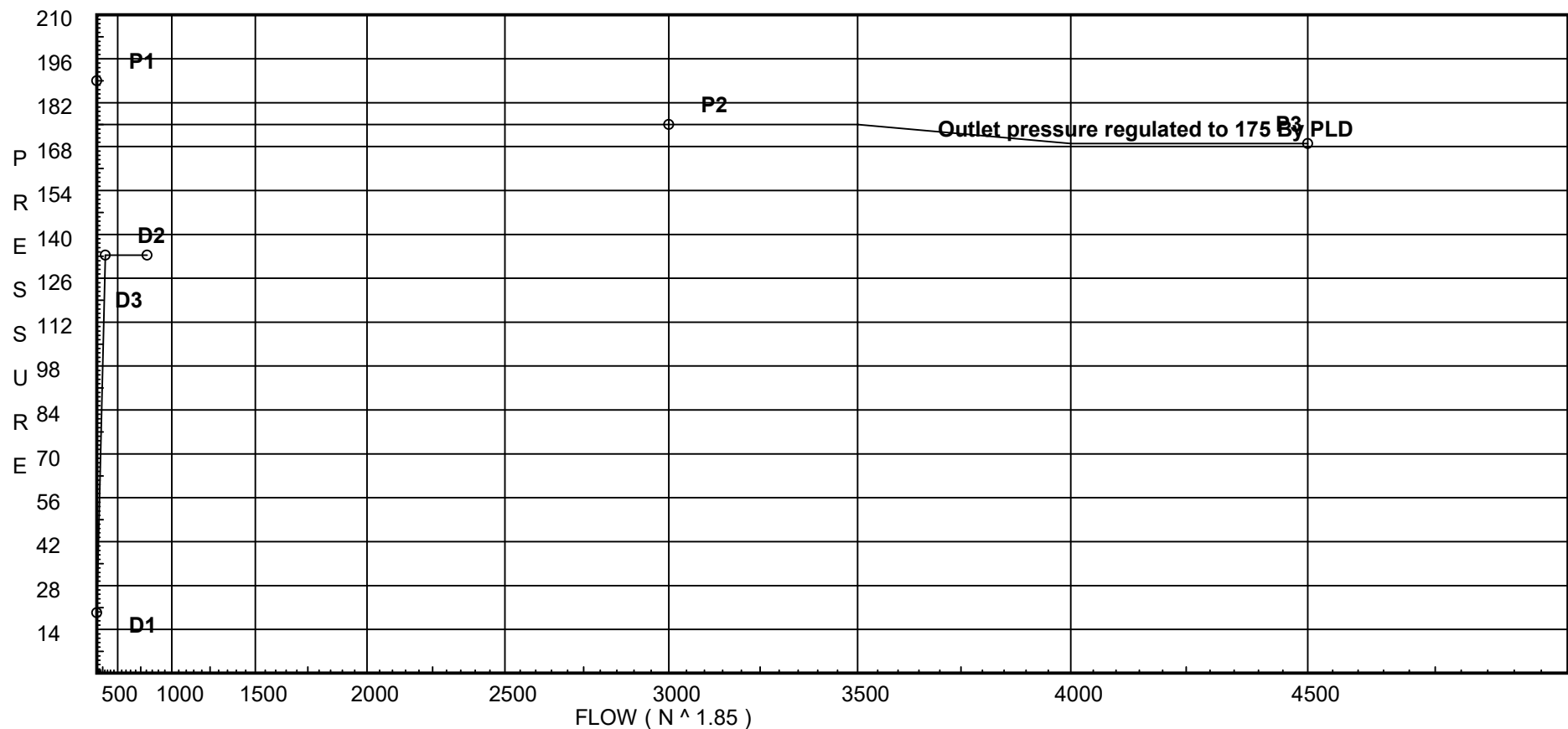
Page 2
Date

Pump Data:

P1 - Pump Churn Pressure : 189
P2 - Pump Rated Pressure : 175
P2 - Pump Rated Flow : 3000
P3 - Pump Pressure @ Max Flow : 169
P3 - Pump Max Flow : 4500

Demand:

D1 - Elevation : 19.325
D2 - System Flow : 307.131
D2 - System Pressure : 133.404
Hose (Demand) : 500
D3 - System Demand : 807.131
Safety Margin : 41.596



Fittings Used Summary

WIGINTON FIRE SYSTEMS
USCS PH3

Page 3
Date

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
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
L	NFPA 13 Long Turn Elbow	0.5	1	2	2	2	3	4	5	5	6	8	9	13	16	18	24	27	30	34	40
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
V	90' Ell Firelock #001	0	0	0	0	0	3.5	4.3	5	0	6.8	8.5	10	13	4.5	5.1	0	0	0	0	0

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

WIGINTON FIRE SYSTEMS
USCS PH3

Page 4
Date

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>
PUMP	See Information on Pump Curve			189.314	807.13	133.404

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>	
H21	44.62	5.6	28.67	29.98	0.3	1
H22	44.62	5.6	28.77	30.04	0.3	1
H23	44.62	5.6	29.14	30.23	0.3	1
H24	44.62	5.6	29.92	30.63	0.3	1
H25	44.62	5.6	31.26	31.31	0.3	1
609	0.0		104.92			
607	44.62		86.71			
606	58.38		86.53			
605	0.0		112.54			
604	58.38		88.7			
604A	58.38		90.78			
603	54.5		93.89			
602	54.47		94.55			
601	23.53		110.13			
611	23.53		110.89			
600A	23.41		112.18			
600	23.41		115.92			
TOR7	23.13		116.29			
BOR7	3.0		127.92			
BOR6	3.0		127.92			
STU2	3.0		127.94			
UG5	-8.0		132.73			
UG4	-8.0		132.86	500.0		
UG2	-8.0		134.15			
UG1	-8.0		135.2			
UG	-8.0		136.52			
STUB	4.0		131.44			
PUMP	0.0		133.4			
H26	36.17	5.6	29.72	30.53	0.3	1
H27	36.17	5.6	29.82	30.58	0.3	1
H28	36.17	5.6	30.2	30.77	0.3	1
H29	36.17	5.6	31.01	31.18	0.3	1
H30	36.17	5.6	32.39	31.87	0.3	1
610	0.0		104.22			
608	36.17		89.69			

Final Calculations : Hazen-Williams

WIGINTON FIRE SYSTEMS
USCS PH3

Page 5
Date

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	*****
H21 to H22	44.62 44.62	5.60	29.98 29.98	2 2.157		8.830 8.830	100 0.0116	28.669 0.0 0.102		Vel = 2.63	
H22 to H23	44.62 44.62	5.60	30.04 60.02	2 2.157		8.830 8.830	100 0.0416	28.771 0.0 0.367		Vel = 5.27	
H23 to H24	44.62 44.62	5.60	30.23 90.25	2 2.157		8.830 8.830	100 0.0884	29.138 0.0 0.781		Vel = 7.92	
H24 to H25	44.62 44.62	5.60	30.63 120.88	2 2.157		8.830 8.830	100 0.1520	29.919 0.0 1.342		Vel = 10.61	
H25 to 609	44.62 0	5.60	31.31 152.19	2 2.157	V 3.074	230.460 3.074 233.534	100 0.2327	31.261 19.325 54.333		Vel = 13.36	
609 to 607	0 44.62		0.0 152.19	2.5 2.635	T 11.758	1.000 11.757 12.757	100 0.0878	104.919 -19.325 1.120		Vel = 8.95	
607 to 606	44.62 58.38		154.94 307.13	2.5 2.635	V 4.213	13.750 4.213 17.963	100 0.3217	86.714 -5.959 5.779		Vel = 18.07	
606 to 605	58.38 0		0.0 307.13	3 3.26	V 4.796	1.500 4.795 6.295	100 0.1141	86.534 25.284 0.718		Vel = 11.81	
605 to 604	0 58.38		0.0 307.13	3 3.26	V 4.796	7.917 4.795 12.712	100 0.1141	112.536 -25.284 1.450		Vel = 11.81	
604 to 604A	58.38 58.38		0.0 307.13	3 3.26	V 4.796	13.375 4.795 18.170	100 0.1141	88.702 0.0 2.074		Vel = 11.81	
604A to 603	58.38 54.5		0.0 307.13	4 4.26	V 6.39	39.750 6.390 46.140	100 0.0310	90.776 1.680 1.431		Vel = 6.91	
603 to 602	54.5 54.47		0.0 307.13	4 4.26	V 6.39	14.660 6.390 21.050	100 0.0310	93.887 0.013 0.652		Vel = 6.91	
602 to 601	54.47 23.530		0.0 307.13	4 4.26	V 6.39	63.833 6.390 70.223	100 0.0310	94.552 13.400 2.178		Vel = 6.91	
601 to 611	23.530 23.530		0.0 307.13	4 4.26	2V 12.78	11.833 12.780 24.613	100 0.0310	110.130 0.0 0.763		Vel = 6.91	
611 to 600A	23.530 23.410		0.0 307.13	4 4.26		39.700 39.700	100 0.0310	110.893 0.052 1.231		Vel = 6.91	
600A to 600	23.410 23.410		0.0 307.13	4 4.26		120.667 120.667	100 0.0310	112.176 0.0 3.742		Vel = 6.91	

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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	*****
600 to TOR7	23.410 23.13		0.0 307.13	6 6.357	4V 26.921 17.947 28.716	35.894 20.375 35.895 56.270	100 0.0044	115.918 0.121 0.248		Vel = 3.10	
TOR7 to BOR7	23.13 3		0.0 307.13	6 6.357	T 2B S	20.130 73.583 93.713	100 0.0044	116.287 11.218 0.414		* * Fixed Loss = 2.5 Vel = 3.10	
BOR7 to BOR6	3 3		0.0 307.13	8 8.249		3.000 3.000	100 0.0013	127.919 0.0 0.004		Vel = 1.84	
BOR6 to STU2	3 3		0.0 307.13	8 8.249	V 10.897	2.280 10.897 13.177	100 0.0012	127.923 0.0 0.016		Vel = 1.84	
STU2 to UG5	3 -8		0.0 307.13	8 8.27	L 15.459	10.000 15.459 25.459	120 0.0009	127.939 4.764 0.023		Vel = 1.83	
UG5 to UG4	-8 -8		0.0 307.13	8 7.68	T G 4.412	100.090 43.014 143.104	140 0.0009	132.726 0.0 0.135		Vel = 2.13	
UG4 to UG2	-8 -8	H500	500.00 807.13	8 7.68	T 43.857	216.330 43.857 260.187	150 0.0050	132.861 0.0 1.290		Vel = 5.59	
UG2 to UG1	-8 -8		0.0 807.13	8 7.68	T G 5.012	162.700 48.869 211.569	150 0.0050	134.151 0.0 1.050		Vel = 5.59	
UG1 to UG	-8 -8		0.0 807.13	8 7.68	L 16.29	249.333 16.290 265.623	150 0.0050	135.201 0.0 1.317		Vel = 5.59	
UG to STUB	-8 4		0.0 807.13	8 8.27	L 20.56	9.000 20.560 29.560	140 0.0039	136.518 -5.197 0.116		Vel = 4.82	
STUB to PUMP	4 0		0.0 807.13	10 10.42	B 2L S	34.74 58.509 100.563	150 0.0011	131.437 1.732 0.235		Vel = 3.04	
PUMP			0.0 807.13					133.404		K Factor = 69.88	
System Demand Pressure								133.404			
Safety Margin								41.596			
Regulated Pressure								175.000		PLD	
H26 to H27	36.17 36.17	5.60	30.53 30.53	2 2.157		8.830 8.830	100 0.0120	29.715 0.0 0.106		Vel = 2.68	
H27 to H28	36.17 36.17	5.60	30.58 61.11	2 2.157		8.830 8.830	100 0.0429	29.821 0.0 0.379		Vel = 5.37	
H28 to H29	36.17 36.17	5.60	30.77 91.88	2 2.157		8.830 8.830	100 0.0915	30.200 0.0 0.808		Vel = 8.07	
H29 to H30	36.17 36.17	5.60	31.19 123.07	2 2.157		8.830 8.830	100 0.1571	31.008 0.0 1.387		Vel = 10.81	

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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	*****
H30 to 610	36.17 0	5.60	31.87 154.94	2 2.157	V	3.074 233.534	100 0.2405	32.395 15.665 56.161		Vel = 13.60	
610 to 608	0 36.17		0.0 154.94	2.5 2.635	T	16.474 17.474	120 0.0647	104.221 -15.665 1.131		Vel = 9.12	
608 to 607	36.17 44.62		0.0 154.94	2.5 2.635		10.600 10.600	120 0.0648	89.687 -3.660 0.687		Vel = 9.12	
607			0.0 154.94					86.714		K Factor = 16.64	